PROJECT MANUAL

CJC 2nd Floor Remodel
Blackwell-Thurman Criminal Justice Center
509 W. 11th Street, Austin, Texas

IFB No.: B1502-001-JE
FMD Project No.: CJC-52-14R-3R
Issue Date: February 11, 2015

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TRAVIS COUNTY FACILITIES MANAGEMENT DEPARTMENT
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Travis County, Texas

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IFB. No.: B1502-001-JE
FMD Project No. CJC-52-14R-3R
SECTION 011000 – SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Work under separate contracts.
5. Future work.
6. Purchase contracts.
7. Work that is Owner-furnished/Owner-installed (OF/OI)
8. Work that is Contractor-furnished, Owner-installed (CF/OI)
10. Work restrictions.

B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: CJC 2nd Floor Remodel

1. Project Location: 509 W. 11th Street, Austin, Texas

B. Owner: Travis County

1. Owner's Representative: Roger A. El Khoury, M.S., P.E., Director, Facilities Management Dept.

C. Design Team Consultants: The Owner has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Mechanical, Electrical, Plumbing Engineer and Commissioning Agent: TTG Goetting, 12710 Research Blvd., #355, Austin, Texas 78759.
1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. The Project is an interior remodel of a portion of the 2nd Floor of the Blackwell-Thurman Criminal Justice Center. The 2nd Floor is presently occupied by part of the Travis County Jail and is inaccessible to the 2nd Floor office space currently occupied by the District Attorney. The project will be the office space portion that is approximately 16,000 SF. This area will be vacated by the DA and selectively demolished for construction of two courtrooms, two jury rooms, conference rooms, office spaces, public waiting areas, public restrooms, staff restrooms, jury deliberation suites and a prisoner holding area that will connect to the jail transport elevators. These elevators will require programming changes and opening new doorways to allow the two elevators to stop on the 2nd Floor. This is a secure facility and access will be limited and restricted. The other floors of the building will remain in operation as courts and offices. Noise, dust control and materials handling will be restricted to minimize disruption of court proceedings and other Owner occupancy. Refer to the Contract Documents for more information.

B. Type of Contract

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

1.5 PHASED CONSTRUCTION

A. The Work will be conducted in one phase.

B. Prior to commencing Work, in accordance with requirements in Paragraph 4.10 of General Conditions and Section 013200 of General Requirements, submit the Contractor's Construction Schedule indicating tasks, the critical path sequence of the Work, commencement, substantial completion and final completion dates.

1.6 WORK BY OWNER

A. General: Cooperate fully with Owner so the Work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Preceding Work: None

C. Concurrent Work:

1. Owner will perform data cabling work under separate contracts using County vendors.

2. Security access equipment and installation will be by a County Vendor under separate contract. Refer to the Contract Documents for any required infrastructure wiring or other requirements to support this work.
D. Subsequent Work: FF&E delivery and installation will occur immediately following substantial completion. Other work may occur and will be coordinated with Contractor.

1.7 OWNER-FURNISHED PRODUCTS

A. Owner will furnish the following products. The Work includes receiving, unloading, handling, storing, protecting, and installing these Owner-furnished products.

B. Owner-Furnished Products:

1. Restroom accessories: Jumbo toilet paper holders, jumbo paper towel dispensers, hand soap dispensers, toilet seat cover dispensers, sanitary napkin dispensers. Restroom accessories not named herein are to be provided by the Contractor.

1.8 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the limits of construction and as indicated by requirements of this Section. Do not disturb portions of Project site beyond areas in which the Work is indicated without prior written authorization by the County Project Manager.

B.

1. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, the general public and emergency vehicles at all times. Do not use these areas for parking or storage of materials without prior written authorization by the County Project Manager. Coordinate each operation with the County Project Manager.

2. The Criminal Justice Center and Jail are secure facilities under the security jurisdiction of the Travis County Sheriff. Contractor personnel are subject to the rules of the Sheriff. Background checks and access badges will be required for access to portions of the facility that are not secured as part of the project site on the 2nd Floor.

3. The 2nd floor project site will be secured by temporary doors to be installed by Contractor as part of the Work. These doors will be alarmed with delayed egress hardware for emergency use or by card key access of authorized personnel. The Contractor will provide an exterior construction elevator for equipment, materials and personnel access to the 2nd floor. Installation and removal will be under the contract along with restoration of parts of the building and grounds affected by the elevator installation and use.

4. Equipment and materials lay-down space will be limited and will require authorization of the Project Manager.
1.9 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations and restrictions on use of public streets and rights-of-way by authorities having jurisdiction. The Contractor will be required to provide necessary permits and traffic controls.

B. On-Site Work Hours: County work hours are between 8:00 AM and 5:00 PM, Monday thru Friday. No utility shutdowns, major material deliveries or other disruptive activities will be permitted during standard County work hours unless by prior written authorization of the Owner (County Project Manager).

1. Weekend Hours: Schedule with Owner.
2. Early Morning and Late Evening Hours: Schedule with Owner.
3. Hours for Utility Shutdowns: Schedule with Owner.
4. Hours for noisy activities: Coordinate with Owner. Schedule noisy activities outside County work hours unless advance approval has been obtained from the Owner. The Contractor will be required to immediately stop any noisy work upon notification from the Owner. Typically, this may be required if the work is disrupting courtroom proceedings on other floors. The Contractor will not be compensated for delay caused by these shut down requests.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless Contractor has satisfied the following conditions:

1. Notify Owner not less than seven days in advance of proposed utility interruptions.
2. Coordinate schedule for utility interruptions with Owner.
3. Obtain Owner's written permission before proceeding with utility interruptions. If required by Owner, provide temporary utilities at no additional cost to Owner.

D. Nonsmoking Building and Site: Smoking is not permitted within any County building or outdoors on any County property.

E. Controlled Substances: Use of controlled substances on the Project site is prohibited.

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. Specifications requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications and indicated on the Drawings.

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 scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.11 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 012100 - ALLOWANCES

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 governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:
   1. Unit-cost allowances.
   2. Lump-sum allowances.

1.3 SUBMITTALS

A. Submit proposals for rental of equipment included in allowances, in the form specified for Change Orders.

B. Submit documentation to show cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

A. Coordinate allowance items with other portions of the Work

B. If applicable, allowance shall include any rental cost to the Contractor including maintenance, set up and tear down.

1.5 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between actual costs and the allowance.

   1. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Confirm that conditions are acceptable for installation of allowance items and that prior work has been coordinated.

3.2 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Construction Elevator installed on the side of the building and extending from the ground to the 2nd floor. Use the following assumptions:

1. Assume that monthly rent for the Construction Elevator will be $8,000 and that the rental period will be for seven (7) months. Total rental allowance, including traffic controls specific to the elevator, mobilization, maintenance, inspection and demobilization will be $56,000.

2. Allowance for repair of the building, including window removal/replacement, temporary plywood infill, patching of anchor bolt holes and restoration of landscaping around the base of the elevator will be $6,000.

B. Allowance No. 2: Interior building signage including all costs for fabrication, delivery and installation:

1. Room identification signs: $125 x 62 = $4,650.

2. Courtroom identification signs over courtroom doors: $1,500 x 2 = $3,000.

3. Bronze or aluminum seals, one each of State of Texas and Travis County for installation on the wall behind the two judges’ benches: $1,500 x 2 = $3,000.

4. Emergency evacuation signs: $150 x 4 = $400.

5. 2nd Floor wayfinding signs: lump sum of $1000.

6. Modifications to Courts Directories in Lobby, Elevators and other areas of the building: lump sum of $1500.

C. Allowance No. 3: Four (4) Counsel Tables, two in each courtroom. Tables are to be custom made and match the existing tables in the courtrooms on the upper floors. Examine the existing tables for size, type of wood, finish and construction. Obtain at least two bids from custom woodwork shops who are qualified to fabricate tables of this type.

1. Allowance for tables to include examination, bidding, shop drawings, materials, labor, transportation and installation: $2,000 x 4 = $8,000.

END OF SECTION 012100
SECTION 012500 - SUBSTITUTION 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 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specifications Section number and title and Drawing numbers and titles.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

   a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
   b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
   c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.

f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

i. Research reports evidencing compliance with building codes in effect for Project.

j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

2. Owner's Action: If necessary, Owner will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Owner will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.


b. Use product specified if Owner does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

   A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

   A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.
PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause:  Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions:  Owner will consider Contractor's request for substitution when the following conditions are satisfied.  If the following conditions are not satisfied, Owner will return requests without action, except to record noncompliance with these requirements:

   a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   b. Substitution request is fully documented and properly submitted.
   c. Requested substitution will not adversely affect Contractor's construction schedule.
   d. Requested substitution has received necessary approvals of authorities having jurisdiction.
   e. Requested substitution is compatible with other portions of the Work.
   f. Requested substitution has been coordinated with other portions of the Work.
   g. Requested substitution provides specified warranty.
   h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience:  Owner will consider requests for substitution if received within 60 days after the Notice of Award.  Requests received after that time may be considered or rejected at discretion of Owner.

1. Conditions:  Owner will consider Contractor's request for substitution when the following conditions are satisfied.  If the following conditions are not satisfied, Owner will return requests without action, except to record noncompliance with these requirements:

   a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume.  Owner's additional responsibilities may include compensation to Owner's consultants for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   b. Requested substitution does not require extensive revisions to the Contract Documents.
   c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.

f. Requested substitution has received necessary approvals of authorities having jurisdiction.

g. Requested substitution is compatible with other portions of the Work.

h. Requested substitution has been coordinated with other portions of the Work.

i. Requested substitution provides specified warranty.

j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

C. The Contractor's submittal and the Owner's acceptance of Shop Drawings, Product Data or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specifications Sections, apply to this Section. Refer particularly to Section 00700, Article 12, Changes in Work.

1.2 SUMMARY

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

1.3 CHANGES IN THE WORK

A. Authority to issue changes in the work rests solely with the Owner. Approval may be required by the Travis County Commissioners Court (the Commissioners Court).

1.4 CHANGE PROPOSAL REQUEST (CPR)

A. The Change Proposal Request (CPR) will be issued for all construction changes necessitated as a result of design errors or omissions, unknown conditions, code compliance requirements or Owner requested changes.

B. Owner-Initiated CPR's: Owner will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. CPR's issued by Owner are not instructions either to stop work in progress or to execute the proposed change.

2. Within 10 working days after receipt of a CPR, submit a detailed proposal for adjustments to the Contract Sum and, if applicable, the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

c. Include costs of labor and supervision directly attributable to the change.

d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

e. Comply with applicable Articles of Section 00700.

f. Quotation Form: Use forms acceptable to Owner.
C. Contractor-Initiated CPR's: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a CPR to Owner.

1. Include a statement outlining reasons for the requested change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. CPR form: Use form acceptable to Owner.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: Refer to Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

1.6 CHANGE ORDER (CO) PROCEDURES

A. Following Owner's approval of a CPR, or several CPR's, Owner will issue a CO for approval signatures.

1. The CO form will be first signed by Contractor and 3 original signed documents returned to Owner. The FMD Project Manager and Director will sign and forward to the Purchasing Agent. If required, the CO will then be considered for approval by the Commissioners Court.
2. Original signed and approved CO documents will be distributed to Contractor, Purchasing Office and FMD.

1.7 CONSTRUCTION CHANGE DIRECTIVE (CCD)

A. Owner may issue a CCD instructing the Contractor to proceed with a change in the Work prior to execution of a CO.

1. The CCD contains a complete description of changes in the Work and designates method to be followed to later determine changes in the Contract Sum and/or the Contract Time. Refer to Section 00700, Article 12 for specific requirements.
B. Documentation: Maintain detailed records on a time and material basis of work required by the CCD.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.8 Architect’s Supplemental Instructions (ASI)

A. Owner or, if applicable, Owner's consulting Architect will issue ASI’s authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 012900 - PAYMENT 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 Specifications Sections, apply to this Section.

1.2 SUMMARY

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

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.

1.4 SCHEDULE OF VALUES

A. The Schedule of Values shall comply with the General Conditions, Article 9. The Schedule of Values is a breakdown of the various costs included in the Construction Contract and is used as the basis for reviewing Contractor’s Applications for Payment. Contractor is required to submit this schedule to the Owner's Representative at the earliest possible date but no later than 15 days following issuance of the Notice to Proceed. Included with this submission must be the Contractor’s Construction Schedule for the entire Project. Refer to Section 013200 for Construction Schedule requirements.

B. Coordination: Coordinate preparation of the items in the Schedule of Values with preparation of the tasks in Contractor’s Project Schedule. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
   1. Application for Payment forms with Continuation Sheets.
   2. Tasks in Contractor’s Project Schedule.
   3. Submittal Schedule

C. Format and Content

Use AIA form G703. Use Contractor’s Project Manual table of contents, arranged in accordance with CSI “Masterformat”, as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Section of the Specifications or as necessary to indicate subcontract division of the Work.

   1. Include the following Project identification on the Schedule of Values:
      a. Project name and location
      b. Travis County Project Number, Contract Number, and Purchase Order Number
      c. Contractor’s name and address
      d. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
   a. Related Specifications Section or Division.
   b. Description of Work.
   c. Signed Change Orders (nos.) that affect value.
   d. Dollar value. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports.
   a. Provide separate line items of principal subcontract amounts in excess of five percent of Contract Sum.
   b. Provide separate line items for LEED documentation requirements, by Contractor and principal subcontractors, for which the amounts exceed five percent of the Contract Sum.
   c. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
   d. For all items except those related to Sitework, provide separate costs for each of the 6 building sections.
   e. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   f. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
   g. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
   h. At a minimum, provide separate line items in the Schedule of Values for the following parts of the Work:
      - General Conditions
      - Mobilization and demobilization
      - Insurance and bonds
   i. Temporary facilities and other major cost items that are not direct cost of actual work-in-place shall be shown as separate line items in the Schedule of Values.
   j. Each item in the Schedule of Values and Applications for Payment shall be complete.
   k. Schedule Updating: Update and resubmit the Schedule of Values before the next Application for Payment when fully executed and signed Change Orders result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT
A. Contractor's monthly Application for Payment shall comply with General Conditions, Article 9. It shall be on AIA form G702, showing the time period of the Work covered. The Application for Payment shall include and be consistent with an updated Schedule of Values. Each Application for Payment shall be consistent with previous Owner-approved applications and shall include supporting documents, including:
1. Updated Contractor's Construction Schedule, as required by Section 013200.
2. Updated HUB Subcontractor Payment Report as set out in Section 00400 HUB Program Requirements
3. List of stored materials, related insurance letter or certificate, and other required documentation

B. In each Application for Payment, the amount requested for General Conditions items may not exceed the percentage of completion of the Project as shown in the Application, and the Owner shall not be obligated to pay any such excess amount, unless otherwise approved in writing by the Owner prior to approval of the initial Schedule of Values.

C. At least five (5) days prior to the due date for submission of Application for Payment, Contractor shall provide to the Owner’s Representative a draft Application for Payment. Upon receipt of the draft Application for Payment, the Owner’s Representative, with Contractor’s representative, may visit the area(s) where the Work is in progress. Based on his observations, the Owner’s Representative may request Contractor to make adjustments before submitting the notarized Application for Payment.

D. Contractor shall submit to the Owner one (1) signed, notarized copy of the Application for Payment, Schedule of Values and supporting documents. Applications for Payment shall be submitted and Owner shall make payments in accordance with Article 9 of the General Conditions.

E. Owner will approve payment for stored major items provided they can be designated for use on this Project only and are on site or in a bonded warehouse within Travis County. Materials stored off-site must be insured and tagged as belonging to Owner prior to payment being issued. These materials must be available for inspection by the Owner. These materials must be indicated on Contractor’s Application for Payment as stored materials and the value noted accordingly. Provide the following documentation with Contractor’s Application for Payment:
   1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
   2. Provide supporting documentation that verifies material quantities and amount requested such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
   3. Provide the address where the materials are stored.
   4. Provide summary documentation for stored materials indicating the following:
      a. Materials previously stored and included in previous Applications for Payment.
      b. Work completed for this Application utilizing previously stored materials.
      c. Additional materials stored with this Application.
      d. Total materials remaining stored, including materials stored with this Application.

F. Initial Application For Payment
1. Administrative actions and submittals that must precede submittal of initial Application for Payment include the following:
   a. List of subcontractors, principal suppliers, and fabricators
   b. Project Directory
   c. Schedule of Values
   d. Contractor’s Construction Schedule
   e. Submittal Schedule
2. The first Application for Payment shall include the following:
   a. Any of the above submittals not previously provided.
   b. Copies of building permits as applicable at the time of submission.
   c. Copies of authorizations and licenses from governing authorities for performance of the Work.

G. Application For Payment At Substantial Completion
1. Prior to submitting the Application for Payment at Substantial Completion, Contractor shall confirm that all of the requirements for Substantial Completion described in the General Conditions and in Section 017700, Closeout Procedures, have been satisfied and all Substantial Completion deliverables have been provided to Owner.
2. Following issuance of the Certificate of Substantial Completion, Contractor shall submit an Application for Payment showing 100 percent completion for the portion of the Work claimed as substantially complete. If 100 percent completion cannot be shown, Contractor shall include a Punchlist of incomplete items, and the value of incomplete construction.

H. Final Application For Payment
The final Application for Payment will not be reviewed until all prerequisites for Project close-out have been satisfactorily completed and delivered to Owner per the General Conditions, Article 9, and Section 017700 Closeout Procedures, including:
1. All Project close-out submittals detailed in Sections 017700, 017823, and 017839 for both Substantial Completion and Final Completion.
2. AIA Document G706, “Contractor’s Affidavit of Payment of Debts and Claims.”
4. AIA Document G707, “Consent of Surety to Final Payment”, or equivalent document provided by surety
5. Lien releases from Subcontractors and suppliers.
6. Final cleaning completed, including removal of surplus materials, rubbish, and similar elements.
7. Transmittal of required Project construction records to Owner.
8. Insurance certificates for products and completed operations, where required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General Project coordination procedures.
2. Administrative and supervisory personnel.
3. Coordination drawings.
4. Requests for Information (RFIs).
5. Project meetings.

B. Each contractor and subcontractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

1.3 DEFINITIONS

A. RFI (“Requests for Information”): Request from Owner or Contractor seeking information from each other during construction.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work, including with those operations of other contractors and entities. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation; each contractor shall coordinate its operations with others.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation and updating of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Startup and adjustment of systems.
8. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: If Coordination Drawings are required to comply with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity then comply with the following requirements.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

   a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
   b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
d. Indicate space and access requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.
g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Owner indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations, as determined by Owner in its sole discretion, will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.

2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.

4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.

5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

6. Mechanical and Plumbing Work: Show the following:

a. Sizes and bottom elevations of equipment, ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:

a. Runs of vertical and horizontal conduit 1-1/4 inch diameter and larger.
b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire alarm locations.

c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.

d. Location of pull boxes and junction boxes dimensioned from column center lines.

8. Fire Protection System: Show the following:

a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Review: Owner will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If the Owner determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Owner will so inform Contractor, who shall make changes as directed and resubmit.

10. Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."

C. Coordination Digital Data Files: Prepare coordination digital data files in accordance with the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as the original Drawings.

2. File Preparation Format: DWG, no earlier version than AutoCAD 2010, operating in Microsoft Windows operating system.

3. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.

4. Owner will furnish Contractor one set of digital data files of the Drawings for use in preparing coordination digital data files.

   a. Owner makes no representations as to the accuracy or completeness of digital data files as they relate to the Drawings.

   b. Digital Data Software Program: The Drawings are available in AutoCAD 2010 thru AutoCAD 2013. Coordinate version with Owner.

   c. Contractor shall execute a data licensing agreement in the form of AIA Document C106.

1.6 KEY PERSONNEL (Project Directory)

A. Key Personnel Names: At Pre-Construction Conference, submit Project Directory with a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide
names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office and by each temporary telephone. Keep list current at all times.

1.7 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Owner will return RFIs submitted to Owner by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Owner.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specifications Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
   a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form with substantially the same content as indicated above and acceptable to Owner.

D. Owner’s Action: Allow seven working days for Owner’s response for each RFI. RFI’s received by Owner after 1:00 p.m. will be considered as received the
following working day. Refer to Section 007000 Paragraph 3.3.7 and Paragraph 4.2.1 for time limits on RFI’s and additional requirements.

1. The following RFIs will be returned without action:
   a. Requests for approval of submittals.
   b. Requests for approval of substitutions.
   c. Requests for coordination information already indicated in the Contract Documents.
   d. Requests for adjustments in the Contract Time or the Contract Sum.
   e. Requests for interpretation of Owner’s actions on submittals.
   f. Incomplete RFIs or inaccurately prepared RFIs.

2. Owner’s action may include a request for additional information, in which case Owner’s time for response will date from time of receipt of additional information.

3. Owner’s action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Owner in writing within 10 days of receipt of the RFI response.

E. On receipt of Owner’s action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Owner within seven days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at Progress Meetings.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Owner.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Owner’s response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

   A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner of scheduled meeting dates and times.

2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, within seven days of the meeting.

B. Preconstruction Conference: Owner will schedule and conduct a preconstruction conference before instructing Contractor to begin construction, at a time convenient to Owner, but no later than 15 days after award of the Contract.

1. Conduct the conference to review responsibilities and personnel assignments.

2. Attendees: Authorized representatives of Owner, Owner’s Consultants as required, Contractor’s authorized representatives and others invited at discretion of Owner and Contractor. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress, including the following:

   a. Tentative construction schedule.
   b. Phasing if applicable.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Lines of communications.
   f. Procedures for processing field decisions and Change Orders.
   g. Procedures for RFI’s.
   h. Procedures for testing and inspecting.
   i. Procedures for processing Applications for Payment.
   j. Distribution of the Contract Documents.
   k. Submittal procedures and due dates for early important submittals.
   l. Sustainable design requirements.
   m. Preparation of record documents.
   n. Use of the premises.
   o. Work restrictions.
   p. Working hours.
   q. Owner’s occupancy requirements.
   r. Responsibility for temporary facilities and controls.
   s. Procedures for moisture and mold control.
   t. Procedures for disruptions and shutdowns.
   u. Construction waste management and recycling.
   v. Parking availability.
   w. Office, work, and storage areas.
   x. Equipment deliveries and priorities.
   y. First aid.
z. Security.
   aa. Progress cleaning.
   bb. Time and days for Progress Meetings.

4. Minutes: Owner will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction. Owner may waive requirement for preinstallation conference at Owner’s option. Any changes in these requirements shall only be communicated in writing.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Owner and Owner’s Commissioning Authority of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Purchases.
   f. Deliveries.
   g. Submittals.
   h. Review of mockups.
   i. Possible conflicts.
   j. Compatibility problems.
   k. Time schedules.
   l. Weather limitations.
   m. Manufacturer’s written recommendations.
   n. Warranty requirements.
   o. Compatibility of materials.
   p. Acceptability of substrates.
   q. Temporary facilities and controls.
   r. Space and access limitations.
   s. Regulations of authorities having jurisdiction.
   t. Testing and inspecting requirements.
   u. Installation procedures.
   v. Coordination with other work.
   w. Required performance results.
   x. Protection of adjacent work.
   y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Contractor shall record and distribute minutes of the meeting to each party present and to other parties requiring information.

5. Do not proceed with installation if the conference is not successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a Project closeout conference, at a time convenient to Owner, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Owner’s Consultants as required, Contractor’s authorized representatives and others invited at discretion of Owner and Contractor.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
   a. Preparation of record documents.
   b. Commissioning activities.
   c. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
   d. Submittal of written warranties.
   e. Requirements for preparing sustainable design documentation.
   f. Requirements for preparing operations and maintenance data.
   g. Requirements for demonstration and training.
   h. Preparation of Contractor’s punch list.
   i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
   j. Submittal procedures.
   k. Coordination of separate contracts.
   l. Owner’s partial occupancy requirements.
   m. Installation of Owner’s furniture, fixtures, and equipment.
   n. Responsibility for removing temporary facilities and controls.

4. Minutes: Owner will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at weekly intervals unless modified by mutual agreement between Owner and Contractor.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: Owner’s and Contractor’s authorized representatives and others required to attend as necessary for proper coordination of the project. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review Look Ahead schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements
2) Safety issues.
3) Sequence of operations.
4) Status of submittals.
5) Deliveries.
6) Off-site fabrication.
7) Access.
8) Site utilization.
9) Temporary facilities and controls.
10) Progress cleaning.
11) Quality and work standards.
12) Status of correction of deficient items.
13) Field observations.
14) Status of RFIs.
15) Status of proposal requests.
16) Pending changes.
17) Status of Change Orders.
18) Pending claims and disputes.
19) Documentation of information for payment requests.

4. Minutes: Owner will record and distribute the meeting minutes to each party present and to parties requiring information.

   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct Project coordination meetings at biweekly intervals unless modified by mutual agreement between Owner and Contractor. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: Owner’s and Contractor’s authorized representatives and others required to attend as necessary for proper coordination of the
project. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

   a. Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

   b. Schedule Updating: Revise Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

   c. Review present and future needs of each contractor present, including the following:

      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.
      8) Temporary facilities and controls.
      9) Work hours.
     10) Hazards and risks.
     11) Progress cleaning.
     12) Quality and work standards.
     13) Change Orders.

3. Reporting: Owner will record and distribute meeting minutes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Daily construction reports.
3. Material location reports.
4. Field condition reports.
5. Special reports.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times in order not to impact the Project completion date.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

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

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

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

E. Event: The starting or ending point of an activity.
F. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
   3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

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

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:
   1. PDF electronic file.
   2. Two paper copies.

B. Contractor's Construction Schedule: Initial schedule, of size required to display detailed schedule for entire construction period.

C. Daily Construction Reports: Submit at weekly intervals.

D. Field Condition Reports: Submit at time of discovery of differing conditions.

E. Special Reports: Submit at time of unusual event.

1.5 QUALITY ASSURANCE

A. Employ staff or consultant experienced and proficient in CPM scheduling with the capability of producing CPM reports and diagrams within 24 hours of Owner's request.

B. During the Pre-Construction Conference, or another time by mutual agreement between Owner and Contractor, review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
   1. Software, content and format for reports.
   2. Verify availability of qualified personnel needed to develop and update schedule.
   3. Discuss constraints.
   4. Delivery dates for Owner-furnished products.
   5. Schedule for work of Owner's separate contracts.
   6. Identify list of long lead items.
   7. Turn-around times required for review of submittals and resubmittals.
8. Requirements for tests and inspections by independent testing and inspecting agencies.
9. Durations for completion and startup procedures.
10. Finalize list of construction activities to be included in schedule.
11. Submittal requirements and procedures.

1.6 COORDINATION

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

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Owner.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery. Contractor shall include all long lead items as separate activities in Contractor's Construction Schedule.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
4. Startup and Testing Time: Include not less than 15 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Owner's administrative procedures necessary for certification of Substantial Completion.

6. Punch List and Final Completion: Include not more than 30 days for resolution of the final punch list and achievement of final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents, and as follows, and show how the sequence of the Work is affected.

1. Work under More Than One Contract: Include a separate activity for each contract.

2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.

3. Products Ordered in Advance

4. Owner-Furnished Products

5. Work Restrictions: Show the effect of the following items on the schedule:
   a. Uninterruptible services at adjacent buildings.
   c. Seasonal variations.
   d. Environmental control.

6. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   a. Submittals.
   b. Purchases.
   c. Mockups.
   d. Fabrication.
   e. Sample testing.
   f. Installation.
   g. Tests and inspections.
   h. Adjusting.
   i. Curing.

7. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural completion.
   b. Permanent space enclosure.
   c. Completion of mechanical installation.
   d. Completion of electrical installation.
   e. Substantial Completion.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered RFIs.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.

F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

G. Computer Scheduling Software: Prepare schedules using current version of Microsoft Project for Windows.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type schedule, demonstrating general compliance with format requirements, at the Pre-Construction Conference for review and comment. Submit the approved schedule within 15 days of issuance of the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

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

B. CPM Schedule: Prepare Contractor's Construction Schedule using a time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 15 days after date established for the Notice to Proceed.

a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Owner's approval of the schedule.
2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

3. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to correlate with Contract Time.

C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the start-up network diagram, prepare a skeleton network to identify probable critical paths.

   1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
      a. Preparation and processing of submittals.
      b. Mobilization and demobilization.
      c. Procurement of long lead items.
      d. Delivery.
      e. Fabrication.
      f. Utility interruptions.
      g. Installation.
      h. Work by Owner that may affect or be affected by Contractor's activities.
      i. Testing and commissioning.
      j. Punch list and final completion.

   2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.

   3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

   4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
      a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

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

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

   1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
5. Changes in the critical path.
6. Changes in total float or slack time.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Construction Change Directives received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial completions and occupancies.
18. Substantial Completions authorized.

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

2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
PART 3 - EXECUTION (not used)

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 Specifications 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.

1. Schedule of Values
2. List of subcontractors, principal suppliers and fabricators
3. Permits
4. Insurance certificates
5. Performance and payment bonds
6. Project directory
7. Construction Schedule
8. Submittal Schedule
9. Substitutions
10. Shop drawings
11. Coordination drawings
12. Product data.
13. Samples
14. Color schedule
15. Construction site submittals
16. Safety submittals
17. Weekly construction reports
18. Requests for Information
19. Quality Assurance submittals
20. Existing conditions video recording where appropriate or required
21. Construction progress photos if required
22. Mock-ups if required by some Sections

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Owner’s responsive action. Action submittals are those submittals indicated in individual Specifications Sections as action submittals.

B. Informational Submittals: Written and graphic information and physical samples that do not require Owner’s responsive action. Submittals may be rejected for
not complying with requirements. Informational submittals are those submittals indicated in individual Specifications Sections as informational submittals.


1.4 ACTION 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 Owner and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with Contractor's Construction Schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.
   a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:
   a. Scheduled date for first submittal.
   b. Specification Section number and title.
   c. Submittal category: Action, informational.
   d. Name of subcontractor.
   e. Description of the Work covered.
   f. Scheduled date for Owner's final release or approval.
   g. Scheduled dates for purchasing.
   h. Scheduled dates for installation.
   i. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Owner’s Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Owner for Contractor's use in preparing submittals.
1. Owner will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.

   a. Owner makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
   b. Digital Drawing Files will be prepared in either AutoCAD or Revit, latest edition, at Owner’s sole discretion. Drawing files may be converted to another format if required by Contractor but Owner will not be responsible for compatibility of such converted drawing files with Contractor’s drawing file format.
   c. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specifications 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 Specifications 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.

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

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Owner’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 14 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Owner 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 14 days for review of each resubmittal.
   4. Sequential Review: Where sequential review of submittals by Owner’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 Owner and to Owner’s
consultants, allow 14 days for review of each submittal. Submittal will be returned to Owner before being returned to Contractor.

D. 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 4 x 6 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name of Owner.
   d. Name of Contractor.
   e. Name of subcontractor.
   f. Name of supplier.
   g. Name of manufacturer.
   h. Submittal number or other unique identifier, including revision identifier.

   1) Submittal number shall use Specifications Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
   i. Number and title of appropriate Specifications Section.
   j. Drawing number and detail references, as appropriate.
   k. Location(s) where product is to be installed, as appropriate.

E. Identification and Information: If electronic submittal files are used, identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
   a. File name shall use project identifier and Specifications Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Owner.
4. Include the following information on an inserted cover sheet:
   a. Project name.
b. Date.
c. Name and address of Owner.
d. Name of Contractor.
e. Name of firm or entity that prepared submittal.
f. Name of subcontractor.
g. Name of supplier.
h. Name of manufacturer.
i. Number and title of appropriate Specifications Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Related physical samples submitted directly.

F. Options: Identify options requiring selection by the Owner.

G. Deviations: Identify deviations from the Contract Documents on submittals.

H. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Owner.

I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Owner will return submittals, without review received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:

   a. Project name.
   b. Date.
   c. Destination (To:).
   d. Source (From:).
   e. Names of subcontractor, manufacturer, and supplier.
   f. Category and type of submittal.
   g. Submittal purpose and description.
   h. Specifications Section number and title.
   i. Indication of full or partial submittal.
   j. Drawing number and detail references, as appropriate.
   k. Transmittal number, numbered consecutively.
   l. Submittal and transmittal distribution record.
   m. Remarks.
   n. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Owner on previous submittals, and deviations from requirements in the
Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

J. 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.
   3. Resubmit submittals until they are marked with approval notation from Owner’s action stamp.

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

L. Use for Construction: Use only final submittals that are marked with approval notation from Owner’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 Specifications Sections.
   1. Action Submittals: Submit five paper copies of each submittal, unless otherwise indicated. Owner will return four copies.
   2. Informational Submittals: Submit one paper copy of each submittal, unless otherwise indicated. Owner will not return copies.
   3. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
   4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
      a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
      b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
   5. 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.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.

6. Submit Product Data in the following format:
   a. Five paper copies of Product Data, unless otherwise indicated. Owner 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, unless submittal based upon Owner's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.

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 but no larger than 30 by 42 inches.
3. Submit Shop Drawings in the following format:

   a. Five opaque (bond) copies of each submittal. Owner will return four copies.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specifications Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specifications Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

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

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
a. Number of Samples: Submit two sets of Samples. Owner will retain one Sample set; remainder will be returned.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

F. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

G. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

H. Project Directory: Provide list of Key Personnel in accordance with Section 013100 "Project Management and Coordination".

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Submit Subcontract List within 15 days following issuance of Notice to Proceed. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specifications Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.
4. Submit subcontract list in the following format:

   a. Number of Copies: Five paper copies of subcontractor list, unless otherwise indicated. Owner will return four copies.

J. LEED Submittals: Comply with requirements specified in Division 01 Section "Sustainable Design Requirements."

1. Submit LEED submittals in the following format:

   a. Five paper copies of LEED submittals, unless otherwise indicated.

K. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
L. 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.


N. 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.

O. 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.

P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

R. 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.

S. 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.

T. 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. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.
U. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

X. 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.

Y. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

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

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Owner.

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

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

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."

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

3.2 OWNER’S ACTION

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

B. Action Submittals: Owner will review each submittal, make marks to indicate corrections or modifications required, and return it. Owner will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

1. No exception taken
2. Revise as noted
3. Revise and resubmit
4. Rejected

C. Informational Submittals: Owner will review each submittal and will not return it, or will return it if it does not comply with requirements. Owner will forward each submittal to appropriate party.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

F. 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 Specifications Sections, apply to this Section. Article 7 of the General Conditions specifically addresses additional testing requirements and procedures.

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.

1. Specific quality-assurance and quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and -control services required by Owner or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

A. Authority Having Jurisdiction (AHJ): Governmental regulatory agency responsible for inspecting, testing, and approving portions of the construction. Examples of AHJ's include the City of Austin, Travis County Fire Marshal, Texas Department of Licensing and Regulation.

B. 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.

C. 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.
D. 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.

E. 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.

F. Product Testing: Tests and inspections that are performed by a National Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (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.

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

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

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

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

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

K. 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 ACTION SUBMITTALS

A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.
2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 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.

1.7 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.

1. Project quality-control manager may also serve as Project superintendent.

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, including the following:
1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.

2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."

3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.

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 Owner 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.

1.8 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

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

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

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

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specifications Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specifications 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 products that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain Specifications 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.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

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.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

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.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:
   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.

e. When testing is complete, remove test specimens, assemblies, mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Owner, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

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. Build mockups in location and of size indicated or, if not indicated, as directed by Owner.
2. Notify Owner seven days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at the Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Owner's approval of mockups before starting work, fabrication, or construction.

   a. Allow seven days for initial review and each re-review of each mockup.

6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed, unless otherwise indicated.

L. Integrated Exterior Mockups: Construct integrated exterior mockup in accordance with approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specifications Sections, along with supporting materials.

1.10 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. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
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.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
   a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
4. For quality-control services that are Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, 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 reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. 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.

G. Regulatory Agency Inspections: It is Contractor's responsibility to arrange and schedule the regulatory agency inspections necessary to obtain the Certificate of Occupancy. Prior to the date of the regulatory agency inspection, Contractor should inspect the Project to insure that construction complies with the agency requirements. Contractor is responsible for being sufficiently familiar with the regulatory agency's requirements regarding inspection scheduling so that the inspections can be scheduled in a manner that will not delay the construction program. Contractor must understand the agency requirements and take all measures necessary to insure that these requirements are met. Contractor must give sufficient notice to all parties so that inspections can be arranged in advance and the proper personnel are present.

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.
2. Notify Owner of scheduled times for tests, inspections, obtaining samples, and similar activities at the same time that such activities are scheduled with the testing agency or AHJ.
3. Contractor shall not cover up any underground site utilities or MEP systems within the building nor proceed with placing any structural concrete or exterior pavement without prior approval from the Owner. Contractor will request such approvals from the Owner concurrent with notice of associated AHJ inspections, as applicable. In no case shall such request be provided less than 24 hours from required inspection and approval.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.
1.11 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner may engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and may include the following, as required. These special tests and inspections are in addition to the normal testing and inspections required by the authority having jurisdiction which are the responsibility of Contractor in accordance with Section 007000 General Conditions, paragraph 4.7.1.

1. Bolts installed in concrete
2. Concrete (slump and compression cylinder breaks)
3. High strength bolting
4. Penetration firestopping
5. Pilings, drilled piers and caissons
6. Reinforcing steel and pre-stressing steel
7. Soils bearing test
8. Soil compaction
9. Soils analysis
10. Soils/base testing
11. Special grading, excavations and filing
12. Structural welding
13. Welding of open-web steel joists – field welding

B. Special Tests and Inspections: Conducted by a qualified testing agency or special inspector as required by authorities having jurisdiction, as indicated in individual Specifications Sections, and in Statement of Special Inspections attached to this Section, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

A. Travis County-approved testing agencies:
   1. List to be provided upon request.

3.2 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.

3.3 REPAIR AND PROTECTION

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

   1. Provide materials and comply with installation requirements specified in other Specifications Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

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

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

END OF SECTION
SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

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

B. "Approved": When used to convey Owner's action on Contractor's submittals, applications, and requests, "approved" is limited to Owner's duties and responsibilities as stated in the General Conditions of the Contract.

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

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

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

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

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

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

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

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the
same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

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

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

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

B. Submit RFI’s if any doubt exists as to the meaning or intent of abbreviations and acronyms.

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 Specifications Sections apply to this Section.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged on this project to use temporary services and facilities without cost, including, but not limited to, Owner, testing agencies, and authorities having jurisdiction. Pay service use charges for usage by all entities for construction operations. For interior projects existing restrooms, water, sanitary sewer and electricity will be available in the project area. Coordinate construction to maintain access to these services. Use of facilities or utilities outside the project area is prohibited without prior written authorization from the Owner’s project manager.

1.4 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, signage, traffic controls 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.

1. Indicate sequencing of work that requires water, such as sprayed fire-resistant materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

C. Dust-Control and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust-control and HVAC-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. Include the following:

1. Locations of dust-control partitions at each phase of the work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air filtration system discharge.
4. Other dust-control measures.
5. Waste management plan.

1.5 QUALITY ASSURANCE

A. Electric Service: If required, comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70 and with authorities having jurisdiction.

B. Tests and Inspections: If applicable, arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.


1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
   1. Maintain facilities such as restrooms, drinking fountains and storage areas within the project boundaries in a clean and serviceable condition. Clean-up shall be daily. Stock restrooms with appropriate cleaning materials and supplies. Protect permanent equipment, surfaces and finishes from damage, soiling and staining. Repair or replace, at no cost to Owner, any damaged or soiled materials, equipment or finishes that cannot be satisfactorily cleaned. Prior to commencement of construction document any such damage and provide a copy to the Owner's project manager.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Dust Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

2.2 TEMPORARY FACILITIES

A. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel office activities and to accommodate project meetings.
specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip, at a minimum, as follows:

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
2. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
3. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations as needed to ensure security, safety and protection of materials.

1. Store combustible materials apart from building.

C. Project Identification Sign: NOT REQUIRED.

2.3 EQUIPMENT

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

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 13 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures".

C. Air Filtration Units: HEPA primary and secondary filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

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.
1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."

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

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. 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.

1. Toilets: Use of Owner's existing toilet facilities will not be permitted.

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

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

   1. Install electric power service overhead, unless otherwise indicated.
   2. Connect temporary service to Owner's existing power source, as directed by Owner and as authorized by authority having jurisdiction.

I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install at least one telephone line for each field office.

   1. Provide additional telephone lines for the following:

      a. Provide a dedicated telephone line for each facsimile machine in each field office.

   2. At each telephone, post a list of telephone numbers including the following:

      a. Police and Fire Dept.(911 for emergency / 311 for non-emergency)
      b. Contractor's home office
      c. Principal subcontractors' field and home offices.
      d. County Project Manager
      e. Sheriffs Office contact information when working within or near jail facilities
      f. County Security numbers (24-Hour)
      g. Facilities Management Dept. Workorder Desk

   3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

K. Electronic Communication Service: Provide a computer in the primary field office with internet-based email service in order to maintain electronic communications or maintain email service with a portable cell phone device in the possession of the Contractor's Project Manager and Superintendent.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
1. Maintain support facilities until Owner 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. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

C. Signs: Provide project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
      a. Provide temporary, directional signs for construction personnel and visitors.
   3. Maintain and touchup signs so they are legible at all times.

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

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 to 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. 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. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

C. 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.

D. Temporary Egress: Maintain temporary egress from existing occupied floors as indicated and as required by authorities having jurisdiction.

E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, other construction operations, and similar activities.
F. 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.
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 MOISTURE AND MOLD CONTROL


B. Controlled Construction Phase of Construction: Prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
   a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
   b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record daily readings over a forty-eight hour period. Identify materials containing moisture levels higher than allowed. Report findings in writing to Owner.
   c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 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.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

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

D. 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.

1. Materials and facilities that constitute temporary facilities are property of Contractor.

2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION
SECTION 015100 – CONSTRUCTION INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes requirements for construction indoor air quality, including:
   1. Construction Indoor Air Quality Management Purpose
   2. Construction Indoor Air Quality Procedures
   3. Construction Indoor Air Quality Submittals

B. This section includes references to the following external documents:

1.3 PURPOSE

A. The intent of Construction IAQ (Indoor Air Quality) management is to reduce indoor air quality problems resulting from the construction process in order to help sustain the health and well-being of construction workers and building occupants.

1.4 PROCEDURES

A. The Contractor shall make every effort to reduce pollutants throughout the construction process in order to achieve compliance with IAQ testing maximum concentrations discussed below. The most significant method for achieving success is through source control, that is:
   1. Install products and materials that are low- or zero-VOC, do not contain added formaldehyde, and are free of particulates
   2. Request in-factory flush-out from manufacturers wherever possible, to flush out pollutants before products arrive at the site

B. The Contractor shall adopt an IAQ management plan to protect the HVAC system during construction, control pollutant sources, and interrupt contamination pathways.

C. Contractor shall sequence the installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile and gypsum wallboard.

D. Temporary HVAC units (independent of permanent ductwork and distribution systems) are recommended as the optimal method for achieving the Construction IAQ requirements. This allows permanent HVAC equipment to be fully protected. If Contractor is utilizing permanent HVAC equipment for fresh air, heating, or cooling during construction, all air intakes shall be protected from incoming construction debris. Contractor shall use filtration media in all
permanent air handling equipment during construction, and replace this media immediately before occupancy.
1. Regularly occupied spaces: Filtration media during and after construction shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ANSI/ASHRAE 52.2-1999. Obtain a diagram from MEP Engineer indicating location of all regularly occupied spaces.
2. All other spaces: Filtration media during and after construction shall have a Minimum Efficiency Reporting Value (MERV) of 8 as determined by ANSI/ASHRAE 52.2-1999.
E. The Contractor shall employ Green Housekeeping methods wherever practicable.
   1. Use non-toxic cleaners per Green Seal, www.greenseal.org
   2. Conserve energy by shutting off lights and HVAC in all areas except those currently being cleaned.

1.5 SUBMITTALS

A. With first Application for Payment, the Contractor shall submit a draft Construction IAQ Management Plan. Architect will return plan with revisions or approval, to be resubmitted as many times as necessary for Architect’s final approval. The plan shall be divided into 6 parts, addressing each of the following topics per “IAQ Guidelines for Occupied Buildings Under Construction”, Sheet Metal and Air Conditioning Contractors’ National Association (SMACNA), www.smacna.org, (703) 803-2980. The plan shall also include requirements described in “Procedures” above.
   1. HVAC protection
   2. Source Control
   3. Pathway Interruption
   4. Housekeeping
   5. Filter Maintenance Schedule
   6. Scheduling
B. With subsequent Applications for Payment, the Contractor shall submit documentation of IAQ procedures as follows:
   1. Provide cut sheets of filtration media used during construction with MERV values highlighted (per ANSI/ASHRAE 52.2-1999). Fresh clean filters must be installed immediately prior to occupancy.
   2. During construction, take 18 total photographs of Construction IAQ Management procedures, that is: 6 photos on three different occasions and identify SMACNA approach featured, such as protection of ducts, physical barriers protecting areas under construction, and the sequencing of installation for absorptive materials.

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:

2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.

1.3 DEFINITIONS

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

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

1.4 INFORMATIONAL SUBMITTALS

A. Certificates: If professionally prepared certificates are required by other sections, submit certificates signed by the appropriate licensed professional certifying compliance with requirements.

B. Cutting and Patching Plan: Submit plan describing procedures at least 5 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

   a. Include description of provisions for temporary services and systems during interruption of permanent services and systems as applicable.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

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 Owner of locations and details of cutting and await directions from Owner before proceeding. Shore, brace, and support structural elements 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. Operational elements can include the following:

   a. Fire separation assemblies.
   b. Air or smoke barriers.
   c. Fire-suppression systems.
   d. Mechanical systems piping and ducts.
   e. Control systems.
   f. Communication systems.
   g. Fire-detection and -alarm systems.
   h. Conveying systems.
   i. Electrical wiring systems.

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. Other construction elements can include but are not limited to the following:

   a. Water, moisture, or vapor barriers.
   b. Membranes and flashings.
c. Exterior wall construction.
d. Sprayed fire-resistive material.
e. Equipment supports.
f. Piping, ductwork, vessels, and equipment.
g. Noise- and vibration-control elements and systems.

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 Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Also, including the County Cabling Contractor which will be work performed by Owner but requiring coordination with other trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

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

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in other sections of this project manual.

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.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Owner for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. 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.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   1. Description of the Work.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. 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.

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

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information (RFI) to Owner.

3.3 CONSTRUCTION LAYOUT-NOT USED

3.4 FIELD ENGINEERING-NOT USED

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

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 in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. 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.

H. Attachment: Provide blocking and 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.

   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owner.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. 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.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous and, if a LEED project, that comply with requirements.
3.6 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. 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.

C. Temporary Support: Provide temporary support of work to be cut.

D. 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.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."

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

G. 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.

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 Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

H. 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.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
   b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

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

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

changes to schedule are required due to differences in actual construction progress.

2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

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.
   a. Use containers intended for holding waste materials of type to be stored.
4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

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. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

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

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

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
G. 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 other sections.

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

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

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

3.9 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."

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

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

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

E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 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.

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

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 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous construction waste.
2. Recycling nonhazardous construction waste.
3. Disposing of nonhazardous construction 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. 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.

C. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

E. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of minimum 75 percent by weight of total non-hazardous solid waste generated by the Work. 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, including the following:

1. Demolition Waste:
   a. Metals.
b. Gypsum Board  
c. Ceramic Tile  
d. ACT and metal Grid  
e. Select HM frames  
f. Wood doors  
g. HVAC ducts and equipment  
h. Interior glazing.  
i. Carpet and pad  
j. Electrical conduit and panels  

2. Construction Waste:  
   a. Metals.  
   b. Ceramic Tile.  
   c. Insulation.  
   d. Carpet and pad.  
   e. Gypsum board.  
   f. Piping.  
   g. Electrical conduit.  
   h. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials: 
      1) Paper.  
      2) Cardboard.  
      3) Boxes.  
      4) Plastic sheet and film.  
      5) Polystyrene packaging.  
      7) Plastic pails.  
   i. Resilient flooring.  

1.5 ACTION SUBMITTALS  
   A. Waste Management Plan: Submit plan within 14 days of date established for the Notice to Proceed.  

1.6 INFORMATIONAL SUBMITTALS  
   A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste and Form CWM-8 for demolition/site clearing waste. Include the following information:  
      1. Material category.  
      2. Generation point of waste.  
      3. Total quantity of waste in tons.  
      4. Quantity of waste salvaged, both estimated and actual in tons.  
      5. Quantity of waste recycled, both estimated and actual in tons.
6. Total quantity of waste recovered (salvaged plus recycled) in tons.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. LEED Submittal: LEED letter template for Credit MR 2 as found at the Project site online, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

H. Qualification Data: For waste management coordinator.

I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

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. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL - 017419 - 3
Coordination.” Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of waste management coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Use Form CWM-1 for construction waste and Form CWM-2 for demolition/site clearing waste. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use Form CWM-3 for construction waste and Form CWM-4 for demolition waste. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container
labeling, and designated location where materials separation will be performed.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use Form CWM-5 for construction waste and Form CWM-6 for demolition waste. Include the following:

1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

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.

1. Comply with operation, termination, and removal requirements in Division 01 Section "Temporary Facilities and Controls."

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
   1. Clean salvaged items.
   2. Store items in a secure area until installation.
   3. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
   1. Clean salvaged items.
   2. Store items in a secure area and coordinate with Owner for Owner's representatives to transport items to Owner's storage area off-site.
   3. Protect items from damage during transport and storage.

3.3 RECYCLING CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:
   1. Tri-Recycling, P.O. Box 26488 (3600 Lyons Road), Austin, TX 78702. Phone: (512) 329-0172. General Waste Recycling.
   2. Concrete Recycling, 973 Concrete Pits, 6900 FM 973, Austin, TX. Concrete Waste Recycling.
   3. Austin Metal and Iron Co., 1000 East 4th Street, Austin, TX, 78702. Phone: (512) 477-4640. Ferrous and non-ferrous metals.
   4. Texas Organic Products, TDS, 3016 FM 1327, Creedmore, TX. Wood and gypsum.
   6. Cycled Plastics, 10200 McKalla Place, Austin, TX 78758. Plastic waste.
   7. Austin Recycling Co., 830 Airport Blvd., Austin, TX. Phone (512) 389-2655.
   8. American Metal Processing, Inc., 200 Pflugerville Loop, Pflugerville, TX. Phone: (512) 251-5052.
9. The FM 812 Resource Recovery Center. Accepts air conditioners, hot water heaters, dryers, stoves, refrigerators and other metal appliances; car batteries; all types of metals (steel, aluminum, tin, copper, brass, stainless steel); used antifreeze, motor oil and oil filters. Does not accept computer monitors, microwaves or televisions.

C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

D. 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.

E. 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 removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.

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. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

4. Store components off the ground and protect from the weather.

5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.


3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.

4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:
1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
   a. Comply with requirements in Division 32 Section "Plants." for use of clean sawdust as organic mulch.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
   1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
      a. Comply with requirements in Division 32 Section "Plants." for use of clean ground gypsum board as inorganic soil amendment.

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.
   1. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

3.6 ATTACHMENTS

A. Form CWM-1 for construction waste identification.
B. Form CWM-2 for demolition/site clearing waste identification.
C. Form CWM-3 for construction waste reduction work plan.
D. Form CWM-4 for demolition waste reduction work plan.
E. Form CWM-5 cost/revenue analysis of construction waste reduction work plan.
F. Form CWM-6 cost/revenue analysis of demolition waste reduction work plan.
G. Form CWM-7 for construction waste
H. Form CWM-8 for demolition waste.

END OF SECTION
### FORM CWM-1: CONSTRUCTION WASTE IDENTIFICATION

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CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

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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.

1.3 REGULATORY AGENCY INSPECTION

A. Contractor shall schedule regulatory agency inspections as required so as to not delay Owner’s occupancy. Coordinate inspection and occupancy scheduling with Owner. Cooperate with Owner for any planned partial occupancy. When a Temporary Certificate of Occupancy (TCO) is required by Owner cooperate and coordinate with regulatory agencies to ensure proper authorizations are obtained prior to Owner’s occupancy.

1.4 SUBSTANTIAL COMPLETION

A. Prior to requesting Owner’s inspection for determining date of Substantial Completion conduct a preliminary substantial completion inspection with appropriate subcontractors.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include all Certificates of Occupancy required by authorities having jurisdiction. Include operating certificates and similar releases.
5. Prepare and submit operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
6. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings.

7. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

8. Clean and repair, if required, permanent facilities used during the construction period including, but not limited to, the following:
   a. Replace air filters and clean inside of ductwork and housings.
   b. Replace significantly worn parts and parts subject to unusual operating conditions.
   c. Replace lamps burned out or noticeably dimmed by hours of use.


10. Complete startup testing of systems.

11. Submit test/adjust/balance records.

12. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.


14. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

15. Complete final cleaning requirements, including touchup painting.

16. 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, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner 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 Owner, 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. Immediately following receipt of the Owner's Punch List, Contractor shall pursue correction of deficiencies. Continual delay with regard to the correction of deficiencies will be cause for withholding payments to the Contractor. The Punch List is expected to be completely resolved within 30 calendar days of the date of Substantial Completion.

2. Results of completed inspection will form the basis of requirements for final completion.

C. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of building before overall substantial completion provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work. The specific requirements for partial Owner occupancy relevant to this project are as follows:
1. The Owner reserves the right to occupy the MDF Room approximately 45 days prior to the Contract Completion Date.

2. Before partial Owner occupancy, the room shall meet the requirements of Substantial Completion: mechanical, electrical, and datacom systems shall be fully operational and required tests and inspections shall be successfully completed; all room finishes shall be complete, inspected by Contractor, and accepted by Owner; final cleaning of room shall be performed; and Owner's lock and keys shall be provided.

3. Upon Owner occupancy, Contractor’s personnel and Subcontractors will no longer have access to the owner-occupied space without Owner’s permission.

4. Upon occupancy, Owner shall assume responsibility for damages to finishes and custodial service within the Owner-occupied space.

1.5 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 Owner's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Owner. 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. Prepare and submit Project Record Documents

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner 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.

1.6 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. Use CSI Form 14.1A.
1. Organize list of spaces in sequential order, starting with interior areas first and proceeding from lowest floor to highest floor.

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 Owner.
   d. Name of Contractor.
   e. Page number.

4. Submit list of incomplete items in the following format:
   a. PDF electronic file.
   b. Three paper copies of product schedule or list, unless otherwise indicated. Owner will return two copies.

1.7 WARRANTIES

A. Submittal Time: Submit written warranties on request of Owner 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 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.
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.

1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

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. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

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 snow and ice to provide safe access to building.

f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess
nap; shampoo if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and
windows. Remove glazing compounds and other noticeable, vision-
obscuring materials. Replace chipped or broken glass and other
damaged transparent materials. Polish mirrors and glass, taking care
not to scratch surfaces.

k. Remove labels that are not permanent.

l. 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.

1) Do not paint over "UL" and other required labels and identification,
including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment and similar
equipment. Remove excess lubrication, paint and mortar droppings,
and other foreign substances.

n. Replace parts subject to operating conditions during construction that
may impede operation or reduce longevity.

o. Clean plumbing fixtures to a sanitary condition, free of stains, including
stains resulting from water exposure.

p. Replace disposable air filters and clean permanent air filters. Clean
exposed surfaces of diffusers, registers, and grills.

q. Clean ducts, blowers, and coils if units were operated without filters
during construction or that display contamination with particulate matter
upon inspection.

Provide written report upon completion of cleaning.

r. Clean light fixtures, lamps, globes, and reflectors to function with full
efficiency. Replace burned-out bulbs, and those noticeably dimmed by
hours of use, and defective and noisy starters in fluorescent and
mercury vapor fixtures to comply with requirements for new fixtures.

s. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final
inspection and rid Project of rodents, insects, and other pests. Prepare a
report.

D. Construction Waste Disposal: Comply with waste disposal requirements in
Division 01 Section "Construction Waste Management and Disposal."

3.2 WARRANTY PROCEDURES

A. Unless stated otherwise in the Certificate of Substantial Completion, the
beginning of the Warranty phase coincides with the issuance of the Certificate
of Substantial Completion. The expectation of Owner is that Contractor will give prompt corrective attention to any warranty item submitted.

B. Initiation of Requests: Owner will normally initiate a request for corrective work following a review to determine whether a maintenance or warranty issue. If determined to be a warranty item, Owner will address a warranty notification to Contractor for action and will retain a copy in a suspense file.

C. Response to Request: Contractor, upon receipt of a Warranty Notification Letter, shall either initiate the repair with his work force or forward a copy to the subcontractor for action. If Contractor forwards the action to the subcontractor, he will retain a copy in a suspense file. Prior to commencing any repairs, Contractor or subcontractor must contact Owner to coordinate schedule.

1. Warranty repairs to critical life safety systems and health-related building systems must be performed within 48 hours of receipt of a warranty notification. Critical life safety systems and health-related building systems include, but are not limited to: fire alarm system, fire sprinkler system, plumbing system, and HVAC system.

D. Coordination shall be made with Owner's maintenance personnel prior to commencing repairs. Owner's maintenance personnel must be present to acknowledge completion of the repair and must sign off and date a copy of the warranty request. Return of the signed copy to Contractor constitutes completion of the request and all file copies can be so annotated.

E. Owner will maintain a log of all Warranty Items mailed to Contractor. After 10 days from initiation of the request, if the copy has not been returned, follow-up letters will be sent to Contractor for action. Warranty items which take longer than 15 days to complete, unless by prior arrangement with Owner, will be considered non-responsive.

END OF SECTION
SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation manuals for systems, subsystems, and equipment.
   2. Product maintenance manuals.
   3. Systems and equipment maintenance manuals.
   4. Emergency manuals as applicable to the system

1.3 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual specification sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

   1. Where applicable, clarify and update reviewed manual content to correspond to modifications and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

   1. PDF electronic file. Assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to Owner.

      a. Title each indexed document file in composite index with applicable item name. Include a complete O&M directory.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Owner and Commissioning Agent will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and before commencing demonstration and training. Owner and Commissioning Agent will return copy with comments.

   1. Correct or modify each manual to comply with Owner's and Commissioning Agent's comments. Submit copies of each corrected manual within 15 days of receipt of Owner's and Commissioning Agent's comments.
PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

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

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

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

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

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

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

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

B. Title Page: Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name and contact information for Contractor.
   6. Name and contact information for Commissioning Agent.
   7. Names and contact information for major consultants to the Owner that designed the systems contained in the manuals.
8. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specifications Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

   a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

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

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specifications Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.


5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

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

B. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specifications Sections and the following information:

2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams – Manufacturer’s internal and Contractor’s installation diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer’s name.
3. Equipment identification with serial number of each component and Manufacturer’s installation instructions.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

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

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

2.5 PRODUCT MAINTENANCE MANUALS

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

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

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer’s name.
3. Color, pattern, and texture.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.
6. Materials, methods and requirements for lubrication.

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

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

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

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

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.
5. Control systems installation wiring diagrams and installation drawings and control sequences.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Valve tag list and schematic diagram.
4. Precautions against improper maintenance.
5. Disassembly; component removal, repair, and replacement; and reassembly instructions.
6. Aligning, adjusting, and checking instructions.
7. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

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

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

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

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

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

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

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

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

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 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. Submit Final Record Documents prior to required date for Final Completion.

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

1. Record Drawings
2. Record Specifications
3. Miscellaneous record submittals.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of marked-up record prints.
2. Number of Copies: Submit copies of record Drawings as follows:
   a. Initial Submittal: Submit one paper copy set of marked-up record prints and one set of plots from corrected record digital data files if applicable. Owner will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
   b. Final Submittal: Submit one paper copy set of marked-up record prints and one set of record digital data files if applicable. Plot each drawing file, whether or not changes and additional information were required to be recorded.

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

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, using red pencil or pen for clear identification.
   c. Record data as soon as possible.
   d. Record and check the markup before enclosing concealed installations.
   e. Cross-reference record prints to corresponding archive photographic documentation.
   f. Cross-reference record prints to corresponding Change Order, RFI, or ASI, as appropriate.

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 Owner'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. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Name each file with the sheet identification. Include identification in each digital data file.

3. Identification: As follows:
   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
   d. Name of Owner.
   e. Name of Contractor.

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 Specifications, 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 Specifications Sections for miscellaneous record keeping and submittal in connection with actual performance of the 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 Owner's reference during normal working hours.

C. Maintain accurate and up-to-date record drawing mark-ups during the course of construction. Cooperate with Owner's periodic review.

END OF SECTION
SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

A. Submit two copies of training module information within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

   a. Name of Project.
   b. Name of Owner.
   c. Name of Contractor.

2. Prepare on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, three-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder.

3. At completion of training, submit complete training manual(s) for Owner's use.
1.5 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

1.6 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specifications Sections.

B. Develop instruction outline for each module. Include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.

2. Documentation: Review the following items in detail:

   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project record documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
c. Shutdown instructions for each type of emergency.
d. Operating instructions for conditions outside of normal operating limits.
e. Sequences for electric or electronic systems.
f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Hazards
   h. Instructions on stopping.
   i. Normal shutdown instructions.
   j. Operating procedures for emergencies.
   k. Operating procedures for system, subsystem, or equipment failure.
   l. Seasonal and weekend operating instructions.
   m. Required sequences for electric or electronic systems.
   n. Special operating instructions and procedures.

5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.

7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
   h. Lubrications and fuels.

8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."

B. Set up instructional equipment, as applicable, at instruction location.

3.2 INSTRUCTION

A. Engage a qualified instructor to prepare instruction program, training modules and to coordinate with Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed upon times. For equipment that requires seasonal operation, provide instruction as necessary for particular operating protocols for seasons.

1. Schedule training with Owner with at least seven days' advance notice.

D. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION
SECTION 018000 - WEATHER DELAYS

1. EXTENSION OF CONTRACT TIME

1) In the event that progress of the work is delayed by adverse weather conditions, the Contractor shall notify the Owner at the end of each month in which delay occurs. When the number of weather days exceeds the number of days listed as the Standard Baseline, the Contractor may submit a claim for extension of Contract Time.

2) The Contractor’s sole relief for delay for weather days will be a time extension.

2. STANDARD BASELINE FOR AVERAGE CLIMATIC RANGE

1) The State of Texas has reviewed weather data available from the Office of the Texas State Climatologist and determined a Standard Baseline of average climatic range for the State of Texas.

2) Standard Baseline represents the normal and anticipated number of calendar days for each month during which construction activity is expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is included in the Work and is not eligible for extension of Contract Time.

Standard Baseline is:

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3. ADVERSE WEATHER AND WEATHER DELAY DAYS

1) Adverse Weather is defined as the occurrence of one or more of the following conditions which prevents exterior construction activity or access to the site within 24 hours:
   a) Precipitation (rain, snow or ice) in excess of one-tenth inch (0.1") measure.
   b) Temperatures which do not rise above 32 degrees F by 10:00 a.m.
   c) Standing snow in excess on one inch (1.00")

2) Adverse Weather may include, if appropriate, “dry-out” or “mud” days when the following conditions are met:
   a) There is a hindrance to: (i) site access; (ii) work on the envelope of the building such as masonry or roofing; (iii) site work such as excavation, backfill and footings; or (iv) site improvements such as paving.
   b) At a rate no greater than one make-up day for each day or consecutive days of rain beyond the standard baseline that total 1.0 inch or more, liquid measure.

3) A Weather Delay Day may be counted if adverse weather prevents work on the Project for fifty percent or more of the Contractor’s scheduled workday.

4. DOCUMENTATION AND SUBMITTALS

Contractor shall:

1) Submit daily job site work logs showing which and to what extent construction activities have been affected by weather on a monthly basis.

2) Submit actual weather data to support claim for time extension obtained from nearest NOAA weather station or other independently verified source approved by the County at beginning of Project.
3) Use Standard Baseline data provided in this Section when documenting actual delays due to weather in excess of the average climatic range.

4) Organize claim and documentation to facilitate evaluation on a basis of calendar month periods, and submit in accordance with the procedures for claims established in the General Conditions.

5) If an extension of the Contract Time is appropriate, it shall be processed as a Change Order in accordance with the General Conditions. All extensions of time shall be given in calendar days.

6) In no event will an extension of time be granted for delays that merely extend the duration of non-critical activities, or which consume only float without delaying the Project completion date.

END OF SECTION
SECTION 018113 - SUSTAINABLE DESIGN 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 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general requirements and procedures for compliance with sustainable design requirements. The overall building will be submitted for LEED EB in the future.

1. Other LEED prerequisites and credits needed to obtain LEED certification depend on material selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.

2. Additional LEED prerequisites and credits needed to obtain the indicated LEED certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.

B. Related Sections:

1. Divisions 01 through 33 Sections for LEED requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.

1.3 DEFINITIONS

A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

B. LEED: Leadership in Energy & Environmental Design.

C. Rapidly Renewable Materials: Materials made from plants that are typically harvested within a 10-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.

D. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site. If only a
fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

E. Regionally Manufactured Materials: Materials that are manufactured within a radius of 500 miles from Project site. Manufacturing refers to the final assembly of components into the building product that is installed at Project site.

F. Regionally Extracted and Manufactured Materials: Regionally manufactured materials made from raw materials that are extracted, harvested, or recovered within a radius of 500 miles from Project site.

G. Rapidly Renewable Materials: Materials considered to be an agricultural product, both fiber and animal, that takes 10 years or less to grow or raise, and to harvest in an ongoing and sustainable fashion. Includes cork, bamboo, linoleum, wheatboard, cotton insulation, wool, and (sorghum) strawboard.

H. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

1. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.

2. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

I. Recycled Content: The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer).

1. Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials.

2. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.

1.4 ACTION SUBMITTALS

A. General: Submit additional LEED submittals required by other Specifications Sections.

B. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate
copies as a separate submittal to verify compliance with indicated LEED requirements.

C. LEED Documentation Submittals:

1. Credit EA 5: Product data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy-consumption performance over a period of time of not less than one year of postconstruction occupancy.

2. Credit MR 2: Comply with Division 01 Section "Construction Waste Management and Disposal."

3. Credit MR 4: Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.

4. Credit MR 5: Product data for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.

5. Credit MR 5: Product data indicating location of material manufacturer for regionally manufactured materials. Include statement indicating cost for each regionally manufactured material and for each regionally extracted and manufactured material.
   a. Include statement indicating distance from manufacturer to Project for each regionally manufactured material.
   b. Include statement indicating location of and distance from Project to point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials.

6. Credit IEQ 3.1:
   a. Construction indoor-air-quality management plan.
   b. Product data for temporary filtration media.
   c. Product data for filtration media used during occupancy.
   d. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials.

7. Credit IEQ 4.1: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to SCAQMD, Rule #1168 (V2.2 CFR 59, Subpart D (EPA Method 24).

8. Credit IEQ 4.2: Product data for paints and coatings used inside the weatherproofing system indicating chemical composition and VOC content of each product used. Indicate VOC content in g/L calculated according to

9. Credit IEQ 4.3: Product data for carpet and carpet cushion showing the product meets the requirements of the Carpet and Rug Institute Green Label Program. Product data for carpet adhesives including VOC content. VOC content should be less than 50g/L. Product data for all hard surface flooring which must be Floor Score certified. Concrete sealer must meet the requirements of SCAQMD Rule 1113. Tile setting adhesives and grout must meet SCAQMD Rule 1168.

10. Credit IEQ 4.4: Product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.

1.5 INFORMATIONAL SUBMITTALS

A. Project Materials Cost Data: Provide statement indicating total cost for building materials used for Project, excluding mechanical, electrical, and plumbing components, and specialty items such as elevators and equipment. Include statement indicating total cost for wood-based materials used for Project.

B. LEED Action Plans: Provide preliminary submittals within 14 days of date established for the Notice to Proceed indicating how the following requirements will be met:

1. Credit MR 2: Waste management plan complying with Division 01 Section "Construction Waste Management and Disposal."
2. Credit MR 3: List of proposed salvaged and refurbished materials. Identify each material that will be salvaged or refurbished, including its source and cost.
3. Credit MR 4: List of proposed materials with recycled content. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
4. Credit MR 5: List of proposed regional materials. Identify each regional material, including its source, cost, and the fraction by weight that is considered regional.
5. Credit MR 5: List of proposed regionally manufactured materials and regionally extracted and manufactured materials.
   a. Identify each regionally manufactured material, including its source and cost.
   b. Identify each regionally extracted and manufactured material, including its source and cost.

C. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans for the following:

1. Credit MR 2: Waste reduction progress reports complying with Division 01 Section "Construction Waste Management and Disposal."
2. Credit MR 4: Recycled content.
3. Credit MR 5: Regional materials.
4. Credit MR 5: Regionally manufactured materials and regionally extracted and manufactured materials.

1.6 QUALITY ASSURANCE

A. LEED Coordinator: The Owner will act as LEED Project Administrator for the USGBC-web interface and as LEED Project Coordinator for the project. The Contractor will engage a waste management coordinator who may also serve as Project Superintendent, if experienced in both roles.

PART 2 - PRODUCTS

2.1 RECYCLED CONTENT OF MATERIALS

A. Credit MR 4: Provide building materials with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 20 percent of cost of materials used for Project.

1. Cost of post-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
2. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
3. Do not include mechanical and electrical components in the calculation.

2.2 LOW-EMITTING MATERIALS

A. Credit IEQ 4.1: For field applications that are inside the weatherproofing system, use adhesives and sealants that comply with the following limits for VOC content when calculated according to SCAQMD Rule #1168:

1. Wood Glues: 30 g/L.
2. Metal to Metal Adhesives: 30 g/L.
3. Adhesives for Porous Materials (Except Wood): 50 g/L.
4. Subfloor Adhesives: 50 g/L.
5. Plastic Foam Adhesives: 50 g/L.
6. Carpet Adhesives: 50 g/L.
7. Carpet Pad Adhesives: 50 g/L.
8. Cove Base Adhesives: 50 g/L.
9. Gypsum Board and Panel Adhesives: 50 g/L.
10. Ceramic Tile Adhesives: 65 g/L.
11. Multipurpose Construction Adhesives: 70 g/L.
12. Fiberglass Adhesives: 80 g/L.
13. Contact Adhesive: 80 g/L.
14. Structural Glazing Adhesives: 100 g/L.
15. Wood Flooring Adhesive: 100 g/L.
16. Structural Wood Member Adhesive: 140 g/L.
17. Special Purpose Contact Adhesive (contact adhesive that is used to bond melamine covered board, metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber or wood veneer 1/16 inch or less in thickness to any surface): 250 g/L.
18. Top and Trim Adhesive: 250 g/L.
19. Plastic Cement Welding Compounds: 250 g/L.
20. ABS Welding Compounds: 325 g/L.
21. CPVC Welding Compounds: 490 g/L.
22. PVC Welding Compounds: 510 g/L.
23. Adhesive Primer for Plastic: 550 g/L.
24. Sheet Applied Rubber Lining Adhesive: 850 g/L.
27. Special Purpose Aerosol Adhesive (All Types): 70 percent by weight.
28. Other Adhesives: 250 g/L.
29. Architectural Sealants: 250 g/L.
30. Nonmembrane Roof Sealants: 300 g/L.
31. Single-Ply Roof Membrane Sealants: 450 g/L.
32. Other Sealants: 420 g/L.
33. Sealant Primers for Nonporous Substrates: 250 g/L.
34. Sealant Primers for Porous Substrates: 775 g/L.
35. Modified Bituminous Sealant Primers: 500 g/L.
36. Other Sealant Primers: 750 g/L.

B. Credit EQ 4.2: For field applications that are inside the weatherproofing system, use paints and coatings that comply with the following limits for VOC content when calculated according to:


Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates indicate VOC content which must not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, Anti Corrosive Paints, 2nd Edition, January 7, 1997.
Clear wood finishes, floor coatings, stains, primers, and shellacs applied to interior elements must not exceed the VOC content limits established in SCAQMD Rule 1113, Architectural Coatings, rules in effect on 1.1.2004.

Categories below are taken from LEED rating systems and the standards referenced by them; if clarification is required, see those documents or the reference guides.

1. Flat Paints, Coatings, and Primers: VOC not more than 50 g/L.
2. Nonflat Paints, Coatings, and Primers: VOC not more than 50 g/L.
3. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
4. Clear Wood Finishes, Varnishes: VOC not more than 275 g/L.
5. Clear Wood Finishes, Lacquers: VOC not more than 275 g/L.
6. Floor Coatings: VOC not more than 50 g/L.
7. Shellacs, Clear: VOC not more than 730 g/L.
8. Shellacs, Pigmented: VOC not more than 550 g/L.
9. Stains: VOC not more than 100 g/L.
10. Flat Interior Topcoat Paints: VOC not more than 50 g/L.
11. Nonflat Interior Topcoat Paints: VOC not more than 50 g/L.
12. Primers, Sealers, and Undercoaters: VOC not more than 100 g/L.
13. Dry-Fog Coatings: VOC not more than 150 g/L.
14. Zinc-Rich Industrial Maintenance Primers: VOC not more than 100 g/L.
15. Pretreatment Wash Primers: VOC not more than 420 g/L.
16. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
17. Restricted Components: Paints and coatings shall not contain any of the following:

   a. Acrolein.
   b. Acrylonitrile.
   c. Antimony.
   d. Benzene.
   e. Butyl benzyl phthalate.
   f. Cadmium.
   g. Di (2-ethylhexyl) phthalate.
   h. Di-n-butyl phthalate.
   i. Di-n-octyl phthalate.
   j. Diethyl phthalate.
   k. Dimethyl phthalate.
   l. Ethylbenzene.
   m. Formaldehyde.
   n. Hexavalent chromium.
   o. Isophorone.
   p. Lead.
   q. Mercury.
   r. Methyl ethyl ketone.
   s. Methyl isobutyl ketone.
t. Methylene chloride.
u. Naphthalene.
v. Toluene (methylbenzene).
w. 1,1,1-trichloroethane.
x. Vinyl chloride.

C. Credit IEQ 4.3: Product data for carpet and carpet cushion showing the product meets the requirements of the Carpet and Rug Institute Green Label Program. Product data for carpet adhesives including VOC content. VOC content should be less than 50g/L. Product data for all hard surface flooring which must be Floor Score certified. Concrete sealer must meet the requirements of SCAQMD Rule 1113. Tile setting adhesives and grout must meet SCAQMD Rule 1168.

D. Credit IEQ 4.4: Do not use composite wood or agrifiber products or adhesives that contain urea-formaldehyde resin.

PART 3 - EXECUTION

3.1 REFRIGERANT REMOVAL

A. Prerequisite EA 3: Provide cut sheets and schedules highlighting CFC-free refrigerants for all HVAC&R equipment indicated.

3.2 CONSTRUCTION WASTE MANAGEMENT

A. Credit MR 2: Comply with Division 01 Section "Construction Waste Management and Disposal."

3.3 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

A. Credit IEQ 3.1: Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."

1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 01 Section "Temporary Facilities and Controls," install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.

2. Replace all air filters immediately prior to occupancy.
   1) Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Nonfixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.
   2) Number of sampling locations will vary depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq. ft. or for each contiguous floor area, whichever is larger, and shall include
areas with the least ventilation and greatest presumed source strength.

3) Air samples shall be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

END OF SECTION
SECTION 021000 – EXISTING CONDITIONS

1.1 GENERAL

A. The drawings and specifications for this project describe selective demolition, and new construction for the office space portion of the 2nd floor of the Blackwell-Thurman Criminal Justice Center.

B. The project is within a 10-story building in downtown Austin. There are 14 criminal courts located on floors 3 thru 9. The lower three floors of the tower contain office spaces, Central Booking, Jail Prisoner Holding, and public lobby. The tower is connected internally and externally to the Travis County Jail and the N. L. Gault Building and the three are, in effect, a single building. The facility, with the exception of the office spaces on the 2nd floor, will continue to remain occupied during the course of this construction project. The 2nd floor, previously used as office space for the District Attorney, is the area that is being remodeled under this Contract.

C. Effort has been made to describe the Work under this Contract as completely as possible. Bidders will be given an opportunity to visit the site and familiarize themselves with the existing conditions and to submit questions during bidding. Failure to do so will not be grounds for an automatic change order during construction for unforeseen conditions that were visible during the bid period. A site visit will be arranged during the Pre-Bid Conference. If needed, one additional site visit will be scheduled after the Pre-Bid Conference.

D. Refer to Section 011000, Summary of Work for additional information concerning the scope of work for this Project.

END OF SECTION
SECTION 033053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

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 cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.3 SUBMITTALS
A. Product Data: For each type of product indicated.
B. Design Mixtures: For each concrete mixture.

1.4 QUALITY ASSURANCE
A. Comply with the following sections of ACI 301, unless modified by requirements in the Contract Documents:
   1. "General Requirements."
   2. "Formwork and Formwork Accessories."
   3. "Reinforcement and Reinforcement Supports."
   4. "Concrete Mixtures."
   5. "Handling, Placing, and Constructing."
B. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS

2.1 FORMWORK
A. Furnish formwork and formwork accessories according to ACI 301.

2.2 STEEL REINFORCEMENT
A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

2.3 CONCRETE MATERIALS
A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:
   1. Portland Cement: ASTM C 150, Type I. Supplement with the following:
2.4 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.5 CURING MATERIALS

A. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

2.6 CONCRETE MIXTURES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:

1. Minimum Compressive Strength: 3000 psi at 28 days.
2. Slump Limit: 5 inches, plus or minus 1 inch.

2.7 CONCRETE MIXING

A. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
3.4 CONCRETE PLACEMENT
A. Comply with ACI 301 for placing concrete.
B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
C. Do not add water to concrete during delivery, at Project site, or during placement.
D. Consolidate concrete with mechanical vibrating equipment.

3.5 FINISHING FORMED SURFACES
A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch.

3.6 CONCRETE PROTECTING AND CURING
A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.
B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:
   1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Maintain continuity of coating and repair damage during curing period.

3.7 FIELD QUALITY CONTROL
A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
B. Tests: Perform according to ACI 301.
   1. Testing Frequency: One composite sample shall be obtained for each day's pour of each concrete mix exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
3.8 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION
SECTION 042200 - CONCRETE 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 Includes:
   1. Concrete masonry 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 SUBMITTALS

A. Product Data: For each type of masonry and accessory product required.

B. Material Certificates: For each type and size of the following:
   1. Masonry units.
      a. Include material test reports substantiating compliance with requirements.
   2. Cementitious materials. Include brand, type, and name of manufacturer.
   3. Preblended, 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.
   7. Anchors, ties, and metal accessories.

C. 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.
1.5 QUALITY ASSURANCE

A. 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.

B. 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.

C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

1.6 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 preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, 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 accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

A. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

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 sills, ledges, and projections from mortar droppings.
   2. 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 may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
B. Fire-Resistance Ratings: Where indicated, 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. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide bullnose units for outside corners unless otherwise indicated.

2.3 MASONRY LINTELS

A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.4 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C 91.
B. Mortar Cement: ASTM C 1329.
C. Aggregate for Mortar: ASTM C 144.
E. Water: Potable.

2.5 REINFORCEMENT

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

B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

1. Interior Walls: Hot-dip galvanized, carbon steel.
2. Wire Size for Side Rods: 0.187-inch diameter.
4. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
5. Provide in lengths of not less than 10 feet.

C. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

2.6 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
2. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 zinc coating.
3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Partition Top anchors: 0.105-inch thick metal plate with 3/8-inch diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel.

2.7 MISCELLANEOUS ANCHORS

A. Anchor Bolts: Headed steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

B. Postinstalled Anchors: Torque-controlled expansion anchors or chemical anchors.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 unless otherwise indicated.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene or urethane.

B. 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 steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

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. Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
   c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
   d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

2.9 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, 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.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended 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, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
   1. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N or Type S.
   2. For CMU used on the perimeter and the interior of the secure prisoner holding area use Type S.

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 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
   3. Provide grout with a slump of 8 to 11 inches 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.
   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 for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Build chases and 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, where possible, 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 or minus 1/4 inch.
2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch 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, or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch 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, 1/4 inch in 20 feet, or 1/2 inch maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

G. Fill cores in hollow CMUs solid unless otherwise indicated. Ensure reinforcement is installed prior to filling.

H. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
   1. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.
   2. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with requirements for a 2-hour fire resistance rating.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs 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.
   3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
   4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
   1. Space reinforcement not more than 8 inches o.c.
   2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at corners by using prefabricated L-shaped units.

3.7 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:
1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.

2. Anchor masonry with anchors embedded in masonry joints and attached to structure.

3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.8 LintelS

A. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.9 REINFORCED UNIT MASONRY INSTALLATION

A. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

B. 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.

3.10 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner may 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.

3.11 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, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

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 uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

3. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.12 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.

END OF SECTION
SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 DESCRIPTION:
A. This section specifies materials and services required for installation of cold-formed steel, including tracks and required accessories as shown and specified. This Section includes the following:

1. Interior ceiling framing for gypsum wallboard ceilings.

1.2 RELATED WORK:
A. Gypsum board assemblies: Section 09 29 00, GYPSUM BOARD.

1.3 DESIGN REQUIREMENTS:
A. Design steel in accordance with American Iron and Steel Institute Publication "Specification for the Design of Cold-Formed Steel Structural Members", except as otherwise shown or specified.

B. Structural Performance: Engineer, fabricate, and erect cold-formed metal framing to withstand design loads within limits and under conditions required.

1. Design Loads: As indicated.

2. Design framing systems to withstand design loads without deflections greater than the following:

b. Interior ceilings: Vertical deflection of 1/360 of the ceiling joist unsupported length.

3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change (range) of 67 degrees C (120 degrees F).

4. Design framing system to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.
1.4 SUSTAINABLE DESIGN AND WASTE MANAGEMENT

A. Refer to Division 1 Sections “LEED Requirements” and “Construction Waste Management” for sustainable design and waste management project goals and definitions and Leadership in Energy and Environmental Design (LEED) information checklists.

B. Materials and Resources (MR): Items below refer to LEED Materials & Resources credits that are affected by this Section. Certify products meet or exceed specified LEED requirements.

1. Construction Waste Management (MRc2.1-2.2): To divert a minimum of 50% by weight of construction, demolition, and land clearing debris from landfill disposal, participate in the Contractor’s Waste Management Plan as outlined in Division 1 Section “Construction Waste Management.”

   a. Reuse, Salvaging, Recycling, and Disposal – Refer to Division 1 Section “Construction Waste Management” for specific procedures and submittal information.

2. Recycled Content Materials (MRc4.1, 4.2): To increase demand for building products that have incorporated recycled materials, provide a minimum of 50% post-consumer recycled content or highest available recycled content while fulfilling performance requirements. Refer to Division 1 Section “LEED Sustainable Design and Construction” for definitions of “post-consumer recycled content”, “post-industrial recycled content”, and “recycled material”.

3. Local/Regional Materials (MRc.5.1): To increase demand for building products that are manufactured locally, provide steel materials that are manufactured regionally within a radius of 500 miles as specified.

1.5 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

1.6 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Iron and Steel Institute (AISI):

   Specification and Commentary for the Design of Cold-Formed Steel Structural Members (1996)
C. American Society of Testing and Materials (ASTM):

A36/A36M(REV. A)-2003 Standard Specifications for Carbon Structural Steel

A123/A123M-2002 Standard Specifications for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A153/A153M-2003 Standard Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

A307-2002 Standard Specifications for Carbon Steel Bolts and Studs

A653/A653M-2003 Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

C955-2003 Standard Specifications for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases

C1107-2002 Standard Specifications for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)


D. American Welding Society (AWS):

D1.3-(98) Structural Welding Code-Sheet Steel

E. Military Specifications (Mil. Spec.):

MIL-P-21035B(Reinst. Notice 2) Paint, High Zinc Dust Content, Galvanizing Repair
PART 2 – PRODUCTS

2.1 MATERIALS:

A. Sheet Steel for studs and accessories 16 gage and heavier: ASTM A653, structural steel, zinc coated G90, with a yield of 340 MPa (50 ksi) minimum.

B. Sheet Steel for studs and accessories 18 gage and lighter: ASTM A653, structural steel, zinc coated G90, with a yield of 230 MPa (33 ksi) minimum.

C. Galvanizing Repair Paint: MIL-P-21035B.

2.2 WALL FRAMING:

A. Steel Studs: Manufacturer’s standard C-shaped steel studs of web depth indicated, with lipped flanges, and complying with the following:
   1. Design Uncoated-Steel Thickness: 1.20 mm (0.0474 inch)
   2. Flange Width: (1-5/8 inches)
   3. Web: Punched

B. Steel Track: Manufacturer’s standard U-shaped steel track, unpunched, of web depths indicated, with straight flanges, and complying with the following:
   1. Design Uncoated-Steel Thickness: Matching steel studs.
   2. Flange Width: Manufacturer’s standard deep flange where indicated, standard flange elsewhere.

2.3 FRAMING ACCESSORIES:

A. Fabricate steel framing accessories of the same material and finish used for framing members, with a minimum yield strength of 230 MPa (33 ksi).

B. Provide accessories of manufacturer’s standard thickness and configuration, unless otherwise indicated, as follows:
   1. Supplementary framing.
   2. Bracing, bridging, and solid blocking.
   3. Web stiffeners.
5. Deflection track and vertical slide clips.
7. Joist hangers and end closures.
8. Reinforcement plates.

2.5 ANCHORS, CLIPS, AND FASTENERS:
A. Steel Shapes and Clips: ASTM A36, zinc coated by the hot-dip process according to ASTM A123.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times the design load, as determined by testing per ASTM E1190 conducted by a qualified independent testing agency.

E. Mechanical Fasteners: Corrosion-resistant coated, self-drilling, self-threading steel drill screws. Low-profile head beneath sheathing, manufacturer’s standard elsewhere.

2.6 REQUIREMENTS:
A. Furnish members and accessories by one manufacturer only.

PART 3 - EXECUTION
3.1 FABRICATION:
A. Framing components may be preassembled into panels. Panels shall be square with components attached.

B. Cut framing components squarely or as required for attachment. Cut framing members by sawing or shearing; do not torch cut.

C. Hold members in place until fastened.

D. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

1. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
2. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer’s instructions with screw penetrating joined members by not less than 3 exposed screw threads.

E. Where required, provide specified insulation in double header members and double jamb studs which will not be accessible after erection.

3.2 ERECTION:
A. Securely anchor tracks to supports as shown.
B. At butt joints, securely anchor two pieces of track to same supporting member or butt-weld or splice together.
C. Plumb, align, and securely attach studs to flanges or webs of both upper and lower tracks.
D. Install jack studs above and below openings and as required to furnish support. Securely attach jack studs to supporting members.
E. Install headers in all openings that are larger than the stud spacing in that wall.
F. Attach bridging for studs in a manner to prevent stud rotation. Space bridging rows as shown.
G. Studs in one piece for their entire length, splices will not be permitted.
H. Provide temporary bracing and leave in place until framing is permanently stabilized.

3.3 TOLERANCES:
A. Vertical alignment (plumbness) of studs shall be within 1/960th of the span.
B. Horizontal alignment (levelness) of walls shall be within 1/960th of their respective lengths.
C. Spacing of studs shall not be more than 3 mm (1/8 inch) +/- from the designed spacing providing that the cumulative error does not exceed the requirements of the finishing materials.
D. Prefabricated panels shall be not more than 3 mm (1/8 inch) +/- out of square within the length of that panel.

3.4 FIELD REPAIR:
   A. Touch-up damaged galvanizing with galvanizing repair paint.

END OF SECTION
SECTION 055213 - PIPE AND TUBE RAILINGS

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. Steel pipe railings.

B. Related Sections:
   1. Division 06 Section "Miscellaneous Carpentry" for wood blocking for anchoring railings.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:
   a. Uniform load of 50 lbf/ft. applied in any direction.
   b. Concentrated load of 200 lbf applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:
   a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
   b. Infill load and other loads need not be assumed to act concurrently.

1.4 SUBMITTALS

A. Product Data: For the following:
   1. Railing brackets.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

A. Fabricate steel railings to greatest extent practical in a shop using qualified welders.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.
1.7 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers’ written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.2 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

2.3 FASTENERS

A. General: Provide the following:

1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

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

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

F. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

G. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

H. Form changes in direction as follows:
1. By bending or by inserting prefabricated elbow fittings.

I. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

J. Close exposed ends of railing members with prefabricated end fittings.

K. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to
structural supports and prevent bracket or fitting rotation and crushing of substrate.

M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.7 STEEL AND IRON FINISHES

A. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

B. Shop-Painted Finish: Comply with Division 9 Section "Painting."


PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.

3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 ATTACHING RAILINGS

A. Attach railings to wall with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

B. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

3.5 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings. Remove protective coverings at time of Substantial Completion.
SECTION 061053 - MISCELLANEOUS CARPENTRY

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. Coordinate the work of this section with the section on Interior Architectural Woodwork.

B. This section includes the following:
   1. Wood blocking and nailers.
   2. Wood furring.
   3. Wood sleepers.
   4. Interior wood trim.
   5. Wood shelving.
   6. Plywood backing panels.
   7. Finish carpentry items exposed to view.
   8. Miscellaneous framing with dimension lumber.

C. Related work that may be included in this section depending upon coordination:
   1. Courtroom platforms and steps.
   2. Certain courtroom exposed wood trim such as hardwood window stools, etc.
   3. Replacement, repair or installation of wood window stools throughout the floor.

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
   2. NLGA: National Lumber Grades Authority.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. All wood products installed in this project that are concealed within walls, chases, ceilings, steps and platforms must be fire retardant treated. Include data for fire-
retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver interior wood materials that are to be exposed to view only after building is enclosed and weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).
1. Use treatment that does not promote corrosion of metal fasteners.
2. Use Exterior type for exterior locations and where indicated.
3. Use Interior Type A, unless otherwise indicated.

B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Furring.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 15 percent maximum moisture content of any species.

2.5 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.


D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1.

G. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when
installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.


PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Do not splice structural members between supports, unless otherwise indicated.

D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Securely attach carpentry work to substrate.

F. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.4 WOOD TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

1. Match color and grain pattern across joints.
2. Install trim after gypsum board joint-finishing operations are completed.
3. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads and fill holes.
SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

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. Courtroom woodwork for judges benches, jury boxes, gallery rails, etc.
2. Bullet Resistant (B.R.) material within courtroom millwork.
3. Platforms, ramps and stairs associated with Courtroom woodwork.
4. Interior standing and running trim.
5. Flush wood paneling and wainscots.
7. Plastic-laminate countertops.
8. Solid-surfacing-material countertops.

B. This Section may include the following depending upon coordination with other sections. Extent of repair or replacement will be indicated on drawings:

1. New window and storefront stools (sills) to replace existing damaged components.
2. Repair and refinishing of window and storefront stools (sills).

C. Related Sections include the following:

1. Division 06 Section Miscellaneous Carpentry for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.

1.3 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

B. This section includes platforms, steps and ramps associated with courtroom judges benches, witness stands, gallery rails, wall paneling and jury boxes. These elements are required to integrate with any existing woodwork in courtrooms, such as window stools noted above.
1.4 SUBMITTALS

A. Product Data: For each type of product indicated including cabinet hardware and accessories, handrail brackets, finishing materials and processes and bullet-resistant panels.

1. Include data for wood fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Fire-retardant treated wood products will be required if installed within walls, platforms, stairs and ramps.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples for Initial Selection:

1. Shop-applied transparent finishes.
2. Shop-applied opaque finishes.
4. PVC edge material.
5. Solid-surfacing materials.
6. Natural stone materials if applicable.

D. Samples for Verification:

1. Lumber for transparent finish, not less than 5 inches wide by 24 inches long, for each species, finished on 1 side and 1 edge. Apply finish same as final woodwork.
2. Veneer-faced panel products for transparent finish, 12 by 24 inches, for each species and cut. Apply finish same as final woodwork.

E. Mock-Ups: Provide the following mock-ups. Apply finishes with same prep work that will be required for finished millwork. Refer to Quality Standards below for more information.

1. Typical wall/desk top rail cap with reveal and partial front panel for courtroom woodwork. Indicate edge banding at reveals. Mock-up to be at least 24” long and of sufficient size to show joinery.
2. Typical desk edge with top portion. Mock-up to be at least 24” long and of sufficient size to show joinery and part of the top.

F. Fabricator and Installer Qualifications: Provide information on fabricator and installer. See Quality Assurance below for requirements.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Provide references on fabricator. Include information on similar installations in Austin, Texas.

B. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production and finishing of interior architectural woodwork with transparent finish.
C. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

D. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

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. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Shop Visit: At Owner's option, arrange and coordinate a shop visit to the Millwork Fabricator's shop at which the components specified in this division are to be fabricated. The visit will be for purposes of examining work in progress and discussing the project with the Millwork Subcontractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Where woodwork is 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.
   1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed.
   2. Established Dimensions: Only with prior approval of Owner, where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Species and Cut for Transparent Finish: White oak, rift sawn or cut.

C. Wood Species for Opaque Finish: Any closed-grain hardwood.

D. Wood Products: Comply with the following:
   2. Medium-Density Fiberboard: ANSI A208.2, Grade MD.

E. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
   1. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semiexposed edges.

F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.
   1. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
      a. Abet Laminati, Inc.
      b. Arborite; Division of ITW Canada, Inc.
      c. Formica Corporation.
      d. Lamin-Art, Inc.
      e. Nevamar Company, LLC; Decorative Products Div.
      f. Panolam Industries International Incorporated.
      g. Westinghouse Electric Corp.; Specialty Products Div.
      h. Wilsonart International; Div. of Premark International, Inc.

G. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. ABA Industries.
      b. Avonite, Inc.
      d. Formica Corporation.
      e. LG Chemical, Ltd.
2.2 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified.

1. Do not use treated materials that do not comply with requirements of referenced woodworking standard or that are warped, discolored, or otherwise defective.
2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
3. Identify fire-retardant-treated materials with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.3 BULLET-RESISTANT MATERIAL

A. General: Provide bullet-resistant (B.R.) material within courtroom woodwork as indicated in the drawings.

1. Install B.R. material per manufacturer's instructions.
2. B.R. material is to provide complete coverage over the area indicated in the drawings.

B. B.R. Panels:

1. Panel Composition: Multiple layers of woven roving ballistic grade fiberglass impregnated with a thermoset polyester resin and compressed into rigid flat sheets. Production technique and materials used shall cause controlled delamination and encapsulation of penetrating projectiles.
3. Panels shall be 7/16" thickness and of sufficient dimension to minimize the number of joints. All joints must occur over supporting structural members.

C. Acceptable Products and Manufacturers: Subject to compliance with requirements provide the following or approved equal products from other manufacturers.

1. Armorcore Level 3, by Waco Composites I, Ltd., Waco, Texas
2. Armortex OF 300, by Safeguard Security Services, Ltd., San Antonio, Texas

D. Execution:
1. Joints shall be reinforced by a back-up layer of the same B.R. material. Minimum width of the back-up layer shall be 4" with 2" overlap on each side of the joint.

2. Fasten the B.R. material to the supporting members using an industrial panel adhesive, screws or bolts.

2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."

B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening, self-closing.

C. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.

D. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

E. Drawer Slides: BHMA A156.9, B05091.
   1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball-bearing slides.

F. Door Locks: BHMA A156.11, E07121.

G. Drawer Locks: BHMA A156.11, E07041.

H. Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.

I. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
   1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.

J. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

D. Adhesives, General: Do not use adhesives that contain urea formaldehyde.
2.6 FABRICATION, GENERAL

A. Interior Woodwork Grade: Unless otherwise indicated, provide Custom grade interior woodwork complying with referenced quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:


D. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of openings in countertops with a coat of varnish.

2.7 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

A. Grade: Custom.

B. Wood Species and Cut: White Oak, plain or rift sawn.

C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.

2.8 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

A. Grade: Custom.

B. Wood Species: Any closed-grain hardwood.

C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.

2.9 FLUSH WOOD PANELING AND WAINSCOTS

A. Grade: Custom.
B. Wood Species and Cut: Match Courtroom Woodwork specified elsewhere in this section.

2.10 COURTROOM MILLWORK PLATFORMS

A. Materials - General: Platforms may be constructed from either of the options below.
   1. Fire-retardant treated wood for framing and decking
   2. Light-gage metal framing with fire-retardant treated wood decking

B. Framing members, whether dimension lumber, composite engineered wood or light-gage metal shall be at 16" O.C. and capable of supporting normal loads on the platforms without noticeable deflection.

C. Platform decking: Two layers of ¾" T & G plywood. Stagger joints. Glue and screw with construction adhesive such as NP-1 or Liquid Nails. Use adhesive between plywood and framing. Top layer of decking shall be either B grade or C grade with no surface irregularities that will telegraph through glue-down carpet.

D. Construct platforms to heights indicated on plans with allowable variation in height at steps no greater than 1/8".

2.11 INTERIOR RAMPS

A. Materials: Ramps may be constructed from any of the three options below. However, the transitions between ramp and floor or ramp and platform must be smooth with no discernable ridges or gaps. Ramps must not flex or squeak from normal use.
   1. Fire-retardant treated wood for framing and decking
   2. Light-gage metal framing with fire-retardant treated plywood decking
   3. Poured-in-place concrete using carton forms where thickness of concrete exceeds 8"

B. Construct ramps true to line without dips or irregularities and to heights indicated on plans.

C. If wood decking is used provide two layers of plywood as described above for platforms.

2.12 PLASTIC-LAMINATE CABINETS

A. Grade: Custom.

B. AWI Type of Cabinet Construction: Reveal overlay on face frame.

C. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
   1. Horizontal Surfaces Other Than Tops: Grade HGS.
   2. Postformed Surfaces: Grade HGP.
   3. Vertical Surfaces: Grade HGS.
4. Edges: Grade HGS.

D. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: Thermoset decorative panels.
   a. For semisexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade VGS.

2. Drawer Sides and Backs: Solid-hardwood lumber.
3. Drawer Bottoms: Hardwood plywood.

E. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

F. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

2.13 PLASTIC-LAMINATE COUNTERTOPS

A. Grade: Custom

B. High-Pressure Decorative Laminate Grade: HGS

C. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

D. Grain Direction: Parallel to cabinet fronts.

E. Edge Treatment: Same as laminate cladding on horizontal surfaces.

F. Core Material: Exterior-grade plywood.


2.14 SOLID-SURFACING-MATERIAL COUNTERTOPS

A. Grade: Custom.

B. Solid-Surfacing-Material Thickness: 3/4 inch.

C. Colors, Patterns, and Finishes: Provide materials and products that result in colors of solid-surfacing material complying with the following requirements:
   1. As selected by Architect from manufacturer's full range of standard colors.

D. Fabricate tops in one piece, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.
   1. Fabricate tops with shop-applied edges of materials and configuration indicated.

E. Install integral sink bowls in countertops in shop.
F. Drill holes in countertops for plumbing fittings and soap dispensers in shop.

2.15 CLOSET AND UTILITY SHELVING
A. Shelf Material: 3/4-inch veneer-faced panel product with solid-lumber edge.
B. Wood Species: Any close-grain hardwood.

2.16 SHOP FINISHING
A. Grade: Custom.
B. General: Shop finish transparent-finished interior architectural woodwork at fabrication shop as specified in this Section. Refer to Division 09 painting Sections for finishing opaque-finished architectural woodwork.
C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
   1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

D. Transparent Finish:
   1. Grade: Custom.
   2. AWI Finish System: Conversion Varnish, Clear Satin sheen.
   3. Staining: Match approved sample for color.
   4. Wash Coat for Stained Finish: Apply wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.
   5. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.

E. Opaque Finish:
   1. Grade: Custom.
   2. System: Refer to Division 9 Section "Painting."
   3. Color: As selected by Architect from manufacturer's full range.
   4. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION
3.1 PREPARATION
A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

G. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 60 inches long, except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.

1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
2. Install wall railings on indicated metal brackets securely fastened to wall framing.
3. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.

H. Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening, unless covered by trim.

1. Install flush paneling with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.

I. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
2. Maintain veneer sequence matching of cabinets with transparent finish.
3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c.
4. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

5. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

6. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.

7. Secure backsplashes to walls with adhesive.

8. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

J. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

K. Refer to Division 09 Sections for final finishing of installed architectural woodwork not indicated to be shop finished

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate if appropriate, and adjust hardware.

C. Clean woodwork on exposed and semiexposed surfaces. Touch up finishes to restore damaged or soiled areas.

END OF SECTION
SECTION 072100 - INSULATION

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. Sound attenuation insulation.

1.3 DEFINITIONS

A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blanket with latter formed into batts (flat-cut lengths) or rolls.

1.4 PERFORMANCE REQUIREMENTS

A. Plenum Rating: Provide glass-fiber insulation where indicated in ceiling plenums whose test performance is rated as follows for use in plenums as determined by testing identical products per "Mold Growth and Humidity Test" described in UL 181, or on comparable tests from another standard acceptable to authorities having jurisdiction.
   1. Mold Growth and Humidity Test Results: Insulation shows no evidence of mold growth, delamination, or other deterioration due to the effects of high humidity, after inoculation with Chaetomium globosium on all surfaces and storing for 60 days at 100 percent relative humidity in the dark.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with
manufacturer’s written instructions for handling, storing, and protecting during installation.

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, manufacturers specified.

2.2 GLASS-FIBER BLANKET INSULATION

A. Available Manufacturers:

1. CertainTeed Corporation.
2. Guardian Fiberglass, Inc.
4. Knauf Fiber Glass.
5. Owens Corning.

B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

C. Provide products specifically designated by the manufacturer to be for the purpose of sound attenuation insulation.

D. Where sound attenuation insulation is indicated to be installed in walls provide product of thickness equal to metal studs.

E. Where sound attenuation insulation is indicated to be installed above ceilings provide 3-½” minimum thickness batts.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean areas to receive insulation. Remove debris and accumulated dust within wall cavity spaces and above ceiling areas.
3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to moisture.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Install insulation in cavities formed by framing members according to the following requirements:
   
   1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
   
   2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
   
   3. Maintain 3-inch clearance of insulation around recessed lighting fixtures.

E. Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces as necessary for complete coverage. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..

3.4 INSTALLATION OF INSULATION IN CEILINGS FOR SOUND ATTENUATION

A. Install sound attenuation batts over suspended ceilings at partitions noted to receive sound attenuation insulation in a width that extends insulation 48 inches on either side of partition.

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. Silicone joint sealants.
   2. Latex joint sealants.
   3. Acoustical joint sealants.
   4. High security urethane joint sealant.

B. Related Sections:
   1. Division 07 Section "Fire-Resistive Joint Systems" for sealing joints in fire-resistance-rated construction.
   2. Division 08 Section "Glazing" for glazing sealants.
   3. Division 09 Section "Gypsum Board" for sealing perimeter joints.
   4. Division 09 Section Acoustical Tile Ceilings for sealing edge moldings at perimeters with acoustical sealant.

1.3 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.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.5 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.
   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.
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.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, those from the following manufacturers:
   a. Dow Corning Corporation.
   b. GE Advanced Materials.
   c. May National Associates, Inc.
   d. Pecora Corporation.
   e. Sika Corporation.
   f. Tremco Incorporated.

2.3 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

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. BASF Building Systems; Sonolac.
   c. May National Associates, Inc.
   d. Pecora Corporation; AC-20+.
   e. Schnee-Morehead, Inc.; SM 8200.
   f. Tremco Incorporated; Tremflex 834.

2.4 HIGH SECURITY URETHANE JOINT SEALANT

A. STPU (silyl-terminated polyurethane) joint sealant for use in Inmate Court Holding Area for sealing fixtures, control joints, joints between dissimilar materials and other applications where the sealant is within reach of inmates.

1. Subject to conditions governing substitutions provide a product equal to Pecora DynaFlex SC, a one part, non-sag, tamper resistant elastomeric sealant manufactured by Pecora Corporation, Harleysville, PA.

2. Follow manufacturer’s recommendations on backer rods, joint width limits, tooling and other installation criteria.
2.5 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. 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.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

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 and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.
B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer’s written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

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 of kind indicated 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.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. 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.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

   a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 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.

3.5 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. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:
   a. Control and expansion joints on exposed interior surfaces of exterior walls.
   b. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
   c. Other joints as indicated.

2. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Sealant Location:
   a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   b. Other joints as indicated.

2. Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, Silicone.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Location:
   a. Acoustical joints where indicated.

2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
D. High Security Inmate Court Holding Area.
   
1. All applications where a sealant is indicated and that can be within reach of inmates.
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION
SECTION 081113 - HOLLOW METAL FRAMES

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. Existing hollow metal frames: The drawings indicate existing hollow metal frames remaining in place as well as hollow metal frames to be reused. Demolition on the floor will remove all the hollow metal doors and frames except those noted in the Door Schedule to remain.

B. New hollow metal frames: Standard hollow metal frames as specified herein.

C. Detention Hollow Metal Frames are specified elsewhere.

D. Related Sections:
   1. Division 08 Section, Hardware
   2. Division 08 Section, Flush Wood Doors
   3. Division 09 Section for field painting hollow metal frames

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, fire resistance rating and finishes.

B. Shop Drawings: Include the following:
   1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   2. Locations of reinforcement and preparations for hardware.
   3. Details of each different wall opening condition.
   4. Details of anchorages, joints, field splices, and connections.
   5. Details of accessories.
   6. Details of moldings, removable stops, and glazing.
   7. Details of prep for power, signal, and control systems.

C. Samples for Verification:
   1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches.
D. Other Action Submittals:

1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

2. Where Fire Rated Assemblies are indicated provide submittal for door, frame and related components documenting compliance with required fire rating. Coordinate this work with the Division 08 Section, Flush Wood Doors.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

B. Store hollow metal work in a secure area under cover at Project site in a manner to protect from damage. Do not store in a manner that traps excess humidity.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Amweld Building Products, LLC.
2. Benchmark; a division of Therma-Tru Corporation.
3. Ceco Door Products; an Assa Abloy Group company.
4. Curries Company; an Assa Abloy Group company.
5. Deansteel Manufacturing Company, Inc.
7. Fleming Door Products Ltd.; an Assa Abloy Group company.
2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.

C. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.

D. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

E. Glazing: Comply with requirements in Division 08 Section "Glazing."

2.3 STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
   1. Fabricate frames as fully welded.

B. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.4 STOPS AND MOLDINGS

A. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.

2.5 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

C. Hollow Metal Frames:
   1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
   2. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
   3. Jamb Anchors: Provide number and spacing of anchors as follows:
      a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
1) Four anchors per jamb.

4. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
   a. Drill stop in strike jamb to receive three door silencers.

D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
   1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
   2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
   3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
   4. Coordinate locations of conduit and wiring boxes for electrical connections.

2.6 STEEL FINISHES

A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
   1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine existing hollow metal frames on site for suitability to be incorporated into the work. Refer to the Door Schedule.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

   a. At fire-protection-rated openings, install frames according to NFPA 80.
   b. Install frames with removable glazing stops located on secure side of opening.
   c. Remove temporary braces necessary for installation only after frames have been properly set and secured.
   d. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

   a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

4. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

   a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
   c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
   d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113
SECTION 081416 - FLUSH WOOD DOORS

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. Existing Doors:

1. Refer to Door Schedule on Drawings for reuse of existing doors salvaged from demolition and stored on jobsite.

2. For reuse of salvaged doors conform to the provisions of this section for installation, fit and adjustment.

3. For new doors required conform to the provisions of this section.

B. Section Includes:

1. Solid-core wood doors with plastic-laminate faces.
2. Preparation of doors for installation into standard hollow metal frames.

C. Related Sections:

1. Division 08 Section "Glazing" for glass view panels in flush wood doors.

1.3 SUBMITTALS

A. Product Data: For each type of door indicated. Include details of core and edge construction.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.

C. Samples for Initial Selection: Match existing plastic-laminate door faces.

1. Wilsonart, 7860-60, Bannister Oak

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors from single manufacturer.
B. **Quality Standard:** In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

C. **Fire-Rated Wood Doors:** Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

1.5 **DELIVERY, STORAGE, AND HANDLING**

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in [plastic bags or cardboard cartons] [cardboard cartons and wrap bundles of doors in plastic sheeting].

C. Mark each door with opening number used on Shop Drawings.

1.6 **PROJECT CONDITIONS**

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 **WARRANTY**

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.


**PART 2 - PRODUCTS**

2.1 **MANUFACTURERS**

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Algoma Hardwoods, Inc.
2. Ampco, Inc.
3. Buell Door Company Inc.
4. Chappell Door Co.
5. Eagle Plywood & Door Manufacturing, Inc.
7. Graham; an Assa Abloy Group company.
8. Haley Brothers, Inc.
10. Ipik Door Company.
11. Lambton Doors.
12. Marlite.
14. Mohawk Flush Doors, Inc.; a Masonite company.
15. Oshkosh Architectural Door Company.
17. Vancouver Door Company.
18. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

A. WDMA I.S.1-A Performance Grade: Heavy Duty.

B. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-1.
2. Blocking: Provide wood blocking in particleboard-core doors as follows:
   a. 5-inch top-rail blocking, in doors indicated to have closers.
   b. 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
   c. 5-inch midrail blocking, in doors indicated to have exit devices.

C. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.

2.3 PLASTIC-LAMINATE-FACED DOORS

A. Interior Solid-Core Doors:

1. Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS.
2. Colors, Patterns, and Finishes: Refer to 1.3.C, Submittals
5. Construction: Three plies. Stiles and rails are bonded to core, then entire unit abrasive planed before faces are applied.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames before hanging doors.

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.

2. Prior to installing frames or doors, confirm suitability of existing hollow metal frames to receive new doors. Check frames for unrepairable damage, unsuitable hardware prep or other problem that would make the frames uneuseable.
3. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.

   a. Comply with NFPA 80 for fire-rated doors.

   2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

   3. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416
SECTION 083000 - ELEVATOR DOOR SMOKE CONTAINMENT SYSTEM

GENERAL

1.01 SUMMARY

A. Section Includes: Smoke detector activated elevator door smoke containment screen and control system designed to provide a tight-fitting, smoke- and draft-control assembly.

B. Products Supplied But Not Installed Under This Section:
   1. End-of-line diode (3.9V, 2W). Installed at smoke detector to monitor the circuit.
   2. Field painting of specified components; repainting of existing field painted elevator door frames.
   4. Division 16 Sections for 120VAC and control circuit power including conduit, boxes, conductors, wiring devices, and emergency power.

1.02 REFERENCES


B. ICC Evaluation Service report ESR-1136

C. NFPA Codes and Standards:
   1. 70 – National Electrical Code.
   2. 105 – Recommended Practice for the Installation of Smoke-Control Door Assemblies.

D. UL Standards:
   2. 508 – Industrial Control Equipment.
   3. 864 – Control Units for Fire Protective Signaling Systems.
   4. 1784 – Air Leakage Tests for Door Assemblies.

1.03 SUBMITTALS

A. Reference Section 01330–Submittal Procedures; submit following items:
   1. Product Data.
   2. Shop Drawings: Include door width and height, jamb width, jamb and head projection, screen width, mounting height, and housing width. Show and identify related work performed under other sections of the specifications.
   3. Quality Assurance/Control Submittals:
      a. Qualifications:
         1) Proof of manufacturer qualifications.
         2) Proof of Installer qualifications.
      b. Certifications: Copy of specified items.
      c. Manufacturer’s installation instructions and testing procedures

B. Closeout Submittals:
1. Operation and Maintenance Manual
2. Manufacturer’s Warranties

1.04 QUALITY ASSURANCE

A. Overall Standards:
   1. Manufacturer shall maintain a quality control program in accordance with ICBO-ES Acceptance Criteria AC 77.

B. Qualifications:
   1. Manufacturer Qualifications: Minimum seven years experience in producing smoke containment systems of the type specified.
   2. Installer Qualifications: Factory trained by manufacturer.

C. Certifications:
   1. Manufacturer’s ICC Evaluation Service report ESR-1136.
   2. Testing Laboratory Label.
   3. UL Listing.

D. Pre-Installation Meeting:
   1. Schedule and convene a pre-installation meeting prior to commencement of field operations with representatives of the following in attendance: Owner, Architect, General Contractor, smoke containment system sub-contractor, painting sub-contractor, and electrical sub-contractor.
   2. Review substrate conditions, requirements of related work, installation instructions, storage and handling procedures, and protection measures.
   3. Keep minutes of meeting including responsibilities of various parties and deviations from specifications and installation instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Follow manufacturer’s instructions.

1.06 WARRANTY

A. Time Period: One year from Date of Substantial Completion.

B. Conditions: Manufacturer’s standard warranty form.

1.07 OWNER’S INSTRUCTIONS

A. Maintenance and Testing:
   1. Perform minimum semi-annual maintenance and testing on each smoke containment system as required by the manufacturer’s warranty, code agency evaluation reports, and as required by local authority having jurisdiction.
   2. Retain permanent record of tests.

B. Future Painting: Paint elevator door frame and/or auxiliary rails in accordance with Operation and Maintenance Manual.

C. Required Replacement: Smoke containment screen requires replacement following exposure to temperatures exceeding 200 degrees F (93 degrees C).
PART 2 - PRODUCTS

2.01 MANUFACTURER AND PRODUCTS

A. Acceptable Manufacturers:
   1. Smoke Guard Corporation, 287 Maple Grove, Boise, Idaho 83704
   2. Approved equal products of other manufacturers may be considered.

B. Product
   1. Model 400

2.02 PERFORMANCE REQUIREMENTS

A. Air Leakage: Not to exceed 3 cfm (0.001416 m³/s) per sf of door opening at 0.1 in (25 Pa) water pressure differential at ambient temperature and 400 degrees F (204 degrees C) tested per IBC 2000 714.2.3 or per 1997 UBC Vol. 3, Standard 7-2, Part II.

2.03 COMPONENTS

A. Screen:
   1. Film: Minimum 1 mil (0.025 mm) thick transparent polyimide film reinforced with minimum 100 denier Nomex yarn at .25 in (6.35 mm) each way.

B. Housing: 20 gauge, powder coated, cold rolled steel container with dust cover and door with concealed hinges. Housings are 55, 64, or 73" in length plus 1-1/2 inches for a junction box on the left side.

C. Auxiliary Rails:
   1. Material: 16 gage ASTM A 240/240M, Type 430, ferritic stainless steel.
   2. Size: 2 inches (51 mm) wide; 1 inch (25 mm), 3/4 inch (19 mm) or 1/2 inches (13 mm) deep, depth as required to project beyond face of elevator door frame, as shown in Shop Drawings.
   3. Field Painting of existing rails, if required, shall be done according to the manufacturer's instructions using heat resistant (300 degree F.) paint, spray applied to a maximum of 5 mils thickness, including primer.

D. Rewind Motor: NFPA 70, 90v DC.


F. Screen Rewind Switch: Include switch to rewind screen into housing.

2.04 IDENTIFICATION

A. Label each smoke containment system with following information:
   1. Manufacturer’s name.
   2. Maximum leakage rating at specified pressure and temperature conditions.
   3. Label of quality control agency.
PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates upon which work will be installed.
   1. Verify related work performed under other sections is complete and in accordance with Shop Drawings.
   2. Verify wall surfaces and elevator door frames are acceptable for installation of smoke containment system components.
   3. Verify existing field painted elevator door frames to be used for screen adherence have been repainted in accordance with smoke containment system manufacturer’s instructions or they have the original factory paint.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Commencement of work by installer is acceptance of substrate.

3.02 INSTALLATION

A. Install smoke containment system components in accordance with manufacturer’s installation instructions.

3.03 FIELD QUALITY CONTROL

A. Field Test: Follow manufacturer’s cycle test procedures.
   1. Notify Owner’s Representative, local Fire Marshal, alarm sub-contractor and elevator sub-contractor and elevator service company in advance of scheduled testing.
   2. Complete maintenance service record.

3.04 CLEANING

A. Upon acceptance by Owner clean according to manufacturer's instructions.

3.05 DEMONSTRATION

A. Demonstrate required testing and maintenance procedures to Owner’s Representative.

END OF SECTION
SECTION 083050 - ACCESS DOORS

PART 1 GENERAL

1.01 SUMMARY
A. Access door and frame units.
B. High Security access door and frame units for Detention Holding Area.
C. Provide access doors as needed and in each location necessary for access to plumbing and mechanical components within walls and hard ceilings that cannot otherwise be accessed.

1.02 SUBMITTALS
A. Submit product data and manufacturer's installation instructions.
B. Indicate door configuration for size, frame type, anchor types, spacing and finish.

1.03 DELIVERY, STORAGE AND PROTECTION
A. Protect products under requirements of Division 01, General Requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Provide Karp access doors as manufactured by Karp Associates, Inc., Melville, N.Y. or approved equal under the provisions of Division 01, General Requirements.
1. Standard Access Doors: Karp DSB-214-SM, Universal Access Door with flush lock in standard Manufacturer's finish, color to be selected by Owner. Sizes and mounting conditions indicated in drawings or, if not indicated, in sizes and configurations required to achieve access.
2. Detention Access Doors: Karp High Security Access Doors, DSB-123SD, with heavy duty detention type lock. standard Manufacturer’s finish. Sizes and mounting conditions indicated in drawings or, if not indicated, in sizes and configurations required to achieve access.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install access doors in locations indicated in the drawings or in areas necessary for access to valves and controls within walls, ceilings and chases.
B. Coordinate installation with each specific type of frame and wall construction. When installed in walls finished with ceramic tile coordinate the access door openings with the modular tile openings to avoid cutting tiles whenever possible. Align adjacent access doors for uniform appearance unless access to wall cavity equipment dictates otherwise. Install doors plumb and level.
C. For ceiling access doors consult with Owner prior to installation to confirm locations, sizes and relationships to other ceiling components such as lighting fixtures, HVAC registers and grilles and fire alarm components. Do not commence installation without approval.
D. Install with countersunk screws. Screws are to be either stainless steel or painted to match frames. If painted screws, they shall be provided with the doors from the same Manufacturer and with the same finish system as the doors. Take care to avoid scratches to screws and frames. Replace damaged screws. For detention access doors provide detention grade fasteners suitable for mounting the doors to the substrate. If not stainless steel, paint to match door finish.
E. Coordinate installation with the work of other trades.
F. Deliver keys to the Owner. Clearly mark keys as necessary for identification and location.

3.02 ADJUSTING AND CLEANING
A. Adjust for smooth and balanced door movement and proper operation of hardware.
B. Clean surfaces of fingerprints and dust.

END OF SECTION
SECTION 084113 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

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. Aluminum-framed storefront system with aluminum-framed doors using single glazed infill for interior use.

1.3 SUBMITTALS

A. Product Data: For aluminum framing system.

1. Information for factory finish, glazing gaskets, accessories and other required components.

2. Color chart for manufacturer’s standard frame finishes.

3. Manufacturer’s handling and installation instructions.

1.4 QUALITY ASSURANCE

A. Provide frames and doors from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of manufacturer's written instructions.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install frames until spaces are ready to receive materials. Do not fit wood doors, if applicable, to frames until HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace frames that fail in materials or workmanship within specified warranty period.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Provide Trifab 400 system (non-thermal) manufactured by Kawneer Company, Inc. or, subject to compliance with requirements, an approved equal product from another manufacturer. Refer to applicable sections of Division 01, General Requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine project conditions and verify that project is ready for work of this section to proceed. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Coordinate wall thickness and mounting conditions with installation requirements.

3.2 INSTALLATION

A. Comply with frame and door manufacturer’s printed installation instructions and approved shop drawings.

B. Install frames plumb and square, free from warp or twist, securely anchored to substrates with fasteners recommended by frame manufacturer. Maintain dimensional tolerances and alignment with adjacent work. Ensure joints are tight and surfaces flush with adjacent components.

C. Set all doors in locations as shown on the drawings, level, square, plumb and in alignment with other work in accordance with the manufacturer’s installation instructions and approved shop drawings.

D. Install glass in accordance with section 088000, Glazing.

3.3 ADJUSTING AND CLEANING

A. Protect exposed portions of aluminum surfaces from damage by plaster, lime, acid, cement, and other contaminants.

B. Touch up marred areas so that touch-up is not visible from a distance of 4 feet. Remove and replace frames that cannot be satisfactorily adjusted or repaired.

3.4 PROTECTION

A. Protect as required to assure that frames and doors will be without damage until Substantial Completion.

END OF SECTION
SECTION 087100 - DOOR HARDWARE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Door Hardware. Note that many hollow metal frames and doors, salvaged from the selective demolition, will be reused in the project. Many of the hardware items will also be reused such as glazing, hinges, stops, silencers, closers and sound seals. All locksets will be new for each door.

B. Coordination with features of the fire alarm and security systems, as applicable. Refer to the Hardware Schedule and to the Electrical Drawings and Specifications for references to electronically operated locksets and security alarm connection.

1.02 REFERENCES

A. ANSI A115.2 - Door and Frame Preparation for Bored or Cylindrical Locks for 1-3/4 inch Doors.

B. ANSI A156.1 - Butts and Hinges.

C. ANSI A156.2 - Locks and Lock Trim.

D. ANSI A156.3 - Exit Devices.

E. ANSI A156.4 - Door Controls (Closers)

1.03 DESCRIPTION OF WORK

A. Definition: "Door Hardware" includes items known commercially as builders hardware which are required for swinging, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame. Types of items in this section include but are not necessarily limited to:
1. Hinges
2. Lock and latch sets
3. Floor and Head bolts
4. Exit devices
5. Push/pull units
6. Closers
7. Miscellaneous door control devices
8. Door trim units
9. Protection plates
1.04 QUALITY ASSURANCE

A. Manufacturer: Obtain each kind of hardware (latch and lock sets, hinges, closers, etc.) from one manufacturer, although several may be indicated as offering products complying with requirements.

B. Supplier: A recognized builders hardware supplier who has been furnishing hardware in the project's vicinity for a period of not less than five years, and who is, or employs, an experienced hardware consultant who is available, at reasonable times during the course of the work for consultation about project's hardware requirements.

C. Fire Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80. Provide only hardware which has been tested and listed by UL for types and sizes of doors required and complies with requirements of door and door frame labels. Hardware Schedule lists hardware components showing quality, operation and type. Where door and frame assemblies are in rated openings, provide rated hardware for those openings to match the standards given in the Hardware Schedule.

1.05 SUBMITTALS

A. Submit Shop Drawings and product data under provisions of Section 013300.
   1. Indicate locations and mounting heights of each type of hardware.
   2. Indicate required styles and finishes.

B. Product Data: Submit manufacturer's technical information for each item of hardware.
   1. Include information necessary to show compliance with requirements.
   2. Include instructions for installation, maintenance and finishes.
   3. Transmit copy of applicable approved data to the Installer prior to installation.

C. Final Hardware Schedule
   1. The Design Hardware Schedule at the end of this Section is to convey the Owner's general intent. The Contractor shall be responsible for a complete builder's hardware installation including any required items that may have been omitted from the Design Hardware Schedule.
   2. Organize the Final Hardware Schedule into sets indicating complete designations of each item. Include the following information:
      a. Type, style, function, size and finish of each hardware item.
      b. Name and manufacturer for each item.
      c. Location of hardware sets cross-referenced to indications on Drawings and Schedules.
      d. Explanation of all abbreviations, symbols, codes, etc. contained in the Final Hardware Schedule.
e. Mounting locations for hardware, per BHMA Standards.

3. Submit the Final Hardware Schedule at the earliest possible date to avoid delay in fabricating components dependent upon approvals.

D. At the time of Final Hardware Schedule submittal include submittals for other products for which approval is required for coordinated review.

1.06 KEYING

A. Door Locksets: Compatible with Best Access Systems lock cores per Owner's Standards.

B. Owner will furnish and install permanent cores and keys. Coordinate removal of any Contractor-provided key cores with Owner to meet schedule for installation of key cores.

C. Owner will coordinate keying with Users.

D. Ensure that the plastic insert in the lockset is in place for each lockset to receive a core at the appropriate time to coordinate with the permanent core installation.

1.07 OPERATION AND MAINTENANCE DATA

A. Provide Owner with manufacturer's parts list and maintenance instructions for each type of hardware supplied and necessary wrenches and tools required for proper maintenance of hardware.

1.08 PRODUCT HANDLING

A. Packaging of hardware on a set by set basis, is the responsibility of the supplier. As material is received by the hardware supplier from the various manufacturers, sort and repackage in containers marked with the hardware set number. Two or more identical sets may be packed in the same container.

B. Inventory hardware jointly with representatives of the hardware supplier and the hardware installer until each is satisfied that the count is correct.

C. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control, handling and installation of hardware items which are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses, both before and after installation.

1.09 JOB CONDITIONS

A. Coordination: Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include
basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of the thicknesses, profile, swing, security and similar requirements indicated, as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

B. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared and jobsite prepared for the installation of hardware. Upon request, check the shop drawings of such other work to confirm that adequate provisions are made for the proper installation of hardware.

PART 2 PRODUCTS

2.01 HARDWARE

A. Provide all door hardware items for each door to be completely functional as an installed unit.

B. Contractor shall provide a hardware schedule, prepared by a company specializing in builders hardware, for review and approval by the Owner. Refer to Submittals Section. The Hardware Schedule, Section 3.03 below, is provided to convey Owner’s intent and for direction to the Hardware Vendor in providing the submittal for approval.

C. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of builders hardware is indicated in the Hardware Schedule at the end of this section and have been taken from the catalogs of:

1. Lawrence Brothers, Inc.
2. Best Access Systems
4. Quality Hardware
5. A.J. May Weatherstripping Co.
6. LCN Closers
7. Von Duprin Corporation

2.02 MATERIALS AND FABRICATION

A. Furnish each item of hardware for proper installation and operation of the door movement as shown.

B. Manufacturer's identification will be permitted on rim of lock cylinders only.

C. Base Metals: Produce hardware units of the basic metal and forming method indicated, using the manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser applicable hardware units by FS FF-H-106, FS FF-G-111, FS FF-H-116 and FS FF-H121. Do not furnish "optional"
materials for forming methods for those indicated, except as otherwise specified.

D. Fasteners: Manufacturer hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

E. Furnish screws for installation, with each hardware item. Provide Phillips flat head screws except as otherwise indicated. Finish exposed screws to match the hardware finish or if exposed in surfaces of other work, to match the finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.

F. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use through bolts for installation where the bolt head or the nut on the opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work.

G. Tools for Maintenance: Furnish a complete set of specialized tools as needed for Owner's continued adjustment, maintenance and removal and replacement of builders hardware.

2.03 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head all-purpose or machine screws installation of units, except furnish Phillips flat-head all-purpose or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   1. Steel Hinges - steel pins.
   3. Exterior doors - non-removable pins, held in place with set screws that can be removed only when door is open.
   5. Interior Doors - non-rising pins.
   6. Tips - flat button and matching plug, finished to match leaves, except where hospitable tip (HT) indicated.
   7. Numbers of hinges - provide number of hinges indicated but not less than three hinges per door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.
2.04 LOCK CYLINDERS AND KEYING

A. General: Locksets must accept Best Access Systems 7-pin interchangeable cores. Permanent cores and keys will be furnished and installed by Owner. Contractor shall provide, install and remove any construction cores and hardware as required for safety and security of the project until such time as permanent cores and hardware are installed.

B. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

2.05 LOCKSETS, LATCHES AND BOLTS

A. Locksets: Provide Best Access Systems, 9K Series, Heavy Duty, or approved equal. Refer to Section 012500 SUBSTITUTIONS and other pertinent Division 01 Sections.

B. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

C. Lock Throw: Provide 3/4" minimum throw to latch and deadbolt used on pairs of doors. Comply with UL requirements or throw of bolts and latch bolts on rated fire openings. Provide 1/2" minimum throw on other latch and deadlock bolts.

D. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod.

E. Trim: Best 14D, curved return with 3 ½" convex rose

2.06 PUSH/PULL UNITS

A. Exposed fasteners - provide manufacturer's standard exposed fasteners for installation; through-bolted for matched pairs, but not for single units.

2.07 CLOSERS

A. Type: Surface-mounted, full rack and pinion liquid type with shells of cast iron.

B. Function: Capable of controlling doors the full 180 degree arc of swing; mounted to permit maximum swing of door.

C. Fasteners: Use sex bolts to fasten closers to doors.

D. Adjustment: By key values for sweep arc, latch arc and back check.
E. Mounting: Normal butt-side; if mounted on opposite-to-butt-side, mounting to be parallel arm. Corner or soffit brackets will not be acceptable.

F. Warranty: Furnish manufacturer's factory guarantee covering material and workmanship for a period of five years.

G. Manufacturer: Provide LCN Super Smoothee series closers, or approved equal.

2.08 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screw. Screws shall be countersunk.

B. Fabricate edge trim of stainless, not more than 1/2" or less than 1/16" smaller in length than door dimension.

C. Protection Plates: metal plates - stainless steel, 16 ga.; size - 10" high; door width - less 1" on pairs of doors and 1-1/2" on single doors.

2.09 HARDWARE FINISHES

A. All hardware to be satin chrome plated, 652 (US 26D) on steel base, 626 (US 26D) on brass base metal unless indicated differently in the Hardware Schedule. Hardware to match the existing hardware. On exposed parts that are non-metallic or cannot be plated provide manufacturer's painted finish in color closest to the plated hardware finish.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install hardware in accordance with manufacturer's recommendations, using proper templates.

B. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by the Owner.

C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection and finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

3.02 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Final adjustment - wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

C. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

3.03 HARDWARE SCHEDULE

A. General Note: Most of the doors and hollow metal frames are salvaged for reuse except for the detention hollow metal and a few others as indicated. Refer to Demolition Drawings for existing doors/frames designated with a "D". These numbers are shown on the Door Schedule along with the new door numbers.

B. General Note: All locksets are to be replaced on the salvaged doors. Retain all other hardware that is appropriate and in good order. Modify salvaged doors and frames as required to outfit with specified hardware.

C. Door #'s 2.509a, 2.509b, 2.510, 2.511a, 2.511b, 2.511c, 2.512, 2.507, 2.508a and 2.511d are Detention Hollow Metal with Detention Hardware.

D. Hardware Groups:

HW1: 2.009, 2.010, 2.011, 2.012, 2.013, 2.311
Existing door, frame and hardware to remain in place.
Inspect condition and operation. Adjust hardware for proper function.
Recommend corrective action if needed. Repairs required to existing door, lockset, closer, hinges or strikes will be by Change Order.
HW2: 2.101a, 2.101b, 2.201a, 2.201b
1½ pr. butts: 4½” x 4½”
1 lockset, classroom function
1 panic bar
1 closer
1 set silencers
1 vision panel, 4” x 18” tempered glass

HW3: 2.101c, 2.201c
1½ pr. butts: 4½” x 4½”
1 lockset, classroom function
1 closer
1 set silencers

HW4: 2.100, 2.200
Aluminum framed, tempered glass doors that are part of the storefront system comprising the courtroom vestibule. Refer to Section 084113, Aluminum Entrances and Storefronts and to Drawing Sheet A5.0, door type 7, for additional information.
1 lockset
2 panic bars
2 closers
Manufacturer's standard seals and miscellaneous hardware

HW5: 2.002
1½ pr. butts: 4½” x 4½”
1 lockset, electrified storeroom function
1 panic bar, set up for alarmed, 15 second delayed release
1 closer
Set-up for card reader and remote door latch operation from Court Offices, Rms. 2.410 and 2.420

HW6: 2.102, 2.202
1½ pr. butts: 4½” x 4½”
1 lockset, classroom function
1 wall stop

HW7: 2.401, 2.402, 2.405, 2.406, 2.407, 2.412, 2.422
1½ pr. butts: 4½” x 4½”
1 latchset, privacy function
1 set sound seals
1 wall stop
CJC 2nd Floor Remodel  
Travis County, Texas

HW8: 2.001, 2.004, 2.300a, 2.300b, 2.312, 2.403, 2.408a, 2.408b, 2.410, 2.420, 2.435  
1½ pr. butts: 4½” x 4½”  
1 lockset, electrified storeroom function, set up for card reader  
1 set silencers  
1 closer  

HW9: 2.310  
1½ pr. butts: 4½” x 4½”  
1 lockset, storeroom function  
1 set silencers  
1 wall stop  
1 kickplate  

HW10: 2.400a, 2.400b, 2.430  
1½ pr. butts: 4½” x 4½”  
1 lockset, classroom function  
1 set sound seals  
1 closer  

HW11: 2.508a  
1½ pr. butts: 4½” x 4½”  
1 lockset, electrified storeroom function, set up for card reader  
1 set silencers  
1 closer  

HW12: 2.301, 2.302  
1½ pr. butts: 4½” x 4½”  
1 double cylinder deadbolt (to be only locked by maintenance)  
1 pull handle  
1 push plate  
1 set silencers  
1 closer  
1 kickplate  

HW13: 2.310, 2.432, 2.434  
1½ pr. butts: 4½” x 4½”  
1 lockset, storeroom function  
1 set silencers  
1 wall stop  

HW14: 2.431, 2.433  
1½ pr. butts: 4½” x 4½”  
1 lockset, office function  
1 set silencers  
1 wall stop
HW15: 2.411a, 2.411b, 2.421a, 2.421b  
1½ pr. butts: 4½” x 4½”  
1 lockset, office function  
1 set sound seals  
1 wall stop  

HW16: 2.500  
1½ pr. butts: 4½” x 4½”  
1 lockset, storeroom function, set up for call button intercom and remote  
   door release from the Inmate Holding Area, Rm. 2.515.  
1 closer  
1 set silencers  

HW17: 2.404, 2.501, 2.502  
1½ pr. butts: 4½” x 4½”  
1 lockset, passage function  
1 closer  
1 set sound seals  

HW18: 2.503  
1½ pr. butts: 4½” x 4½”  
1 lockset, passage function  
1 wall stop  
1 set sound seals  

HW19: 2.504, 2.505, 2.506  
1½ pr. butts: 4½” x 4½”  
1 lockset, passage function  
1 door lite unit with ¼” clear tempered glass, 4"x 18"  
1 set sound seals  

END OF SECTION
SECTION 088000 - GLAZING

PART 1  GENERAL

1.01  WORK INCLUDED
   A. Glass and glazing for
      1. Vision panels in wood doors with metal frames.
      2. Door sidelites installed in metal frames

1.03  REFERENCES
   B. FS DD-G-1403 - Glass, Plate (Float), Sheet, Figured, and Spandrel (Heat Strengthened and Fully Tempered).
   D. SIGMA No. 64-7-2 - Specification for Sealed Insulating Glass Units.

1.04  QUALITY ASSURANCE
   A. Conform to Flat Glass Marketing Association (FGMA) Glazing Manual for glazing installation methods.

1.05  SUBMITTALS
   A. Submit product data under provisions of Section 01300.
   B. Provide data on glazing sealant. Identify colors available.
   C. Submit sealed glass unit manufacturer's certificate under provisions of Section 01400 indicating units meet or exceed specified requirements.

1.06  DELIVERY, STORAGE, AND PROTECTION
   A. Deliver products to site in original unopened and undamaged packaging.
   B. Store and protect products under provisions of Section 01600.

1.07  WARRANTY
   A. Provide manufacturer's standard warranty.
   B. Provide warranty required under other provisions of this contract.

PART 2  PRODUCTS

2.01  ACCEPTABLE MANUFACTURERS
   A. Provide products from one of the following manufacturers or, subject to compliance with substitution requirements, products from another manufacturer may be considered.
      1. PPG Industries
      2. Pilkington Building Products (formerly Pilkington, Libbey-Owens-Ford)
      3. Hartung Glass Industries
      4. Oldcastle Glass

2.02  GLASS MATERIALS
   A. The following are guidelines for glazing materials. Not all will necessarily be used on the project. Refer to appropriate sections of the specifications and drawings.
      1. Float Glass: Clear, FS DD-G-451D and ASTM C 1036-85; 1/4" thick, LOF, clear, float or approved equivalent.
      3. Wired Glass: ASTM C 1036, Type II (patterned and wired flat glass), Class 1 (clear), Quality-Q-6; and of form and mesh pattern selected by Architect from Manufacturer's
standard.

2.03 GLAZING ACCESSORIES
A. Setting Blocks: Neoprene; 70-90 Shore A durometer hardness; four inch long x 3/8 inch wide x 1/4 high.
B. Spacer Shims: Neoprene; 50 Shore A durometer hardness; three inch long x 1/4 inch wide x 1/4 inch thick.
C. Glazing Tape: Preformed butyl compound 10-15 Shore A durometer hardness; coiled on release paper; black color.
D. Glazing Splines: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; color to match adjacent material.
E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 INSPECTION
A. Verify surfaces of glazing channels or recesses are clean, free of obstructions, and ready for work of this Section.
B. Beginning of installation means acceptance of substrate.

3.02 PREPARATION
A. Clean contact surfaces with solvent and wipe dry.
B. Seal porous glazing channels or recesses.
C. Prime surfaces scheduled to receive sealant.

3.03 INSTALLATION
A. Comply with Flat Glass Jobbers Association requirements.

3.04 CLEANING
A. After installation, mark pane with an "X" by using plastic tape or removable paste.
B. Remove glazing materials from finish surfaces.
C. Remove labels after work is completed.

PART 4 SCHEDULE

4.01 INTERIOR WINDOW AND DOOR UNITS
A. Provide ¼", or thickness as required for size, clear tempered glass.
B. Refer to drawings for quantities, locations and sizes.

END OF SECTION
SECTION 092216 - NON-STRUCTURAL METAL FRAMING

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. Non-load-bearing steel framing systems for interior gypsum board assemblies.

B. Related Requirements:
   1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; soffit framing and ceiling joists.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals:
   1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
2.2 FRAMING SYSTEMS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
   1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.

C. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.
   1. Steel Studs and Runners:
      b. Depth: As indicated on Drawings.

D. Slip-Type Head Joints: Where indicated, provide one of the following:
   1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
   2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
   3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   1) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track
   2) MBA Building Supplies
   3) Steel Network Inc. (The)
   4) Superior Metal Trim; Superior Flex Track System (SFT).
   5) Telling Industries
   6) USG

E. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.
   1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.
   1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 Installing Framed Assemblies

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.
   1. Space studs as follows:
      a. Single-Layer Application: 24 inches (610 mm) o.c. unless otherwise indicated.
      b. Multilayer Application: 24 inches (610 mm) o.c. unless otherwise indicated.
      c. Tile Backing Panels: 16 inches (406 mm) o.c. unless otherwise indicated.

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
   1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
   a. Install two studs at each jamb unless otherwise indicated.
   b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
   c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
   a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

6. Curved Partitions:
   a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
   b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches (150 mm) o.c.

D. Z-Furring Members:
   1. Erect insulation (specified in Section 072100 "Thermal Insulation") vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
   2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
   3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

F. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

END OF SECTION
SECTION 092900 - GYPSUM BOARD

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. Interior gypsum board.

B. Related Sections include the following:

1. Division 07 Section "Thermal Insulation" for insulation and vapor retarders installed in assemblies that incorporate gypsum board.

2. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

1.5 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. 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:
   a. American Gypsum Co.
   b. BPB America Inc.
   c. G-P Gypsum.
   d. Lafarge North America Inc.
   e. National Gypsum Company.
   f. PABCO Gypsum.
   g. Temple.
   h. USG Corporation.

2. Type X:

   1. Thickness: 5/8 inch.

2.3 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.

2. 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:
   a. Fry Reglet Corp.
   b. Gordon, Inc.
   c. Pittcon Industries.

2.4 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

   1. Interior Gypsum Wallboard: Paper.
C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

C. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

G. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Type X: Throughout at each area indicated in drawings for gypsum board application.

B. Single-Layer Application:

1. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
   b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
C. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
   1. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
      a. Primer and its application to surfaces are specified in other Division 09 Sections.

3.6 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION
SECTION 093000 - TILING

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. Ceramic tile.

B. Related Sections:
   1. Division 07 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.3 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. Module Size: Actual tile size plus joint width indicated.

C. Face Size: Actual tile size, excluding spacer lugs.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.

1.5 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain tile from one source or producer.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

C. Preinstallation Conference: Conduct conference at Job Site, prior to installation, with General Contractor, Subcontractor and Owner present.

1. Review requirements for substrates and for preparation by other trades.

2. Review layout and obtain approval from Owner when decisions are required concerning layout of tile joints and termination of tile against other materials.
1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

D. Store liquid materials in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.8 EXTRA MATERIALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents. Deliver "attic stock" to location specified by Owner.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.2 TILE PRODUCTS

A. Tile Type: Porcelain Ceramic Tile.

1. Basis-of-Design Product: Subject to compliance with requirements, provide San Ruffino Porcelain Tile by American Olean, Division of Dal-Tile International, Inc. or comparable product by one of the following:

   a. Crossville, Inc.
   b. Daltile; Division of Dal-Tile International Inc.
   c. Deutsche Steinzeug America, Inc.
   d. Interceramic.
   e. Lone Star Ceramics Company.
   f. Grupo Porcelanite.
   g. Portobello America, Inc.
h. Seneca Tiles, Inc.

2. Composition: Porcelain
3. Module Size: as indicated on the drawings
4. Thickness: 3/8".
5. Face: per selection.
6. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
7. Grout Color: As selected by Architect from manufacturer's full range.
8. Trim Units: None

2.3 SETTING MATERIALS


1. Manufacturers: available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Boiardi Products; a QEP company.
   b. Bonsal American; an Oldcastle company.
   c. Bostik, Inc.
   d. C-Cure.
   e. Custom Building Products.
   f. Jamo Inc.
   g. Laticrete International, Inc.
   h. MAPEI Corporation.
   i. Southern Grouts & Mortars, Inc.
   j. Summitville Tiles, Inc.
   k. TEC; a subsidiary of H. B. Fuller Company.

2.4 GROUT MATERIALS


1. Manufacturers: available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Boiardi Products; a QEP company.
   b. Bonsal American; an Oldcastle company.
   c. Bostik, Inc.
   d. C-Cure.
   e. Custom Building Products.
   f. Jamo Inc.
   g. Laticrete International, Inc.
   h. MAPEI Corporation.
   i. Southern Grouts & Mortars, Inc.
   j. Summitville Tiles, Inc.
   k. TEC; a subsidiary of H. B. Fuller Company.

2.5 ELASTOMERIC SEALANTS

A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
1. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.

C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Products: available products that may be incorporated into the Work include, but are not limited to, the following:
   a. DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
   b. Dow Corning Corporation; Dow Corning 786.
   c. GE Silicones; a division of GE Specialty Materials; Sanitary 1700.
   e. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
   f. Tremco Incorporated; Tremsil 600 White.

2.6 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

C. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

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. Bonsal American; an Oldcastle company; Grout Sealer.
   b. Bostik, Inc.; CeramaSeal Grout & Tile Sealer.
   c. C-Cure; Penetrating Sealer 978.
   d. Custom Building Products; Surfaceguard Grout Sealer.
   e. Jamo Inc.; Matte Finish Penetrating Sealer.
   f. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.
   g. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
   i. TEC; a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone Grout Sealer.
2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that concrete substrates for tile floors installed with thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
   a. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 TILE INSTALLATION

A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

E. Joint Widths: 3/16"

F. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

G. Grout Sealer: Apply grout sealer according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION
SECTION 095113 - ACOUSTICAL PANEL CEILINGS

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 acoustical panels and exposed suspension systems for ceilings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.

2. Product Data for Credit EQ 4.1: For sealants, documentation including printed statement of VOC content.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full-size panels equal to 3 percent of quantity installed.

2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to NVLAP for testing indicated.
1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 or less.

B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ACOUSTICAL PANELS, GENERAL

A. Low-Emitting Materials: Acoustical panel ceilings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Source Limitations:
1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
2. Suspension System: Obtain each type from single source from single manufacturer.

C. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.

D. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

E. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.

F. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation, Radar CP SLT #2220 or comparable product by one of the following:

1. Armstrong
2. CertainTeed Corp.
3. Chicago Metallic Corporation.
4. Tectum Inc.

B. Color: White.

C. LR: Not less than 0.84.

D. NRC: Not less than 0.55.

E. Edge/Joint Detail: SLT edge.

F. Thickness: 5/8 in.
G. Modular Size: 24 by 24 inches.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

B. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304, nonmagnetic.
4. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.

C. Hanger Rods or Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch- thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

E. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

F. Impact Clips: Where indicated, provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

2.5 METAL SUSPENSION SYSTEM

A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation DX/DXL profile, Shadowline edge detail, 15/16" exposed Tee grid or comparable product by one of the following:

1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. Chicago Metallic Corporation.
4. USG Interiors, Inc.; Subsidiary of USG Corporation.

2.6 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers: Subject to compatibility with suspension system specified, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. Chicago Metallic Corporation.
4. Fry Reglet Corporation.
5. Gordon, Inc.
6. USG Interiors, Inc.; Subsidiary of USG Corporation.

2.7 ACOUSTICAL SEALANT

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Acoustical Sealant for Exposed and Concealed Joints:
   a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
   b. USG Corporation; SHEETROCK Acoustical Sealant.

2. Acoustical Sealant for Concealed Joints:
   a. Henkel Corporation; OSI Pro-Series SC-175 Acoustical Sound Sealant.
   b. Pecora Corporation; AIS-919.

B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

3. Acoustical sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Arrange directionally patterned acoustical panels as follows:
   a. Install panels with pattern running in one direction parallel to long axis of space.
2. For teg-edged panels, install panels with upper edges fully hidden from view by flanges of suspension-system runners and moldings.
3. Install hold-down impact clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.
4. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's
written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION
SECTION 096513 - RESILIENT BASE

PART 1 GENERAL

1.01 WORK INCLUDED
A. Application of resilient base.

1.02 REFERENCES

1.03 SUBMITTALS
A. Samples of each type of product specified indicating manufacturer's full range of standard colors.

1.04 ENVIRONMENTAL REQUIREMENTS
A. Maintain minimum 70 degrees F air temperature at installation area for three days prior to, during, and for 24 hours after installation.
B. Store materials in area of application. Allow three days for material to stabilize.

PART 2 PRODUCTS

2.01 BASE MATERIALS
A. Base: Conforming to FS SS-W-40, Type I rubber; top set coved at resilient flooring, toeless at carpeting, four inch high, 1/8 inch thick including premolded end stops and external corners, color as selected by Owner from manufacturer's full color line.
B. Manufacturer: Roppe Corporation, Pinnacle Rubber Base (TS), or approved equal.

2.02 ACCESSORIES/ADHESIVES/SEALERS
A. Provide sealers and cleaners recommended by manufacturer of base material.

PART 3 EXECUTION

3.01 INSPECTION
A. Ensure flooring is installed or finished and that wall surfaces are painted and ready to receive base.
B. Notify immediately if area or substrate is not ready for installation. Commencement of work signifies acceptance of conditions.

3.02 INSTALLATION - BASE
A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.
B. Miter internal corners. Use premolded sections for external corners and exposed ends.
C. Install base on solid backing. Adhere tightly to substrate.
D. Scribe and fit to door frames and other obstructions.
E. Install straight and level to variation of plus or minus 1/8 inch over 10 feet (1/960).

3.03 CLEANING
A. Remove excess adhesive without damaging materials or surroundings.
B. Clean floor and base surfaces in accordance with manufacturer's instructions.

END OF SECTION
SECTION 096519 - RESILIENT TILE FLOORING

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. Vinyl Composition Tile (VCT) floor tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. LEED Submittals:

1. Product Data for Credit IEQ 4.1: For adhesives, documentation including printed statement of VOC content.

C. Samples for Initial Selection: For each type of floor tile indicated.

D. Samples for Verification: Full-size units of each color and pattern selected.

E. Product Schedule: For floor tile [Use same designations indicated on Drawings.]

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MATERIALS MAINTENANCE SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.
1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation indicated.

B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.9 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, in spaces to receive floor tile during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. FloorScore Compliance: Resilient tile flooring shall comply with requirements of FloorScore Standard.

B. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
2.2 VCT FLOOR TILE

A. **Products:** Subject to compliance with requirements, provide the following or an approved equal product under provisions of Section 012500 Substitution Procedures:
   1. Johnsonite, A Tarkett Co.; The Azrock Collection

B. Thickness: 1/8”.

C. Size: 12 by 12 inches.

D. Colors and Patterns: As selected by Architect from full range of manufacturer’s colors.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. For Tile Installation System, Full Spread: Provide Armstrong S-515 or S-700 Resilient Tile Adhesive or approved equal product that can be recommended by the manufacturer.

C. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer’s written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
   a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are same temperature as space where they are to be installed.

   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

   1. Lay tiles square with room axis in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

   1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.

B. Perform the following operations immediately after completing floor tile installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.
   1. Apply two coat(s).

E. Protect floor tile until Substantial Completion. Repair to as new condition or replace damaged floor tile.

END OF SECTION
SECTION 096816 - CARPET

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. Carpet tile.

1.3 ACTION SUBMITTALS

A. Product Data: For the following, including installation recommendations for each type of substrate:

1. Carpet: For each type indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance.

B. LEED Submittals:

1. Product Data for Credit EQ 4.3:

   a. For carpet, documentation indicating compliance with testing and product requirements of CRI's "Green Label Plus" program.
   b. For installation adhesive, including printed statement of VOC content.

2. Laboratory Test Reports for Credit EQ 4: For carpet and installation adhesives, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Drawings: Show the following:

1. Doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet.
2. Carpet type.
3. Seam locations.
4. Type of subfloor.
5. Type of installation.
6. Pattern type, repeat size, location, direction, and starting point, if applicable.
7. Type, color, and location of edge, transition, and other accessory strips.
8. Transition details to other flooring materials.
D. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet: 24-inch- square Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- long Samples.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For carpet and carpet cushion, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet and carpet cushion.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet: Tiles equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. or two boxes of carpet tiles.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An experienced Installer who has a history of installations of this type of floor covering. Provide resume if requested.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.9 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet and carpet cushion until spaces are enclosed and weather-tight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
C. Do not install over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.10 WARRANTY

1. Warranty: Manufacturer’s standard warranty

PART 2 - PRODUCTS

2.1 CARPET TILES

A. Products: Basis of Design is Aladdin Commercial by Mohawk, Design Medley carpet tile:

B. Color: As selected by Owner from manufacturer's full range.

C. Style: 1T79 Design Medley Tile.

D. Installation: Monolithic and Quarter Turn-locations TBD

E. Pile Characteristic: Cut or Cut-and-loop pile.

F. Backing: Manufacturer's standard.

G. Antimicrobial Treatment: Manufacturer's standard material.

H. Performance Characteristics: As follows:

1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm.
2. Dry Breaking Strength: Not less than 100 lbf per ASTM D 2646.
4. Emissions: Provide carpet that complies with testing and product requirements of CRI's "Green Label Plus" program.
5. Emissions: Provide carpet that complies with the product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet cushion manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet and carpet cushion manufacturers.
1. Use adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Use adhesives that comply with the product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

D. Transition Strips: Rubber or composite materials of height required to protect exposed edge of carpet and meet ADA requirements, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet cushion manufacturer.

2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in-Place Concrete" for slabs receiving carpet.

3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch, unless more stringent requirements are required by manufacturer's written instructions.
C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet cushion manufacturer.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

3.3 INSTALLATION

A. Comply with CRI 104 and carpet and carpet cushion manufacturers' written installation instructions for the following:

1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-Down Installation."

B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.

C. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings and thresholds. Bind or seal cut edges as recommended by carpet manufacturer.

D. Extend carpet into toe spaces, door reveals, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

E. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.

3.4 CLEANING AND PROTECTING

A. Perform the following operations immediately after installing carpet:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
2. Remove yarns that protrude from carpet surface.

B. Protect installed carpet to comply with CRI 104, Section 16, "Protecting Indoor Installations."

C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and adhesive manufacturers.

END OF SECTION
SECTION 098413 - WALL MOUNTED SOUND-ABSORPTIVE PANELS

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 wall mounted fabric covered fiberglass sound absorptive panels.

B. Related Sections include the following:

Section 064023, INTERIOR ARCHITECTURAL WOODWORK for wood wainscote panels and other courtroom woodwork adjacent to acoustical panels.

1.3 SUBMITTALS

A. Product Data: For each type of panel edge, core material, and mounting indicated.

B. Shop Drawings: For acoustical wall panels. Include mounting devices and details showing panels against ceilings, wainscote, inside and outside corners. Include elevations showing panel sizes and direction of fabric weave and pattern matching.

C. Samples for Initial Selection: For each type of fabric facing material from acoustical wall panel manufacturer's full range.

D. Qualification Data: For fabricator and testing agency.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of acoustical wall panel.

F. Maintenance Data: For acoustical wall panels to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal recommendations.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Source Limitations: Obtain acoustical wall panels through one source from a single manufacturer.

C. Fire-Test-Response Characteristics: Provide acoustical wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 200 or less.
3. Room/Corner Wall Test: Fabric-covered panels shall meet the acceptance criteria of NFPA 265 Corner Test.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with fabric and acoustical wall panel manufacturers’ written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.

B. Deliver materials and panels in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

C. Protect panel edges from crushing and impact.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical wall panels until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Lighting: Do not install acoustical wall panels until a permanent level of lighting is provided on surfaces to receive acoustical wall panels.

C. Field Measurements: Verify locations of acoustical wall panels by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 WARRANTY

A. Special Warranty: Manufacturer’s standard form in which manufacturer agrees to repair or replace components of acoustical wall panels that fail in performance or materials within specified warranty period.

1. Failure in performance includes, but is not limited to, acoustical performance.

2. Failures in materials include, but are not limited to, fabric sagging, distorting, or releasing from panel edge; or warping of core.

3. Warranty Period: One (1) year from date of Substantial Completion.

4. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrently with other warranties made by the Contractor.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fabric: For each fabric, color, and pattern installed, provide length equal to 24 sq. ft. of panel or approximately 48” w x 72” h.
PART 2 - PRODUCTS

2.1 BACK-MOUNTED, EDGE-REINFORCED ACOUSTICAL WALL PANELS WITH GLASS-FIBER CORE

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. Armstrong World Industries, Inc.

B. COURTROOM WALL PANELS: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back border of dimensionally stable, rigid glass-fiber board core; with edges chemically hardened to reinforce panel perimeter against warpage and damage.

1. Equal to Soundsoak Acoustical Wall Panels.

2. Facing Material: Woven fabric from same dye lot; color and pattern as selected by Architect from manufacturer's full range.

3. Core: Fiberglass panel 1" thickness.

4. Size at Courtrooms: 24" wide by 72" high by 1" thick.

5. Panel Edge: Square. Cut panels to required width and length as necessary and wrap with fabric following manufacturer's instructions.


C. JAIL HOLDING AREA WALL PANELS: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back border of dimensionally stable, rigid glass-fiber board core; with edges chemically hardened to reinforce panel perimeter against warpage and damage.

1. Equal to Soundsoak Acoustical Wall Panels.

2. Facing Material: Woven fabric from same dye lot; color and pattern as selected by Architect from manufacturer's full range.

3. Core: Fiberglass panel 1" thickness.

4. Size at Jail Holding Area: 36" wide by 24" high by 1" thick.

5. Panel Edge: Square. Cut panels to required width and length as necessary and wrap with fabric following manufacturer's instructions.

6. Mounting at Jail Holding Area: Install individual panels on CMU walls using masonry anchors, galvanized coated or painted screws and washers. Install four screws, one at each corner of the panel. Screws shall penetrate the wall panels.
and be of sufficient length to adequately hold in the wall anchor. Provide
construction adhesive in addition to screws. Locate screws equal distance from
each edge of panel and at the same location on each panel in order to present a
neat, uniform appearance.

7. Quantity: Provide twelve (12) panels to be installed in locations on the walls
within the Holding Area to be determined by Owner.

2.2 FABRICATION

A. Fabric Facing: Stretched straight, on the grain, tight, square, and free from puckers,
ripples, wrinkles, sags, blisters, seams, adhesive, or other foreign matter. Applied with
visible surfaces fully covered.

B. Core-Face Layer: Evenly stretched over core face and edges and securely attached to
core; free from puckers, ripples, wrinkles, sags.

C. Spline-Mounting Accessories for Courtroom Installation: Manufacturer's standard
concealed, extruded-aluminum or plastic connecting splines designed and fabricated
for screw attachment to walls.

D. Panel Adhesive: Use only adhesives that have a VOC content of 70 g/L or less when
calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fabric, substrates, blocking, and conditions, with Installer present, for
compliance with requirements, installation tolerances, and other conditions affecting
performance of acoustical wall panels.

1. Proceed with installation only after unsatisfactory conditions have been
   corrected.

3.2 INSTALLATION

A. Install acoustical wall panels in locations indicated with vertical surfaces and edges
plumb, top edges level and in alignment with other panels, faces flush, and scribed to
fit adjoining work accurately at borders and at penetrations.

1. Cut units to be at least 50 percent of unit width, with facing material extended
   over cut edge to match uncut edge. Scribe acoustical wall panels to fit adjacent
   work. Butt joints tightly.

B. Comply with acoustical wall panel manufacturer's written instructions for installation of
panels using type of concealed mounting accessories indicated or, if not indicated, as
recommended by manufacturer. Anchor panels securely to supporting substrate.

C. Match and level fabric pattern and grain among adjacent panels.

D. Installation Tolerances: As follows:

1. Variation from Level and Plumb: Plus or minus 1/16 inch.
2. Variation of Panel Joints from Hairline: Not more than 1/16 inch wide.

3.3 CLEANING

A. Clip loose threads; remove pills and extraneous materials.

B. Clean panels with fabric facing, on completion of installation, to remove dust and other foreign materials according to manufacturer's written instructions.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure that acoustical wall panels are without damage or deterioration at time of Substantial Completion.

B. Replace acoustical wall panels that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION
SECTION 099123 - 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 the following interior substrates:

1. Wood.
2. Gypsum board.
3. Exposed structure.
4. Concrete floor.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

C. LEED Submittal:

1. Product Data for Credit EQ 4.2: For paints, including printed statement of VOC content and chemical components.

1.4 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."

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.
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 and sealers only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints or sealers when relative humidity exceeds 85 percent; at temperatures less than 5 deg F 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 gallon of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Product: Subject to compliance with requirements, provide products from the following manufacturers. Equal products from other manufacturers may be considered.

1. Acid Stain USA.
2. Behr
4. Decosup Concrete Sealers.
5. General Polymers.
6. ICI Dulux.
7. Kelly Moore
8. Kemiko.
9. KWAL Paint.
12. Sherwin Williams
13. Sika Corporation
14. SRI Concrete Products

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide 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. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
2. Nonflat Paints, Coatings, and Primers: VOC content of not more than 150 g/L.
3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
4. Floor Coatings: VOC not more than 100 g/L.
5. Shellacs, Clear: VOC not more than 730 g/L.
6. Flat Topcoat Paints: VOC content of not more than 50 g/L.
7. Nonflat Topcoat Paints: VOC content of not more than 150 g/L.
8. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
9. Floor Coatings: VOC not more than 100 g/L.
10. Shellacs, Clear: VOC not more than 730 g/L.
11. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.

C. Chemical Components of Field-Applied Interior Paints and Coatings: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
2. Restricted Components: Paints and coatings shall not contain any of the following:
   a. Acrolein.
   b. Acrylonitrile.
   c. Antimony.
   d. Benzene.
   e. Butyl benzyl phthalate.
   f. Cadmium.
   g. Di (2-ethylhexyl) phthalate.
   h. Di-n-butyl phthalate.
   i. Di-n-octyl phthalate.
   j. 1,2-dichlorobenzene.
k. Diethyl phthalate.
l. Dimethyl phthalate.
m. Ethylbenzene.
n. Formaldehyde.
o. Hexavalent chromium.
p. Isophorone.
q. Lead.
r. Mercury.
s. Methyl ethyl ketone.
t. Methyl isobutyl ketone.
u. Methylene chloride.
v. Naphthalene.
w. Toluene (methylbenzene).
x. 1,1,1-trichloroethane.
y. Vinyl chloride.

D. Colors: As selected by Owner from manufacturer’s samples.

2.3 BLOCK FILLERS

   1. VOC Content: E Range of E3.

2.4 PRIMERS/SEALERS

A. Interior Latex Primer/Sealer: MPI #50.
   1. VOC Content: E Range of E3.
   2. Environmental Performance Rating: EPR 3.

B. Interior Alkyd Primer/Sealer: MPI #45.
   1. VOC Content: E Range of E2.

C. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.

2.5 METAL PRIMERS

A. Alkyd Anticorrosive Metal Primer: MPI #79.
   1. VOC Content: E Range of E2.

B. Quick-Drying Alkyd Metal Primer: MPI #76.
   1. VOC Content: E Range of E3.

C. Rust-Inhibitive Primer (Water Based): MPI #107.
1. VOC Content: E Range of E3.
2. Environmental Performance Rating: EPR 3.

2.6 WOOD PRIMERS

A. Interior Latex-Based Wood Primer: MPI #39.
   1. VOC Content: E Range of E3.
   2. Environmental Performance Rating: EPR 3.

2.7 LATEX PAINTS

A. Interior Latex (Eggshell): MPI #52 (Gloss Level 3).
   1. VOC Content: E Range of E3.
   2. Environmental Performance Rating: EPR 3.

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. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Concrete: 12 percent.
   2. Wood: 15 percent.
   3. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
   1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates 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.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

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. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

E. Wood Substrates:
   1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
   2. Sand surfaces that will be exposed to view, and dust off.
   3. Prime edges, ends, faces, undersides, and backsides of wood.
   4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

F. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

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 equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

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.
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 may 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 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 noncomplying-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 Owner, 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 INTERIOR PAINTING SCHEDULE

A. Wood Panel and Dimension Lumber Substrates.

1. Latex.
   c. Topcoat: Interior latex (semigloss).

B. Gypsum Board Substrates:

1. Latex System.
   c. Topcoat: Interior latex (eggshell).
END OF SECTION
SECTION 102113 - TOILET COMPARTMENTS

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. Solid polymer toilet compartments configured as toilet enclosures and urinal screens.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. LEED Submittals:

1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.

C. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.

1. Show locations of reinforcements for compartment-mounted grab bars.
2. Show locations of centerlines of toilet fixtures.
3. Show overhead support or bracing locations.

D. Samples for Initial Selection: For each type of unit indicated include samples requiring Owner's material and color selection.

E. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.4 QUALITY ASSURANCE


B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having
jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 45 or less.
2. Smoke-Developed Index: 120 or less.


1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

B. Stainless-Steel Castings: ASTM A 743/A 743M.

2.2 SOLID-POLYMER UNITS

A. Basis of Design Product: Provide Accurate Partitions, 9500 Ivory Essence Speckle Solid Color Reinforced Composite (SCRC) Toilet Partition System. Partitions to match the Ned Granger Building 5th Floor Project. Subject to compliance with requirements, available manufacturers offering similar products are the following:

1. Accurate Partitions Corporation.
2. Ampco, Inc.
5. General Partitions Mfg. Corp.
6. Global Steel Products Corp.
7. Hadrian Manufacturing Inc.
8. Metpar Corp.
B. Toilet-Enclosure Style: Floor and ceiling anchored.

C. Entrance-Screen Style: Floor and ceiling anchored.

D. Urinal-Screen Style: Wall hung.

E. Door, Panel, Screen, and Pilaster Construction: Solid panel material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.
   1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
   2. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
   3. Color and Pattern: as selected by Architect from manufacturer's full range.

F. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.
   1. Color and Pattern: As selected by Architect from manufacturer's full range.

G. Brackets (Fittings):
   1. Full-Height (Continuous) Type: Manufacturer's standard design.
      a. Polymer Color and Pattern: Matching panel.

2.3 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
   2. Hinges: Manufacturer's standard integral hinge for solid-polymer doors.
   3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
   4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
   5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
   6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.4 FABRICATION

A. Floor-and-Ceiling-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at tops and bottoms of pilasters. Provide shoes and sleeves (caps) at pilasters to conceal anchorage.

B. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, in-swinging doors for standard toilet compartments and 36-inch-wide, out-swinging doors with a minimum 32-inch-wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:
   a. Pilasters and Panels: 1/2 inch.
   b. Panels and Walls: 1 inch.

B. Floor-and-Ceiling-Anchored Units: Secure pilasters to supporting construction and level, plumb, and tighten. Hang doors and adjust so doors are level and aligned with panels when doors are in closed position.

C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.2 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION
SECTION 102600 – CORNER GUARDS

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 corner guards.

B. Related Sections:
   1. Division 08 Section "Door Hardware" for metal armor, kick, mop, and push plates.

1.3 PERFORMANCE REQUIREMENTS

1.4 SUBMITTALS

A. Product Data: Manufacturer’s cut sheets

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain impact-resistant wall protection units from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store in original undamaged packages and containers protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install impact-resistant wall protection units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature and humidity levels.

1.8 WARRANTY

A. Manufacturer’s standard form in which manufacturer agrees to repair or replace components of impact-resistant wall protection units that fail in materials or workmanship within specified warranty period.

   1. Warranty Period: from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel Sheet

2.2 CORNER GUARDS

A. Surface-Mounted, Metal Corner Guards: Fabricated from one-piece, formed or extruded metal with formed edges; with 90 degree turn to match wall condition.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. American Floor Products Co., Inc.
   b. Arden Architectural Specialties, Inc.
   c. Balco, Inc.
   d. Boston Retail Products.
   e. Construction Specialties, Inc.
   f. IPC Door and Wall Protection Systems; Division of InPro Corporation.
   g. Korogard Wall Protection Systems; a division of RJF International Corporation.
   h. Pawling Corporation.
   i. Tepromark International, Inc.
   j. WallGuard.com.

2. Material: Stainless steel, Type 304 or Type 430.

   a. Thickness: Minimum 0.0500 inch.
   b. Finish: Directional satin, No. 4.

3. Wing Size: Nominal 2-1/2 by 2-1/2 inches.


B. Adhesive: As recommended by manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 CLEANING

A. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

B. Maintain protective plastic film in place until substantial completion.

END OF SECTION
SECTION 102800 – TOILET AND BATH ACCESSORIES

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. Toilet and bath accessories
   2. Custodial accessories.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:
   1. Construction details and dimensions.
   2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   3. Material and finish descriptions.
   4. Features that will be included for Project.
   5. Manufacturer’s warranty.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

C. Maintenance Data: For toilet and bath accessories and custodial accessories to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.
1.6 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.

C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.


E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.


2.2 TOILET AND BATH ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
6. Tubular Specialties Manufacturing, Inc.

B. Waste Receptacle:
1. Mounting: Semirecessed.
4. Liner: Reusable vinyl liner.
5. Lockset: Tumbler type for waste-receptacle.

C. Grab Bar:

1. Mounting: Flanges with concealed fasteners.
2. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. Configuration and Length: As indicated on Drawings.

D. Sanitary-Napkin Disposal Units:

1. Mounting: Surface mounted.
2. Door or Cover: Self-closing, disposal-opening cover.

E. Mirror Unit:

1. Frame: Stainless-steel angle, 0.05 inch thick.
   a. Corners: Manufacturer's standard.
   a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
   b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
3. Size: As indicated on Drawings.

2.3 CHILDCARE ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. American Specialties, Inc.
2. Brocar Products, Inc.
3. Diaper Deck & Company, Inc.
4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
5. Koala Kare Products; a division of Bobrick Washroom Equipment, Inc.
6. SSC, Inc.
7. Tubular Specialties Manufacturing, Inc.

B. Diaper-Changing Station:
   1. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap.
      a. Engineered to support a minimum of 250-lb static load when opened.
   2. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.
   5. Liner Dispenser: Built in.

2.4 UNDERLAVATORY GUARDS

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. Plumberex Specialty Products, Inc.
   2. Truebro by IPS Corporation.

B. Underlavatory Guard:
   1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.

2.5 CUSTODIAL ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. A & J Washroom Accessories, Inc.
   2. American Specialties, Inc.
   5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
   6. Tubular Specialties Manufacturing, Inc.

B. Mop and Broom Holder:
1. **Description:** Unit with shelf, hooks, holders, and rod suspended beneath shelf.
2. **Length:** 36 inches.
3. **Hooks:** Three.
4. **Mop/Broom Holders:** Four, spring-loaded, rubber hat, cam type.
5. **Material and Finish:** Stainless steel, No. 4 finish (satin).
   a. **Shelf:** Not less than nominal 0.05-inch-thick stainless steel.
   b. **Rod:** Approximately 1/4-inch-diameter stainless steel.

### 2.6 FABRICATION

**A. General:** Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

**B. Keys:** Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

**A.** Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

**B.** **Grab Bars:** Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

#### 3.2 ADJUSTING AND CLEANING

**A.** Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

**B.** Remove temporary labels and protective coatings.

**C.** Clean and polish exposed surfaces according to manufacturer's written recommendations.

**END OF SECTION**
SECTION 104413 - FIRE EXTINGUISHERS AND CABINETS

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. Existing Fire Extinguishers and Cabinets may be reused subject to compliance with codes. Owner will be responsible for annual test, inspection and update for reused fire extinguishers. Provide labor necessary for handling and reinstallation of existing fire extinguishers and cabinets. If additional units are required or, at the Contractor’s option, provide new units complying with the requirements of this section.

B. Section Includes:
   1. Portable hand-held fire extinguishers
   2. Fire extinguisher cabinets and accessories.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles.
   1. Fire Extinguisher Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
   2. Fire Extinguishers.

B. Maintenance Data: For fire protection cabinets and fire extinguishers to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHER CABINET

A. Cabinet Type: provide quantity indicated in drawings and suitable for fire extinguisher specified.
   1. Products: Basis of design is the following cabinet manufactured by Larsen’s Manufacturing Company; 7421 Commerce Lane NE, Mpls, MN 55432. Subject
to compliance with requirements the products of other manufacturers are acceptable.

a. Model 2409-R4
b. Semi-Recessed, 3 ½", 24"h. x 9 ½" w. x 6" d.
c. Vertical Duo door with clear acrylic glazed window
d. Rolled edge trim
e. Optional recessed handle
f. Identification lettering complying with authorities having jurisdiction for letter style, size, spacing, and location.

B. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher inside security fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: provide quantity indicated in drawings

1. Products: Provide an MP5, 2A-10B:C multi-purpose extinguisher with fluidized and siliconized mono ammonium phosphate powder in a steel container. Subject to compliance with requirements the products of the following manufacturers are acceptable.

a. Amerex Corporation.
b. Ansul Incorporated; Tyco International Ltd.
c. Badger Fire Protection; a Kidde company.
d. Buckeye Fire Equipment Company.
e. Fire End & Croker Corporation.
g. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
h. Larsen's Manufacturing Company.
i. Moon-American.
j. Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.
k. Potter Roemer LLC.
l. Pyro-Chem; Tyco Safety Products.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for fire protection cabinets as required by type and size of cabinet and trim style.
3.3 INSTALLATION

A. General: Install fire protection cabinets in locations shown in drawings and at mounting heights indicated below.
   1. Fire Extinguisher Cabinets: 50 inches above finished floor to top of cabinet or as manufacturer recommends for TAS and ADA compliance.

B. Fire Extinguisher Cabinets: Fasten cabinets to structure, square and plumb.
   1. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

C. Identification: Apply decals or vinyl lettering, if applicable, at locations indicated by the manufacturer.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer’s written installation instructions.

B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.

E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

F. Install fire extinguishers inside cabinets prior to turnover to Owner.

END OF SECTION 104413
SECTION 109500 - MISCELLANEOUS BUILDING SPECIALTIES

PART 1 GENERAL

1.01 WORK INCLUDED
   A. The following products are to be furnished and installed under the provisions of this section:
      1. television wall mount brackets

1.03 SUBMITTALS
   A. Product information indicating design data, test reports and manufacturer’s installation instructions.

1.05 QUALIFICATIONS
   A. Manufacturer: Company specializing in the manufacture of products specified in this Section with a minimum of three years experience.
   B. Installer: Company specializing in applying the work of this Section with a minimum of two years experience installing the specified products.

1.06 REGULATORY REQUIREMENTS

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Deliver products to site in unopened manufacturer’s shipping containers.
   B. Secure products in storage area protected from construction activities.

1.08 WARRANTY
   A. Provide Manufacturer's standard warranty.

PART 2 PRODUCTS

2.01 TELEVISION MOUNT:
   A. Peerless #SWM 375 with a key lock for security and adjustable tilt, as located in the drawings, at 7'-4" A.F.F. to the bottom of the mounting bracket. Coordinate with the Owner on sizes of TV's to be installed and verify clearances to ceilings. Coordinate with appropriate trades to ensure that blocking is installed in proper locations for concealed mounting.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that surfaces are ready to receive work.
   B. Commencement of installation signifies acceptance of conditions.

3.02 INSTALLATION
   A. Installation is to be done in accordance with manufacturer's instructions and locations approved by Owner.

END OF SECTION
SECTION 101400 - SIGNAGE

PART 1-GENERAL

1.01 Summary: Provide the following sign types under Section 012100, ALLOWANCES.

- A1. Room identification sign with room number and braille on cover.
- A2. Room identification sign with both room number and name of room on cover with braille.
- A3. Room identification sign with pictograms, room number and room name on cover with braille.
- A4. Wayfinding, floor directories and informational signs
- B. Emergency Plan signs
- C. Courtroom identification lettering.
- D. County seal and State seal plaques, one for each of the two courtrooms.
- E. Modifications to existing building wayfinding signage and directories.

1.02 References and Regulatory Requirements

A. Americans with Disabilities Act Accessibility Guidelines, current adoption.
B. Texas Accessibility Standards (TAS) of the Architectural Barriers Act, Article 9102, Texas Civil Statutes, current adoption.
C. International Building Code, current City of Austin adoption.

1.03 Submittals

A. Product Data:
   1. Manufacturer’s specifications, installation instructions and recommendations for specified products.
   2. Provide a list and layout of all signs and sign text for approval by the Owner prior to fabrication.
   3. For individual lettering, symbols and vinyl lettering provide full size sample on paper of actual font to be used.
   4. Provide sample lettering for signage composed of individual letters

B. Samples and Shop Drawings:
   1. Sample of actual 8"x8" Type A sign with sample room number applied to surface of sign cover.
   2. Provide color chips or samples when required for color and material selections.

1.04 Quality Assurance

A. Manufacturer: Company specializing in manufacture of the products specified in this Section. Provide, if requested, documentation sufficient to substantiate a minimum of three years of experience.
B. Obtain specified products for each type of sign from a single manufacturer to ensure continuity of color and design.
   1. Accessories: Provide accessory items recommended by the manufacturer or as required for installation.

C. Replace damaged or defective products at no cost to the Owner.

PART 2 - PRODUCTS

2.01 Manufacturers

A. Provide products equal to those specified or, if not specified, by a manufacturer in business continuously for at least 10 years.

2.02 Interior Signage

A. Types A1, A2 and A3, interior sign

1. Vista Contour System, Series S7000
2. Removable clear plastic cover with one side non-glare finish installed to face out.
3. Provide 1” high x 3/32” thick black plastic letters/numbers/pictograms glued to the outer non-glare surface of the clear plastic removable cover. Comply with ADA and Texas Accessibility Standards.
4. Provide class 2 Braille beneath the letters/numbers in compliance with ADA and Texas Accessibility Standards.
5. Maintain a ¾” margin on all sides measured from the aluminum frame after installation of the cover. Align text on left margin. All Room Numbers to be installed ¾” from top and left side margin. For signs indicated to have lettering instead of, or in addition to, the numbers, center text horizontally and align on left margin.
6. Silver colored aluminum sign body with gray end caps.
7. Inserts behind clear plastic sign cover are Not-In-Contract. To be provided by Owner.
8. For pictograms required on Type A4 signs the numbers and room name may be smaller than 1”. Comply with Texas Accessibility Standards requirements.
9. For Type A3 signs the Room Name may be any size lettering, within the range allowed by Texas Accessibility Standards that best fits the sign size.
10. Provide a 1/8” thick plastic backer plate on the opposite side of glazing when the backs of signs will be visible.

B. Type A4, Wayfinding and Informational signs

1. Vista Contour System, Series S7000
2. Removable clear plastic cover with one side non-glare finish installed to face out.
3. Provide 1” high x 3/32” thick black plastic letters/numbers glued to the...
outer non-glare surface of the clear plastic removable cover. Comply with ADA and Texas Accessibility Standards.

4. Provide class 2 Braille beneath the letters/numbers in compliance with ADA and Texas Accessibility Standards.

5. Maintain a ¾” margin on all sides measured from the aluminum frame after installation of the cover. Align text on left margin. For signs indicated to have lettering instead of or in addition to the numbers, center text horizontally and align on left margin.

6. Silver colored aluminum sign body with gray end caps.

7. Inserts behind clear plastic sign cover are Not-In-Contract. To be provided by Owner. For wayfinding signs develop size, format and changeable insert covers by consulting with Owner. Include this information in the final signage schedule for approval.

C. Type B, Emergency Plan Map Holders

1. Equal to Seton Identification Products Company
   a. Model: Evacuation Map Holder
   b. Style: 79892
   c. Color: Red Border with Raised White Lettering
   d. Material: Scratch resistant, non-glare plastic
   e. Fasteners: Provide adhesive and mechanical fasteners per mfg. recommendation.
   f. Size: 17" x 11"
   g. Insert to be provided by Owner

2. Install in locations and at height identified by Owner.
   a. Install level.
   b. Secure to wall surface according to manufacturer’s recommendation.

D. Type C, Courtroom Identification Lettering

1. Individual cast or cut aluminum letters to be stud-mounted to drywall.
2. Size approximately 4”, sans serif letters.
3. Location per Owner’s direction.

E. Type D, Bulletin Boards

1. Aluminum frames with black cork board material for push-pin and tack mounting. Match appearance of existing bulletin boards in main lobby and on each court floor.
2. Size approximately 48” high by 60” wide. Final size to be determined.
3. Quantities and locations per Owner’s direction.

F. Type E, Plaques

1. Cast or machined aluminum plaques of the State of Texas official seal and County of Travis official seal.
2. 18” diameter in manufacturer’s standard thickness.
3. One plaque for each of the two courtrooms.
4. Locate behind judge’s bench according to Owner’s instructions.
5. Stud mount on wall according to manufacturer’s instructions.

G. Type F, Updates

1. Identify locations within building, in consultation with Owner, that require updates to existing directories and wayfinding signage.
2. Fabricate new labels and signage to match existing.
3. Install new labels and modify signage as needed.

2.03 Signage Schedule

A. Refer to Section 012100, Allowances, for amounts to include in bid. Actual cost will be adjusted during construction according to the requirements of this section and other sections in Division 01.
B. Prepare a signage schedule and obtain Owner’s approval. Refer to submittals requirements in Division 01.

PART 3 - EXECUTION

3.01 Installation

A. Signage Vendor is responsible for complete installation of signage shown in the Signage Schedule or to be installed under the allowances. Changeable inserts, where indicated for room signs and emergency procedure plan holders, will be provided and installed by Owner. Raised lettering and braille to be provided by Signage Vendor.

B. Locate on wall or glass per ADA and TAS requirements as applicable. Where back of sign is visible through glazing install a backing plate to match material and color of sign.

C. Confirm locations with Owner prior to installation. Do not commence fabrication or installation until submittal and location approvals are received from Owner. Improperly installed signage shall be reinstalled or replaced if damaged and any wall damage repaired at no cost to Owner.

END OF SECTION
SECTION 102113 - TOILET COMPARTMENTS

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. Solid polymer toilet compartments configured as toilet enclosures and urinal screens.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. LEED Submittals:

1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.

C. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.

1. Show locations of reinforcements for compartment-mounted grab bars.
2. Show locations of centerlines of toilet fixtures.
3. Show overhead support or bracing locations.

D. Samples for Initial Selection: For each type of unit indicated include samples requiring Owner’s material and color selection.

E. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.4 QUALITY ASSURANCE


B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having
jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 45 or less.
2. Smoke-Developed Index: 120 or less.


1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

B. Stainless-Steel Castings: ASTM A 743/A 743M.

2.2 SOLID-POLYMER UNITS

A. Basis of Design Product: Provide Accurate Partitions, 9500 Ivory Essence Speckle Solid Color Reinforced Composite (SCRC) Toilet Partition System. Partitions to match the Ned Granger Building 5th Floor Project. Subject to compliance with requirements, available manufacturers offering similar products are the following:

1. Accurate Partitions Corporation.
2. Ampco, Inc.
5. General Partitions Mfg. Corp.
6. Global Steel Products Corp.
7. Hadrian Manufacturing Inc.
8. Metpar Corp.
10. Santana Products, Inc.
11. Sanymetal; a Crane Plumbing company.

B. Toilet-Enclosure Style: Floor and ceiling anchored.

C. Entrance-Screen Style: Floor and ceiling anchored.

D. Urinal-Screen Style: Wall hung.

E. Door, Panel, Screen, and Pilaster Construction: Solid panel material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.

1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
2. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
3. Color and Pattern: as selected by Architect from manufacturer's full range.

F. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.

1. Color and Pattern: As selected by Architect from manufacturer's full range.

G. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design.
   a. Polymer Color and Pattern: Matching panel.

2.3 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.

2. Hinges: Manufacturer's standard integral hinge for solid-polymer doors.
3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.4 FABRICATION

A. Floor-and-Ceiling-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at tops and bottoms of pilasters. Provide shoes and sleeves (caps) at pilasters to conceal anchorage.

B. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, in-swinging doors for standard toilet compartments and 36-inch-wide, out-swinging doors with a minimum 32-inch-wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:
   a. Pilasters and Panels: 1/2 inch.
   b. Panels and Walls: 1 inch.

B. Floor-and-Ceiling-Anchored Units: Secure pilasters to supporting construction and level, plumb, and tighten. Hang doors and adjust so doors are level and aligned with panels when doors are in closed position.

C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.2 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION
SECTION 102600 – CORNER GUARDS

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 corner guards.

B. Related Sections:
   1. Division 08 Section "Door Hardware" for metal armor, kick, mop, and push plates.

1.3 PERFORMANCE REQUIREMENTS

1.4 SUBMITTALS

A. Product Data: Manufacturer’s cut sheets

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain impact-resistant wall protection units from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store in original undamaged packages and containers protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install impact-resistant wall protection units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature and humidity levels.

1.8 WARRANTY

A. Manufacturer’s standard form in which manufacturer agrees to repair or replace components of impact-resistant wall protection units that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel Sheet

2.2 CORNER GUARDS

A. Surface-Mounted, Metal Corner Guards: Fabricated from one-piece, formed or extruded metal with formed edges; with 90 degree turn to match wall condition.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. American Floor Products Co., Inc.
   b. Arden Architectural Specialties, Inc.
   c. Balco, Inc.
   d. Boston Retail Products.
   e. Construction Specialties, Inc.
   f. IPC Door and Wall Protection Systems; Division of InPro Corporation.
   g. Korogard Wall Protection Systems; a division of RJF International Corporation.
   h. Pawling Corporation.
   i. Tepromark International, Inc.
   j. WallGuard.com.

2. Material: Stainless steel, Type 304 or Type 430.
   a. Thickness: Minimum 0.0500 inch.
   b. Finish: Directional satin, No. 4.

3. Wing Size: Nominal 2-1/2 by 2-1/2 inches.


B. Adhesive: As recommended by manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 CLEANING

A. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

B. Maintain protective plastic film in place until substantial completion.

END OF SECTION
SECTION 102800 – TOILET AND BATH ACCESSORIES

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. Toilet and bath accessories
   2. Custodial accessories.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:
   1. Construction details and dimensions.
   2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   3. Material and finish descriptions.
   4. Features that will be included for Project.
   5. Manufacturer’s warranty.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

C. Maintenance Data: For toilet and bath accessories and custodial accessories to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.
1.6 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.

C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.


E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.


2.2 TOILET AND BATH ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
6. Tubular Specialties Manufacturing, Inc.

B. Waste Receptacle:
1. Mounting: Semirecessed.
4. Liner: Reusable vinyl liner.
5. Lockset: Tumbler type for waste-receptacle.

C. Grab Bar:

1. Mounting: Flanges with concealed fasteners.
2. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. Configuration and Length: As indicated on Drawings.

D. Sanitary-Napkin Disposal Units:

1. Mounting: Surface mounted.
2. Door or Cover: Self-closing, disposal-opening cover.

E. Mirror Unit:

1. Frame: Stainless-steel angle, 0.05 inch thick.
   a. Corners: Manufacturer's standard.
   a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
   b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
3. Size: As indicated on Drawings.

2.3 CHILDCARE ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. American Specialties, Inc.
2. Brocar Products, Inc.
3. Diaper Deck & Company, Inc.
4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
5. Koala Kare Products; a division of Bobrick Washroom Equipment, Inc.
6. SSC, Inc.
7. Tubular Specialties Manufacturing, Inc.

B. Diaper-Changing Station:
   1. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap.
      a. Engineered to support a minimum of 250-lb static load when opened.
   2. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.
   5. Liner Dispenser: Built in.

2.4 UNDERLAVATORY GUARDS

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. Plumberex Specialty Products, Inc.
   2. Truebro by IPS Corporation.

B. Underlavatory Guard:
   1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.

2.5 CUSTODIAL ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. A & J Washroom Accessories, Inc.
   2. American Specialties, Inc.
   5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
   6. Tubular Specialties Manufacturing, Inc.

B. Mop and Broom Holder:
1. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
2. Length: 36 inches.
5. Material and Finish: Stainless steel, No. 4 finish (satin).
   a. Shelf: Not less than nominal 0.05-inch-thick stainless steel.
   b. Rod: Approximately 1/4-inch-diameter stainless steel.

2.6 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION
SECTION 104413 - FIRE EXTINGUISHERS AND CABINETS

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. Existing Fire Extinguishers and Cabinets may be reused subject to compliance with codes. Owner will be responsible for annual test, inspection and update for reused fire extinguishers. Provide labor necessary for handling and reinstallation of existing fire extinguishers and cabinets. If additional units are required or, at the Contractor's option, provide new units complying with the requirements of this section.

B. Section Includes:
   1. Portable hand-held fire extinguishers
   2. Fire extinguisher cabinets and accessories.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles.
   1. Fire Extinguisher Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
   2. Fire Extinguishers.

B. Maintenance Data: For fire protection cabinets and fire extinguishers to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHER CABINET

A. Cabinet Type: provide quantity indicated in drawings and suitable for fire extinguisher specified.
   1. Products: Basis of design is the following cabinet manufactured by Larsen's Manufacturing Company; 7421 Commerce Lane NE, Mpls, MN 55432. Subject
to compliance with requirements the products of other manufacturers are acceptable.

a. Model 2409-R4
b. Semi-Recessed, 3 ½", 24"h. x 9 ½" w. x 6" d.
c. Vertical Duo door with clear acrylic glazed window
d. Rolled edge trim
e. Optional recessed handle
f. Identification lettering complying with authorities having jurisdiction for letter style, size, spacing, and location.

B. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher inside security fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: provide quantity indicated in drawings

1. Products: Provide an MP5, 2A-10B:C multi-purpose extinguisher with fluidized and siliconized mono ammonium phosphate powder in a steel container. Subject to compliance with requirements the products of the following manufacturers are acceptable.

a. Amerex Corporation.
b. Ansul Incorporated; Tyco International Ltd.
c. Badger Fire Protection; a Kidde company.
d. Buckeye Fire Equipment Company.
e. Fire End & Croker Corporation.
g. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
h. Larsen's Manufacturing Company.
i. Moon-American.
j. Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.
k. Potter Roemer LLC.
l. Pyro-Chem; Tyco Safety Products.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for fire protection cabinets as required by type and size of cabinet and trim style.
3.3 INSTALLATION

A. General: Install fire protection cabinets in locations shown in drawings and at mounting heights indicated below.
   1. Fire Extinguisher Cabinets: 50 inches above finished floor to top of cabinet or as manufacturer recommends for TAS and ADA compliance.

B. Fire Extinguisher Cabinets: Fasten cabinets to structure, square and plumb.
   1. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

C. Identification: Apply decals or vinyl lettering, if applicable, at locations indicated by the manufacturer.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer’s written installation instructions.

B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.

E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

F. Install fire extinguishers inside cabinets prior to turnover to Owner.

END OF SECTION 104413
SECTION 109500 - MISCELLANEOUS BUILDING SPECIALTIES

PART 1 GENERAL

1.01 WORK INCLUDED
   A. The following products are to be furnished and installed under the provisions of this section:
      1. television wall mount brackets

1.03 SUBMITTALS
   A. Product information indicating design data, test reports and manufacturer's installation instructions.

1.05 QUALIFICATIONS
   A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum of three years experience.
   B. Installer: Company specializing in applying the work of this Section with a minimum of two years experience installing the specified products.

1.06 REGULATORY REQUIREMENTS

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Deliver products to site in unopened manufacturer's shipping containers.
   B. Secure products in storage area protected from construction activities.

1.08 WARRANTY
   A. Provide Manufacturer's standard warranty.

PART 2 PRODUCTS

2.01 TELEVISION MOUNT:
   A. Peerless #SWM 375 with a key lock for security and adjustable tilt, as located in the drawings, at 7'-4" A.F.F. to the bottom of the mounting bracket. Coordinate with the Owner on sizes of TV's to be installed and verify clearances to ceilings. Coordinate with appropriate trades to ensure that blocking is installed in proper locations for concealed mounting.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that surfaces are ready to receive work.
   B. Commencement of installation signifies acceptance of conditions.

3.02 INSTALLATION
   A. Installation is to be done in accordance with manufacturer's instructions and locations approved by Owner.

END OF SECTION
SECTION 111900 - BASIC DETENTION EQUIPMENT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Basic Detention Equipment Requirements related to the Court Holding Area on the 3rd Floor. The Court Holding Area includes one Group Holding Cell, one H.C. Holding Cell, three Non-Contact Visitation Booths, two Vestibules for access to the two Courtrooms. The holding area is accessed by two Prisoner Transport Elevators.

B. Related Sections:

1. 111910 Detention Hollow Metal
2. 111920 Detention Hardware
3. 111930 Security Glazing
4. 111940 Detention Furniture
5. 111950 Detention Metal Ceilings

1.2 DEFINITIONS

A. DSC = Detention Systems Contractor, the subcontractor selected by the General Contractor to provide the detention systems described.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For doors, frames, glazing, hardware and furniture. Include plans, elevations, sections, details, and attachments to other work as necessary to fully describe the configuration and installation requirements.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.

C. Welding certificates.

D. Certificates from Manufacturers that the DSC is certified to provide the equipment and systems required for this project.

E. Operation and maintenance data.

F. Warranty.

1.4 QUALITY ASSURANCE

B. Fire-Resistance Ratings: Where indicated, provide products identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

C. Preinstallation Conference: Conduct conference at project site with General Contractor, DSC Project Manager, DSC Superintendent, Owner and any Subcontractors involved in coordination of this work. Notify the G.C. in sufficient time to coordinate the conference.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to job site, coordinate storage requirements with G.C.

1.6 COORDINATION

A. Coordinate installation schedule to ensure that other work is in place and ready to receive detention equipment products.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products or components of products that fail(s) in materials or workmanship within specified warranty period.

1. Warranty Period: one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Refer to individual sections.

2.2 SOURCE QUALITY CONTROL

A. Provide each product of same type from a single source.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine project site before installation. Provide a written report to the G.C. acknowledging that site is ready to commence work or listing items that require correction prior to commencement of work. Commencement of work shall signify acceptance of site as being ready for installation of detention products.

3.2 ADJUSTING

A. Adjust all products to function smoothly and designed by the manufacturer.
B. Prior to acceptance by Owner, remove all protective film, packaging, tags and other marks that are not to remain as part of the permanent installation.

C. Clean all installed products. Remove grease, soil, paint overspray, etc. Clean glass and stainless steel surfaces.

3.3 PROTECTION

A. Protect products from damage until acceptance by Owner or until the date of Substantial Completion, whichever occurs first.

3.4 DEMONSTRATION

A. Provide training or orientation session with Owner's operating and maintenance personnel. If training or orientation is not needed by Owner, obtain acknowledgement, in writing, from the Owner's Project Manager.

END OF SECTION
SECTION 111910 – DETENTION HOLLOW METAL

PART 1 GENERAL

1.01 SCOPE OF WORK:

A. The work covered by this Section includes the furnishing of all labor, material, equipment and incidentals required to manufacture detention hollow metal as indicated in the drawings or herein specified.

B. Related Documents:

1. Architectural drawings and general provisions of the Contract, including General and Supplementary Conditions.

C. Related products furnished by others, but not specified in this section:

1. Door Hardware, including food pass hardware
2. Security Glass and Glazing Materials
3. Gaskets and Weatherstrips
4. Intercoms and Intercom Back Boxes
5. Caulkings and Adhesives
6. Grouting of frames

1.02 REFERENCES

A. ASTM A366, Steel, Carbon, Cold rolled, Commercial Quality
B. ASTM A569, Steel, Carbon, Hot rolled Sheet and Strip, Commercial Quality
C. ASTM A525, Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, General Requirements
D. ASTM A526, Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, Commercial Quality
E. ASTM A167 and A240, Stainless Steel Type 304
F. NAAM 863-98

1.03 SUBMITTALS

A. Shop Drawings: Manufacturer shall provide shop drawings for review and approval, which include at least the following:
1. Door and frame elevations and sections
2. Schedule of openings including dimensions, gauges, anchors and label requirements.
3. Manufacturers standard instructions for frame installation and for material handling and storage.
4. Location and detail of openings in frames or doors.
5. Glazing types and stops
6. When a fire resistance classification is shown or scheduled for steel doors or frames provide fire rated doors with recognized testing laboratory labels affixed. During the submittal process, identify openings that may not receive labels due to hardware, dimensional or other limitations. For such openings, provide certification that the door and frame components have been constructed in accordance with the requirements of the testing laboratory.
B. Testing and performance: Doors and frames shall meet the following minimum test standards. Upon request from the Owner, compliance with test requirements shall be certified by reports of independent testing agencies. Test reports shall indicate the construction of the samples tested with sufficient particularity that construction can be verified.

1. **Static Load Test:** This test is intended to verify the integrity of the door construction system employed by the manufacturer. With a 36" by 84" door panel supported by both ends, and load applied equally one fourth of the distance from each end, the test panel shall deflect not more than 0.40" at the center and shall rebound to not more than 0.015" for 12 gauge and .520" deflection with rebound of not more than .05" when load is removed.

<table>
<thead>
<tr>
<th>Door Gauge</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Load</td>
<td>14,000#</td>
<td>14,000#</td>
<td>8,100#</td>
</tr>
</tbody>
</table>

2. **Rack Load Test:** This test simulates a prying attack on a corner of the door. A 36" by 84" test panel is rigidly restrained at one end. A third corner is simply supported. Loads are applied and deflections measured at the fourth corner. Under the following loads, deflection shall not exceed the amounts shown.

<table>
<thead>
<tr>
<th>Door Gauge</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Load</td>
<td>7,500#</td>
<td>7,500#</td>
<td>4,000#</td>
</tr>
<tr>
<td>Permitted Deflection</td>
<td>1.50&quot;</td>
<td>2.25&quot;</td>
<td>2.10&quot;</td>
</tr>
<tr>
<td>Max. Per. Deflection</td>
<td>.063&quot;</td>
<td>.25&quot;</td>
<td>.50&quot;</td>
</tr>
</tbody>
</table>

3. **Door Impact Test:** This test simulates a battering attack on a door and frame assembly, using impact of 200 foot pounds applied to the stop side of the door by a steel pendulum having a 4 square inch hitting surface. 12 and 14 gauge doors shall be secured with a Folger Adam 82 lock installed in a door pocket. 16 gauge doors shall be secured with a Folger Adam 2" narrow jamb lock mounted in the frame jamb. Door shall remain closed during testing and shall be fully operable following the test.

<table>
<thead>
<tr>
<th>Door Gauge</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hits (6&quot; from bolt)</td>
<td>600</td>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td>Hits (6&quot; each hinge)</td>
<td>200</td>
<td>150</td>
<td>*50</td>
</tr>
</tbody>
</table>

*center hinge only

4. **Removable Glass Stop Testing:** Prepare a 12 gauge test window frame of 28" by 33" glass opening, and glaze it with a 3/8" steel plate. Security screws used and screw spacing shall be the manufacturer’s standards. Subject the test frame to 400 impacts of 200 foot pounds each on the steel glazing panel within 6" of a single corner. Stops must remain in place, and not more than one screw may be broken upon completion.

1.04 **QUALITY ASSURANCE**

A. Materials covered by this section shall be supplied only by manufacturers having at least ten years of experience supplying detention grade hollow metal, and who have furnished at least 50,000 openings for detention installations.

B. The following suppliers are approved and are acknowledged to have met the standards contained in this section. Subject to prior approval and compliance with tests and requirements the products of other manufacturers may be acceptable.

1. Habersham Metal, Cornelia, GA.
2. American Steel, Demorest, GA

1.05 **WARRANTY**

A. Products supplied under this section shall be warranted by the manufacturer and the DSC to be free of defects in material or workmanship for a period of one year of Substantial Completion.

**PART 2 PRODUCTS**

2.01 **MATERIALS**
A. Doors and frames shall be constructed using new, commercial quality hot or cold rolled steel, or stainless steel as identified in the architectural drawings. Steel used shall be in conformity with Paragraph 1.02 of this Section.

2.02 GLASS MOLDINGS

A. Where specified or indicated on drawings, doors and frames shall be supplied with removable glass moldings. These shall be formed steel angles of 10 gauge minimum. Where dimensional restrictions preclude use of an angle, offset surface mounted stops may be used. All stops shall have tightly fitted butted or mitered corners and shall be secured with 1/4" - 28 torx head security screws no more than 8" on center.

2.03 DOOR CONSTRUCTION

A. General: All door face sheets shall be 12 gauge unless specified differently. Manufacturer’s door reinforcements and fabrication techniques shall be consistent with, or more substantial than, the construction employed in doors tested to demonstrate compliance with the performance requirements herein.

B. Specific Additional Reinforcement: The following reinforcement requirements shall also be met:

1. Doors shall be internally reinforced with one of the following systems:
   a. Continuous steel truss design core material, 28 gauge minimum, having truncated triangular sections extending continuously from one door face to the other, spotwelded to each face 2-3/4" oc horizontally and 3" oc vertically. Core material to extend full height and width of door.
   b. Rolled or formed 1/8" steel channels extending from top to bottom of door and continuous from one door face to the other, spaced not more than 4" oc and spotwelded to door faces not more than 3" oc vertically.
   c. Continuous vertical hat sections, one such hat section welded to each face of the door, 16 gauge minimum, with vertical webs no more than 4" apart, spotwelded to faces no more than 3" oc vertically. Hat sections shall be welded to each other at least every 6" oc both sides in order to prevent door separation. The vertical edges shall be reinforced by a continuous steel channel, not less than 10 gauge thickness extending the full height of the door. Channel which is notched or broken at the hinge mortises shall not be acceptable.

2. Door face sheet shall be joined at their vertical edges by a continuous weld extending the full height of the door. Intermittent welds with filler will not be acceptable.

3. Top and bottom of the door shall be closed with a 12 gauge formed channel, 16 gauge for 16 gauge door. Top and bottom closing channels shall be welded to the edge reinforcing. Top and bottom of doors shall be finished flush with inverted channels of not less than 12 gauge, 16 gauge for 16 gauge doors.

4. Hinge reinforcements shall be minimum 3/16" thick of the size and shape utilized in testing. They shall be projection welded to the door edge, and after installation additionally electrically spot welded to the door edge. In addition, a backup channel stiffener of not less than 14 gauge shall be welded to each hinge reinforcing and to each door face, to prevent rocking failure of the hinge reinforcing.

5. Swing door edges shall be beveled 1/8 in 2". Sliding doors shall have square edges.

6. Hardware Preparation - Doors shall be reinforced, drilled, tapped and prepared for templated mortised hardware only, in accordance with a final approved hardware schedule and templates provided by the hardware supplier. Where surface hardware is to be applied, doors shall be reinforced only. Reinforcing dimension shall be as follows:
   a. Surface Mounted Hinges - Minimum 3/8" reinforcing
   b. Mortised Hinges and Pivots - 3/16"
   c. Internal Reinforcing for Other Hardware - 12 ga
7. Louvers - Louvers, if required, shall be of the inverted V type with blades formed from 10 gauge minimum material and positioned so that no rigid flat object can be passed through them. Louver design shall meet the performance standards set out in Paragraph 1.08.

8. Speakers - Speaking devices, if required, shall consist of a rectangular pattern of round holes, not exceeding 1/4” in diameter in both face sheets. The hole pattern shall be at least 4” by 5”. The space between the hole patterns shall be baffled with steel sections of not less than 18 gauge so that objects cannot be passed through the door.

9. Food Pass Openings
   a. The food pass opening shall be a flush opening fabricated using 10 gauge interior channels securely welded to the inside of both face sheets. Reinforcing for food pass locks and hinges shall be 10 gauge channel. The clear opening shall be as shown in the architectural drawings. The four corner seams shall be continuously arc welded. The finished opening shall be of such construction that it cannot be dismantled or otherwise affected by tampering or scraping.
   b. The food pass shutter shall be constructed from two 10 gauge steel plate. The overall shutter size shall overlap the opening by ½” minimum on all sides.
   c. The shutters shall be chemically treated for maximum paint adhesion and primed in accordance with Paragraph 2.06 of this Section.

C. Doors shall have the Architect’s mark number permanently stamped on the center hinge reinforcement for swing doors and on the top for sliding doors.

D. Field Examination: If directed by the architect, the erector shall destroy a randomly selected security hollow metal door by sawing it in half. When examination discloses door construction at variance with the details shown in performance test reports (Paragraph 1.08), the door manufacturer shall replace all non-conforming doors shipped to the project with doors constructed in conformance with construction of doors tested. Under conditions of non-conformity, the door manufacturer shall pay for the destroyed door and related labor. When examination proves that the door construction is consistent with tested doors, the owner will pay to replace the destroyed door and related labor.

2.04 FRAME CONSTRUCTION

A. General: All frames shall be 12 gauge or 14 gauge for applications with security doors. All frames shall be formed of hot or cold rolled steel produced in accordance with ASTM A569 or ASTM A366. Frames scheduled as galvanized shall be in accordance with ASTM A526 (A60). Frames shall be straight, neat in appearance, and free of warpage and buckling. All frame joints shall be welded, except where overall size of frame precludes shipment, in which case appropriate splices shall be provided for field erection by others. Following fabrication, welded areas of galvanized frames shall be re-sprayed with a cold galvanizing product complying with mil spec. P.46105.

B. Frame Details
   1. Jamb, head and sill profiles shall be as scheduled or shown in architectural drawings. Stop height for frames shall be one inch (1 1/4") for glass openings and 3/4" for door openings.
   2. Corner joints shall have all contact edges closed tight with faces mitered and stops butted or mitered. Corner joints shall be continuously welded and the use of gussets or splice plates is unacceptable.
   3. Frames for multiple openings shall have mullion members which are closed tubular shapes conforming to profiles shown on drawings and which have no visible seams or joints. All joints between faces of abutted members shall be continuously welded and finished smooth.
   4. Frames shall have the architect’s door number permanently stamped in the center hinge reinforcement. Where frames do not receive hinge preparation, number shall be stamped in a prominent location, where it will not be visible after installation.
5. Frames shall be mortised, reinforced, drilled and tapped for all templated mortised hardware only, in accordance with the final approved hardware schedule and templates provided by the hardware manufacturer. Where surface mounted hardware is to be applied, frames shall be drilled and tapped for all security hardware, unless otherwise noted herein.

6. Mortised hinge and pivot reinforcement shall be a minimum of 3/16" thick, 1-1/2" wide and 9" long. Reinforcements shall be projection welded to the frame and shall be MIG welded to the frame at top and bottom of each reinforcing. The top hinge shall be additionally reinforced with a 3/16" thick formed angle welded both to the hinge reinforcing and frame face.

7. Drilling and tapping of frames for surface mounted hinges shall be by field erector, after door is fitted plumb and true into frame.

8. Other Reinforcements: The following applications shall be reinforced as indicated:
   - Lock Bolt Opening Backup 10 gauge minimum
   - Surface Mount Closers 7 gauge minimum
   - Concealed Closers 3/16" minimum
   - Strike Mounting Clips 3/16" minimum

9. Floor clips shall be provided of gauge at least as great as the frame gauge and shall be welded in place at the bottom of each jamb. They shall have two holes for anchoring to floor. If so scheduled, adjustable floor clips shall be provided.

10. Frames shall be caulked in order to limit leakage of grout into frame openings.

11. Removable glass stops minimum 10 gauge 1 1/4" for frames.

12. Glass stop screws 1/4-20 button head torx with grout protection on inside throat of frame and mullion section.

C. Jamb Anchors
1. Masonry - Provide a minimum of three (3) non-removable floating masonry anchors for each jamb mounted in masonry up to 84" in length. Anchors shall have holes in them permitting insertion of reinforcing bar. For longer jambs, provide sufficient anchors to permit maximum spacing of 24". Where dictated by fire rating testing laboratory procedures, supply anchors complying with such requirements.

2. Prefinished Masonry, Concrete Openings - Factory punched and countersunk holes for 3/8" diameter expansion bolt anchors, not more than 6' from top and bottom of jamb and 24" on center. Weld in 12 gauge minimum reinforcing chairs to prevent frame deformation while tightening anchor bolts. Concrete anchors and bolts shall be provided under the general contract.

D. Mortar Guards of not less than 24 gauge steel shall be welded in place at all hardware mortises on frames to be set in masonry or concrete. Guards for closers shall be 18 gauge minimum.

E. All frames shall be provided with two temporary steel spreaders welded to the feet of the jambs to serve as bracing during shipping and handling only. These shall be removed prior to installation and are not to be used for setting of proper frame tolerances.

2.05 FABRICATION AND WORKMANSHIP

A. All material shall be smooth and free of surface blemishes. Gauge of frame members and door face sheets shall be as indicated in the architectural drawings. Doors and frames shall be neat in appearance and free from warpage or buckle. Edge bends shall be true and straight.

2.06 PRIME PAINTING

A. Clean, treat and paint exposed surfaces of fabricated hollow metal units, including galvanized surfaces.

B. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before the application of the shop coat of paint.

SECURITY HOLLOW METAL 111910 - 5
C. Apply pretreatment to cleaned metal surfaces, using cold phosphate solution (SSPC-PT2), hot phosphate solution (SSPC-PT4) or basic zinc chromate-vinyl butyral solution (SSPC-PT3).

D. Apply shop coat of prime paint within time limits recommended by pretreatment manufacturer. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 2.0 mils.

PART 3 EXECUTION

3.01 HANDLING AND STORAGE OF MATERIALS

A. Frame erector shall receive material at jobsite, unload it, note any damage and file any required freight claims, and store the material, all in accordance with Manufacturer's instructions. Any scratches or paint damage that has occurred during shipment shall be cleaned and touched up with primer.

3.02 INSTALLATION

A. Prior to installation, frame erector shall check frames for size, swing, squareness, alignment, twist and plumbness. Conduit connections shall be checked to assure that they have not loosened during shipment. Screw protection, if provided, shall be checked to assure that it has not been removed or tampered with.

B. Install frames as set forth in Manufacturer's instructions with jambs parallel, frame faces in the same plane and parallel with wall surfaces, frames set squarely in openings. Maximum deviation shall be 1/6" in any such dimension as described in Manufacturer's installation instructions.

END OF SECTION
SECTION 111920 – DETENTION HARDWARE

PART 1 GENERAL

1.01 SUMMARY
A. Section includes detention hardware for the Courts Holding Area. Hardware is to match or be approved equal to the detention hardware installed on floors 3 through 9 of the building.

1.02 REFERENCES
A. ASTM F1577-95 Test Methods for Detention Locks for Swing Doors

1.03 SUBMITTALS:
A. Make submittals in accordance with the requirements of Division 1 Section “Submittals” and Division 11, Section 111900 “Basic Detention Equipment Requirements”.
B. Submit specifications, installation instructions and general recommendations for products as required, including locks, hinges, lock mount covers, bolt keepers, wall bumpers, weatherstripping, thresholds, escutcheons, etc.
C. Hardware and Keying Schedules:
1. Submit two copies of each schedule type. Indicate all products by name and number for each separate opening. Include all other pertinent hardware information.
2. Upon return of submittals promptly make any corrections or changes necessary in schedules to comply with requirements. Resubmit two copies of revised schedules.
D. Templates for Fabrication:
1. Forward templates for each type of detention equipment hardware required to fabricators of work in Division 11, Section 111910 “Detention Hollow Metal” following final review of hardware and keying schedules.
E. Closeout Submittals - Furnish three copies of Operating/Maintenance Manuals including parts lists for security locks and locking devices.

1.04 QUALITY ASSURANCE
A. Throughout the specifications and drawings, types of materials may be specified by the manufacturer’s name and catalog number in order to establish standards of quality and performance.

1. Manufacturers Qualifications: Provide security equipment products from manufacturers who have been actively engaged in the production of security equipment for a minimum of ten (10) years in successfully completing projects of equal scope and magnitude with products as herein specified. This evidence shall consist of a list of ten (10) projects that have been complete and operational for a minimum of five (5). The manufacturer shall now be actively engaged in the design and manufacture of security locks, locking devices, furnishings and miscellaneous security hardware and products. All locks, locking devices and related security hardware shall be provided by the same manufacturer.

B. Approved Detention Hardware Suppliers. Others may also be approved at Owner’s discretion:
1. Southern Steel Company, San Antonio, TX
2. Folger Adam Company, Lemont, IL

1.05 PRODUCT HANDLING

A. Comply with requirements of Division 11, Section 111900 “Basic Detention Equipment Requirements”.

B. For products delivered to door manufacturer and for products delivered to project site, package each item of hardware separately in containers, complete with necessary fasteners, installation instructions and installation templates. Mark each container with item numbers, location of installation in accord with corresponding information shown on final hardware schedule.

C. Store products at site to prevent damage or loss until installation is made.

D. Control handling and installation of hardware products which are not immediately replaceable, so that the completion of work will not be delayed by hardware losses, both before and after installation.

E. Deliver keys by secure carrier (hand carrier or registered mail) from manufacturer directly to authorized representative of the Owner.

1.06 WARRANTY

A. Comply with requirements of Division 11, Section 111900 “Basic Detention Equipment Requirements”.

1.07 MAINTENANCE

A. Fasteners and Accessories:
   1. Furnish five (5) percent extra fasteners and other miscellaneous accessories for installation.

B. Furnish for institution use only, four (4) complete sets of:
   1. Special tools required for locking device and hardware maintenance.
   2. One lock repair kit

PART 2 PRODUCTS

2.01 MANUFACTURER:

A. Provide products that match existing products installed in court holding areas on floors 3 through 9 unless authorized by Owner, in writing, to substitute other products.

B. Catalog numbers of the first manufacturers listed have been used to establish the quality required. The only other manufacturers approved are listed. Other manufacturers seeking approval shall do so in writing per General Requirements and shall list exact catalog numbers and description of the items proposed to furnish.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hinges</td>
<td>Southern Steel</td>
<td>Folger-Adam</td>
<td>Hager</td>
</tr>
<tr>
<td>Closers</td>
<td>LCN</td>
<td>Norton</td>
<td>Yale</td>
</tr>
<tr>
<td>Stops</td>
<td>Portland</td>
<td>H.B. Ives</td>
<td></td>
</tr>
<tr>
<td>Holders, Surface Bolts</td>
<td>Glynn-Johnson</td>
<td>Checkmate</td>
<td>Yale</td>
</tr>
<tr>
<td>Push/Pull</td>
<td>Hager</td>
<td>Hiawatha</td>
<td></td>
</tr>
<tr>
<td>Thresholds</td>
<td>Pemko</td>
<td>Reese</td>
<td>Zero</td>
</tr>
</tbody>
</table>
DESIGNATIONS: Following abbreviations identify listed manufacturers:

Checkmate Rixon, Inc.; Franklin Park, IL
Falcon Falcon Lock; Colorado Springs, CO
Folger-Adam Folger-Adam Co.; Lemont, IL
Glynn-Johnson Glynn-Johnson Corp.; Chicago, IL
Hager Hager Hinge Co.; St. Louis, MO
Hiawatha Metalcraft, Inc.; Minneapolis, MN
Ives H.B. Ives Div.; New Haven, CT
LCN LCN Closers; Princeton, IL
Norton Norton Closer Div; Charlotte, NC
Pemko Pemko Mfg. Co.; Emeryville, CA
Portland Portland Hardware; Portland, OR
Reese Reese Enterprises; Rosemount, MN
Southern Steel Southern Steel Co.; San Antonio, TX
Zero Zero Weatherstripping; Bronx, NY

2.02 KEY CABINET

A. Owner will use existing key control cabinet.

PART 3 EXECUTION

3.01 GENERAL

A. Comply with requirements of Division 11, Section 11190 “Basic Detention Equipment Requirements” and with the General and Supplementary Conditions and Division 01 Requirements.

END OF SECTION
SECTION 111930 – SECURITY GLAZING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes glazing for security hollow metal door lites, visitation booth windows and holding cell windows within the Courts Holding Area.

1.02 REFERENCES

2. HP White TP-0500 - Transparent Materials for Use in Forced Entry or Containment Barriers. Earlier versions of this standard will not be accepted.
7. GANA Sealant Manual; Glass Association of North America.

1.03 DEFINITIONS

A. Bullet-Resistant Glass: A multiple lamination of glass or glass and plastic that is designed to resist penetration from medium-to-super-power small arms and high-power rifles and to minimize spalling.
B. Forced Entry Glass: A multiple lamination of glass or glass and plastic that is designed to resist penetration from physical attack.

1.04 SUBMITTALS

A. Submit 12-inch (305mm) square samples of each type of glass indicated (except clear monolithic glass products)
B. Submit manufacturer's product data for each security glazing type, including type of materials, thickness, method of test, test performance report and glazing and cleaning instructions.
C. Glazing contractor shall obtain compatibility and adhesion test reports from sealant manufacturer, indicating that glazing materials were tested for compatibility and adhesion with glazing sealant, as well as other glazing materials including insulating units.
D. Glazing Contractor shall provide test reports showing that the glass meets the requirements of any security test reports specified herein.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications: Firm experienced in manufacturing security glass, types as specified, with a minimum documented 5 years of successful in-service performance.
B. Installers Qualification: Engage a firm experienced in installing security glass, types as specified, with a minimum documented 5 years of successful in-service performance.
C. Testing Agencies: Subject to compliance with requirements, acceptable testing agencies are:
   1. HP White Laboratories, Inc.
   2. Warnock-Hersey International
   4. Underwriters Laboratories, Inc
D. Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.
   1. GANA Publications
2. AAMA Publications
   E. Single-source fabrication responsibility: All fabricated glass shall be processed and supplied by a single fabricator.

1.06 DELIVERY, STORAGE AND HANDLING

   A. Comply with manufacturer's instruction for receiving, handling, storing and protecting glass & glazing materials.
   B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
   C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
   D. Exercise exceptional care to prevent edge damage to glass and damage/deterioration to coating on glass.

1.07 PROJECT / SITE CONDITIONS

   A. Environmental Requirements: Installation of glass products at ambient air temperature below 40 degrees F (4.4 degrees C) is prohibited.
   B. Field Measurements: When construction schedule permits, verify field measurements with drawing dimensions prior to fabrication of glass products.

1.08 WARRANTY

   A. Provide written 5-year warranty from date of manufacture for laminated security glass. Warranty covers deterioration due to normal conditions of use and not to handling installing, protecting and maintaining practices contrary to glass manufacturer’s published instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

   A. Approved Manufacturers: Subject to compliance with requirements, provide products from the following manufacturer or, subject to requirements in Division 01, products from other manufacturers:
      1. Oldcastle Glass

2.02 MATERIALS

   A. Laminated Assemblies: Laminated security glass assemblies are to be bonded with polyvinyl and/or aliphatic polyurethane interlayers, as required, and fabricated in an autoclave using heat, plus pressure producing products free of foreign substances and air pockets.
   B. Security Glazing - Glass-Clad Polycarbonates.
      1. Type SG-FE2 - Glass-clad polycarbonate, Clear: Inner and outer lites shall be 3mm heat strengthened glass with a single ply polycarbonate core. Overall nominal thickness shall be 9/16". Product shall comply with:
         i. HPW-TP-0500, Forced Entry Level 1 and Ballistics Level A, .38 Special (ballistics stoppage spall penetration).
         ii. Earlier versions of the HP White standard will not be accepted.
         iii. Basis for design Oldcastle Glass ArmorProtect Plus #121100.
C. Glazing Products

1. Select appropriate glazing sealants, tapes, gaskets and other glazing materials of proven compatibility with other materials that they contact. These include, but are not limited to, glass products, insulating glass unit seals and glazing channel substrates under installation and service conditions, as demonstrated by testing and field experience.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Site Verification and Conditions
   1. Verify that site conditions are acceptable for installation of the glass.
   2. Verify openings for glazing are correctly sized and within tolerance.
   3. Verify that the minimum required face and edge clearances are being followed.
   4. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protection
   1. Handle and store product according to manufacturers' recommendations.

B. Surface Preparation
   1. Clean and prepare glazing channels and other framing members to receive glass.
   2. Remove coatings and other harmful materials that will prevent glass and glazing installation required to comply with performance criteria specified.

3.03 INSTALLATION

A. Install products using the recommendations of manufacturers of glass, sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those in the "GANA Glazing Manual".

B. Install glass in prepared glazing channels and other framing members.

C. Install setting blocks in rabbets as recommended by referenced glazing standards in GANA Glazing Manual and IGMA Glazing Guidelines.

D. Provide bite on glass, minimum edge and face clearances and glazing material tolerances recommended by GANA Glazing Manual.

E. Set glass lites in each series with uniform pattern, draw, bow and similar characteristics.

F. Distribute the weight of the glass unit along the edge rather than at the corner.

G. Protect glass from edge damage during handling and installation.

H. Prevent glass from contact with contaminating substances that result from construction operations, such as weld spatter, fireproofing or plaster.

3.04 CLEANING

A. Clean excess sealant or compound from glass and framing members immediately after application, using solvents or cleaners recommended by manufacturers.

B. Glass to be cleaned according to:
   1. GANA Glass Informational Bulletin GANA 01-0300 - Proper Procedures for Cleaning Architectural Glass Products.
   2. GANA Glass Information Bulletin GANA TD-02-0402 – Heat-Treated Glass Surfaces Are Different.

C. Do not use scrapers or other metal tools to clean glass.

END OF SECTION
PART 1 GENERAL

1.01 SCOPE OF WORK:

A. Detention Systems Contractor

1. Furnish and install Detention Furnishings indicated on drawings and in schedules.
2. Furnish for installation all embedded anchors for Detention Furnishings.
3. Coordinate installation of embedded items with other trades.

1.02 QUALITY ASSURANCE

Manufacturer’s Qualifications - Manufacturers of security equipment shall be a firm specializing in the design and manufacture of the equipment as listed herein for a period of not less than ten (10) years.

1.03 SUBMITTALS

A. According to requirements of Division 01 Section “Submittals” and Division 11, Section 111900 “Basic Detention Equipment Requirements”.

B. Submittals shall include adequate descriptive literature, catalog cuts, shop drawings and other data necessary to determine that the proposed equipment and materials comply with the specification requirements.

1.04 PRODUCT HANDLING

A. Comply with requirements of Division 11, Section 111900 “Basic Detention Equipment Requirements”.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer of Security/Detention Equipment:

1. ISI Detention Contracting Group, Inc. – San Antonio, TX
2. Peterson Enterprises – Orange, CA
3. Southern Steel Company, San Antonio, TX
4. Folger Adam Company, Lemont, IL
5. Peerless Industries
6. Creative Industries

2.02 SECURITY FURNISHINGS

A. Detention Mirror. Provide one in each of the two holding cells.

1. Construction:

   a. Mirror frame shall be 12-1/2” wide x 16-1/2” tall x ¼” deep
   b. One piece construction from 20-gauge Type 304 stainless steel
   c. Mirror Finish #8
   d. Eight countersunk mounting holes for ¼” fasteners
B. Stainless Steel Grab Bar, install at H.C. Holding Cell:

1. Construction
   a. #7 gauge stainless steel plate with ¼” diameter weep holes
   b. Provide embedded stainless steel plate with masonry anchors
   c. 1 ½” diameter stainless steel pipe with end caps

C. Stool, install one in each of smaller Non-Contact Visitation Rooms on Jail side only. Total two (2).

1. Construction
   a. Padded roto-molded seat with non-absorbent surface securely fastened to base. Color: dark blue
   b. Painted steel base and support pipe for floor mounting with expansion anchors. Color: black

D. Writing Shelf. One each on both sides of Non-Contact Visitation Rooms. Total six (6)

1. Construction
   a. 12 ga. stainless steel with folded edges. Front edge 2” with ½” return. Shelf to be 12” deep and extend full width of Non-Contact Visitation Room. Triangular steel brackets may be painted mild steel in same or similar gauge as SS top.
   b. Securely fasten to CMU walls.

E. Detention Seating: Bench type, 18” deep x required lengths. Refer to plans for locations in holding cells. 2 in group holding, 1 in H.C. holding.

1. Construction
   a. 12 ga. stainless steel with folded edges. Front edge 2” with ½” return. Seats to be 18” deep. Triangular steel brackets may be painted mild steel in same or similar gauge as SS top.
   b. Securely fasten to CMU walls with expansion anchors.
   c. Sizes: (1) 10'-0" long, (1) 6'-0" long, (1) 4'-0" long

2.03 SECURITY/DETENTION EQUIPMENT ACCESSORIES

A. Provide accessories, anchorage inserts and security fasteners for a complete tamperproof installation.

B. Exposed Security Fasteners:

1. Provide torx-head (star with center pin) security fasteners for anchoring work in exposed areas. Spanner or other types are not acceptable.

PART 3 EXECUTION

3.01 GENERAL

A. Comply with requirements of Division 11, Section 11190 “Basic Detention Equipment Requirements”.

3.02 INSTALLATION
A. Comply with requirements of Division 11, Section 11190 “Basic Detention Equipment Requirements”.

3.05 PROTECTION AND CLEANING

A. Comply with requirements of Division 11, Section 11190 “Basic Detention Equipment Requirements”.

END OF SECTION
SECTION 111950 - DETENTION METAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Suspended security metal ceilings within the Court Holding Area. Refer to plans.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Shop Drawings: For security metal ceilings include plans, elevations, sections, details, and attachments to other work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide equal product assemblies as those manufactured by:
   1. Trussbilt, New Brighton, MN

B. Product: Security Grade 5 and 6 double skin ship lap joint plank ceiling system equal to TrussDek, as manufactured by Trussbilt.
   1. Ceiling Panels: 24" wide in standard lengths of 6', 8' or 10' as needed.
   2. Accessories: Provide all required accessories such as wall perimeter angles, interim Tee supports, suspension system rods and anchors, pin Torx tamper-proof fasteners, concealed fasteners and acoustical material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine project site and confirm suitability for installation. Correct or have corrected any conditions that are unsuitable.

3.2 CONNECTIONS

A. Connect to building structure as required by manufacturer to meet design performance criteria.
B. Coordinate with other trades to ensure proper installation of lighting, piping systems and HVAC components. Independently support these components from building structure, not from metal ceiling system.
END OF SECTION
CJC 2nd Floor Remodel  
Travis County, Texas

SECTION 123661 - SIMULATED STONE COUNTERTOPS

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. Quartz agglomerate countertops and backsplashes.

B. Related Sections:

1.3 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. LEED Submittals:

   1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

C. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

D. Samples for Initial Selection: For each type of material exposed to view.

E. Samples for Verification: For the following products:

   1. Countertop material, 6 inches square.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.5 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.
PART 2 - PRODUCTS

2.1 QUARTZ AGGLOMERATE COUNTERTOPS

A. Configuration: Provide countertops with the following front and backsplash style:

1. Front: Beveled.
2. Backsplash: Beveled.

B. Countertops: 3/4 inch thick, quartz agglomerate.

C. Backsplashes: 3/4-inch-thick, quartz agglomerate.

D. Fabrication: Fabricate tops in one piece with shop-applied edges, endsplashes and backsplashes unless otherwise indicated. Comply with quartz agglomerate manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

   1. Fabricate with loose backsplashes for field assembly.

2.2 COUNTERTOP MATERIALS

A. Composite Wood and Agrifiber Products: Provide products that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

C. Adhesives: Adhesives shall not contain urea formaldehyde.

D. Adhesives: Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Quartz Agglomerate: Solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin and complying with the "Physical Characteristics of Materials" Article of ANSI SS1.

   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

      a. Cambria.
      b. Cosentino USA.
      d. LG Chemical, Ltd.
      e. Meganite Inc.
CJC 2nd Floor Remodel  
Travis County, Texas

f. Samsung Chemical USA, Inc.
g. Technistone USA, Inc.
h. Transolid, Inc.

2. Colors and Patterns: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet.

B. Fasten countertops as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

1. Install backsplashes and endsplashes to comply with manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

END OF SECTION
SECTION 126713 - COURTROOM PEW SEATING

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 manufacture and installation of wood pews with upholstered seats.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, including wood components, upholstery padding and fabrics, wood finishing and fasteners.

B. List of previous installations including client name, location and contact information.

C. Shop Drawings: Show location of each pew relative to the surrounding walls and gallery rail.

D. Instructions on care and maintenance of wood finishes and fabrics.

E. Samples:
   1. Full range of available shop-applied stains with transparent finish.
   2. Selection of manufacturer's standard upholstery fabrics.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Provide a list of previous projects including client name, location and contact information.

B. Standards: The following standards and codes shall apply to work of this section:
   1. "Quality Standards" of the Architectural Woodwork Institute (AWI)
   2. The National Association of Furniture Manufacturers (NAFM)
   3. Upholstery-Drapery Fabric Manufacturers Association (UDFMA)
   4. Upholstery Fabric Industry tests

C. Quality Level: Unless noted otherwise woodwork shall comply with AWI Custom Grade.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver pews to project site until time for installation.
B. Vendor shall be responsible for coordinating delivery, handling, access to Owner's building and storage of materials and tools. This is a secure project site and materials, equipment, tools and personnel are subject to inspection prior to being given access.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabrication after consultation with General Contractor and Owner.

PART 2 - PRODUCTS

2.1 FABRICATORS

A. Available Fabricators: Subject to compliance with requirements, fabricators offering courtroom pew seating that may be incorporated into the Work include, but are not limited to, the following:
   1. American Pew and Bench LLC, Lockhart, Texas
   2. Summit Seating, Canton, Georgia
   3. Imperial Woodworks, Inc., Waco, Texas

2.2 MATERIALS

A. Hardwood Species for Transparent Finish: Red Oak, White Oak or Ash

B. Pew Seat: Hardwood Plywood or Solid Finger Jointed Hardwood covered with minimum 3" thick high-density foam and upholstery fabric. Seats shall be continuous and unbroken for the length of the pew.

C. Pew Back: Exposed wood without upholstery. Hardwood core and veneer plywood or solid finger jointed hardwood for stain and transparent finish.

D. Pew Ends: Red or White Oak laminated to actual 2" thickness. No particle board or plywood. Join seat and back tenons into routed mortise in pew ends. Selection from Manufacturer's standard plain pew ends.

2.3 FINISHES

A. Wood Finish.
   1. AWI Premium Grade factory finish.
   2. Stain finish to be selected from Manufacturer's full range of standard finishes.

B. Upholstery:
   1. Meet Upholstery Fabric Industry standard test for heavy-duty contact.
   2. Meet IBC flame spread and smoke developed requirements for Assembly Occupancy.
   3. Fabric to be selected from Manufacturer's full range of standard fabrics.
2.4 FABRICATION

A. Pew Fasteners shall not be used in a manner that requires penetration into end grain of solid wood or edge of plywood.

B. Installation Fasteners: Secure to concrete floor with approved expansion anchors.

C. Supports: 1¼" thick minimum spaced not more than 6'-0" O.C. Fabricate from same wood species as benches and finish to match.

D. Glue: stainless, water-resistant and fungus/mildew proof.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.

B. Inspect installation area for completion of carpet or floor finish. Do not commence work until prior construction installation is completed and area is ready for pew installation.

3.2 INSTALLATION

A. Confirm location of pews with Owner prior to floor drilling and fastening.

B. Scribe pews to floor irregularities to ensure level and stable installation.

C. Cut carpet to avoid runs and snags during drilling and fastener installation.

3.3 ADJUSTING AND CLEANING

A. Conduct final check for secure installation to floor.

B. Clean dust and debris from woodwork, fabric and floor.

C. Remove all packaging and shipping materials from site.

END OF SECTION
SECTION 142100 - MODIFICATIONS TO EXISTING ELEVATORS

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 modifications to existing passenger elevators to allow a stop on the 2nd floor. The existing two prisoner transport elevators presently bypass the 2nd floor and originally bypassed the 3rd floor. The previous project on 3rd floor, similar to this project on 2nd floor, opened the doorways into new holding cells and modified the controls as is required for this project. Travel is from the Prisoner Transport Holding Area on the Ground Floor to Court Holding Areas on floors Three through Nine.

B. Existing elevators are KONE and first became operational in 1999.

C. The elevator shaft is 12" thick poured-in-place concrete. Door openings exist on the 2nd floor and are infilled with CMU.

D. These elevators are for the transport of jail inmates for trial on the court floors. Coordination with the Owner will be required to ensure that court and jail operations are not compromised or disrupted. Hours of operation are between 8:00 AM and 5:00 PM, Monday through Friday. Usually, one elevator may remain operational at all times while work is ongoing on the other elevator. However, confirm this with the Owner prior to disabling any elevator. Owner’s single point of contact is the Facilities Management Department Project Manager.

E. Scope of work for this section will include:

1. Remove CMU infill and prep openings to receive sill, frame and new hoistway doors.
2. Install new sills, door frames, hoistway doors, hall lanterns, call boxes/buttons and other hardware necessary for the two elevators to service the 2nd floor.
3. Activate 2nd floor stop buttons in each cab.
4. Program operating software to allow 2nd floor stop.
5. Install drop-down smoke screens and program for proper operation with the fire alarm system. These screens shall match those installed on other floors and comply with Austin Fire Department requirements and the building code.

1.3 SUBMITTALS

A. Product Data: Include product data for the following:

1. Hoistway entrances.
2. Operation, control, and signal systems.
3. Drop-down mylar smoke control screens.
B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at landing, coordination with building structure, relationships with other construction, and locations of equipment and signals.

C. Samples for Initial Selection: For finishes involving color selection.

D. Samples for Verification: For exposed finishes of hoistway doors and frames, and signal equipment; 3-inch square samples of sheet materials; and 4-inch lengths of running trim members.

E. Qualification Data: For Installer.

F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Elevator manufacturer or manufacturer's authorized representative who is trained and approved for installation of equipment required for this Project.

B. Regulatory Requirements: Comply with applicable International Building Code requirements, Austin Fire Department regulations and other applicable regulatory agency requirements.

C. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging.

B. Store materials, components, and equipment off of ground, under cover, and in a dry location. Handle according to manufacturer's written recommendations to prevent damage, deterioration, or soiling.

1.6 COORDINATION

A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

B. Coordinate sequence of elevator equipment installation with other work to avoid delaying the Work.
1.7 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.

1. Warranty Period: One year from date of Substantial Completion.

1.8 MAINTENANCE SERVICE

A. Initial Maintenance Service: Not required for this project.

B. Continuing Maintenance Proposal: Not required for this project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by KONE, Inc. or other approved manufacturer that are compatible with the existing KONE elevators and associated equipment.

2.2 SYSTEMS AND COMPONENTS

A. General: Provide manufacturer's standard elevator components.

B. Inserts: Furnish and install or have installed all required concrete and masonry inserts and similar anchorage devices for sills, door frames and other components.

2.3 OPERATION SYSTEMS

A. General: Program existing operating system to allow 3rd floor stop. Furnish and install any necessary software required to achieve satisfactory operation.

2.4 DOOR REOPENING DEVICES

A. Infrared Array: Provide door reopening devices with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more of the light beams shall cause doors to stop and reopen.

B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.5 HOISTWAY ENTRANCES

A. General: Provide manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Provide frame size and profile to coordinate with hoistway wall construction.

B. Materials and Fabrication: Provide manufacturer's standards, but not less than the following:
1. Enameled-Steel Frames: Formed from cold-rolled or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
2. Steel Subframes: Formed from cold-rolled or hot-rolled steel sheet with factory-applied enamel finish or corrosion-inhibiting primer. Fabricate to receive applied finish as indicated.
4. Sills: Extruded metal, with grooved surface, 1/4 inch thick.

2.6 SIGNAL EQUIPMENT

A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with long-life incandescent lamps and acrylic or other permanent, nonyellowing translucent plastic diffusers to match existing components in cars and on other floors in this bank of elevators.

B. Hall Push-Button Stations: Provide one hall push-button station at landing to match others installed in this bank of elevators.

C. Hall Lanterns: Match existing on other floors in this bank of elevators.

D. Hall Annunciator: Match existing on other floors in this bank of elevators.

E. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Examine hoistways, hoistway openings, pits, and machine rooms as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.

1. For the record, prepare a written report, endorsed by Installer, listing dimensional discrepancies and conditions detrimental to performance or indicating that dimensions and conditions were found to be satisfactory.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions.

B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation,
adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

C. Alignment: Coordinate installation of hoistway entrances with elevator guide rails for accurate alignment of entrances with car. Reduce clearances to minimum, safe, workable dimension at each landing.

D. Leveling Tolerance: 1/8 inch, up or down, regardless of load and direction of travel.

E. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

F. Locate hall signal equipment for elevators to match those on other floors.

3.3 DEMONSTRATION

A. Check operation of each elevator with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

END OF SECTION
SECTION 21 11 00 - FIRE PROTECTION PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Pipe, fittings, valves, and connections for combination automatic fire sprinkler and standpipe systems.

1.2 SCOPE: Provide a new and complete Vendor designed fire sprinkler system and Permit for full building coverage approved by the City of Austin AHJ. The overall scope of work includes a complete and operational Vendor Designed fire protection system to provide automatic fire sprinkler coverage for the entire 2nd floor.

1.3 SUBMITTALS

A. Submit under provisions of Section 23 05 01.

B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, elevation, weights, mounting and support details, piping, connections, anchors and thrust blocks.

C. Product Data: Provide manufacturer’s catalog information on all materials and equipment. Indicate valve data and ratings.

D. Maintenance Instructions: Include installation instructions, spare parts lists, and maintenance procedures.

1.4 QUALITY ASSURANCE

A. Installation shall comply with all requirements of the Local Code and the Authorities Having Jurisdiction.


F. Piping: Refer to 21 11 00.2.1 for general materials and methods.

FIRE PROTECTION PIPING- 21 11 00

1
G. Valves: Bear UL and FM label or marking. Provide manufacturer’s name and pressure rating marked on valve body. Refer to Section 21 11 00.2.2.B for line control and trim and drain valve requirements.

H. Whenever the specification requirements are more stringent than the Code provisions, comply with the specifications.

I. Welding Materials and Procedures:
   1. Conform to ANSI/ASME Boiler and Pressure Vessel Code Section IX, and applicable state labor regulations. All field welding and cutting operations shall strictly conform to the requirements of NFPA 51B – “Standard for Fire Prevention in Use of Cutting and Welding Procedures”.
   2. All piping materials, fabrication, erection, flanging, welding, tests, etc., shall be in accordance with ASME B31.9, current edition. Wire type “Short Arc” welding machines will not be acceptable for field welds, except where “shop procedures and methods” can be maintained for prefabrication of piping systems, such as the central plant piping, subject to the approval of the Engineer. Wire type short arc welding machines will be acceptable for shop-fabricated piping. If in the opinion of the Engineer any “short-arc” weld is found unsatisfactory, the use of the wire type short welding machine shall be discontinued for all remaining welding and re-welding the defective welds. The Engineer shall have unrestricted access, at all times during normal working hours, to the pipe fabrication facilities.

J. Welders’ Certification:
   1. Welders shall be tested and certified within the preceding 12 months by the National Certified Pipe Welding Bureau and in accordance with the ANSI/ASME Boiler and Pressure Vessel Code Section IX. Furnish welder performance qualification test certificates for positions 2G, 5G or 6G made in strict compliance with the above codes. Welders shall be certified for the type of pipe material specified hereinafter. All costs incident to procedures and welder’s qualification tests shall be assumed by the Contractor.
   2. Two (2) copies of the qualification test report and certification with welder’s identification number, letter, etc., shall be submitted to the Engineer, via the Architect, for his file before any welding commences.
   3. Each weld shall bear the welder’s identification mark permanently indented in the weld.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products under provisions of Section 23 05 01.

B. Deliver and store valves in shipping containers, with labeling in place.

C. Provide temporary protective coating on cast iron and steel valves.
D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation. Maintain in place until transfer to inside the building.

PART 2 - PRODUCTS

2.1 ABOVE GROUND FIRE PROTECTION PIPING

A. Pipe: ASTM A53 or ANSI/ASTM A135; black steel.
   1. Pipe Material:
      a. Acceptable Manufacturers: U.S. Steel, Wheatland, Laclede, Sawhill Tubular, or LTV.
      b. Piping Four (4) Inches and Smaller: ASTM A 53, Grade B, Type S (seamless) or Type E (ERW) or ASTM A 135 Grade B, Type E (ERW) Schedule 40 black steel.
      c. Piping 1 inch through three (3) inches and smaller on wet systems, on the low pressure side of automatic pressure regulation control valves or where the full flow pressure is less than 100 PSIG on loop or branch piping may be Schedule 10 (A 135), Schedule 10 piping manufactured outside the United States will not be acceptable.
      d. Piping 5 Inches and Larger: ASTM A 53 Grade B Type S (seamless), Type E (ERW), or API 5L, Grade B, Type S (seamless), or Type E (ERW) black steel.
      e. ERW pipe shall be fully normalized after welding.
   2. Pipe thickness shall be in accordance with ANSI B36.10, current edition and shall be as follows:
      a. For 175 PSIG wet loop and branch pipe systems on the low pressure side of all automatic pressure regulating control valves:
         (2) One (1) Inch through Three (3) Inches – Schedule 10.
      b. For 175 AND 30 PSIG working pressure systems in the high pressure side of all automatic pressure regulating control valves:
         (1) 10 Inches and Smaller – Schedule 40.
   3. Joining Methods:
      a. Piping Two (2) Inches and Smaller: Threaded joints made up with graphite and oil or WKM “Key-Tite”, LACO, or Engineer accepted equivalent pipe joint compound. Screw threads shall be in accordance with ANSI/ASME B1.20.1 standards. Threaded fittings are not allowed on Schedule 10 pipe.
      b. Piping 2-1/2 Inches and Larger: Butt welded joints constructed in strict accordance with Chapter 5 of ANSI B31.1.0, except in locations where flanges are required for servicing and/or removal of equipment for repair, etc.

B. Fittings:
1. Piping Two (2) Inches and Smaller:
   a. 175 PSIG working pressure systems: Class 150, ANSI B16.3 screwed malleable iron (sch 40 only)
   b. 300 PSIG working pressure systems: Class 300, ANSI B16.3 screwed malleable iron (sch 40 only).
   c. Acceptable Manufacturers: Stockham, Grinnel, J.P. Ward, or Engineer accepted equivalent.

2. Piping 2-1/2 Inches and larger:
   a. Main pipe and branch pipe one size smaller than the diameter of the main pipe:
      (1) ANSI B16.9 full line size factory made welded fittings with wall thickness and material identical to pipe in which installed.
      (2) All weld fittings shall be USA factory made wrought carbon steel butt-welding fittings conforming to ASTM A234 and ASME/ANSI B16.9, latest edition. Each fitting shall be stamped as specified by ASME/ANSI B16.9 and, in addition, shall have the laboratory control number metal stenciled on each fitting for ready reference as to physical properties required for any fittings, selected at random. Fittings, which have been machined, remarked, printed or otherwise produced domestically from non-domestic forgings or materials will not be acceptable. Each in accordance with MSS SP-25. Markings shall be placed on the fittings at the farthest point from the edge to be welded to prevent disfiguring from the welding process. Submittal data for these fittings shall include a letter signed by an official of the manufacturing firm certifying compliance with these specifications.
      (3) Acceptable Manufacturer’s: by Weld Bend, Tube Turn, Hackney, or Ladish Company. Only one manufacturer of weld fittings will be approved for the project.
   b. For branch pipes more than one size smaller than the diameter of the main pipe:
      (1) Bonney Forge “Weldolet”, “Threadolet”, or Allied Type T-1 integrally reinforced branchlets, ANSI B16.9 fittings may be used.
      (2) “Weldolet” and “Threadolet” fittings shall have a wall thickness as required by the ANSI B31.1.0 and ANSI 36.10 Code and shall be suitable for the working pressure and temperature of the pipe to which they connect. No branch shall be made by burning a hole in the main and welding in the branch line.
      (3) Acceptable manufacturers: Tube-Turn, Anvil, Taylor Forge, Ladish, Weld Bend, Hackney, Tube Forgings of America, Tube-Line, or Babcock & Wilcox.
C. Unions, Flanges and Couplings:

1. Pipe Size 2 Inches and Smaller: ANSI B16.3 malleable iron threaded unions (sch 40), Class 150 for 175 PSIG working pressure, Class 300 for 300 PSIG working pressure.

2. Pipe Size 2-1/2 Inches and Larger: ANSI B16.5 PSIG forged steel slip-on or weld neck flanges with preformed gaskets. Class 150 for 175 PSIG working pressure. Class 300 for 300 PSIG working pressure.

3. Additional Flange Requirements:

   a. At each joint the flanges shall have matching flat faces or raised faces, and the flanges shall be identical in configuration and pressure rating. Steel flanges shall have a minimum tool finish. When 150 lb. steel flanges are connected to 125 lb. cast iron flanged valves or fittings, the steel flanges shall be flat face medium finish.

   b. Flange bolting materials for flanges shall be carbon steel ASTM A 307 Grade A hexagon head bolts and hexagonal nuts. Furnish Grade B bolts for flanged joints in piping systems where one or both flanges are cast iron. Where the configuration or arrangement of flanged fittings prevents the use of machine bolts, stud bolts shall be used.

   c. Flange bolt thread lubricant shall be an anti-seize compound designed for temperatures up to 1,000 degrees F and shall be Crane Anti-Seize Thread Compound or Engineer accepted equivalent.

   d. Acceptable Manufacturers: Taylor Forge, National Flange, Ladish, Anvil, Hackney, Weld Bend, Federal Flange, Cofer Flange, or Engineer accepted equivalent.

4. Flange Gaskets:

   a. Gaskets shall be made with high strength aramid fibers bonded with high grade Nitrile NBR rubber. Gaskets shall contain no asbestos and shall be so certified.

   b. Unless recommended otherwise by the manufacturer, gaskets shall be 1/16 inch thick for all pipe sizes 10 inches and smaller and 1/8 inch thick for all pipe sizes 12 inches and larger. Gaskets shall be preformed ring type between raised face flanges and full face type between flat face flanges with punched bolt holes and pipe opening.

   c. Acceptable Manufacturers:

      (1) Durabla.
      (2) J.M. Clipper.
      (3) John Crane.

   d. Acceptable Manufacturer/Product: Durabla “Durlon 8500 Green”.

   e. Insulation Kit for Flanges: Provide dielectric flange insulating kit with insulating sleeves and washers for each bolt for connections between dissimilar metals.
D. Grooved Couplings and Fittings:
   1. At the Contractor’s option and subject to the approval by the local Authorities Having Jurisdiction, grooved couplings and fittings may be used in lieu of welded or screwed joints specified here-in-before as follows:
      a. For Loop and Branch Piping: Victaulic Style 77 UL listed, painted ductile iron couplings for cut groove on Schedule 40 and higher, may be used subject to the Special Requirements in Paragraph d) hereinafter. Schedule 10 piping may be used with Victaulic roll groove only.
      b. For Riser and Main Piping: Victaulic Style 07 “Zero Flex” couplings with cut groove may be used for up to and including 400 PSIG working pressure and Victaulic Style HP70 coupling with cut groove may be used for over 400 PSIG working pressure subject to the Special Requirements in Paragraph d) hereinafter. NOTE: Victaulic cut groove only.
      c. For Fittings: Victaulic UL listed, painted ductile iron full flow fittings and Style 920 mechanical tees with cut groove for Schedule 30 and 40 pipe and roll groove for Schedule 10 pipe. All fittings shall be suitable for the design working pressures specified in the Section titled “Design Conditions” and may be used subject to the Special Requirements in paragraph d) hereinafter.
      d. Special Requirements: Victaulic full flow fittings and couplings shall be made of ASTM A 47 Grade 32510, malleable iron or ASTM A 536 Grade 65-45-12 ductile iron, with grooved ends.
      e. Victaulic gaskets shall be UL listed for the service and working pressure of the systems. Victaulic flanges, reducing couplings and outlet couplings shall not be allowed.
   2. Acceptable Manufacturers: If they comply with these Specifications, UL listed couplings, full flow fittings, and gaskets manufactured by Victaulic Company of America, Gruvlock or Gustin-Bacon will be acceptable.

E. Support in accordance with NFPA 13.
   1. Provide electro-galvanized hanger rods with cadmium-plated nuts and washers.

2.2 VALVES

A. Furnish and install manual isolation valves in accordance with Section 22 05 23.

B. Fire Protection System Trim and Drain Valves:
   1. Ball Valves: TFE seats, threaded ends, blowout-proof stem and lever handle, UL listed and/or FM Approved for trim and drain service and in compliance with MSS-SP-110, rated for 175 psi water working pressure or greater. Provide drain valves with cap and chain.
      a. 1/4 Inch – 1 Inch: NIBCO KT585-70UL, Milwaukee 722, Anvil

FIRE PROTECTION PIPING- 21 11 00
2. Globe/Angle Valves: Rubber seat disc and threaded ends. UL listed and/or FM approved for trim and drain service and rated for 175 PSI water working pressure or greater.
   b. Angle: NIBCO KT67-ULT301-W, Kennedy 98SD, Stockham B222, or approved equal by a listed manufacturer.

2. Check Valves: To be rated 175 PSI or greater. Valves to have rubber seat discs and threaded ends. Valve to be of Y-pattern horizontal swing-type. Valve shall be in compliance with MSS-SP80. NIBCO KT403-W, Kennedy 440SD, Stockham B320B, or approved equal by a listed manufacturer.

2.3 FIRE HYDRANTS (NOT USED)

2.4 DETECTOR CHECK VALVE

   A. U.L. listed and FM approved; bronze or galvanized cast iron body; Hersey Model DC, Model EDC or Engineer accepted equivalent.
      1. Provide elevated bypass with service shut off valves.
      2. Suitable for 175 PSI working pressure and tested at 350 PSI.

2.5 FIRE PROTECTION VALVE TAMPER SWITCH

   A. UL rated and/or FM approved valve supervisory switch with two (2) sets of contacts rated 15 amps at 115 volt AC with die cast aluminum cover in red enamel finish; Potter Electric Signal Co. Model OSYSU-2 for outside screw and yoke valves and Model PCVS-2 for control valves or approved equal. Provide integration with new building Fire Alarm System.

PART 3 - EXECUTION

3.1 PREPARATION

   A. Make all joints smooth and unobstructed inside. Ream all cut pipe and tube ends to remove burrs. Bevel plain end ferrous pipe before welding. Remove all obstructions prior to fabrication.

   B. Remove scale and foreign material, from inside and outside, before assembly. Before installing pipe that has been cut and threaded, the lengths of pipe shall be upended and tamped to remove all shavings.

  7 21 11 00
C. Prepare piping connections to equipment with flanges or unions.

D. Prepare piping connections to equipment with flanges or unions.

E. Before backfilling, all underground piping, fittings, joints, and valves shall be checked by the manufacturer’s representative for location of possible tears and holes in the protective coating. Repair any breaks in the protective coating as recommended by the Manufacturer.

F. Before welding, surfaces shall be thoroughly cleaned. The piping shall be carefully aligned and no metal shall project within the pipe.

3.2 INSTALLATION

A. Install piping in accordance with NFPA 13 (Latest Adopted Edition) for automatic fire sprinkler systems, NFPA 14, (Latest Adopted Edition) for fire standpipe and hose systems, NFPA 24, (Latest Adopted Edition) for fire service mains and provisions of these specifications whichever is more stringent.

B. Connect underground fire protection piping serving the building fire standpipe and automatic sprinkler systems to the site water main as indicated on the Drawings.

C. Piping sizes indicated on the Drawings are the minimum acceptable. The qualified Fire Protection Subcontractor shall provide proper sizes, materials, and installation as required by the appropriate NFPA Standards and hydraulic calculations.

D. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

E. Install piping to conserve building space, and not interfere with use of space and other work.

F. Group piping whenever practical at common elevations.

G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

H. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.

I. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer prior to welding. Refer to Section 09900.

J. Do not penetrate building structural members unless indicated.
K. Provide sleeves. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required. Refer to Section 22 05 17.

L. Die cut screw joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only. Screw joints shall be made tight with Teflon pipe joint compound applied to the pipe threads only and not to fittings. Screw threads shall be in accordance with American Pipe Thread Standards.

M. The grooved coupling/fitting manufacturer’s cut or roll groove machine shall be used for all grooves in piping. The manufacturer shall provide a certified letter with the Shop Drawing stating that the cut grooving machine (roll grooving machine for Schedule 10 pipe), and fittings will provide a system complying with the pressure class and piping materials previously specified. The grooved coupling/fitting manufacturer’s cut groove depth control tool (roll groove for Schedule 10 pipe) shall be used for field and shop grooving of piping. The grooved coupling/fitting manufacturer’s hole cutting tool shall be used in lieu of burning a hole in the piping. The piping shall be installed in accordance with the joint manufacturer’s instructions.

N. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.

O. Provide drain valves at main shut-off valves and low points of piping and apparatus.

P. Provide reaction blocking or anchorage at all dead ends, tees, crosses and bends in underground piping.
   1. Locate behind the fitting and symmetrical with the axis of the resultant thrust.
   2. Minimum 1500 PSI; concrete.
   3. Place blocking so joints remain accessible.

Q. Where not provided integrally with the valve, furnish and install valve tamper switches as shown on the Drawings and as required by NFPA standards and Local Codes for connection to the building fire alarm system. Coordinate all requirements with the Division 26 Fire Alarm System Subcontractor.

3.3 TESTS

A. Flush and hydraulically test underground fire main. All flushing and tests shall be witnessed by the Authorities Having Jurisdiction, the Owner, and the Engineer. All controlling valves on the underground fire main shall be opened and closed while the system is under operating pressure.
B. Upon completion and prior to acceptance of the installation, the Contractor shall subject the system to the tests required by NFPA 13, 14 and 24 and the requirements of the local Authority Having Jurisdiction.

C. At the conclusion of the flushing and tests, the installing contractor shall furnish a signed “Contractor’s Material and Test Certificate”, countersigned by the witnesses, to the Owner.

END OF SECTION
SECTION 21 15 00 - FIRE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wet-pipe sprinkler system.
B. Dry-pipe sprinkler system.
C. Pre-action sprinkler system.
D. System design, installation, and certification.
E. Fire department inlet connections.

1.02 SYSTEM DESCRIPTION

1.1 SCOPE: Provide a new and complete Vendor designed fire sprinkler system and Permit for 2nd floor coverage approved by the City of Austin AHJ. The overall scope of work includes a complete and operational Vendor Designed fire protection system to provide automatic fire sprinkler coverage for the 2nd floor renovated area.

A. Hydraulic Calculations:
   1. System piping shall be hydraulically designed throughout all areas in accordance with the rules and regulations of NFPA 13 using the design densities indicated on the Drawings and Part 3 of this section. Calculations shall be taken back to the fire pump. Pipe friction losses shall be determined on the basis of the Hazen-Williams Formula as denoted in NFPA Standard 13. “C” values for the Hazen-Williams Formula shall be denoted in NFPA Standard 13 unless Jurisdictional Authorities recommend other “C” values. Refer to the Drawings for pressure and flow conditions to use for calculations. Velocity pressure shall be used in the hydraulic calculations.
   2. The hydraulic calculations for the floor sprinkler system downstream of the floor control valve shall be based on a maximum outlet pressure of 150 psig or the lower pressure actually available. The velocity of water through the fire protection piping system shall not exceed 20 feet per second. The hydraulic calculations shall be based on the specified hydrant flow test at the Project site.

B. The Fire Protection Drawings and Specifications depict typical details, pipe routing and general notes. This information is conveyed to the Contractor to assist in the development of complete sprinkler systems required for this specific project. The Drawings do not relieve the Contractor of his responsibilities to satisfy the specified regulatory requirements.
C. Provide dry pipe systems for areas subject to freezing conditions.

D. Pre-action systems shall be designed in such a manner that the system shall not discharge unless the detection system has activated the deluge valve and a sprinkler head has fused.
   1. Provide a complete automatic detection and activation system utilizing Smoke Detectors; electric manual control stations and supervision of the detection circuit.
   2. Provide supervised air pressure control.
   3. Provide deluge control panel with visual and audible trouble alarm and electric deluge valve activation with visual annunciation.
   4. Interface this system with the building control system building fire detection and alarm system.

E. Determine volume and pressure of incoming water supply from current hydrant water flow test data available from the local fire department as scheduled on the Drawings. Revise design when test data is available but prior to submittals.

F. Interface system with building control system.

G. Provide fire department connections as indicated on the Drawings.

1.03 SUBMITTALS

A. Submit under provisions of Section 23 05 01.

B. Preliminary Shop Drawings: Prior to detailed submission, submit preliminary layout of finished ceiling areas indicating only head locations coordinated with ceiling installation.

C. Shop Drawings: Indicate hydraulic calculations, detailed pipe layout, hangers and supports, components and accessories. Indicate system controls.

D. Product Data: Provide data on sprinkler heads, valves, and specialties, including manufacturers catalog information. Submit performance ratings rough-in details, weights, support requirements, and piping connections.

E. Submit shop drawings and hydraulic calculations to authority having jurisdiction and Fire Marshall for projects subject to Texas Department of Health Regulations, submitted sprinkler drawings and calculations must be certified by a certified independent agent or a professional engineer with minimum five (5) years experience in fire sprinkler design that they are in compliance with all requirements of NFPA-13 for approval prior to submission to the Engineer. Submit proof of approval to Engineer.

F. Samples: Submit one (1) of each style of sprinkler head specified.
G. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 23 05 01.

B. Record actual locations of sprinkler heads and deviations of piping from drawings. Indicate drain and test locations.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 23 05 01.

B. Operation Data: Include manufacturer's data for all system components.

C. Maintenance Data: Include components of system, servicing requirements, Record Drawings, inspection data, replacement part numbers and availability, and location and numbers of service agency.

D. Include Fire Protection valves on project valve schedule. Refer to Section 22 05 23.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with NFPA 13 and the requirements of the local authority having jurisdiction. In cases where the specifications are more stringent than NFPA 13, comply with the specifications.

B. Equipment and Components: Bear UL and FM label or marking.

C. All electrical work shall comply with the Division 26 Specifications.

D. Provide certificate of compliance from authority having jurisdiction indicating approval of field acceptance tests.

1.07 QUALIFICATIONS

A. Installer: Company specializing and regularly engaged in the design and installation of automatic fire sprinkler systems as specified in this Section with minimum three (3) years experience. Evidence to support the above requirements may be required and any proposed installer who cannot demonstrate suitable experience will be rejected.

B. Design sprinkler system under direct supervision of a Responsible Managing Employee (RME) experienced in design of this work and licensed in the State of Texas.
1.08 REGULATORY REQUIREMENTS

A. Perform Work in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, latest edition. In cases where the Specifications are more stringent than these standards, comply with the Specifications.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and protect products under provisions of Section 23 05 01.

B. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

C. Equipment, pre-painted piping and fittings and miscellaneous manufactured items such as valves, alarms and gages shall be covered and protected during the execution of the work. Equipment and piping shall be protected from freezing. Labeling to remain in place.

D. Unloading, hauling, handling of materials, and cutting and patching required for installation shall also be the responsibility of the Contractor.

E. In the event of damage, immediately make repairs and replacements necessary at no expense to the Owner.

F. The Contractor shall take care to avoid marring the pre-painted surfaces of the piping systems to limit quantity of touch-up required.

1.10 EXTRA MATERIALS

A. Provide extra sprinkler heads in every type and temperature rating used in the system under provisions of NFPA 13.

B. Provide suitable wrenches for each sprinkler head type.

C. Provide metal storage cabinet in location designated by the Architect.

PART 2 - PRODUCTS

2.01 GENERAL

A. All materials and equipment used in the installation of the sprinkler system shall be listed as approved by the Underwriters Laboratories, Inc., List of Inspected Fire Protection Equipment and Materials, or the Factory Mutual Testing Laboratories List of Approved Equipment, Fire Protection Devices and Devices Involving Fire Hazard, and shall be the latest design of the manufacturer. All piping, control valves, drain
valves, fittings, etc. shall be as specified under this Section and related Sections, utilizing welded, flanged, threaded and grooved fittings only. Where valves are not specified by Figure No. they shall be of specified manufacture, UL listed and/or FM approved for service, and of same quality level as Figure Nos. specified.

B. Occupied areas shall include all those areas of the building generally accessible to researchers, office staff, and students. Unoccupied areas shall include those areas of the building accessible only to building operating and maintenance personnel, e.g., storage rooms, janitor’s closets, etc.

C. Acceptable Manufacturers:
1. Central.
3. GEM.
5. Star Sprinkler Corporation.

2.02 PIPING

A. Furnish and install in accordance with Section 21 11 00.

2.03 VALVES

A. Furnish and install line control and trim and drain valves in accordance with Section 21 11 00.

2.04 SPRINKLER HEADS

A. General:
1. Automatic sprinklers shall be FM approved and/or conform to the UL Fire Protection Equipment Directory for required application and shall be placed upright unless otherwise indicated, with the deflector parallel to the ceiling or slope of the roof. Clearances between deflectors and ceiling, roof decking, roof joists, and electric or heating equipment or other obstructions shall be in accordance with NFPA Standard 13.
2. The water distribution pattern shall be uniform, and shall have angles of discharge to provide coverage without excessive waste of water.
3. Water shall be discharged at, applied directly to and distributed equally over all surfaces and equipment to be protected.
4. Do not use on system pressures over 175 psi without specific high pressure listing.
5. Unless otherwise noted on the Drawings temperature rating of sprinklers shall be 165°F, except in storage areas, compressed gas cylinder storage areas, loading docks, and standby generator rooms temperature rating shall be 286°F. The temperature rating for sprinkler heads installed in elevator hoist ways and elevator machine rooms shall be approximately 25°F higher.
than the temperature rating of the heat detector furnished and installed in these areas by the Division 16 Fire Alarm System Contractor. All sprinkler shall be color coded for temperature.

6. Orifice size shall be 1/2 inch for sprinklers in Light Hazard and Ordinary Hazard (Group 1) occupancies and 17/32 inch for sprinklers in Ordinary Hazard (Group 2) Occupancies.

B. Occupied Areas with Suspended Ceiling:
   1. Type: Fully-Recessed pendant type with matching push-on escutcheon plate.
   2. Head Finish: Chrome plated.
   3. Escutcheon Plate Finish: Chrome plated.
   4. Cover Plate: Cover plate shall provide no less than 1/2 inch adjustment; white finish.
   5. Fusible Link: Glass bulb type temperature rated for specified area hazard.

C. Unoccupied Areas with Suspended Ceiling:
   1. Type: Fully-Recessed pendant type with matching push-on escutcheon plate.
   2. Head Finish: Chrome plated.
   3. Escutcheon Plate Finish: Chrome plated.
   4. Cover Plate: Cover plate shall provide no less than 1/2 inch adjustment; white finish.
   5. Fusible Link: Glass bulb type temperature rated for specified area hazard.

D. Exposed Area Type:
   1. Type: Standard upright type with guard.
   2. Head Finish: Chrome plated.
   3. Fusible Link: Glass bulb type temperature rated for specific area hazard.

E. Sidewall Type(Provide in MDF/IDF and Electrical Rooms):
   1. Type: Standard horizontal side wall type with matching push-on escutcheon plate and guard.
   2. Head Finish: Chrome plated.
   3. Escutcheon Plate Finish: Chrome plated.
   4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

F. On/Off Type:
   1. Type: Flush, self-recycling type, capable of shutting off flow due to the removal of heat.
   2. Finish: Chrome plated.
   3. Escutcheon Plate Finish: Chrome plated.
   4. Fusible Link: The sprinkler assembly shall have an initial dual actuation which consists of a thermally sensitive glass bulb (which acts to hold a seat in place) and a bimetallic disc (which actuates a piston assembly). The disc and piston assembly shall not incorporate “O” rings in the sealing design.

G. Guards: Finish to match sprinkler head.
2.05 PIPING SPECIALTIES

A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate electrically operated alarms, suitable for horizontal or vertical installation, with pressure retard chamber and variable pressure trim, standard fittings, pressure gages, pressure switch and electric, water motor alarm gong. The main drain shall allow for a test drain discharge to exterior of the building and a system drain discharge to a floor drain (sanitary sewer). Electrical connection to Fire Alarm Panel will be by Division 26. Coordinate switch requirements with Division 26 Fire Alarm Contractor.

B. Flooding Deluge Valve: Differential Diaphragm type valve with rubber faced bronze clapper, actuated electrically with electrically operated alarms, with alarm testing trim.

C. Pressure Relief Valve: Cast brass spring-operated valve with 3/4 inch N.P.T. male inlet x 3/4 inch N.P.T. female outlet suitable for use downstream from a pressure regulating valve to protect system components from high pressure surges; Potter-Roemer Model 4059 or approved equal.

D. Water Motor Alarm: Hydraulically operated impeller type alarm with aluminum alloy red enameled gong and motor housing, nylon bearings, and inlet strainer. The alarm shall be painted red and suitable for mounting to any type of rigid wall. Assembly shall accommodate the wall thickness indicated on the Architectural Drawings.

E. Tamper Switch: Valve Supervisory switch with two sets of contacts rated 15 amps at 115 volt AC with die cast aluminum cover in red enamel finish.

F. Electric Alarm: Electrically operated red enameled gong with pressure alarm switch.

G. Water Flow Switch: UL listed and/or FM approved vane type switch for mounting horizontal or vertical, with two (2) contacts rated 101 amp at 115 volt AC, with instant recycling feature and field adjustable retard. Potter Electric Signal Co. Model VSR-F or Engineer accepted equivalent by System Sensor or Federal. Switches shall be suitable for installation on the valves provided. Coordinate switch requirements with Division 16 Fire Alarm Contractor.

H. Fire Department Connection:
   1. Type: Flush mounted wall type with chrome plated finish. Free standing type with ductile iron pedestal chrome plated.
   2. Outlets: Two way with thread size to suit fire department hardware; threaded dust cap and chain of matching material and finish.
   4. Label: "Sprinkler - Fire Department Connection".

FIRE SPRINKLER SYSTEMS -21 15 00

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2.06  MAINTENANCE AIR COMPRESSOR (as required)

   A.  Single stage, direct drive, electric motor driven, air cooled, oil-less compressor with air pressure operated electric switch, motor, safety valves, check valve and controls suitable for mounting on the Fire Main.

   B.  Performance:  2.0 S PERCENT at 50 PSI continuous operating pressure.  Safety relief valve set at 65 PSIG.

   C.  Motor 0.25 HP, 7.4 amp, 115 volt, single phase, 60 Hz.

PART 3 - EXECUTION

3.01  PREPARATION

   A.  Coordinate work of this Section with other affected work.

   B.  The Contractor shall be responsible for defining all trouble and alarm connections to the building fire alarm panel with the Owner.

   C.  Flush entire piping system of foreign matter.

3.02  INSTALLATION

   A.  Install equipment in accordance with manufacturer’s instructions.

   B.  Provide valve supervisory switches at all valves.

   C.  Provide water flow switches in the main riser and in branch line from a riser on each floor.

   D.  Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent Siamese connectors to allow full wing of fire department wrench handle.

   E.  Locate outside alarm gong outdoors on building wall as indicated on the Drawings.

   F.  Place pipe runs to minimize obstruction to other work.

   G.  Place piping in concealed spaces above finished ceilings.

   H.  Provide dry pendant heads on wet pipe systems to serve environmental cold rooms and elsewhere as indicated on the Drawings.  Connect to a tee and never to an elbow.  Order exact length to fit.
I. Sprinkler heads in rooms containing sensitive electronic equipment, e.g., mini or mainframe computers and file servers, elevator machine, etc., shall be the on/off type.

J. Elevator machine rooms and elevator hoist ways shall be provided with automatic wet pipe sprinkler protection in accordance with NFPA 13 requirements. Elevator hoist ways shall be sprinklered at the top and bottom only.

K. Arrange sprinkler heads in symmetrical pattern in rooms with suspended ceiling. Locate heads in coordination with other ceiling elements and no closer than 6 inches to the ceiling grid unless specifically detailed otherwise on the Architectural Drawings. Center heads in one direction only in ceiling tile with location in other direction variable, dependent upon spacing and coordination with ceiling elements.

L. Apply masking tape or paper cover to ensure concealed sprinkler head cover plate does not receive field paint finish.

M. Provide guards in exposed areas where heads are subject to damage.

N. Furnish and Install galvanized sheet metal shields to prevent direct water spray on Division 26 electrical equipment located in mechanical equipment rooms and on elevator control equipment located in elevator machine rooms.

O. Installing Contractor shall not add sprinkler heads or institute pipe changes in direction or size without submitting revised hydraulic calculations.

P. Do not provide sprinklers in, or route fire protection piping through, electrical equipment rooms.

3.03 TEST AND DRAIN VALVES

A. Where valves are located above ceilings, with removable panels, the panels shall be provided with a nametag, readily visible, identifying test valve location. Where valves are installed above fixed ceilings or behind walls, an access panel shall be installed, matching ceiling or wall color in accordance with the appropriate section of the specifications. Provide information on number, locations, and required sizes of access panels to Contractor who is to furnish and install access panels.

B. Drain valves shall be installed in any portion of system that cannot drain by gravity to the main drain valve for that system.

3.04 TESTING

A. Hydro-statically test entire system.

B. Following testing of a system, the system shall be returned to functional and operational condition at no cost to the Owner.
C. Any re-testing that is required because of failure of any test shall be conducted at no additional cost to the Owner, and any corrections or repairs to the system to permit re-testing shall also be performed at no cost to the Owner.

3.05 SAMPLE SYSTEM SCHEDULE

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<td>Ordinary Hazard, Group 2</td>
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</tr>
<tr>
<td>Computer Room</td>
<td>Light Hazard, Pre-action</td>
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3.06 SAMPLE SPRINKLER HEAD SCHEDULE

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3.07 FINAL CERTIFICATION FOR TEXAS DEPARTMENT OF HEALTH

A. Upon completion of installation, provide certification from a state recognized independent engineering agent that the installation is in accordance with the previous submittal and meets the requirements of NFPA 13. This certification must be sealed.

END OF SECTION
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SECTION 22 05 17

SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

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. Sleeves.
   2. Sleeve-seal systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.

C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.


E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

2.2 SLEEVE-SEAL SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:

1. Advance Products & Systems, Inc.
2. CALPICO, Inc.
3. Metraflex Company (The).
4. Pipeline Seal and Insulator, Inc.
5. Proco Products, Inc.

C. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
   1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   2. Pressure Plates: Carbon steel.
   3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
   1. Presealed Systems.

C. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

2.4 GROUT


B. Characteristics: Nonshrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
   1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING- 22 05 17

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1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.

2. Cut sleeves to length for mounting flush with both surfaces.
   a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.

3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.
   1. Cut sleeves to length for mounting flush with both surfaces.
   2. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.
   3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.

B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

3.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:

SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING- 22 05 17
1. Exterior Concrete Walls above Grade:
   a. Piping Smaller Than NPS 6 (DN 150) Galvanized-steel wall sleeves.

2. Exterior Concrete Walls below Grade:
   a. Piping Smaller Than NPS 6 (DN 150): Cast-iron wall sleeves with sleeve-seal system.
      1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.
   b. Piping NPS 6 (DN 150) and Larger: Cast-iron wall sleeves with sleeve-seal system.
      1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.

3. Concrete Slabs-on-Grade:
   a. Piping Smaller Than NPS 6 (DN 150): Cast-iron wall sleeves with sleeve-seal system.
      1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.
   b. Piping NPS 6 (DN 150) and Larger: Cast-iron wall sleeves with sleeve-seal system.
      1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.

4. Interior Partitions:
   b. Piping NPS 6 (DN 150) and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION
SECTION 22 05 23

GENERAL-DUTY VALVES FOR PLUMBING PIPING

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. Brass ball valves.
2. Bronze ball valves.
4. Lubricated plug valves.
B. Related Sections:
1. Section 221116 "Domestic Water Piping" for valves applicable only to this piping.
2. Section 226313 "Gas Piping for Laboratory and Healthcare Facilities" for valves applicable only to this piping.

1.3 DEFINITIONS
A. CWP: Cold working pressure.
B. EPDM: Ethylene propylene copolymer rubber.
C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
D. NRS: Nonrising stem.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of valve indicated.

1.5 QUALITY ASSURANCE
A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
B. ASME Compliance:
1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
2. ASME B31.9 for building services piping valves.
C. NSF Compliance: NSF-61-G for valve materials for potable-water service.
1.6 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
   1. Protect internal parts against rust and corrosion.
   2. Protect threads, flange faces, grooves, and weld ends.
   3. Set ball and plug valves open to minimize exposure of functional surfaces.
   4. Set butterfly valves closed or slightly open.
   5. Block check valves in either closed or open position.

B. Use the following precautions during storage:
   1. Maintain valve end protection.
   2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

A. Refer to valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valve Sizes: Same as upstream piping unless otherwise indicated.

D. Valves in Insulated Piping: With 2-inch (50-mm) stem extensions and the following features:
   1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

E. Valve-End Connections:
   1. Solder Joint: With sockets according to ASME B16.18.
   2. Threaded: With threads according to ASME B1.20.1.

F. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRASS BALL VALVES

A. Two-Piece, Full-Port, Brass Ball Valves with Brass Trim:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Crane Co.; Crane Valve Group; Crane Valves.
b. **Crane Co.; Crane Valve Group; Jenkins Valves.**
c. **DynaQuip Controls.**
d. **Flow-Tek, Inc.; a subsidiary of Bray International, Inc.**
e. **Hammond Valve.**
f. **Jamesbury; a subsidiary of Metso Automation.**
g. **Jomar International, LTD.**
h. **Kitz Corporation.**
i. **Legend Valve.**
j. **Marwin Valve; a division of Richards Industries.**
k. **Milwaukee Valve Company.**
l. **NIBCO INC.**
m. **Red-White Valve Corporation.**
n. **RuB Inc.**

2. **Description:**
   a. **Standard:** MSS SP-110.
   b. **SWP Rating:** 150 psig (1035 kPa).
   c. **CWP Rating:** 600 psig (4140 kPa).
   d. **Body Design:** Two piece.
   e. **Body Material:** Forged brass.
   f. ** Ends:** Threaded.
   g. **Seats:** PTFE or TFE.
   h. **Stem:** Brass.
   i. **Ball:** Chrome-plated brass.
   j. **Port:** Full.

B. **Two-Piece, Full-Port, Brass Ball Valves with Stainless-Steel Trim:**

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   a. **Crane Co.; Crane Valve Group; Crane Valves.**
   b. **Crane Co.; Crane Valve Group; Jenkins Valves.**
   c. **Flow-Tek, Inc.; a subsidiary of Bray International, Inc.**
   d. **Hammond Valve.**
   e. **Jamesbury; a subsidiary of Metso Automation.**
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f. Kitz Corporation.
g. Marwin Valve; a division of Richards Industries.
h. Milwaukee Valve Company.
i. RuB Inc.

2. Description:
   b. SWP Rating: 150 psig (1035 kPa).
   c. CWP Rating: 600 psig (4140 kPa).
   d. Body Design: Two piece.
   e. Body Material: Forged brass.
   f. Ends: Threaded.
   g. Seats: PTFE or TFE.
   h. Stem: Stainless steel.
   i. Ball: Stainless steel, vented.
   j. Port: Full.

2.3 BRONZE BALL VALVES

A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. American Valve, Inc.
   b. Conbraco Industries, Inc.; Apollo Valves.
   c. Crane Co.; Crane Valve Group; Crane Valves.
   d. Hammond Valve.
   e. Lance Valves; a division of Advanced Thermal Systems, Inc.
   f. Legend Valve.
   g. Milwaukee Valve Company.
   h. NIBCO INC.
   i. Red-White Valve Corporation.
   j. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:
   b. SWP Rating: 150 psig (1035 kPa).
c. CWP Rating: 600 psig (4140 kPa).
d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Bronze.
i. Ball: Chrome-plated brass.
j. Port: Full.

B. Two-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      b. Crane Co.; Crane Valve Group; Crane Valves.
      c. Hammond Valve.
      d. Lance Valves; a division of Advanced Thermal Systems, Inc.
      e. Milwaukee Valve Company.
      f. NIBCO INC.
      g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
   2. Description:
      b. SWP Rating: 150 psig (1035 kPa).
      c. CWP Rating: 600 psig (4140 kPa).
      d. Body Design: Two piece.
      e. Body Material: Bronze.
      f. Ends: Threaded.
      g. Seats: PTFE or TFE.
      h. Stem: Stainless steel.
      i. Ball: Stainless steel, vented.
      j. Port: Full.

2.4 IRON, GROOVED-END BUTTERFLY VALVES
   A. 175 CWP, Iron, Grooved-End Butterfly Valves:
      1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Kennedy Valve; a division of McWane, Inc.
b. Shurjoint Piping Products.
c. Tyco Fire Products LP; Grinnell Mechanical Products.
d. Victaulic Company.

2. Description:
   a. Standard: MSS SP-67, Type I.
   b. CWP Rating: 175 psig (1200 kPa).
   c. Body Material: Coated, ductile iron.
   e. Disc: Coated, ductile iron.
   f. Seal: EPDM.

2.5 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Valve, Inc.
      b. Crane Co.; Crane Valve Group; Crane Valves.
      c. Crane Co.; Crane Valve Group; Jenkins Valves.
      d. Crane Co.; Crane Valve Group; Stockham Division.
      e. Hammond Valve.
      f. Kitz Corporation.
      g. Milwaukee Valve Company.
      h. NIBCO INC.
      i. Powell Valves.
      j. Red-White Valve Corporation.
      k. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
      l. Zy-Tech Global Industries, Inc.

   2. Description:
      a. Standard: MSS SP-80, Type 3.
      b. CWP Rating: 200 psig (1380 kPa).
      c. Body Design: Horizontal flow.
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e. Ends: Threaded.
f. Disc: Bronze.

B. Class 125, Bronze Swing Check Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Crane Co.; Crane Valve Group; Crane Valves.
   b. Crane Co.; Crane Valve Group; Jenkins Valves.
   c. Crane Co.; Crane Valve Group; Stockham Division.
   d. Hammond Valve.
   e. Kitz Corporation.
   f. Milwaukee Valve Company.
   g. NIBCO INC.
   h. Red-White Valve Corporation.
   i. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:
   a. Standard: MSS SP-80, Type 4.
   b. CWP Rating: 200 psig (1380 kPa).
   c. Body Design: Horizontal flow.
   e. Ends: Threaded.
   f. Disc: PTFE or TFE.

2.6 LUBRICATED PLUG VALVES

A. Class 125, Regular-Gland, Lubricated Plug Valves with Threaded Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Description:
   a. Standard: MSS SP-78, Type II.
   b. CWP Rating: 200 psig (1380 kPa).
   c. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
   d. Pattern: Regular or short.
   e. Plug: Cast iron or bronze with sealant groove.
B. Class 125, Regular-Gland, Lubricated Plug Valves with Flanged Ends:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   2. Description:
      a. Standard: MSS SP-78, Type II.
      b. CWP Rating: 200 psig (1380 kPa).
      c. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
      d. Pattern: Regular or short.
      e. Plug: Cast iron or bronze with sealant groove.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
   B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
   C. Examine threads on valve and mating pipe for form and cleanliness.
   D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
   E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION
   A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
   B. Locate valves for easy access and provide separate support where necessary.
   C. Install valves in horizontal piping with stem at or above center of pipe.
   D. Install valves in position to allow full stem movement.

3.3 ADJUSTING
   A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.
3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:
   1. Shutoff Service: Ball, butterfly, gate, or plug valves.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:
   1. For Copper Tubing, NPS 2 (DN 50) and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
   2. For Copper Tubing, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Flanged ends except where threaded valve-end option is indicated in valve schedules below.
   3. For Copper Tubing, NPS 5 (DN 125) and Larger: Flanged ends.
   4. For Steel Piping, NPS 2 (DN 50) and Smaller: Threaded ends.
   5. For Steel Piping, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Flanged ends except where threaded valve-end option is indicated in valve schedules below.
   6. For Steel Piping, NPS 5 (DN 125) and Larger: Flanged ends.

3.5 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 (DN 50) and Smaller:
   1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
   2. Ball Valves: Two piece, full port, brass or bronze with brass or stainless-steel trim.
   3. Bronze Swing Check Valves: Class 125, bronze disc.

B. Pipe NPS 2-1/2 (DN 65) and Larger:
   1. Iron Valves, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): May be provided with threaded ends instead of flanged ends.
   2. Iron Ball Valves: Class 150.

END OF SECTION
SECTION 22 05 29
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

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. Metal pipe hangers and supports.
   2. Trapeze pipe hangers.
   3. Thermal-hanger shield inserts.
   4. Fastener systems.
   5. Pipe stands.
   6. Equipment supports.

B. Related Sections:
   1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

   1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

   2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
   1. Trapeze pipe hangers.
   2. Metal framing systems.
   3. Fiberglass strut systems.
   4. Pipe stands.
   5. Equipment supports.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:
   1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
   2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
   3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
   4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.

B. Copper Pipe Hangers:
   1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 THERMAL-HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Carpenter & Paterson, Inc.
   3. ERICO International Corporation.
5. PHS Industries, Inc.
6. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.
7. Piping Technology & Products, Inc.
8. Rilco Manufacturing Co., Inc.
9. Value Engineered Products, Inc.

B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig (688-kPa) minimum compressive strength.

C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

E. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield for piping operating below ambient air temperature.

2.4 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.

B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.

C. Low-Type, Single-Pipe Stand: One-piece plastic base unit with plastic roller, for roof installation without membrane penetration.

D. High-Type, Single-Pipe Stand:
1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.

E. High-Type, Multiple-Pipe Stand:
1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
2. Bases: One or more; plastic.
3. Vertical Members: Two or more protective-coated-steel channels.
4. Horizontal Member: Protective-coated-steel channel.
5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.
F. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.5 EQUIPMENT SUPPORTS
A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.6 MISCELLANEOUS MATERIALS
A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
   2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION
3.1 HANGER AND SUPPORT INSTALLATION
A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
   1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
   2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
D. Pipe Stand Installation:
   1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
   2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 077200 "Roof Accessories" for curbs.
E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.


G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

H. Install lateral bracing with pipe hangers and supports to prevent swaying.

I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 (DN 65) and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

L. Insulated Piping:
   1. Attach clamps and spacers to piping.
      a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
      c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
   2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.
   3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.
   4. Shield Dimensions for Pipe: Not less than the following:
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a. NPS 1/4 to NPS 3-1/2 (DN 8 to DN 90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.

5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS
A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS
A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

3.4 ADJUSTING
A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING
A. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE
A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
E. Use carbon-steel pipe hangers and supports and attachments for general service applications.
F. Use stainless-steel pipe hangers attachments for hostile environment applications.
G. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

H. Use padded hangers for piping that is subject to scratching.

I. Use thermal-hanger shield inserts for insulated piping and tubing.

J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
   2. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36 (DN 20 to DN 900), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.
   3. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 (DN 15 to DN 600) if little or no insulation is required.
   4. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.
   5. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
   6. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30 (DN 25 to DN 750), from two rods if longitudinal movement caused by expansion and contraction might occur.

K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24 (DN 24 to DN 600).
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 (DN 20 to DN 600) if longer ends are required for riser clamps.

L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
   2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.
   3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F (49 to 232 deg C) piping installations.

M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.
7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
   a. Light (MSS Type 31): 750 lb (340 kg).
   b. Medium (MSS Type 32): 1500 lb (680 kg).
   c. Heavy (MSS Type 33): 3000 lb (1360 kg).
13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
   2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
   3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

O. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
   2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).
   3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
   4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
   5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
   6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
   7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
   8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
      a. Horizontal (MSS Type 54): Mounted horizontally.
      b. Vertical (MSS Type 55): Mounted vertically.
      c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
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P. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

Q. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

R. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION
SECTION 22 07 19
PLUMBING PIPING INSULATION

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 insulating the following plumbing piping services:
   1. Domestic hot-water piping.
B. Related Sections:
   1. Section 220716 "Plumbing Equipment Insulation."

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).

1.4 QUALITY ASSURANCE
A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.
1.6 COORDINATION
A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING
A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS
A. Products shall not contain asbestos, lead, mercury, or mercury compounds.
B. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
D. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
E. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
1. Products: Subject to compliance with requirements, provide the following:
   a. Aeroflex USA, Inc.; Aerocel.
   b. Armacell LLC; AP Armaflex.
   c. K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.
F. Mineral-Fiber, Preformed Pipe Insulation:
1. Products: Subject to compliance with requirements, provide the following:
   a. Fibrex Insulations Inc.; Coreplus 1200.
   b. Johns Manville; Micro-Lok.
   c. Knauf Insulation; 1000-Degree Pipe Insulation.
   d. Manson Insulation Inc.; Alley-K.
   e. Owens Corning; Fiberglas Pipe Insulation.
2. Type I, 850 Deg F (454 Deg C) Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, without factory-applied jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.2 INSULATING CEMENTS

   1. **Products:** Subject to compliance with requirements, provide the following:
      a. Ramco Insulation, Inc.; Super-Stik.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
   1. **Products:** Subject to compliance with requirements, provide the following:
      a. Aeroflex USA, Inc.; Aeroseal.
      b. Armacell LLC; Armaflex 520 Adhesive.
      d. K-Flex USA; R-373 Contact Adhesive.
   2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

   1. **Products:** Subject to compliance with requirements, provide the following:
      b. Eagle Bridges - Marathon Industries; 225.
      d. Mon-Eco Industries, Inc.; 22-25.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. PVC Jacket Adhesive: Compatible with PVC jacket.

1. **Products:** Subject to compliance with requirements, provide the following:
   a. Dow Corning Corporation; 739, Dow Silicone.
   d. Speedline Corporation; Polyco VP Adhesive.

2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:

1. **Products:** Subject to compliance with requirements, provide the following:
   b. Eagle Bridges - Marathon Industries; 405.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 95-44.
   d. Mon-Eco Industries, Inc.; 44-05.

2. Materials shall be compatible with insulation materials, jackets, and substrates.

3. Fire- and water-resistant, flexible, elastomeric sealant.

4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).

5. Color: Aluminum.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, provide the following:
   b. <Insert manufacturer's name; product name or designation>.

2. Materials shall be compatible with insulation materials, jackets, and substrates.

3. Fire- and water-resistant, flexible, elastomeric sealant.

4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).


6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.5 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Products: Subject to compliance with requirements, provide the following:
   a. Johns Manville; Zeston.
   c. Proto Corporation; LoSmoke.
   d. Speedline Corporation; SmokeSafe.
2. Adhesive: As recommended by jacket material manufacturer.


4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
   a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

2.6 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
   1. Products: Subject to compliance with requirements, provide the following:
      a. ABI, Ideal Tape Division; 428 AWF ASJ.
      b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
      c. Compac Corporation; 104 and 105.
      d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

2. Width: 3 inches.

3. Thickness: 11.5 mils.


5. Elongation: 2 percent.

6. Tensile Strength: 40 lbf/inch in width.

7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
   1. Products: Subject to compliance with requirements, provide the following:
      a. ABI, Ideal Tape Division; 370 White PVC tape.
      b. Compac Corporation; 130.
      c. Venture Tape; 1506 CW NS.

2. Width: 2 inches.

3. Thickness: 6 mils.


5. Elongation: 500 percent.

6. Tensile Strength: 18 lbf/inch in width.
C. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
   1. **Products:** Subject to compliance with requirements, provide the following:
      a. ABI, Ideal Tape Division; 488 AWF.
      b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
      c. Compac Corporation; 120.
      d. Venture Tape; 3520 CW.
   2. Width: 2 inches.
   3. Thickness: 3.7 mils.
   5. Elongation: 5 percent.
   6. Tensile Strength: 34 lbf/inch in width.

2.7 SECUREMENTS

A. Bands:
   1. **Products:** Subject to compliance with requirements, provide the following:
      a. ITW Insulation Systems; Gerrard Strapping and Seals.
      b. RPR Products, Inc.; Insul-Mate Strapping and Seals.
   2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 316; 0.015 inch thick, 1/2 inch wide with wing seal.
   3. Aluminum: ASTM B 209 (ASTM B 209M), Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
   1. Verify that systems to be insulated have been tested and are free of defects.
   2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:

1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F (60 and 149 deg C). Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F (0 and 149 deg C) with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

K. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.

3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at [2 inches (0 mm)] [4 inches (100 mm)] o.c.
   a. For below-ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, according to insulation material manufacturer’s written instructions, to maintain vapor seal.

5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches (100 mm) beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

O. For above-ambient services, do not install insulation to the following:
   1. Testing agency labels and stamps.
   2. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
   1. Seal penetrations with flashing sealant.
   2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
   3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
   4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
   1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.

3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.

4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.

2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.

2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.

3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.

4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.

5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.

6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.

7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.

2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.

4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches (50 mm) over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:
   1. Install pipe insulation to outer diameter of pipe flange.
   2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
   3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
   4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:
   1. Install mitered sections of pipe insulation.
   2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:
   1. Install preformed valve covers manufactured of same material as pipe insulation when available.
   2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
   3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 FINISHES

A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
   1. Flat Acrylic Finish: [Two] <Insert number> finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.8 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
   1. Underground piping.
   2. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.9 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Cold Water:
   1. NPS 1 (DN 25) and Smaller: Insulation shall be one of the following:
      a. Flexible Elastomeric: 1 inch thick.
   2. NPS 1-1/4 (DN 32) and Larger: Insulation shall be[ one of] the following:
      a. Flexible Elastomeric: 1 inch thick.

B. Domestic Hot and Recirculated Hot Water:
   1. NPS 1-1/4 (DN 32) and Smaller: Insulation shall be one of the following:
      a. Flexible Elastomeric: 1 inch thick.
   2. NPS 1-1/2 (DN 40) and Larger: Insulation shall be one of the following:
CJC 2nd Floor Remodel
Austin, Texas

a. Flexible Elastomeric: 1 inch thick.

END OF SECTION
CJC 2nd Floor Remodel  
Austin, Texas

SECTION 22 11 16  
DOMESTIC WATER PIPING

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. Aboveground domestic water pipes, tubes, and fittings inside buildings.
      2. Encasement for piping.

1.3 ACTION SUBMITTALS
   A. Product Data: For transition fittings and dielectric fittings.

1.4 INFORMATIONAL SUBMITTALS
   A. System purging and disinfecting activities report.

1.5 FIELD CONDITIONS
   A. Interruption of Existing Water Service: Do not interrupt water service to facilities 
      occupied by Owner or others unless permitted under the following conditions 
      and then only after arranging to provide temporary water service according to 
      requirements indicated:
      1. Notify Architect, Construction Manager and Owner no fewer than two days 
         in advance of proposed interruption of water service.
      2. Do not interrupt water service without Owner's written permission.

PART 2 - PRODUCTS
2.1 PIPING MATERIALS
   A. Comply with requirements in "Piping Schedule" Article for applications of pipe, 
      tube, fitting materials, and joining methods for specific services, service 
      locations, and pipe sizes.
   B. Potable-water piping and components shall comply with NSF 14 and NSF 61. 
      Plastic piping components shall be marked with "NSF-pw."

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1
2.2 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B) and ASTM B 88, Type M (ASTM B 88M, Type C) water tube, drawn temper.

B. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.


D. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.

E. Copper Unions:
   1. MSS SP-123.
   4. Solder-joint or threaded ends.

F. Copper Pressure-Seal-Joint Fittings:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
      a. Elkhart Products Corporation.
      b. NIBCO Inc.
      c. Viega.
   2. Fittings for NPS 2 (DN 50) and Smaller: Wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
   3. Fittings for NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Cast-bronze or wrought-copper fitting with EPDM-rubber, O-ring seal in each end.

2.3 TRANSITION FITTINGS

A. General Requirements:
   1. Same size as pipes to be joined.
   2. Pressure rating at least equal to pipes to be joined.
   3. End connections compatible with pipes to be joined.

B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

2.4 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Unions:
1. Manufacturers: Subject to compliance with requirements, provide products by the following
   a. Capitol Manufacturing Company; member of the Phoenix Forge Group.
   b. Central Plastics Company.
   d. Jomar International.
   e. Matco-Norca.
   g. Watts; a division of Watts Water Technologies, Inc.
   h. Wilkins; a Zurn company.


C. Dielectric Flanges:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Capitol Manufacturing Company; member of the Phoenix Forge Group.
   b. Central Plastics Company.
   c. Matco-Norca.
   d. Watts; a division of Watts Water Technologies, Inc.
   e. Wilkins; a Zurn company.


3. Factory-fabricated, bolted, companion-flange assembly.


5. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric-Flange Insulating Kits:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

2. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Central Plastics Company.
d. Pipeline Seal and Insulator, Inc.

3. Nonconducting materials for field assembly of companion flanges.
5. Gasket: Neoprene or phenolic.
7. Washers: Phenolic with steel backing washers.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install shutoff valve immediately upstream of each dielectric fitting.

C. Install domestic water piping level without pitch and plumb.

D. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.

E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

G. Install piping to permit valve servicing.

H. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.

I. Install piping free of sags and bends.

J. Install fittings for changes in direction and branch connections.

K. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
L. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

M. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

N. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.2 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Brazed Joints" chapter.

E. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

F. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.

G.

H. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.3 TRANSITION FITTING INSTALLATION

A. Install transition couplings at joints of dissimilar piping.

3.4 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 (DN 50) and Smaller: Use dielectric unions.
C. Dielectric Fittings for NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Use dielectric flanges.

3.5 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for seismic-restraint devices in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Comply with requirements for pipe hanger, support products, and installation in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Vertical Piping: MSS Type 8 or 42, clamps.

2. Individual, Straight, Horizontal Piping Runs:
   a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
   b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.
   c. Longer Than 100 Feet (30 m) if Indicated: MSS Type 49, spring cushion rolls.

3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.

4. Base of Vertical Piping: MSS Type 52, spring hangers.

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch (10 mm).

E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 3/4 (DN 20) and Smaller: 60 inches (1500 mm) with 3/8-inch (10-mm) rod.

2. NPS 1 and NPS 1-1/4 (DN 25 and DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.

3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.

4. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.

5. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.

6. NPS 6 (DN 150): 10 feet (3 m) with 5/8-inch (16-mm) rod.

7. NPS 8 (DN 200): 10 feet (3 m) with 3/4-inch (19-mm) rod.

F. Install supports for vertical copper tubing every 10 feet (3 m).
G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/4 (DN 32) and Smaller: 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
   2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
   3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.
   4. NPS 2-1/2 (DN 65): 11 feet (3.4 m) with 1/2-inch (13-mm) rod.
   5. NPS 3 and NPS 3-1/2 (DN 80 and DN 90): 12 feet (3.7 m) with 1/2-inch (13-mm) rod.
   6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet (3.7 m) with 5/8-inch (16-mm) rod.
   7. NPS 6 (DN 150): 12 feet (3.7 m) with 3/4-inch (19-mm) rod.
   8. NPS 8 to NPS 12 (DN 200 to DN 300): 12 feet (3.7 m) with 7/8-inch (22-mm) rod.

H. Install supports for vertical steel piping every 15 feet (4.5 m).
I. Install hangers for stainless-steel piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/4 (DN 32) and Smaller: 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
   2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
   3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.
   4. NPS 2-1/2 (DN 65): 11 feet (3.4 m) with 1/2-inch (13-mm) rod.
   5. NPS 3 and NPS 3-1/2 (DN 80 and DN 90): 12 feet (3.7 m) with 1/2-inch (13-mm) rod.
   6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet (3.7 m) with 5/8-inch (16-mm) rod.
   7. NPS 6 (DN 150): 12 feet (3.7 m) with 3/4-inch (19-mm) rod.
   8. NPS 8 to NPS 12 (DN 200 to DN 300): 12 feet (3.7 m) with 7/8-inch (22-mm) rod.

J. Install vinyl-coated hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 2 (DN 50) and Smaller: 48 inches (1200 mm) with 3/8-inch (10-mm) rod.
   2. NPS 2-1/2 to NPS 3-1/2 (DN 65 to DN 90): 48 inches (1200 mm) with 1/2-inch (13-mm) rod.
K. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.
B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.
C. Use transition fitting to join dissimilar piping materials.
D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
   1. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
   2. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 (DN 65) and larger.

3.7 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Piping Inspections:
      a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
      b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
         1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
         2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
      c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
      d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
   2. Piping Tests:
      a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.

c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.

d. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.

f. Prepare reports for tests and for corrective action required.

B. Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.8 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
   a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
   b. Adjust calibrated balancing valves to flows indicated.

5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.
3.9 CLEANING

A. Clean and disinfect potable domestic water piping as follows:
   1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
   2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
      a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
      b. Fill and isolate system according to either of the following:
         1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.
         2) Fill system or part thereof with water/chlorine solution with at least 200 ppm (200 mg/L) of chlorine. Isolate and allow to stand for three hours.
      c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
      d. Repeat procedures if biological examination shows contamination.
      e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Clean non-potable domestic water piping as follows:
   1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
   2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:
      a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
      b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

C. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.
3.10 PIPING SCHEDULE

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

D. Aboveground domestic water piping, NPS 2 (DN 50) and smaller, shall be one of the following:
   1. Hard copper tube, ASTM B 88, Type L (ASTM B 88M, Type B) copper, solder-joint fittings; and soldered joints.

E. Aboveground domestic water piping, NPS 2-1/2 to NPS 4 (DN 65 to DN 100), shall be one of the following:
   1. Hard copper tube, ASTM B 88, Type L (ASTM B 88M, Type B) copper, solder-joint fittings; and brazed joints.

3.11 VALVE SCHEDULE

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
   1. Shutoff Duty: Use ball or gate valves for piping NPS 2 (DN 50) and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
   2. Drain Duty: Hose-end drain valves.

B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION
SECTION 22 11 19

DOMESTIC WATER PIPING SPECIALTIES

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. Vacuum breakers.
   2. Backflow preventers.
   5. Temperature-actuated, water mixing valves.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

A. Potable-water piping and components shall comply with NSF 61 and NSF 14.

2.2 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig (860 kPa) unless otherwise indicated.

2.3 VACUUM BREAKERS

A. Pipe- Applied, Atmospheric-Type Vacuum Breakers:

   1. Manufacturers: Subject to compliance with requirements, provide products by the:
a. Ames Fire & Waterworks; a division of Watts Water Technologies, Inc.
b. Cash Acme; a division of Reliance Worldwide Corporation.
c. Conbraco Industries, Inc.
d. FEBCO; a division of Watts Water Technologies, Inc.
e. Rain Bird Corporation.
f. Toro Company (The); Irrigation Div.
g. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
h. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.


3. Size: NPS 1/4 to NPS 3 (DN 8 to DN 80), as required to match connected piping.


5. Inlet and Outlet Connections: Threaded.

6. Finish: Chrome plated.

2.4 BACKFLOW PREVENTERS

A. Intermediate Atmospheric-Vent Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, provide products by the following
   a. Cash Acme; a division of Reliance Worldwide Corporation.
   b. Conbraco Industries, Inc.
   c. FEBCO; a division of Watts Water Technologies, Inc.
   d. Honeywell International Inc.
   e. Legend Valve.
   f. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
   g. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.

2. Standard: ASSE 1012.

3. Operation: Continuous-pressure applications.


5. End Connections: Solder joint.
6. Finish: Chrome plated.

B. Reduced-Pressure-Principle Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Ames Fire & Waterworks; a division of Watts Water Technologies, Inc.
   b. Conbraco Industries, Inc.
   c. FEBCO; a division of Watts Water Technologies, Inc.
   d. Flromatic Corporation.
   e. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
   f. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.


3. Operation: Continuous-pressure applications.

2.5 NOT USED

2.6 TEMPERATURE-ACTUATED, WATER MIXING VALVES

A. Water-Temperature Limiting Devices:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   b. Cash Acme; a division of Reliance Worldwide Corporation.
   c. Conbraco Industries, Inc.
   d. Honeywell International Inc.
   e. Legend Valve.
   f. Leonard Valve Company.
   g. Powers; a division of Watts Water Technologies, Inc.
   h. Symmons Industries, Inc.
   i. TACO Incorporated.
   j. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
   k. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.

4. Type: Thermostatically controlled, water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
7. Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.

B. Primary, Thermostatic, Water Mixing Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   b. Lawler Manufacturing Company, Inc.
   c. Leonard Valve Company.
   d. Powers; a division of Watts Water Technologies, Inc.
   e. Symmons Industries, Inc.
3. Pressure Rating: 125 psig (860 kPa) minimum unless otherwise indicated.
4. Type: Exposed-mounted, thermostatically controlled, water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded union inlets and outlet.
7. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
8. Valve Finish: Rough bronze.

C. Individual-Fixture, Water Tempering Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Cash Acme; a division of Reliance Worldwide Corporation.
   b. Conbraco Industries, Inc.
   c. Honeywell International Inc.
   d. Lawler Manufacturing Company, Inc.
   e. Leonard Valve Company.
   f. Powers; a division of Watts Water Technologies, Inc.
   g. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
h. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.

2. Standard: ASSE 1016, thermostatically controlled, water tempering valve.
3. Pressure Rating: 125 psig (860 kPa) minimum unless otherwise indicated.
5. Temperature Control: Adjustable.
6. Inlets and Outlet: Threaded.
7. Finish: Rough or chrome-plated bronze.

2.7 STRAINERS FOR DOMESTIC WATER PIPING
A. Y-Pattern Strainers:
1. Pressure Rating: 125 psig (860 kPa) minimum unless otherwise indicated.
2. Body: Bronze for NPS 2 (DN 50) and smaller; cast iron epoxy coated and for NPS 2-1/2 (DN 65) and larger.
3. End Connections: Threaded for NPS 2 (DN 50) and smaller; flanged for NPS 2-1/2 (DN 65) and larger.
4. Screen: Stainless steel with round perforations unless otherwise indicated.

2.8 DRAIN VALVES
A. Ball-Valve-Type, Hose-End Drain Valves:
2. Pressure Rating: 400-psig (2760-kPa) minimum CWP.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
8. Inlet: Threaded or solder joint.

2.9 WATER-HAMMER ARRESTERS
A. Water-Hammer Arresters:
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. AMTROL, Inc.
   b. Josam Company.
   c. MIFAB, Inc.
   d. Precision Plumbing Products, Inc.
   e. Sioux Chief Manufacturing Company, Inc.
   g. Tyler Pipe; Wade Div.
   h. Watts Drainage Products.
   i. Zurn Industries, LLC; Plumbing Products Group; Specification Drainage Products.


3. Type: Metal bellows or Copper tube with piston.

4. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.10 TRAP-SEAL PRIMER DEVICE

A. Supply-Type, Trap-Seal Primer Device:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. MIFAB, Inc.
   b. Precision Plumbing Products, Inc.
   c. Sioux Chief Manufacturing Company, Inc.
   e. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.


3. Pressure Rating: 125 psig (860 kPa) minimum.


5. Inlet and Outlet Connections: NPS 1/2 (DN 15) threaded, union, or solder joint.

6. Gravity Drain Outlet Connection: NPS 1/2 (DN 15) threaded or solder joint.

7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.

1. Locate backflow preventers in same room as connected equipment or system.

2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe-to-floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are unacceptable for this application.

3. Do not install bypass piping around backflow preventers.

B. Install water-control valves with inlet and outlet shutoff valves.

C. Install temperature-actuated, water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.

1. Install cabinet-type units recessed in or surface mounted on wall as specified.

D. Install Y-pattern strainers for water on supply side of each pump.

E. Install water-hammer arresters in water piping according to PDI-WH 201.

F. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

3.2 CONNECTIONS

A. Comply with requirements for ground equipment in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Fire-retardant-treated-wood blocking is specified in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for electrical connections.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Test each pressure vacuum breaker reduced-pressure-principle backflow preventer and according to authorities having jurisdiction and the device’s reference standard.

B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.
3.4 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.
B. Set field-adjustable flow set points of balancing valves.
C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION
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. Pipe, tube, and fittings.
      2. Specialty pipe fittings.

1.3 PERFORMANCE REQUIREMENTS
   A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:

1.4 ACTION SUBMITTALS
   A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE
   A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.6 PROJECT CONDITIONS
   A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
      1. Notify Architect, Construction Manager and Owner no fewer than two days in advance of proposed interruption of sanitary waste service.
      2. Do not proceed with interruption of sanitary waste service without Owner's written permission.

PART 2 - PRODUCTS

2.1 SANITARY SEWER, VENT AND STORM DRAIN PIPING, ABOVE GRADE.
   A. Cast Iron Pipe: CISPI 301, hub-less, service weight.
      1. Fittings: Cast Iron, CISPI 301.

B. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 UNIONS AND FLANGES
A. To match piping material.

2.3 DRAINS
A. Floor Drain: Toilets and finished areas (FD-1); Coated cast iron body floor drain, two-piece body with double drainage flange, invertible non-puncturing flashing collar, weepholes, bottom outlet, and adjustable satin nickel-bronze round strainer; Wade 1100STD. Provide 1/2-inch primer tap, satin finish bronze top, and hub outlet with gasket.

B. Floor Drain: Detention Areas (FD-2); Cast iron floor drain with integral trap and floor level cleanout, integral clamping collar, 6" diameter nickel bronze strainer with vandal proof screws, 1/2-inch primer tap; Wade 1120/STD.

2.4 TRAP PRIMERS
A. 1-2 Floor drains: Precision Plumbing Products P-2
B. 3-8 Floor drains: Precision Plumbing Products P-1
C. Provide trap primer distribution unit for more than one drain.

PART 3 - EXECUTION
3.1 PIPING INSTALLATION
A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping at indicated slopes.
F. Install piping free of sags and bends.

G. Install fittings for changes in direction and branch connections.

H. Install piping to allow application of insulation.

I. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

J. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
   1. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
   2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

K. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

L. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

M. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

N. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

O. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Provide clearances at cleanout for snaking drainage system.

P. Install floor cleanouts at elevation to accommodate finished floor.

Q. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

R. Provide clearance in hangers and from structure and other equipment for installation of insulation.
S. Install piping penetrating roofed areas to maintain integrity of roof assembly.

T. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

U. Sleeve pipes passing through partitions, walls and floors.

V. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Division 07.

W. Support cast iron drainage piping at every joint.

X. Insulate up to 15 feet of horizontal sanitary sewer, vent and storm drain piping from roof.

Y. Install fire rated seal (enclosure) at ceiling of rated floor for non-rated fixture penetration.

Z.

3.2 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.

2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.

3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.

4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.

5. Vertical Piping: MSS Type 8 or Type 42, clamps.

6. Install individual, straight, horizontal piping runs:

   a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.

   b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.

   c. Longer Than 100 Feet (30 m) if Indicated: MSS Type 49, spring cushion rolls.
7. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.

8. Base of Vertical Piping: MSS Type 52, spring hangers.

C. Support horizontal piping and tubing within 12 inches (300 mm) of each fitting, valve, and coupling.

D. Support vertical piping and tubing at base and at each floor.

E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.

F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
   2. NPS 3 (DN 80): 60 inches (1500 mm) with 1/2-inch (13-mm) rod.
   3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches (1500 mm) with 5/8-inch (16-mm) rod.
   4. NPS 6 and NPS 8 (DN 150 and DN 200): 60 inches (1500 mm) with 3/4-inch (19-mm) rod.
   5. NPS 10 and NPS 12 (DN 250 and DN 300): 60 inches (1500 mm) with 7/8-inch (22-mm) rod.
   6. Spacing for 10-foot (3-m) lengths may be increased to 10 feet (3 m). Spacing for fittings is limited to 60 inches (1500 mm).

G. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.3 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

C. Connect drainage and vent piping to the following:
   1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
   2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
   3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
   4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
3.4 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
   1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
   2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
   1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
   2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
   3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water (30 kPa). From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
   4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg (250 Pa). Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
   5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
   6. Prepare reports for tests and required corrective action.
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E. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.

2. Cap and subject piping to static-water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

4. Prepare reports for tests and required corrective action.

3.5 CLEANING AND PROTECTION

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION
PART 1 - GENERAL

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

1.1 SUMMARY

A. Section Includes:
1. Water closets
2. Urinals
3. Lavatories
4. Sinks
5. Service sinks
6. Drinking fountains
7. Flush valves
8. Seats
9. Carriers
10. Faucets
11. Fittings, trim, accessories

B. Related Sections:
1. Division 22 - Facility Water Distribution: Supply connections to plumbing fixtures.
2. Division 22 - Sanitary Sewer, Vent & Storm Drain: Waste connections to plumbing fixtures.
3. Division 26 - Equipment Wiring Connections: Execution requirements for electric connections to sensor valves and faucets specified by this section.

1.2 REFERENCES

A. American National Standards Institute:

B. Air-Conditioning and Refrigeration Institute:
1. ARI 1010 - Self-Contained, Mechanically Refrigerated Drinking-Water Coolers.

C. American Society of Mechanical Engineers:
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1. ASME A112.6.1 - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use.
2. ASME A112.18.1 - Plumbing Fixture Fittings.
4. ASME A112.19.2M - Vitreous China Plumbing Fixtures.
5. ASME A112.19.3 - Stainless Steel Plumbing Fixtures (Designed for Residential Use).
6. ASME A112.19.4 - Porcelain Enameled Formed Steel Plumbing Fixtures.
7. ASME A112.19.5 - Trim for Water-Closet Bowls, Tanks and Urinals.

1.3 SUBMITTALS

A. Division 01 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

D. Acceptance or no exceptions taken by the engineer on any substitution proposed by the contractor shall not be construed as relieving the contractor from compliance with the project's specifications and performance requirements nor departure there from. The contractor remains responsible for details and accuracy for confirming and correlating quantities and dimensions and for the selection of fabrication processes, techniques and assembly, coordination of his work with that of all other trades and making any needed modifications consequent to the substitution at his own cost and for performing the work in a safe manner.

1.4 CLOSEOUT SUBMITTALS

A. Division 01 - Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit fixture, trim, exploded view and replacement parts lists.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with NFPA 13, State of Texas & Municipality of local area standards.

B. Provide products requiring electrical connections listed and classified by Underwriters Laboratories Inc., as suitable for purpose specified and indicated.

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C. Maintain one copy of each document on site.

1.6 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Division 01 - Product Requirements: Product storage and handling requirements.
B. Accept fixtures on site in factory packaging. Inspect for damage.
C. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.8 WARRANTY
A. Division 01 - Execution and Closeout Requirements: Product warranties and product bonds.

1.9 EXTRA MATERIALS
A. Division 01 - Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 PRODUCTS

2.1 MANUFACTURERS
A. Manufacturer uniformity of materials and equipment shall be the standard catalogued products of manufacturers regularly engaged in production of such materials or equipment, and shall be their latest standard designs that comply with the specification requirements. Where two units or more of the same class of equipment are required, these units shall be products of a single manufacturer. Each component shall have manufacturer's name, address, model and serial number on a nameplate securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.
B. Substitutions: Division 01 - Product Requirements

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C. The following specification mentions manufacturers that are acceptable for this project.

1. Lavatories, service sinks, water closets, urinals, sinks:
   a. American Standard
   b. Kohler Co.
   c. Bradley

2. Stainless steel sinks:

3. Faucets:
   a. Moen Commercial
   b. Chicago Faucet Co.
   c. Delta
   d. Symmons
   e. Speakman

4. Flush valves:
   a. Sloan Valve Co.
   b. Moen Commercial

5. Water closet seats:
   a. Beneke Corp.
   b. Olsonite

6. Drinking Fountains
   a. Haws
   b. Elkay

7. Fixture supports/carriers:
   a. J.R. Smith
   c. Zurn Industries

8. Floor Drains, Floor Sinks, Roof Receptors:
   a. J.R. Smith
   b. Zurn Industries
   c. Mifab

9. Mixing valves:
   a. Apollo
   b. Symmons
   c. Powers

2.2 FIXTURES

A. Plumbing fixture trim and exposed supplies and wastes are to be brass with polished chromium plated finish unless otherwise specified. Provide individual loose key for all fixture supplies. Separately trap all wastes. Furnish chrome plated wall escutcheons for all exposed supplies and trap arms. Locate stops directly below fixtures or countertops. All fixtures for
use by the handicapped with exposed hot and cold water pipe and tailpiece with trap shall be insulated with protective insulation as specified on plans.

B. Faucets shall be provided with base (gooseneck) laminar flow, plain end with ring. For non-gooseneck faucets provide antimicrobial protected laminar stream type outlet. No aerator is acceptable or permitted.

C. Fixtures shall be in compliance with state water conservation requirements and local code compliance.

2.3 FIXTURE SUPPORTS

A. Lavatory supports: Factory commercial grade cast iron supports, having tubular steel uprights (legs) with concealed arm and sleeves, mounted on adjustable heavy steel wall plate header with escutcheon, and complete with heavy cast iron short feet, alignment trusses, and mounting fasteners.

B. Water closet and sink supports: Factory commercial grade adjustable, cast iron face plate, support base, and appropriated type waste fitting having face plate gasket; zinc plated steel fixture studs and fasteners; coated and threaded adjustable wall coupling with neoprene closet outlet gasket; and chrome plated fixture cap nuts and fiber fixture washers. Provide an appropriate model to suit deep or shallow rough-in, siphon jet or blow out water closet and type of sanitary piping system to which is connected.

C. Urinal supports: Factory commercial grade, concealed arm supports for urinals shall have steel top and bottom plates with bolts to support fixture independently from the wall; adjustable sleeves, steel tubular uprights (legs) and alignment trusses, steel plates with adjustable holes, bolts, nuts and chrome plated cap nuts and washers. Top supporting plates shall have cutouts when used with back inlet urinals.

D. Drinking Fountain Supports: Fountain factory support assembly may be used unless otherwise noted by structural requirements.

E. All wall mounted or supported off floor fixtures shall be supported and installed to be capable of resisting bariatric conditions (up to 750 lbs).

2.4 ESCUTCHEONS

A. Selection as follows:
   1. Chrome plated cast brass with setscrew for all fixture services.
   2. Chrome plated sheet metal steel with friction clips or hinged type for larger exposed miscellaneous pipes thru the wall.
2.5 PLUMBING FIXTURES

A. Water Closet (WC-1) (Handicapped)
   1. Same as WC-2 except mount at ADA height as required.

B. Water Closet (WC-2) (Handicapped)
   2. Flush Valve: Exposed chrome plated, diaphragm type with dual-flush handle, escutcheon, seat bumper, integral screwdriver stop and vacuum breaker; Sloan Model WES-111 (low consumption Uppercut dual-flush 1.6 gallon down, 1.1 gallon up.)
   3. Seat: Solid white plastic, open front, extended back, self-sustaining check hinge, brass bolts, without cover: Kohler model K-4670-SC.
   4. Wall Mounted Carrier: Adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers; Josam model 12000 series.

C. Water Closet (WC-3)
   1. Refer to section 22 46 00 Security Plumbing Fixtures.

D. Water Closet (WC-4)
   1. Refer to section 22 46 00 Security Plumbing Fixtures.

E. Urinal (UR-1)
   1. Same as UR-2 but installed at ADA height as required.

F. Urinal (UR-2)
   1. Kohler K-4904-ET “Bardon,” Wall hung, wall outlet, vitreous china urinal, with top spud, 0.125 gpf.
   2. Flush Valve: Sloan 186-0.125 high efficiency exposed flushometer, chrome plated, diaphragm type.
   3. Wall Carrier: floor mounted, bearing plate, adjustable supporting rods, structural uprights, welded feet and chrome plated trim.

G. Single Station Lavatory (L-1)
   1. Sink: Bradley LVLD1-IR-DCD-6334-TMA single piece molded solid surface counter top and bowl, backsplash, deck mounted soap dispenser, single chrome P-trap waste system. Lavatory shall include all waste and supply connections to wall. Color by architect.
   2. Faucet: Bradley IR-DCD ADA compliant, hands-free activation, infrared sensor, deck mounted faucet with battery powered valve

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control, valve control module. 0.5 gpm flow rate. Bradley Navigator thermostatic mixing assembly. Outlet temperature at 110°F.

3. Stops: McGuire 170LK with loose key angle stop, 1/2-inch copper 5-inch extension tube and chrome plated bell escutcheon and 3/8-inch outside diameter by 12-inch flexible riser.

H. Double Station Lavatory (L-2)

1. Sink: Bradley LVLD2-IR-DCD-6334-TMA single piece molded solid surface counter top and bowl, backsplash, deck mounted soap dispensers, single chrome P-trap waste system. Lavatory shall include all waste and supply connections to wall. Color by architect.

2. Faucet: Bradley IR-DCD ADA compliant, hands-free activation, infrared sensor, deck mounted faucet with battery powered valve control, valve control module. 0.5 gpm flow rate. Bradley Navigator thermostatic mixing assembly. Outlet temperature at 110°F.

3. Stops: McGuire 170LK with loose key angle stop, 1/2-inch copper 5-inch extension tube and chrome plated bell escutcheon and 3/8-inch outside diameter by 12-inch flexible riser.

I. Sink (SK-1)

1. Sink: Elkay LRAD “Lusterstone”, 18-inch by 18-inch by 5.5-inch deep single compartment self-rimming, 18 gage, Type 302 stainless steel sink with the underside undercoated.


4. P-Trap: McGuire 8912 1-1/2 inch adjustable cast brass with tubing drain to wall, cleanout and escutcheon.

5. Supplies: McGuire 167LK supply assembly with loose key angle valve, escutcheon and flexible tube riser.

J. Electric Water Cooler (EWC-1)

1. Elkay EZWS-ERPBM28K, two station recessed wall mounted electric water cooler with sensor activated EZH2O Bottle Filling Station, ADA compliant, stainless steel, safety bubbler, vandal resistant.

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resistant front button, stream guard, stream regulator, wall
mounting frame, access panel; minimum capacity of 8.0 gallons per
hour of 50 degrees F, 115 Volt 400 watts.
2. P-trap: McGuire 8872 chrome plated cast brass P-Trap with tubing
drain to wall, cleanout and escutcheon.
3. Supplies: McGuire No. 160 LK, straight stop valve with loose key
and escutcheon. Provide necessary copper tubing.

K. Mop Sink (MS-1)
1. Mop sink: Fiat SB-2424, 24-inch by 24-inch by 6-inch basin with
cast brass drain body fitted with stainless steel strainer, lint basket
and a self-draining stainless steel shelf top.
2. Faucet: Speakman SC-5811 mixing faucet with vacuum breaker,
integral stops, adjustable wall brace, pail hook and ¾-inch hose
threads.
3. Hose and Hose Bracket: Fiat 832-AA 30-inch long flexible heavy-
duty rubber hose and stainless steel rubber grip.
5. Mop Hanger: Fiat 889-CC, 24 inches long by 3 inches wide,
stainless steel with three rubber tool grips.

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify walls and floor finishes are prepared and ready for installation of
fixtures.
B. Verify electric power is available and of correct characteristics.
C. Confirm millwork is constructed with adequate provision for installation of
counter top lavatories and sinks.

3.2 PREPARATION
A. Rough-in fixture piping connections in accordance with minimum sizes
indicated in fixture rough-in schedule for particular fixtures.

3.3 INSTALLATION
A. Install Work in accordance with State and Local standards.
B. Install each fixture with trap, easily removable for servicing and cleaning.
C. Bath tubs/shower pans shall be installed per factory requirements and
architectural details and code waterproofing.

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D. Fixtures to be insulated for ADA compliance, furnish the following: Safety covers conforming to ANSI A177.1 and consisting of insulation kit of molded closed cell vinyl construction, 3/16 inch thick, white color for insulating tailpiece, P-trap, valves and supply piping. Furnish with weep hole and angle valve access covers. Ensure ALL piping is insulated for ADA compliance including any drain lines, trap primers, etc.

E. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.

F. Install components level and plumb.

G. Install and secure fixtures in place with wall supports, wall carriers and bolts.

H. Seal fixtures to wall and floor surfaces with sealant as specified in Division 07, color to match fixture.

I. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.

J. For ADA accessible water closets, install flush valve with handle to wide side of stall.

K. Solidly attach mixing valve to underside of counter out of sight.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Review millwork shop-drawings. Confirm location and size of fixtures and openings before rough in and installation.

3.5 ADJUSTING

A. Division 01 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.6 CLEANING

A. Division 01 - Execution and Closeout Requirements: Final cleaning.

B. Clean plumbing fixtures and equipment.

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PLUMBING FIXTURES
3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Division 01 - Execution and Closeout Requirements: Protecting installed construction.

B. Do not permit use of fixtures before final acceptance.

END OF SECTION
SECTION 22 46 00
SECURITY PLUMBING FIXTURES

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. Water closet/Urinal Combination.

1.3 DEFINITIONS
A. Front-Access Fixture: Security plumbing fixture designed to mount on wall with installation and removal from fixture side of wall, and with piping and other components accessible only from access panel in fixture.

1.4 SUBMITTALS
A. Division 01 - Submittal Procedures: Submittal procedures.
B. Product Data: Submit catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
D. Acceptance or no exceptions taken by the engineer on any substitution proposed by the contractor shall not be construed as relieving the contractor from compliance with the project's specifications and performance requirements nor departure there from. The contractor remains responsible for details and accuracy for confirming and correlating quantities and dimensions and for the selection of fabrication processes, techniques and assembly, coordination of his work with that of all other trades and making any needed modifications consequent to the substitution at his own cost and for performing the work in a safe manner.

1.5 CLOSEOUT SUBMITTALS
A. Maintenance Data: For security plumbing fixtures and components to include in maintenance manuals.
1.6 QUALITY ASSURANCE
A. Perform Work in accordance with NFPA 13, State of Texas & Municipality of local area standards.
B. Provide products requiring electrical connections listed and classified by Underwriters Laboratories Inc., as suitable for purpose specified and indicated.
C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
C. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.8 DELIVERY, STORAGE, HANDLING
A. Division 01 - Product Requirements: Product storage and handling requirements.
B. Accept fixtures on site in factory packaging. Inspect for damage.
C. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.9 WARRANTY
A. Division 01 - Execution and Closeout Requirements: Product warranties and product bonds.

1.10 EXTRA MATERIALS
A. Division 01 - Execution and Closeout Requirements: Spare parts and maintenance products.
PART 2 - PRODUCTS

2.1 FIXTURES

A. Water Closet (WC-3)

1. ADA Compliant lavatory water closet combination fixture, 14 gauge type 314 stainless steel seamless welded fixture, exposed surfaces shall have a satin finish. Provide unit with 36” long stainless steel grab bar behind toilet. Toilet shall be concealed blowout jet type with elongated bowl, self-draining flushing rim and integral contoured seat with sanitary high polish finish. Toilet shall meet ANSI 112.19.2M requirements, using an average water consumption of 1.28 gallons per flush or less. Toilet trap shall have a minimum 3-1/2” seal that shall pass a 2-1/8” diameter ball and be fully enclosed. Toilet shall be furnished complete with mounting hardware, deck mounted spout, 1.28 gallon per flush valve, electronic valve controls, and recessed paper holder. Acorn 1435 ADA Lav/Toilet Comby.

B. Water Closet (WC-4)

1. Lavatory water closet combination fixture, 14 gauge type 314 stainless steel seamless welded fixture, exposed surfaces shall have a satin finish. Toilet shall be concealed blowout jet type with elongated bowl, self-draining flushing rim and integral contoured seat with sanitary high polish finish. Toilet shall meet ANSI 112.19.2M requirements, using an average water consumption of 1.28 gallons per flush or less. Toilet trap shall have a minimum 3-1/2” seal that shall pass a 2-1/8” diameter ball and be fully enclosed. Toilet shall be furnished complete with mounting hardware, deck mounted spout, 1.28 gallon per flush valve, electronic valve controls, and recessed paper holder. Acorn 1440 Lav/Toilet.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before fixture installation.

B. Examine walls and floors for suitable conditions where fixtures will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install security plumbing fixtures level and plumb according to roughing-in drawings.

B. Install back-access, stainless-steel fixtures as follows:

1. Install wall sleeve in wall if indicated.
2. Install fixture on wall sleeve or wall, as indicated, with access from accessible service space.
3. Extend supply piping from service space to fixture.
4. Install soil and waste piping from fixture and extend into service space.
5. Install fixture trap in service space instead of below fixture drain.

C. Install front-access, stainless-steel fixtures as follows:
   1. Install fixture support or mounting bracket.
   2. Install fixture on support; mount components inside of or attached to fixture.
   3. Extend supply piping from pipe space to fixture.
   4. Install trap below fixture and extend soil and waste piping into pipe space.

D. Install vitreous-china fixture service space as follows:
   1. Install fixture support in service space.
      a. Use combination support and waste fitting assembly for water closet.
      b. Use chair carrier for lavatory (if required).
   2. Install fixture on support.
   3. Install components in service space.

E. Install fixture outlets with gasket seals.
F. Install fixtures designated "accessible" according to ICC A117.1 for heights, dimensions, and clearances.
G. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible fixtures. Comply with requirements in Section 220719 "Plumbing Piping Insulation."
H. Seal joints between fixtures, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."
I. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

3.3 CONNECTIONS
A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
B. Comply with requirements for water piping specified in Section 221116 "Domestic Water Piping."
3.4 ADJUSTING
A. Operate and adjust flushometer valves and flow-control valves on fixtures.

3.5 CLEANING AND PROTECTION
A. After installing fixtures, inspect and repair damaged finishes.
B. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
C. Provide protective covering for installed fixtures and fittings.
D. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION