85% Not for Construction

Project Manual

General Requirements/ Divisions 01 – 32

Cherokee Nation
Cherokee Nation Film Office
Dubbing Studio
16990 East 116th Street North
Owasso, Oklahoma 74055

November 4, 2024

mgm design group

DOCUMENT 000003

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Cherokee Nation Film Office
Dubbing Studio
16990 East 116th Street North
Owasso, Oklahoma

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Cherokee Nation Film Office
Owasso Dubbing Studio

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DOCUMENT 00004
Cherokee Nation Businesses
Cherokee Nation Film Office
Dubbing Studio
16990 East 116th Street North
Owasso, Oklahoma
November 4, 2024

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INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 BID FORMS AND BIDDING

A. Bids shall be submitted on forms identical to the forms included in the Project Manual and in the quantity specified below.

1. Proposal: Proposal shall be authoritatively executed. Proposals carrying riders, alterations of construction time or qualifications which modify the amount of the Bid as submitted will be rejected as irregular. In case of a difference between written words and figures in the Proposal, the amount stated in written words shall govern.

B. Calendar Days to Complete Construction: Bidders shall include in the space provided on the Bid Form the number of calendar days which the Bidder will require to complete the Work. The scheduled completion date will be significant and material factor in selecting the successful Bidder.

C. The successful Bidders shall supply the names and addresses of major material suppliers and subcontractors if required to do so by the Owner.

1.2 CONDITIONS RELATING TO CONSTRUCTION

A. Bidders are required to inform themselves fully of conditions relating to construction and labor under which the work will be performed, and by examination of the site and review of the Drawings and Specifications, including Addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning quantities or the nature of the Work to be done.

1.3 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

A. Bidders shall promptly notify the Procurement Office Buyer of any ambiguity, inconsistency, or error which they may discover upon examination of the Bidding Documents. Request for clarification or interpretation of the Bidding Documents may be made in writing on Contractor's Letterhead or E-Mail to:

Buyer Contact Information
Amy Eubanks
CED Sr Buyer
918-422-6593
Amy.eubanks@cn-bus.com

B. Interpretations, corrections, or changes of the Bidding Documents will be made by Addendum only. Information transmitted in any other manner will not be binding and Bidders shall not rely upon its accuracy.

C. Addenda are written, or graphic instruments issued by the Architect before the execution of the Contract which modify or interpret the Bidding Documents by addition, deletion, clarification or correction. Addenda will be issued to each Bidder requesting access to Bidding Documents. Each Bidder shall acknowledge receipt of addenda on their Proposal.

D. The Owner will not be responsible for any explanations or verbal interpretations of the Bidding Documents. Information obtained from an officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve the Contractor from fulfilling any of the conditions of the Contract.

1.4 SUBSTITUTIONS

A. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

B. No substitution will be considered before receipt of Bids unless written request for approval has been received by the Architect at least five days before the date for receipt of Bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment, or other Work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

C. If the Architect approves any proposed substitution before receipt of Bids, such approval will be set forth by Addenda. Bidders shall not rely upon approvals made in any other manner.

1.5 ADDITIONAL INFORMATION FOR BIDDERS

A. Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and the respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

PART 2 - PRODUCTS – (Not Used)

PART 3 EXECUTION -- (Not Used)

END OF DOCUMENT 002113

SECTION 011000
SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Owner-furnished products.
3. Use of premises.
4. Owner's occupancy requirements.
5. Work restrictions.
6. Specification formats and conventions.

B. Related Sections include the following:

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

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Cherokee Nation Businesses – Cherokee Nation Film Office – Owasso Campus Improvements – Dubbing Studio

B. Project Description: The project includes the Interior build out and construction for a interior buildout of adubbing studio within the Owasso Films Studio's existing facility. Work will take place on the first and second floor of the facility.

C. Owner: Cherokee Nation

D. Owner's Representative: James Cater

E. Architect: MGM Design Group, 1820 South Boulder Avenue, Suite 400, Tulsa, Oklahoma 74119. (918)-269-6097 telephone.

1. Contact: Mitch McClain Mitch@mgmdesigngroup.com

1.4 WORK UNDER OTHER CONTRACTS

A. No work under other contracts is anticipated.

1.5 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated. The Work includes providing support systems to receive Owner's equipment and making plumbing, mechanical, and electrical connections.

1. Owner will arrange for and deliver Shop Drawings, Product Data, and Samples to Contractor.
2. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
3. After delivery, Owner will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
4. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
5. Owner will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Contractor.
6. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.
7. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Architect noting discrepancies or anticipated problems in use of product.
8. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site
9. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
10. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
11. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

1.6 USE OF PREMISES

A. General:

Contractor should coordinate existing site access with owner.

1.7 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterSpec" numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor.

Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012500
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUBSTITUTION PROCEDURES

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

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

1. Substitution Request Form: Use CSI Form 13.1A.
2. Submit requests within 20 days after the Notice of Award.
3. Identify product to be replaced and show compliance with requirements for substitutions. Include a detailed comparison of significant qualities of proposed substitution with those of the Work specified, a list of changes needed to other parts of the Work required to accommodate proposed substitution, and any proposed changes in the Contract Sum or the Contract Time should the substitution be accepted.

C. Architect will review proposed substitutions and notify Contractor of their acceptance or rejection by Change Order. If necessary, Architect will request additional information or documentation for evaluation.

1. Architect 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.

D. Do not submit unapproved substitutions on Shop Drawings or other submittals.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

DOCUMENT 012501
SUBSTITUTION REQUEST FORM
(During the Bidding Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New Product ☐ 2-5 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified products: _____

_____

_____

☐ Point-by-point comparative data attached – REQUIRED BY A/E

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

_____

Savings to Owner for accepting substitution: ($_____).

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

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution, which may subsequently become apparent, are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments:_____

_____

_____

_____

A/E's REVIEW AND ACTION

☐ Substitution approved – Make submittals in accordance with Specification Section _____.

☐☐Substitution approved as noted – Make submittals in accordance with Specification Section _____.

☐☐☐Substitution rejected – Use specified materials.

☐☐☐Substitution Request received too late – Use specified materials.

Signed by:_____ Date: _____

Additional Comments: ☐☐Contractor ☐☐Subcontractor ☐☐Supplier ☐☐Manufacturer ☐☐A/E ☐☐Other

_____

_____

_____

_____

END OF SECTION 012501

SECTION 012600
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Sections include the following:

1. Division 01 Section “Product Requirements” for administrative procedures for handling requests for substitutions made after Contract award.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on Architect’s form, “Architect’s Supplemental Instructions.”

1.3 PROPOSAL REQUEST

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

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and 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.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining reasons for the 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 product 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 "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Contractor's Proposal Request form

1.4 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Architect, Owner and Contractor.

B. Total allowable for profit shall be a fixed percentage of the cost of the Work. For Work performed by the Contractor with his own forces: ten percent (10%). For Work performed by a subcontractor: ten percent (10%) plus five percent (5%) of the amount due the subcontractor for the Contractor. In any event, the total allowed for both overhead and profit shall not exceed fifteen percent (15%) of the cost of the Work.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive. Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.
4. Requests for Interpretation (RFIs).

B. Each Sub Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

C. Related Sections include the following:

1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.3 COORDINATION

A. Coordination: Each Sub Contractor shall coordinate its construction operations with those of other Sub Contractors and entities to ensure efficient and orderly installation of each part of the Work. Each Sub Contractor shall coordinate its operations with operations included in different Sections, which depend on each other for proper installation, connection, and operation.

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 with other Sub Contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

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.

1. 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 and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. 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.

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.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
b. Indicate required installation sequences.

c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Sheet Size: At least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
3. Number of Copies: Submit nine opaque copies of each submittal. Architect, through Contractor, will return two copies.

   a. Submit digital file where Coordination Drawings are required for operation and maintenance manuals. Architect will review and forward to the Owner. The reviewed submittal will be returned. Revise as needed and retain as a Project Record Drawing.

4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

B. Key Personnel Names: Within five days of starting construction operations, submit a list of key personnel assignments to the Contractor, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. 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.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: Each Sub Contractor shall, in addition to the Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

   1. Include special personnel required for coordination of operations with other Sub Contractors.

1.6 PROJECT MEETINGS

A. General: Contractor shall schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

   1. Attendees: Inform participants and Sub Contractors involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner, Contractor, and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Contractor, Architect, and their consultants; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Safety.
    b. Tentative construction schedule.
    c. Phasing.
    d. Critical work sequencing and long-lead items.
    e. Designation of key personnel and their duties.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for RFIs.
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Distribution of the Contract Documents.
    k. Submittal procedures.
    l. Preparation of Record Documents.
    m. Use of the premises.
    n. Work restrictions.
    o. Owner's occupancy requirements.
    p. Responsibility for temporary facilities and controls.
    q. Construction waste management and recycling.
    r. Parking availability.
    s. Office, work, and storage areas.
    t. Equipment deliveries and priorities.
    u. First aid.
    v. Security.
    w. Progress cleaning.
    x. Working hours.

3. Minutes: Contractor will record and distribute meeting minutes.

C. Pre-Installation Conferences: Contractor shall conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.

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 Architect 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:

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

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: The Contractor shall conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner, Contractor, and Architect, each subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these

meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. 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 schedule for next period.

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

        1) Safety.
        2) Interface requirements.
        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) Work hours.
        11) Hazards and risks.
        12) Progress cleaning.
        13) Quality and work standards.
        14) Status of correction of deficient items.
        15) Field observations.
        16) RFIs.
        17) Status of proposal requests.
        18) Pending changes.
        19) Status of Change Orders.
        20) Pending claims and disputes.
        21) Documentation of information for payment requests.

3. Minutes: Contractor will record and distribute to Sub Contractors and participants the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

1.7 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response. Contractor shall maintain a log of RFI's and report their progress at each project meeting.
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 interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

    a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Contractor's and Architect's Action: Contractor and Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

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 Architect's actions on submittals.
    f. Incomplete RFIs or RFIs with numerous errors.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

D. On receipt of Architect's action, the Contractor shall update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's and Contractor'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, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013300
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Sections include the following:

1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 01 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
5. Division 01 Section "Closeout Procedures" for submitting warranties.
6. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
7. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
8. Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
9. Divisions 02 through 49 Sections for specific requirements for submittals in those Sections.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's and Contractor's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect through Contractor for Sub Contractor's use in preparing submittals. Submittals consisting of architect's drawings will be rejected. Submit submittals when possible in Blue beam (PDF) with Submittal Transmittal in Word for Windows version 2007 (Word) to Architect for review.

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. 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. Contractor and Architect reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Contractor will advise Sub Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 15 days for initial review of each submittal.

E. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4” wide the full page height beside title block to record Contractor’s review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name and address of Contractor.
    e. Name and address of Sub Contractor.
    f. Name and address of supplier.
    g. Name of manufacturer.
    h. Submittal number or other unique identifier, including revision identifier.

1) Submittal number shall use Specification Section number followed by the submittal number of that section (e.g. 1.4) followed by a number 0 for the first submittal. Revisions would follow in sequence – e.g. 095113.1.4.0 is first submittal, 095113.1.4.1 is first revision.

i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Other necessary identification.

4. Electronic PDF submittal files shall be named utilizing the specification number followed by a sequential number for the submittal made under the given specification number followed by "r#" if it is a re-submittal, and then followed by a brief description of the submitted item.

   a. The description shall indicate the actual item submitted, shall not be general in nature, and does not have to be that of the specification section heading.
   b. Using the example, "230519-4r2 Differential Pressure Gauge"; 230519 – Meters and Gages for HVAC Piping is the relevant specification, the "4" shows it was the fourth submittal for specification section 230519, "r2" shows it was the second re-submittal, and the description indicates what item is submitted.
   c. Each specification item shall be submitted in a separate PDF file. PDF files with multiple specification items will be returned without review.
   d. Each file shall have sufficient space allowance for the Architects review stamp(s).
   e. Each file shall have the Contractor's review stamp(s) and indicate information required by specification 013300 – 1.4, E.3.

5. All marks made by the Contractor shall be in green.

F. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

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

1. Submit one electronic copy in PDF format of each submittal to concurrent reviewer in addition to Contractor and Architect.
2. Copies submitted for maintenance manuals will not be marked with action taken and will be returned.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, discard submittals 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. Specification Section number and title.
i. Drawing number and detail references, as appropriate.
j. Transmittal number, numbered consecutively.
k. Submittal and transmittal distribution record.
l. Remarks.
m. 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 Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
3. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.

I. 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 via clouds or other distinguishing feature.

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

1.4 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. General: At Contractor's written request, copies of Architect's CAD files will be for Contractor's use in connection with Project, subject to the following conditions:

1. Electronic File Transfer Request Section 013310 is at the end of this section for the Contractor's use.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit one electronic copy in PDF format of each submittal. Architect will review and mark up in red as required and return to the Contractor the same PDF marked up.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Standard color charts.
    e. Manufacturer's catalog cuts.
    f. Wiring diagrams showing factory-installed wiring.
    g. Printed performance curves.
    h. Operational range diagrams.
    i. Mill reports.
    j. Standard product operation and maintenance manuals.
    k. Compliance with specified referenced standards.
    l. Testing by recognized testing agency.
    m. Application of testing agency labels and seals.
    n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit one electronic copy in PDF format of Product Data, unless otherwise indicated. Architect, through Contractor, will return reviewed submittal. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shopwork manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.

i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.
m. Relationship to adjoining construction clearly indicated.
n. Seal and signature of professional engineer if specified.
o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Number of Copies: Submit one electronic copy in PDF format of each submittal to Contractor. Architect, through Contractor, will return one copy.
4. Number of Copies: Submit one electronic copy in PDF format where copies are required for operation and maintenance manuals. Trade Contractor will incorporate drawings into project record documents, refer 017839, 1.3, markup and retain one returned copy as a project record drawing.

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. Comply with all sample requirements as indicated in individual specification sections.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

a. Generic description of Sample.
b. Product name and name of manufacturer.
c. Sample source.
d. Number and title of appropriate Specification Section.
e. Area for architectural stamp.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of the 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 5 full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's

product line. Architect, through Contractor, will return 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 five sets of Samples. Architect and Contractor will retain three Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least five sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.
4. Number of Copies: Submit product schedule or list in PDF format, unless otherwise indicated. Architect, through Construction Manager, will return reviewed schedule.

    a. Mark up and retain one returned copy as a Project Record Document.

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

G. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

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

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

J. Subcontract List: Contractor shall 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. Use CSI Form 1.5A. 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 Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.
4. Number of Copies: Submit subcontractor list, unless otherwise indicated.
    a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit in PDF format Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit one electronic copy in PDF format of each submittal. Architect will review and mark up as required in red and return to the Contractor the same PDF marked up.
2. Certificates and Certifications: Provide a notarized 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.
3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."

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

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

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

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

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

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

J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

M. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

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

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

P. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during

installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Q. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

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

S. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

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

T. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

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

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

V. Material Safety Data Sheets (MSDSs): Submit information to Construction Manager.

2.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Trade 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 Architect.

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

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

PART 3 - EXECUTION

3.1 CONSTRUCTION MANAGER'S REVIEW

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

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

3.2 ARCHITECT'S AND CONSTRUCTION MANAGER'S / ACTION

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

B. Action Submittals: Construction Manager and Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect and Construction Manager will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Final Unrestricted Release: When the Architect marks a submittal “No Exception Taken”, the Work covered by the submittal pay proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.

2. Final-But-Restricted Release: When the Architect marks a submittal "Make Corrections Noted", the Work covered by the submittal may proceed provided it complies with the notations or corrections on the submittal and requirements of the Contract Documents.
3. Returned for Re-submittal: When the Architect marks a submittal "Revise and Resubmit", do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

C. Informational Submittals: Contractor and Architect will review each submittal and will return it "Action Not Required", or will return it without stamp if it does not comply with requirements.

D. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.

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

END OF SECTION 013300

SECTION 014000
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Testing and inspecting services furnished by the Owner are required to verify compliance with requirements specified or indicated. These services do not relieve Sub Contractor of responsibility for compliance with the Contract Document requirements.

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

C. Related Sections include the following:

1. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
2. Division 01 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
3. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

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

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

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination,

testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Pre-Construction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

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

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

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

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

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

J. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

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

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

1.4 SUBMITTALS

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

B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that include the following:

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

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.

1.5 QUALITY ASSURANCE

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

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

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

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

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

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.

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

I. Pre-Construction 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. Sub Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.

b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.

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

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect or Contractor.
2. Notify Architect and Contractor seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's and Contractor’s approval of mockups before starting work, fabrication, or construction.

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

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

1.6 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made by Owner.

3. 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 Sub Contractor.

B. Tests and inspections not explicitly assigned to Owner are Sub Contractor's responsibility. 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.

1. Where services are indicated as Sub Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Sub Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Sub Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Sub Contractor and not required by the Contract Documents are Sub Contractor's responsibility.
5. 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. Retesting/Reinspecting: Regardless of whether original tests or inspections were Trade Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect, Contractor, and Sub Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect, Contractor, and Sub Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Sub Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

6. Do not perform any duties of Sub Contractor.

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. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.

1. Distribution: Distribute schedule to Owner, Architect, Contractor, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.7 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

B. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect, Contractor, and Sub 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, through Contractor, with copy to Sub 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. Not Applicable

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 and Contractor’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 Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

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

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

END OF SECTION 014000

SECTION 014200
REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

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

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

C. "Directed": A command or instruction by Architect. 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.

1.2 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.

D. A current list of industry and association addresses and telephone numbers is available from the Architect's office.

1.3 ABBREVIATIONS AND ACRONYMS

A. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials (See ICC)
ICBO ES	ICBO Evaluation Service, Inc. (See ICC-ES)
ICC	International Code Council
ICC-ES	ICC Evaluation Service, Inc.

B. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

CE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
GSA	General Services Administration
HUD	Department of Housing and Urban Development
LBL	Lawrence Berkeley National Laboratory
NCHRP	National Cooperative Highway Research Program (See TRB)

NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
RUS	Rural Utilities Service (See USDA)
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

C. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes minimum quality requirements for temporary utilities, support facilities, and security and protection facilities. The Contractor, using the base criteria will propose to the Architect and Owner services, facilities and controls to be used. An invoice to the Owner will be submitted and paid for as a separate payment.

B. Related Sections include the following:

1. Division 01 Section "Summary" for limitations on utility interruptions and other work restrictions.
2. Division 01 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
3. Divisions 02 through 49 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
4. Division 32 Section "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

1.2 DEFINITIONS

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

1.3 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contractor’s proposal to the Owner. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Pay sewer service use charges for sewer usage by all entities for construction operations.

C. Water Service: Pay water service use charges for usage by all entities for construction operations. Provide connections and extensions of services as required for construction operations.

D. Electric Power Service: Pay electric power service usage charges for usage by all entities for construction operations. Provide connections and extensions for construction operations.

1.4 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.5 QUALITY ASSURANCE

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

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

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall 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.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pavement: Comply with Division 32 Pavement Sections.

B. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete bases for supporting posts.

C. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."

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

E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

F. Paint: Comply with requirements in Division 09 painting Sections.

2.2 EQUIPMENT

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

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

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

3.2 TEMPORARY UTILITY INSTALLATION

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

1. Arrange with Contractor, 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. Sanitary Facilities: Provide temporary toilets and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. 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.

F. Electric Power Service: Install electric service.

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

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Install lighting for Project identification sign.

H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install a minimum of two telephone line(s) for each field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
2. Maintain support facilities until near Substantial Completion or as required by the Contractor. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated on Drawings.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Use designated areas as directed by Contractor.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

F. Temporary Signs: Provide job sign as detailed on drawings. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Maintain and touchup signs so they are legible at all times.

G. Contractor shall provide hoists, lifts, (exclusive of project elevators and escalators) for delivery of materials, supplies and personnel. Project elevators and escalators shall not be used for delivery of materials, supplies and personnel. Use of project elevators and escalators shall be limited to those authorized by Owner and Architect.

H. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

I. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water-type drinking water units, including paper supply.

J. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.

1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
2. Construction Site Lighting: During hours of darkness provide perimeter lighting along line of construction fence and area lighting within construction site furnishing 1.5 foot-candles of illumination at ground level. Provide 5.0 foot-candles of illumination at all gates and entrances to temporary buildings and new structures under construction. Make provisions for operation of lighting during power failures and include automatic re-start.

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

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

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

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

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

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

B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

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

E. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

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

G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in hazardous fire-exposure 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 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. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion or as agreed upon with the Construction Manager.

E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

END OF SECTION 015000

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Sections include the following:

1. Division 01 Section “Allowances” for products selected under an allowance.
2. Division 01 Section “References” for applicable industry standards for products specified.
3. Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
4. Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

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

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

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

1.3 SUBMITTALS

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

1. Substitution Request Form: Use form provided by Architect at end of Section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified material or product cannot be provided.
    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. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    d. Product Data, including drawings, samples and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    i. 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 lack of availability or delays in delivery.
    j. Cost information, including a proposal of change, if any, in the Contract Sum.
    k. 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.
    l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.

3. Architect's Action:

    a. Pre-Bid Substitution Form of Acceptance: **Addendum only**.
    b. Post-Bid Substitution Form of Acceptance: **Change Order only**.
    c. If Architect does not indicate Acceptance or Approval through addendum or change order, use specified product.

d. No notification will be issued of proposed substitutions not approved by Architect.
e. The Architect's & Owner's decision of approval or disapproval of a proposed substitution shall be final.

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

1. Architect's Action:

a. Acceptance of Comparable Product will be indicated through addendum or deduct change order only
b. If Architect does not indicate Acceptance or Approval through addendum or change order, use specified product.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

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

1. Each sub contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between sub contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

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

B. Delivery and Handling:

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

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner and Contractor.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor or Sub Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 1 "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, that complies with requirements.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply

with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.

9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRE-BID PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received not less than 10 days prior to the date scheduled for receipt of bids. Requests submitted after the above time period will not be considered and no notification will be issued to Contractor of requested substitutions.

B. Materials, products, and equipment described in Contract Documents establish a minimum standard of required function, dimensions, appearance, and quality to be met by any proposed substitution.

C. Conditions: Architect will consider requests for substitution when the following conditions are satisfied. The burden of proof of the merit of the requested substitution is upon the proposer. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements. Entity initiating request shall fill out Substitution Request Form and submit documentation stipulated in paragraph 1.4.A.2, section 016000.

    1. 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 Architect for redesign and evaluation services, (which would be deducted from the Contractor's application for payment from the Owner) increased cost of other construction by Owner, and similar considerations.
    2. Substitution request is timely, fully documented and properly submitted.

3. Evidence that the proposed product does not require extensive revisions to the Contract Documents.
4. Bidder will pay for changes to the building design, including engineering design, detailing, and construction cost caused by the use of proposed substitute.
5. Requested substitution is consistent with the Contract Documents and will produce the indicated results.
6. Bidder has investigated proposed substitute and determined that meets or exceeds the quality level of specified Product.
7. Requested substitution provides specified warranty.
8. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
9. Requested substitution is compatible with other portions of the Work.
10. Requested substitution has been coordinated with other portions of the Work.
11. 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.
12. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
13. Samples, if requested.
14. Requested substitution will not adversely affect Contractor's Construction Schedule.
15. Sub Contractor or Supplier shall submit documentation from manufacturer or material supplier of specified product certifying that specified Product cannot be provided within the Contract Time.
16. Requested substitution has received necessary approvals of authorities having jurisdiction.

D. Each request includes the following:

1. Written request in form and procedures required for Change Order proposals.
2. Identification of specification Section number, Paragraph number, and name and description of specified material, Product, or equipment for which substitution is requested.

    a. Include items specifically required as Submittals in individual specification Sections.
    b. Substitution request not including sufficient information necessary for an evaluation by the Architect will not be approved, nor will Architect contact entity requesting substitution in order to obtain additional information.

3. Description of changes to the Contract Documents which proposed substitute will require for its proper installation.
4. Sub Contractor or Supplier has determined that maintenance and repair parts will be locally available for requested substitute.
5. Contractor has reviewed and approves request as fully complying with the specifications.

E. Sub Contractor's submittal and acceptance by Architect of Product Data, Shop Drawings, Samples, manufacturer's installation instructions, manufacturer's certificates, or test reports for Products not complying with Contract Documents will not constitute valid request for substitution request, acceptance of substitution request or approval of substitution request unless accompanied by substitution request form and substitution is clearly defined and noncompliant nature clearly disclosed.

F. The Architect's and Owner's decision of approval or disapproval of a requested substitution shall be final.

1. No notification will be issued of requested substitutions not approved by Architect and Owner.

2.3 POST-BID PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 60 days after date of agreement between Owner and Contractor or 60 days after date of Notice to proceed, whichever is earlier.

B. Requests submitted after the above time period will not be considered and no notification will be issued to Contractor of requested substitutions.

C. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. The burden of proof of the merit of the requested substitution is upon the proposer. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements. Entity initiating request shall fill out Substitution Request Form and submit documentation stipulated in paragraph 1.3.A.2, section 016000.

1. 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 Architect for redesign and evaluation services, (which would be deducted from the Contractor's application for payment from the Owner) increased cost of other construction by Owner, and similar considerations.
2. Substitution request is timely, fully documented and properly submitted.
3. Evidence that the proposed product does not require extensive revisions to the Contract Documents.
4. Requested substitution is consistent with the Contract Documents and will produce the indicated results.
5. Specified Product cannot be provided within the Contract Time.

    a. Contractor shall submit documentation from manufacturer or material supplier of specified product certifying that specified Product cannot be provided within the Contract Time.

b. Substitution request will not be considered if Product cannot be provided as a result of failure of Contractor to pursue Work promptly or coordinate Work properly.

6. Specified Product cannot receive necessary approval by authority having jurisdiction and requested substitution can be approved.

   a. Contractor shall submit documentation from authority having jurisdiction certifying that specified Product cannot receive necessary approval.

7. Specified Product cannot be provided in a manner compatible with other specified Products and Contractor certifies requested substitute will overcome incompatibility.

   a. Contractor shall submit evidence that specified Product cannot be provided in a manner compatible with other specified Products.

8. Specified Product cannot be coordinated with other specified Products and Contractor certifies requested substitute can be coordinated.

   a. Contractor shall submit evidence that specified Product cannot be coordinated with other specified Products.

9. Requested substitution has received necessary approvals of authorities having jurisdiction.
10. Sub Contractor or Supplier shall submit documentation from manufacturer or material supplier of specified product certifying that specified Product cannot be provided within the Contract Time.
11. Substitution request will not be considered if Product cannot be provided as a result of failure of Sub Contractor or Supplier to pursue Work promptly or coordinate Work properly.

D. Each request includes the following:

1. Four copies of written request in form and procedures required for Change Order proposals.
2. Identification of specification Section number, Paragraph number, and name and description of specified material, Product, or equipment for which substitution is requested.
3. Complete description of the requested substitute including product data, drawings, samples, performance and test data, and other information necessary for an evaluation by the Architect and Owner.

   a. Include items specifically required as Submittals in individual specification Sections.
   b. Detailed comparison of qualities of requested substitution with specified Product.
   c. Architect may request additional information or documentation for evaluation.

d. Description of changes to the Contract Documents which requested substitute will require for its proper installation.
e. Description of changes or modifications needed to other parts of the Work and to construction performed by Owner and Owner's separate contractors, that will be necessary to accommodate requested substitution.
f. Contractor's statement indicating requested substitution's effect on Construction Manager's Construction Progress Schedule compared to schedule without acceptance of requested substitution.

    1) Indicate requested substitution's effect on overall Contract Time.

g. Cost information including a proposal of the net change, if any, in Contract Sum.
h. Construction Manager's certificate of waiver of rights for claim of addition in Contract Sum or extension in Contract Time that may subsequently become necessary because of requested substitution's failure to perform adequately.

2.4 COMPARABLE PRODUCTS

A. Conditions: Architect will consider Construction Manager's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Requests for comparable products are to be submitted per Pre-Bid Substitutions and Post-Bid Substitutions procedure described in this Section.

PART 3 - EXECUTION

3.1 SUBSTITUION REQUEST FORM

A. The form on the following page(s) is a summary of responses required by A/E. This form shall accompany the submittal requirements per Section 016000, Paragraphs 1.4.A. List all attachments.

END OF SECTION 016000

SUBSTITUTION REQUEST

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

_____ _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No: _____

Installer: _____ Address: _____ Phone: _____

History: □ New product □ 2-5 yrs old □ 5-10 yrs old □ More than 10 yrs old

Differences between proposed substitution and specified product: _____

_____

_____

□ Point-by-point comparative data attached – REQUIRED BY A/E

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: □ No □ Yes; explain: _____

Savings to Owner for accepting substitution: _____ ($ _____)

Proposed substitution changes Contract Time: □ No □ Yes [Add] [Deduct] _____ days

Supporting Data Attached: □ Drawings □ Product Data □ Samples □ Tests □ Reports

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades. And will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution, which may subsequently become apparent, are to be waived including electrical power and phase required or other utility requirements for size and demand caused by the substitution.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Subcontractor - _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachment: (Letters from Vendor and Manufacturer) _____

_____

_____

Contractor Approval: _____

Additional Comments: □ Contractor □ Subcontractor □ Supplier □ Manufacturer □ A/E

_____

_____

_____

_____

SECTION 017300
EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

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

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

B. Related Sections include the following:

1. Division 01 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 01 Section "Submittal Procedures" for submitting surveys.
3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 SUBMITTALS

A. Qualification Data: For professional engineer.

B. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

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

D. Certified Surveys: Submit electronic file in pdf format signed by professional engineer.

E. Final Property Survey: Submit electronic file in pdf format showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

    a. Description of the Work.
    b. List of detrimental conditions, including substrates.
    c. List of unacceptable installation tolerances.
    d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

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

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

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

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.3 CONSTRUCTION LAYOUT

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

B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect and Contractor when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
7. Benchmarks and control points destroyed or disturbed by Sub Contractors shall be replaced with a licensed surveyor at the expense of the responsible Sub Contractor.
8. All other survey and layout of the work is to be done by the Sub Contractor.

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

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

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Contractor.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

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

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect or Contractor. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Contractor before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

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

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

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

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

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

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.
4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.

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

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until 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. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

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

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

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

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

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

3.6 OWNER-INSTALLED PRODUCTS

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

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

1. Construction Schedule: Inform Owner of Contractor’s preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Pre-Installation Conferences: Include Owner's construction forces at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

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

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

3.8 STARTING AND ADJUSTING

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

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

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

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."

3.9 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.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

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

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

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

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

END OF SECTION 017300

SECTION 017419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

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

1. Recycling nonhazardous demolition and construction waste.
2. Disposing of nonhazardous demolition and construction waste.

B. Related Sections include the following:

1. Division 01 Section "Summary" for coordination of responsibilities for waste management.
2. Division 01 Section "Temporary Facilities and Controls" for environmental-protection measures during construction**,** and location of waste containers at Project site.
3. Division 04 Section "Unit Masonry" for disposal requirements for masonry waste.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction or repair operations. Construction waste includes packaging.

B. Demolition Waste: Site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

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

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

1.3 PERFORMANCE GOALS

A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 50 percent by weight of total waste generated by the Work.

B. Salvage/Recycle Goals: Owner's goal is to salvage and recycle as much nonhazardous demolition and construction waste as possible including the following materials:
   a. Refrigerants.
   b. Electrical conduit.
   c. Copper wiring.

2. Construction Waste:

   a. Site-clearing waste.
   b. Masonry and CMU.
   c. Lumber.
   d. Wood sheet materials.
   e. Wood trim.
   f. Metals.
   g. Roofing.
   h. Insulation.
   i. Carpet.
   j. Gypsum board.
   k. Piping.
   l. Electrical conduit.
   m. Packaging: Regardless of salvage/recycle goal indicated 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.
      6) Wood crates.
      7) Plastic pails.

1.4 SUBMITTALS

A. Waste Management Plan: Submit 3 copies of plan within 30 days of date established for the Notice to Proceed.

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

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

D. 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.

E. 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.

F. Qualification Data: For refrigerant recovery technician.

G. 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.

1.5 QUALITY ASSURANCE

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

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

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

1.6 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Include separate sections in plan for 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 demolition, site-clearing] and construction waste generated by the Work. 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. 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 Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
2. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
3. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
4. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

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. 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.
6. Savings in hauling and tipping fees by donating 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.

E. Forms: Prepare waste management plan on forms included at end of Part 3.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Architect, Owner, and Construction Manager. 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 Division 01 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

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.

C. 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 Sale and Donation: Not permitted on Project site.

3.3 RECYCLING DEMOLITION AND 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. CMC Recycling
2. National Waste Recycling

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

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are 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 off 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.
2. Polystyrene Packaging: Separate and bag materials.
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. Site-Clearing Wastes: Chip brush, branches, and trees at landfill facility.

1. Comply with requirements in Division 32 Section "Plants" for use of chipped organic waste as organic mulch.

C. 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.

D. Gypsum Board: Stack large clean pieces on wood pallets 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 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. Burning: Burning of waste materials is not permitted on Owner's property.

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

END OF SECTION 017419

SECTION 017700
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 01 Section "Execution" for progress cleaning of Project site.
3. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
6. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

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

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit one digital and one printed copy 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 exterior 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 Architect.
    d. Name of Contractor.
    e. Page number.

1.5 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor and Construction Manager.

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, 3-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.

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.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide 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 similar labels, including mechanical and electrical nameplates.

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

n. Replace parts subject to unusual operating conditions.

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.

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. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017701
PROJECT CLOSEOUT CHECKLIST

Operation & Maintenance Manual
Warranty Manual
Emergency Manual
Product Maintenance Manual
Quality Control Manual
As-Built Drawings
As-Built Specifications
As-Built Submittals and Shop Drawings
As-Built Product Data
As-Built Miscellaneous Record Submittals
Record Photographs

List of Subcontractors with contact names, addresses, phone numbers, and email addresses
Punch List Completion Letter

Three complete final Operation and Maintenance Manuals prepared in the following sequence with titles indicated:

- Manual Cover
  - Project Name
  - Address
  - Owner's Name
  - Architect's Name
  - Date of Substantial Completion
- Manual Index
- Project Participants
  - Owner
  - Owner's Consultants
  - Architect
  - Architect's Consultants
  - Contractor
  - Subcontractors
- Completion Certificates
  - Substantial Completion Certificate
  - Contractor Punch List Completion Letter
  - Consent of Surety to Final Payments, if required
  - Contractor Affidavit of Payment of Debts and Claims
  - Contractor Insurance Certificate
  - Contractor Statement of Insurance Renewability, if required
  - Lien Releases, if required
- As-Built Finish Schedule
- Warranty Certificates
  - Quick Reference Warranty Table
  - General Contractor Warranty
  - Subcontractor Warranties
- Surplus Stock
  - Surplus Stock List
- Operation and Maintenance Manual
  - Filed and tabbed by CSI Division corresponding to Project Manual.
- Emergency Operations Manual
  - Filed and tabbed by CSI Division corresponding to Project Manual.
- Product Maintenance Manual
  - Filed and tabbed by CSI Division corresponding to Project Manual.

END OF PROJECT CLOSEOUT CHECKLIST 017701

SECTION 017823
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials, and finishes and systems and equipment.

B. Related Sections include the following:

1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
3. Division 01 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
4. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 DEFINITIONS

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

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

1.3 SUBMITTALS

A. The Contractor shall receive from the Sub Contractors manuals, documents, and lists as stipulated in Section 017823 in the quantities required. It shall be the Contractor's responsibility to organize the Operation and Maintenance Data in their final form and submit for the Architect's review and approval.

B. Initial Submittal: Submit 1 draft copy of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable

C. Final Submittal: Submit 1 copies of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit 4 copies of each corrected manual within 15 days of receipt of Architect's comments.

1.4 COORDINATION

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

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 MANUALS, GENERAL

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

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

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

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.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.

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

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

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

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

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

2.4 OPERATION MANUALS

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

1. System, subsystem, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.

7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

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

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

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

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

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

2.5 PRODUCT MAINTENANCE MANUAL

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

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

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

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

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

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

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

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

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

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

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

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

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

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

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

1. Test and inspection instructions.

2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training videotape, if available.

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

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

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

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

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

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

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

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

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

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

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

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

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

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

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

END OF SECTION 017823

SECTION 017839
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include the following:

1. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
2. Divisions 02 through 33 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.2 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Initial Submittal: Submit one electronic copy in PDF format. Architect will initial and date each print and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return marked up set for organizing into sets, printing, binding, and final submittal.
b. Final Submittal: Submit one electronic copy in PDF format and (1) set of marked-up Record Drawings. Print each Drawing, whether or not changes and additional information were recorded.

B. Record Product Data: Submit copies of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints 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 prepare the 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 understandable drawing technique.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below first floor.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Duct size and routing.
    i. Locations of concealed internal utilities.
    j. Changes made by Change Order or Construction Change Directive.
    k. Changes made following Architect's written orders.
    l. Details not on the original Contract Drawings.
    m. Field records for variable and concealed conditions.
    n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
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. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.

1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
2. Consult Architect and Contractor for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

C. 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. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
4. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect and Construction Manager.
    e. Name of Trade 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 Product Data, and Record Drawings where applicable.

2.3 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

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. Contractor, at their option, may review project record documents prior to accepting any payment request. Contractor may reject payment request will record documents are correct.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Contractor’s reference during normal working hours.

END OF SECTION 017839

SECTION 024119
SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolition and removal of selected site elements.
   2. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

C. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Predemolition Photographs or Video: Submit before Work begins.

C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

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

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

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

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

D. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, preconstruction videotapes and templates.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

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

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

B. Cast-in-place concrete includes the following:
   1. Slabs-on-grade.

C. Related Sections:

1.2 ACTION SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

   1. Indicate amounts of mix water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures

1.3 INFORMATIONAL SUBMITTALS.

A. Welding Certificates: Copies of certificates for welding procedures and personnel.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

E. ACI Publications: Comply with the following, unless more stringent provisions are indicated:

1. ACI 301, "Specification for Structural Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Avoid damaging coatings on steel reinforcement.
2. Repair damaged epoxy coatings on steel reinforcement according to ASTM D 3963/D 3963M.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, **3/4 by 3/4 inch**, minimum.

D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of the exposed concrete surface.

2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, **Grade 60**, deformed.

B. Plain-Steel Wire: ASTM A 82, as drawn.

C. Deformed-Steel Wire: ASTM A 496.

D. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

1. Fly Ash: ASTM C 618, Class C or F.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:

1. Class: Moderate weathering region, but not less than 3M.
2. Nominal Maximum Aggregate Size: 1 inch.

C. Lightweight Aggregate: ASTM C 330.

1. Nominal Maximum Aggregate Size: 1 inch.

D. Water: Potable and complying with ASTM C 94.

2.5 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately **9 oz./sq. yd.** when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Non-Membrane-Forming Curing Compound: ASTM C 156. or dissipating resin curing compound with fugitive dispersing red dye.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be included in the Work include, but are not limited to, the following:

    a. Unitex; Cure and Chemical Hardener.
    b. W.R. Meadows; 1100 Clear Water-Base Concrete Curing Compound.

2.7 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.

2.8 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from **1/8 inch** and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from **1/4 inch**.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5700 psi at 28 days when tested according to ASTM C 109/C 109M.

2.9 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.
2. Proportion lightweight structural concrete according to ACI 211.2 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. Footings and Grade Beams: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days): 3000 psi.
2. Maximum Slump: 4 inches, plus or minus 1 inch.
3. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8 inches after admixture is added to concrete with 2- to 4-inch slump.
4. Maximum Water/Cement Ratio: 0.58

D. Slab-on-Grade: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days)
   a. Exterior: 3500 psi.

2. Maximum Slump: 4 inches, plus or minus 1 inch.
3. Maximum Water/Cement Ratio: Interior - 0.51, Exterior – 0.45.

E. Building Walls and Framing Sections:

1. Compressive Strength (28 Days): 4000 psi.
2. Maximum Slump: 4 inches, plus or minus 1 inch.
3. Calculated Equilibrium Unit Weight: 145 lb/cu. ft. plus or minus 3 lb/cu. ft. as determined by ASTM C 567.

F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.

G. Maximum Water-Cementitious Materials Ratio: 0.50 for concrete required to have low water permeability.

H. Maximum Water-Cementitious Materials Ratio: 0.45 for concrete exposed to deicers or subject to freezing and thawing while moist.

I. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:

1. Air Content: 5.5 percent for 1-1/2-inch- nominal maximum aggregate size.
2. Air Content: 6 percent for 1-inch- nominal maximum aggregate size.
3. Air Content: 6 percent for 3/4-inch- nominal maximum aggregate size.

J. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

K. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.10 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch; concrete surfaces exposed to view.
2. Class B, 1/4 inch; foundation walls.
3. Class C, 1/2 inch; footings.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

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

1. Install anchor bolts, accurately located, to elevations required.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than **50 deg F** for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR RETARDERS

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Before placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mix.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

D. Deposit concrete in forms in horizontal layers no deeper than **24 inches** and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

G. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

B. 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** in height.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.

C. Rubbed Finish: Apply the following to smooth-formed finished concrete:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.11 CONCRETE PROTECTION 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 recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed 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. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. 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.

    a. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy

rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least two months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid epoxy joint filler full depth in saw-cut joints and at least **2 inches** deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas only when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a **No. 16** sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
5. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 75 cu. yd. or fraction thereof of each concrete mix placed each day.

a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

b. When small pours of less than 10 yards are placed, such as stoops, house keeping pads, stair pans, etc., test cylinders are not required as long as the mix design used has previously been tested and has passed. Wall panels, floor slabs and other structural concrete is not included in this exception.

2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
6. Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days and two at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than **500 psi**.

E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.

F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

END OF SECTION 033000

SECTION 033013
CONCRETE TREATMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Non-membrane forming curing compounds.
2. Concrete sealing compounds.

B. Related Documents:

1. Refer to Drawings for cast-in-place concrete specifications.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Delivery materials to Project site n manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

1. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep containers sealed until ready for use. Keep from freezing.

B. Handling: Protect materials during handling and application to prevent damage or contamination.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Do not apply sealer when concrete or air temperatures are below 40 deg F.

PART 2 - PRODUCTS

2.1 NON-MEMBRANE FORMING CURING COMPOUNDS

A. Clear, Waterborne, Non-Membrane-Forming Curing Compound: ASTM C 156, or dissipating resin curing compound with fugitive dispersing red dye. Use of membrane-forming/retaining curing compounds is not permitted.

1. Basis-of-Design Product:

a. W.R. Meadows; 1100 "Resin-Based, Water Emulsion Concrete Curing Compound."

2. Other Available Manufacturers: Subject to compliance with requirements, other manufacturers offering products which may be included in the Work include, but are not limited to, the following:

    a. DaytonSuperior.

3. Use product where adhered floor finish materials will be used, and removal of membrane-forming curing/sealing compounds is not desired.

2.5 SEALING COMPOUNDS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Concrete Sealer:

    a. Euclid Chemical Company, (The); “Euco #512 Epoxy Sealer,” 2-component water-based epoxy. (New concrete)
    b. L&M Construction Chemicals, Inc., “Aquapel.”

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive concrete sealers. Surfaces must be free of standing water, and clean and dry. Notify Architect if surfaces are not acceptable.

1. Begin surface preparations only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Prepare concrete surfaces in accordance with manufacturer’s written recommendations and instructions.

B. New Concrete: Cure concrete in accordance with sealer manufacturer’s instructions.

3.3 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 ACI 301 for hot-weather protection during curing.

B. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

C. Cure concrete according to ACI 308.1, by one of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

    a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

3.3 APPLICATION OF CONCRETE SEALERS

A. Apply concrete sealers to concrete surfaces in accordance with manufacturer’s written instructions.

B. Application of Sealer Coat: Uniformly apply a continuous sealing compound to concrete, either hardened or untreated, by power spray or roller according to manufacturer’s written recommendations. Spraying may be by hand held “pump up” sprayer or airless industrial sprayer. Use short-napped solvent-resistant sleeve when applying by roller.

C. Apply one coat to troweled surfaces. Apply two coats if concrete surface is porous or worn.

3.5 PROTECTION

A. Protect horizontal surfaces from traffic and incidental damage until sealer has cured.

END OF SECTION 033013

SECTION 054000
COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Non-Load-bearing interior wall framing extending to roof structure
   2. Ceiling joist framing.
   3. Soffit framing.
   4. Any other cold-formed framing system noted on Contract Drawings.

B. Related Requirements:
   1. Section 055000 – Metal Fabrications
   2. Section 092216 – Non-Structural Metal Framing

1.2 SUBMITTALS

A. Product Data: For each type of cold-formed steel framing product and accessory indicated on the Contract Drawings, provide the following:
   1. Section Properties: Submit section properties, material strengths and ASTM specification compliance verification for each size member, strap or brace of each gage used.
   2. Connections: Submit manufacturer's data for each type of manufactured connector, screw, or fastener verifying conformance with the Contract Drawings.

B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
   1. Submit shop drawings and calculation electronically in PDF format via email for review by the Architect and Structural Engineer-of-Record. The Architect and Structural Engineer-of-Record will review the shop drawings and forward stamped electronic documents to the contractor through the Architect via email. The contractor shall be responsible for transmitting the reviewed set to the fabricator for corrections. The printing of shop drawings as required for review is considered a reimbursable expense and will be billed at cost.
   2. For cold-formed steel framing indicated to comply with design loads, include complete structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation and licensed in the state where the project is located. Design calculations will be reviewed by the Engineer-of-Record.

C. Qualification Data: For testing agency.

D. Welding certificates.

E. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.
   1. Steel sheet.
   2. Expansion anchors.
   3. Powder-actuated anchors.
   4. Mechanical fasteners.
   5. Adhesive anchors.
   6. Vertical deflection clips.
   7. Horizontal drift deflection clips
   8. Miscellaneous structural clips and accessories.

F. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

1.3 QUALITY ASSURANCE

A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer licensed in the state where the project is located.

B. 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 cold-formed steel framing that are similar to those indicated on this Project in material, design and extent.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 for testing indicated.

D. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

E. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1, "Structural Welding Code - Steel."
   2. AWS D1.3, "Structural Welding Code - Sheet Steel."

F. Fire-Test-Response Characteristics: Where indicated, provide cold-formed steel framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

G. Comply with current AISI Specifications and Standards.

H. Preinstallation Conference: Conduct conference at Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

B. During construction, adequately distribute all loads applied to framing members so as not to exceed the carrying capacity of any one member.

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. AllSteel & Gypsum Products, Inc.
2. California Expanded Metal Products Company.
3. ClarkDietrich Building Systems, Inc.
4. Consolidated Fabricators Corp.; Building Products Division.
5. Craco Mfg., Inc.
6. Custom Stud Inc.
7. Design Shapes in Steel.
8. Formetal Co. Inc. (The).
9. MarinoWARE.
10. Nuconsteel; a Nucor Company.
11. Olmar Supply, Inc.
12. Quail Run Building Materials, Inc.
13. SCAFCO Corporation.
14. Southeastern Stud & Components, Inc.
15. State Building Products, Inc.
16. Steel Construction Systems.
17. Steel Network, Inc. (The).
18. Steel Structural Systems.
19. Steeler, Inc.
20. Super Stud Building Products, Inc.
21. Telling Industries, LLC.
22. United Metal Products, Inc.
23. United Steel Manufacturing.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.

B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
   1. Design Loads: As indicated on Contract Drawings.
   2. Deflection Limits: Design framing systems to withstand design loads with deflections not exceeding the following limits:
      a. Interior Non-Load-Bearing Wall Framing – Horizontal deflections under a minimum horizontal load of 5 lbf/sq. ft.:
         1) Brittle Finishes: l/360 of the wall height.
         2) Flexible Finishes: l/240 of the wall height.
         3) Masonry Veneer: l/600 of the wall height.
      b. Ceiling Joist Framing: Vertical deflection of 1/360 of the span for live loads of 10 lbf/sq/ft. and 1/240 for total loads of the span.
   3. Design framing systems to provide for movement of framing members located outside the insulated building envelope 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 of 120 deg F.
   4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
      a. Roof Framing: Downward movement of 2 inches and upward movement of 1 inch, unless noted otherwise on Contract Documents.

C. Comply with current AISI Specifications and Standards, unless more stringent requirements are indicated.

D. 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.

2.3 COLD-FORMED STEEL FRAMING, GENERAL

A. Manufacturing Standard: All cold form framing shall be equivalent to SSMA (Steel Stud Manufacturers Association) published standards and installation recommendations, which will be used as a quality standard reference in the event the Contractor furnishes materials in which the submitted manufacturer does not have a published installation manual.

B. Steel Sheet: ASTM A 1003, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
   1. Grade: ST33H or ST50H as indicated or as required by structural performance

2. Coating: G60.

C. Steel Sheet for Vertical Deflection Clips: ASTM A 653, structural steel, zinc coated, of grade and coating as follows:
   1. Grade: 50, Class 1.
   2. Coating: G90.

2.4 INTERIOR NON-LOAD-BEARING WALL FRAMING EXTENDING TO ROOF

A. Steel Studs: The physical and structural properties listed by SSMA shall be the minimum permitted. Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0329 inch or as indicated on Contract Drawings.
   2. Minimum Flange Width: 1-5/8 inches.
   3. Minimum Lip Length: 1/2 inch.

B. Steel Track: The physical and structural properties listed by SSMA shall be the minimum permitted. Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0329 inch or as indicated on Contract Drawings, but shall match wall stud thickness when heavier than 0.0329 inch.
   2. Minimum Flange Width: 1-1/4 inches.

C. Steel Box or Back-to-Back Headers and Girts: The physical and structural properties listed by SSMA shall be the minimum permitted. Manufacturer's standard C-shapes used to form header beams or horizontal girts, of web depths indicated, unpunched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0329 inch or as indicated on Contract Drawings.
   2. Minimum Flange Width: 1-5/8 inches.
   3. Minimum Lip Width: 1/2 inch.

D. Vertical Deflection Clips: Manufacturer's standard bypass and head clips as noted on Contract Drawings, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
   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. AllSteel & Gypsum Products, Inc.
      b. ClarkDietrich Building Systems, Inc.
      c. MarinoWARE.
      d. SCAFCO Corporation.
      e. Steel Network, Inc. (The).
      f. Steeler, Inc.

E. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track as noted on the Contract Drawings; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
   1. Minimum Base-Metal Thickness: 0.0428 inch or as indicated on Contract Drawings.
   2. Minimum Flange Width: 3/4 inch plus the design gap.
   3. Row of bridging to be located 12 inches from top of studs.

F. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
   1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
      a. Minimum Base-Metal Thickness: 0.0428 inch or as indicated on Contract Drawings.
      b. Minimum Flange Width: 3/4 inch plus the design gap.
   2. Inner Track: Of web depth indicated, and as follows:
      a. Minimum Base-Metal Thickness: 0.0329 inch or as indicated on Contract Drawings.
      b. Minimum Flange Width: Equal to sum of outer deflection track flange width plus 1 inch.

G. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 CEILING JOIST FRAMING

A. Steel Ceiling Joists: The physical and structural properties listed by SSMA shall be the minimum permitted. Manufacturer's standard C-shaped steel sections, of web depths indicated, punched with standard holes, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0329 inch or as indicated on Contract Drawings.
   2. Minimum Flange Width: 1-5/8 inches.
   3. Minimum Lip Width: 1/2 inch.

2.6 SOFFIT FRAMING

A. Exterior Soffit Frame: The physical and structural properties listed by SSMA shall be the minimum permitted. Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0329 inch or as indicated on Contract Drawings.
   2. Minimum Flange Width: 1-5/8 inches.
   3. Minimum Lip Width: 1/2 inch.

2.7 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

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.
   4. Anchor clips.
   5. End clips.
   6. Foundation clips.
   7. Gusset plates.
   8. Stud kickers and knee braces.
   9. Joist hangers and end closures.
   10. Hole reinforcing plates.
   11. Backer plates.

2.8 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36, zinc coated by hot-dip process according to ASTM A 123.

B. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.

C. Powder-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

D. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
   1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

E. Welding Electrodes: Comply with AWS standards.

2.9 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A 780.

B. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.10 FABRICATION

A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
   1. Fabricate framing assemblies using jigs or templates.
   2. Cut framing members by sawing or shearing; do not torch cut.
   3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.
   4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
   5. Do not begin fabrication of work prior to receiving approval of shop drawings and calculations. Fabricate per manufacturer’s current printed instructions.
   6. Shop Fabrication: Fabricate items in shop to greatest extent possible so as to minimize field assembly of units at project site. Clearly mark units for assembly and coordinated installation.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
   2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

C. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.

D. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
   1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place,

undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

J. All structural joists and studs shall have a minimum of 10 inches of unpunched steel at bearing or support points.

K. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 INTERIOR NON-LOAD-BEARING WALL EXTENDING TO ROOF INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
   1. Stud Spacing: As indicated on Contract Drawings or Shop Drawings.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Install single deep-leg deflection tracks and anchor to building structure.
   2. Install double deep-leg deflection tracks and anchor outer track to building structure.
   3. Connect vertical deflection clips to bypassing and infill studs and anchor to building structure.
   4. Connect drift clips to cold-formed metal framing and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Contract Drawings or Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.

1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
   a. Install solid blocking at 96-inch centers.
2. Bridging:
   a. Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
   b. Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
   c. Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 JOIST INSTALLATION

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Contract Drawings or Shop Drawings.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
   1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
   2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Shop Drawings.
   3. Splices in joists are not permitted.
   4. Joist webs shall not be in direct contact with rim track webs.

C. Space joists not more than 2 inches from abutting walls, and as follows:
   1. Joist Spacing: As indicated on Contract Drawings or Shop Drawings.

D. Frame openings with built-up joist headers consisting of joist and joist track, or another combination of connected joists if indicated.

E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated on Contract Drawings or Shop Drawings.
   1. Install web stiffeners to transfer axial loads of walls above.

F. Install bridging at intervals indicated on the Contract Drawings or Shop Drawings. Fasten bridging at each joist intersection as follows:
   1. Bridging:

a. Joist-track solid blocking of width and thickness indicated, secured to joist webs.
b. Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.

G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.

H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.6 FIELD QUALITY CONTROL

A. Testing: Contractor will retain a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor, owner and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.7 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055000
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Loose lintels.
3. Miscellaneous steel trim.
4. Loose bearing and leveling plates.

B. Products furnished, but not installed, under this Section:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete.

1.2 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F , ambient; 180 deg F , material surfaces.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Prefabricated building columns.
2. Metal nosings and treads.
3. Paint products.
4. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

C. Samples: For each type and finish of extruded nosing and tread.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Tubing: ASTM A 500, cold-formed steel tubing.

C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

D. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 or Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls.

B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

2.4 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi .

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

C. Weld corners and seams continuously to comply with the following:

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 welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 24 inches o.c.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

C. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.

2.7 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

C. Galvanize exterior miscellaneous steel trim.

2.8 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.9 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.

B. Galvanize loose steel lintels located in exterior walls.

2.10 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.11 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 40 steel pipe or steel shapes, as indicated.

B. Prime bollards with zinc-rich primer.

2.12 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.13 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning.":

1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Items: SSPC-SP 3, "Power Tool Cleaning."

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

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 welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

C. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 INSTALLING STEEL BOLLARDS

A. Anchor drilled-in place bollards in place with concrete footings. Core-drill holes approximately 6 inches deeper than embedded length of bollard or frame indicated on Drawings, and 4 inches larger than OD of bollard or frame vertical post. Clean holes of loose material, insert posts, and fill annular space between post and concrete and subgrade with concrete. Strike concrete fill flush with surrounding concrete floor slab, with slight rise to compensate for concrete shrinkage during curing. Trowel surface of fill to match surrounding concrete floor or paving. Locate bollards true and plumb, at height above finished floor as shown on Drawings. Support and brace bollards in position until concrete has cured.

1. Fill bollards solidly with concrete, mounting top in hemispherical dome shape as indicated.

B. Painting: Comply with requirements of Division 9 Section for preparation, priming and painting. Paint bollards OSHA Safety Yellow, unless indicated otherwise.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

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.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Steel: 72 percent of minimum yield strength.

C. 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.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Qualification Data: For qualified professional engineer.

E. Welding certificates.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

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 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.

B. 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. 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.

1. Provide galvanized finish for exterior installations and where indicated.

B. Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

D. Woven-Wire Mesh: Intermediate-crimp, square pattern, 1-1/2-inch woven-wire mesh, made from 0.135-inch nominal diameter wire complying with ASTM A 510.

2.3 FASTENERS

A. General: Provide the following:

1. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 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 exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
2. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Material for Exterior Locations: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.4 MISCELLANEOUS MATERIALS

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

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.5 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

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. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with either welded or nonwelded connections unless otherwise indicated.

H. 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.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. Form changes in direction as follows:

1. By bending or by inserting prefabricated elbow fittings.

K. 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.

L. Close exposed ends of railing members with prefabricated end fittings.

M. 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.

N. 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.

O. 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.

P. Woven-Wire Mesh Infill Panels: Fabricate infill panels from woven-wire mesh crimped into 1-by-1/2-by-1/8-inch metal channel frames. Make wire mesh and frames from same metal as railings in which they are installed.

1. Orient wire mesh with wires horizontal and vertical.

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. Galvanized Railings:

1. Hot-dip galvanize steel and iron railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
4. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. For nongalvanized steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.

PART 3 - EXECUTION

3.1 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.

3.2 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

3.3 ANCHORING POSTS

A. Anchor posts to floors using drilled-in expansion anchors or drilled-in chemical anchors indicated on Drawings.

B. Where indicated on Drawings, cover bases with flanges fabricated of same material as posts, and secured in place with set screws.

3.4 ATTACHING RAILINGS

A. Attach railings to wall with wall brackets. Provide brackets with 1-1/2-inch (38-mm) 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.

1. Use type of bracket with predrilled hole for exposed bolt anchorage.
2. 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.

3.5 ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.6 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 061053
MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.
2. Wood furring.
3. Utility shelving.
4. Plywood backing panels.
5. Prefabricated plywood backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Fire-retardant-treated wood.

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. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

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. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood nailers, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, and similar concealed members in contact with masonry or concrete.

2.3 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.
4. Utility shelving.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.

C. For utility shelving, provide lumber with 15 percent maximum moisture content of eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Premium or No. 2 Common (Sterling) grade; NeLMA, NLGA, WCLIB, or WWPA.

D. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.
2. Eastern softwoods, No. 2 Common grade; NELMA.
3. Northern species, No. 2 Common grade; NLGA.
4. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

2.4 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.5 PREFABRICATED PLYWOOD BACKING PANELS

A. Factory-Prefabricated Backing Panels: Fire-retardant treated 3/4" CDX Doug Fir Dricon® or FlamePRO® fire-retardant treated wood with factory-applied metal wings for attaching to metal framing; capable of supporting wall-mounted cabinets, plumbing fixtures, wall-protection components, and similar item. 48-inch long sections designed for 16 or 24 inch stud spacing. Unit height: 5-1/8 inches.

1. Danback; ClarkDeitrich Metal Framing, Inc.: D16F; D24F; and Danback “Trimmables.”

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. Power-Driven Fasteners: NES NER-272.

C. Screws for Fastening to Metal Framing: ASTM C 954, length as recommended by screw manufacturer for material being fastened.

2.7 MISCELLANEOUS MATERIALS

A. Flexible Flashing: Self-adhesive rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

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.

B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

G. Kerf back of concealed board nailers and blocking to prevent warping and cupping.

1. Provide 3/8 - inch deep, single-blade-width kerf cuts for each size board as follows:

a. 2x4: two.
b. 2x6, 2x8: three.
c. 2x10, 2x12: four.

3.2 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 061600
SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.

1.2 ACTION 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 fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements.

1.3 WARRANTY

A. Weather Resistant Sheathing Paper: Provide manufacturer's standard form of expressed warranty to cover cost of materials and labor to correct problems caused solely by the failure of building paper for a period of 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WALL SHEATHING

A. Fire Treated Plywood Gypsum Wall Sheathing:
1. Basis-of-Design Product: " Flame-Pro CDX Plywood."
2. Type and Thickness:

a. Regular, ¾ inch.

2.2 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For wall sheathing: Provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

D. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 PLYWOOD SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten Plywood to cold-formed metal framing with screws.
2. Refer to drawings for additional installation information.

END OF SECTION 061600

SECTION 064116
PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-faced architectural cabinets.
2. Plastic-laminate-clad countertops.
3. Cabinet hardware.
4. Standard-use plastic-laminate-clad countertops.
5. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.

B. Related Sections:

1. Division 09 Section “Simulated Stone Surfaces” for solid-surfacing and agglomerate countertops, splashes, and wall surfaces (if indicated).

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product high-pressure decorative laminate and cabinet hardware and accessories.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples:

1. Plastic laminates, for each color, pattern, and surface finish.
2. Thermoset decorative panels, for each color, pattern, and surface finish.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

B. Do not obtain material required for fabrication until Architect has approved mockups, initial samples for selection, and samples for verification.

C. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

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

1.4 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets 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.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.

B. Grade: Custom.

C. Type of Construction: Frameless.

D. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.

E. Reveal Dimension: 1/4 inch.

F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.

1. Manufacturers: Subject to compliance with requirements, provide the product(s) listed in the Finish Legend and Room Finish Schedule.

G. Laminate Cladding for Exposed Surfaces:

1. Balanced construction is mandatory.
2. Horizontal Surfaces: Grade HGS.
3. Horizontal Surfaces Other Than Tops: Grade HGS.
4. Vertical Surfaces: Grade VGS.
5. Cabinet Doors, Inside and Outside, unless otherwise noted: Grade VGS.
6. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.

H. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: Thermoset decorative panels.
2. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding, where unitized drawer systems are not indicated.
3. Drawer Bottoms: Thermoset decorative panels.
4. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

I. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As indicated by laminate manufacturer's designations.
2. Match Architect's sample.
3. As selected by Architect from laminate manufacturer's full range and indicated in the Finish Legend.

J. Edges of Plastic-Laminate Clad Doors, Drawer Fronts, Shelves: PVC tape, 3-mm thickness, matching laminate in color, pattern, and finish. Doellken-Woodtape PVC Edgebanding.

2.2 PLASTIC-LAMINATE COUNTERTOPS

A. Grade: Custom or better, unless otherwise noted.

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:

1. As indicated by manufacturer's designations in Finish Legend.

D. Core Material: 1-1/8 inch thick particleboard or medium-density fiberboard.

1. Provide paper backing on underside of countertop substrate.

E. Core Material at Sinks: 1-1/8-inch thick particleboard made with exterior glue, medium-density fiberboard made with exterior glue, or exterior-grade plywood.

1. Provide paper backing on underside of countertop substrate.

F. Splashes: Provide 2-inch high splashes fabricated from same material as countertop substrate, not less than ½ inch thick, and complying with the following:

1. Provide endsplashes or sidesplashes at countertops which die into walls, partitions, or taller millwork.
2. Match material, color, and height of sidesplashes or endsplashes to backsplashes, and to material and color of countertop.
3. Provide full-height backsplashes, end- and side-splashes where indicated on Drawings.

G. Countertop Edges: Plastic laminate matching countertop.

2.3 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Wood Moisture Content: 8 to 13 percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
2. Particleboard:

    a. ANSI A208.1, Grade M-2, made with binder containing no urea formaldehyde
    b. Grade M-2-Exterior Glue, for countertops at sinks and lavatories.

3. Softwood Plywood: DOC PS 1, medium-density overlay.
4. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.
5. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087111 "Door Hardware (Descriptive Specification)."

B. Butt Hinges: 2-3/4-inch, five-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:

1. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.

C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 100 degrees of opening.

D. Back-Mounted Pulls: BHMA A156.9, B02011.

E. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.

F. Adjustable Shelf Standards and Supports:

1. BHMA A156.9, B04071; with shelf rests, B04081
2. BHMA A156.9, B04102; with shelf brackets, B04112.

G. Shelf Rests: BHMA A156.9, B04013; [metal] [plastic] [metal, two-pin type with shelf hold-down clip].

H. Drawer Slides: BHMA A156.9.

1. Manufactured Unitized Drawer System: Blum: “Metabox.” Version C15. Series 330, or approved alternate product: Full Extension plus 3/4 inch (18 mm) override. Available Heights: Select slide height best suited to height of drawer box indicated on Drawings.

    a. Type N: 2-1/8 inches (54 mm).
    b. Type M: 3-5/8 inches (86 mm).
    c. Type K: 4-5/8 inches (118 mm).

d. Type H: 5-7/8 inches (150 mm).
e. Do not use manufactured unitized drawer system on drawer boxes exceeding 8 inches high, on lateral file drawers, or for box drawers of any depth exceeding 24 inches wide.
f. Limited to drawers not exceeding 100 lbf applied static load or 75 lbf applied dynamic load.

I. Door Locks: BHMA A156.11, E07121.

J. Drawer Locks: BHMA A156.11, E07041.

K. Door and Drawer Silencers: BHMA A156.16, L03011.

L. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Satin Aluminum,
2. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
3. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.
4. Satin Stainless Steel: BHMA 630.

M. Countertop Grommets- Countertop Wire Management: Minimum 3-inch OD, black, molded-plastic, ABS or styrene grommets and matching plastic caps with slot for wire passage:

1. Doug Mockett & Company, Inc.: Series MM5-21.

N. Countertop Support Braces: Prefinished, stamped metal bracket leg, tapered leg, with 3 by 3 inch by 45-degree notch for cleat and wireway; Finish: black powder coat, unless otherwise indicated. For tops up to 25 inches deep: Minimum 400 pound capacity per pair:

1. TMI Systems: Model A7453. (Basis-of-Design).

2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content. Where required, provide fire-retardant treated softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesives: Do not use adhesives that contain urea formaldehyde.

D. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.6 FABRICATION

A. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

B. Shop-cut openings to maximum extent possible to receive hardware, appliances, 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.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

C. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

D. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.

E. 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. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

1. 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.

2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
3. Secure backsplashes to walls with adhesive.
4. Caulk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."
5. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
6. 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, and adjust hardware.

END OF SECTION 064116

SECTION 064661
SOLID SURFACING MATERIALS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product data and material Samples.

PART 2 - PRODUCTS

2.1 SOLID-SURFACE-MATERIAL

A. Window Stools and Aprons: 1/2-inch-thick, solid-surface material.

1. Stool Projection: 1 inch from face of wall, 1 inch return beyond jambs.
2. Stool Edge Detail: Square face with arris on all edges and along return to wall.
3. Apron Edge Detail: Straight, slightly eased edges on bottom and ends.

B. Solid-Surface Material: Homogeneous, filled plastic resin complying with ICPA SS-1.

1. Basis-of-Design Manufacturer: Corian
2. Colors and Patterns: As indicated by manufacturer's designations for product listed on the Drawings.

C. Miscellaneous Materials:

1. Wood Products: As substrates for window stools. Comply with the following:

a. Medium-Density Fiberboard: ANSI A208.2, Grade MD, containing no urea formaldehyde.
b. Particleboard: ANSI A208.1, Grade M-2.
c. Softwood Plywood: DOC PS 1, Medium Density Overlay.

2. Adhesives:

a. Aliphatic-resin, polyurethane, or resorcinol wood glue, compatible with resin-filled materials.
b. Multipurpose Construction Adhesive. Type compatible with resin-filled materials.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Quality Standards:

1. Install woodwork to comply with AWI Section 1700.
2. Install countertops according to manufacturer's written directions.

B. Scribe and cut stools and aprons to fit adjoining work.

C. Fasten to substrates with adhesive. Align adjacent surfaces. Seal seams and perimeter with mildew-resistant silicone sealant.

D. Install level and plumb to a tolerance of 1/8 inch in 8 feet.

END OF SECTION 064661

SECTION 072100
INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rigid polystyrene board insulation.
2. Glass-fiber blanket thermal insulation.
3. Glass-fiber blanket acoustical insulation.

1.2 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.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Research/evaluation reports.

PART 2 - PRODUCTS

2.1 INSULATION PRODUCTS

A. Foundation Insulation: Extruded-Polystyrene Board Insulation: ASTM C 578, Type VI, with flame-spread and smoke-developed indexes of 75 and 450, respectively.

1. Thicknesses: 2 inches.

2.2 BOARD INSULATION PRODUCTS

A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type VI.

B. Acoustic Board: Owens Corning - Select Sound 2” thick.

2.3 BATT INSULATION PRODUCTS

A. Glass-Fiber-Blanket Insulation: ASTM C 665, Type I, unfaced.

B. Glass-Fiber-Blanket Insulation: ASTM C 665, Type III, Class A, foil faced on one.

C. Glass-Fiber-Blanket Insulation: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil-scrim kraft (FSK), or foil-scrim polyethylene.

D. Foil-Face Bubble Sheet: Foil facing both sides.

~~2.4 SPRAY POLYURETHANE FOAM INSULATION~~

~~A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.~~

~~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. BASF Corporation.~~
~~b. BaySystems NorthAmerica, LLC.~~
~~c. Dow Chemical Company (The).~~
~~d. ERSystems, Inc.~~
~~e. Gaco Western Inc.~~
~~f. Henry Company.~~
~~g. NCFI; Division of Barnhardt Mfg. Co.~~
~~h. SWD Urethane Company.~~

~~2. Minimum density of 1.5 lb/cu. ft., thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F.~~

2.5 AUXILLIARY MATERIALS

A. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by insulation manufacturers for sealing joints and penetrations in vapor-retarder facings.

B. Noise Proofing Compound: Green Glue Boise Proofing compound.

PART 3 - PRODUCTS

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation 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. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

E. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF BELOW-GRADE INSULATION

A. On vertical surfaces, set insulation units loosely laid according to manufacturer's written instructions.

1. If not otherwise indicated, extend insulation a minimum of 24 inches below exterior grade line.

B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

1. If not otherwise indicated, extend insulation a minimum of 24 inches in from exterior walls.

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Glass-Fiber Insulation: Install 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 the cavities, 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 not rated for or protected from contact with insulation.
4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
5. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
6. ***Exterior Walls: R19 + 11***

3.4 INSTALLATION OF INSULATION IN CEILINGS FOR SOUND ATTENUATION

A. Where indicated, install 3-inch- thick, unfaced glass-fiber blanket insulation over suspended ceilings at partitions in a width that extends insulation 48 inches on either side of partition. Secure 2 by 4 foot batts of insulation to each 2 by 4 foot acoustical ceiling panel with 3 (three) strips of double-sided carpet tape spaced 10 inches o.c.

3.5 Installation of Green Glue Compound

A. Refer to Green Glue Noise Proofing Compound Installations.

3.6 PROTECTION

A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.7 INSULATION SCHEDULE

A. Extruded-Polystyrene Board Insulation, Foundation Insulation:

1. Foundation insulation. 2 inches thick. Unfaced.

B. Glass-Fiber-Blanket Insulation, Walls:

1. Exterior wall insulation in 6 inch wide metal stud framing. 6 inches thick, R-19. Faced. Continuous blankets or batts sized to fit snugly in framing.
2. Acoustical ceiling batts: 3 inches thick, No R-rating required. 2 by 4 foot batts. Unfaced.

~~C. Sprayed Foam Insulation, Exterior Walls:~~

~~1. Spray onto wall to a minimum of 4 inches thick, or as noted on Drawings.~~

D. Roof Insulation System:

1. Roof Insulation, R30 +11

a. Install on top of upper layer of unfaced glass-fiber insulation which is to be draped over purlins. Install with bubble wrap adjacent to or nearest steel roof deck. Secure to insulation batt using T-pins in sufficient numbers and spacing to keep bubble sheet from sliding out of place.

2. Glass-Fiber-Blanket Roof Insulation, Primary:

a. Roof Insulation, Primary: 4-inch thick batt of unfaced insulation placed on top of 4-inch thick batt of faced insulation, continuous batt faced insulation.
b. Drape batts over roof purlins. Use insulation spaces.

END OF SECTION 072100

SECTION 079200
JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections:

1. Section 084113 “Aluminum Entrances and Storefronts,” for glazing sealants.
2. Section 099123 “Interior Painting” for sealing edge moldings at acoustical ceiling perimeter trim with sealant.
3. Division 32 Sections for sealing joints in asphalt paving and concrete curbs, sidewalks, and paving.

1.2 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants when ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.

1.5 WARRANTY

A. Special Installer's Warranty: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EXTERIOR JOINT SEALANTS

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions.

B. Colors: Selected by Architect from manufacturer’s full range.

C. Sealants for Exterior Uses in in Horizontal Traffic Surfaces:

1. Urethane Joint Sealant ASTM C920, single (S) or multi-component (M) pourable (P) or nonsag (NS), traffic grade (T), Class 25 or Class 50.
2. Manufacturers:

    a. BASF Building Systems.
    b. Bostik, Inc.
    c. Pecora Corporation.
    d. Sika Corporation; Construction Products Division.
    e. Tremco Incorporated.

D. Sealants for Exterior Uses in Vertical Joints:

1. Neutral-Curing Silicone Joint Sealant ASTM C920; Single-Component (S), Nonsag (NS).
2. Specific Joint Conditions:

    a. Joints around and between aluminum storefront window components.
    b. Expansion and control joints in masonry, and metal panels except as noted below for permanently concealed joints.
    c. Expansion and control joints in EIFS.
    d. Provide not less than medium modulus sealants at joints to a height of not less than 7 feet-0 inches (84 inches) above adjacent walking surfaces, or to the first logical transition location above that dimension. Sealants above this height may be low-modulus.

3. Manufacturers, General Use:

    a. BASF Building Systems.
    b. Dow Corning Corporation; 798.
    c. GE Advanced Materials - Silicones.
    d. Pecora Corporation; 890
    e. Sika Corporation; Construction Products Division.
    f. Tremco Incorporated; Spectrem 1.

E. Sealants for Exterior Uses in Concealed Locations:

1. Butyl-Rubber-Based Joint Sealant: ASTM C 1311.
2. Specific Joint Conditions:

    a. Threshold bedding.
    b. Factory-applied in roofing panel interlocking joints.

3. Products:

    a. Bostik, Inc.; Chem-Calk 300.
    b. Pecora Corporation; BC-158.
    c. Tremco Incorporated; Tremco Butyl Sealant; JS733 Non-Curing Butyl Sealant.

2.2 INTERIOR JOINT SEALANTS

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions.

B. Colors: Selected by Architect from manufacturer's full range.

C. Sealants for Interior Horizontal Traffic Joints:

1. Urethane, ASTM C 920, Single (S) or multi-component (M) urethane, Pourable (P); traffic grade (T), Class 25.

a. Specific Joint Conditions: Isolation joints in cast-in-place concrete slabs.

2. Manufacturers:

a. BASF Building Systems.
b. Bostik, Inc.
c. Pecora Corporation.
d. Sika Corporation; Construction Products Division.
e. Tremco Incorporated.

D. Sealants for Interior Uses at Vertical Surfaces and Horizontal Non-Traffic Surfaces:

1. Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

a. BASF Building Systems, Sonolac.
b. Bostik, Inc; Chem-Calk 600.
c. Pecora Corporation; AC-20+.
d. Tremco Incorporated; Tremflex 834.

E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, 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, the following:

a. BASF Building Systems; Omniplus.
b. Dow Corning Corporation; 786 Mildew Resistant.
c. GE Advanced Materials - Silicones; Sanitary SCS1700.
d. May National Associates, Inc.; Bondaflex Sil 100 WF.
e. Tremco Incorporated; Tremsil 200 Sanitary.

F. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products for Exposed or Concealed Joints: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Chemrex, Inc.; PL Acoustical Sealant.
    b. Pecora Corporation; AC-20 FTR.
    c. USG Corporation; SHEETROCK Acoustical Sealant.

2. Products for Concealed Joints: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pecora Corporation: BA-98.
    b. Tremco, Inc.; Tremco Acoustical Sealant

3. Proprietary Acoustical Sealant: One-component, non-skinning, non-drying butyl sealant, for use with acoustical gypsum board panel products.

    a. "QuietSeal" QS-350, by Quiet Solutions, Inc.

2.3 JOINT SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin).

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer. Provide self-adhesive tape where applicable.

C. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

D. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

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

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
2. Remove laitance and form-release agents from concrete.
3. Clean metal and glass surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer.

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.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193.

B. Install sealant backings to support sealants during application and to produce cross-sectional shapes and depths of installed sealants that allow optimum sealant movement capability.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements stated below to form smooth, uniform beads of configuration indicated; to eliminate air pockets. Ensure contact and adhesion of sealant with sides of joint.

1. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

E. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses.

END OF SECTION 079200

SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Standard hollow metal doors and frames.
2. Hollow metal doors and frames for severe weather storm shelters.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Details of conduit and preparations for power, signal, and control systems.

1.3 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 non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inchhigh wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inchspace between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.5 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.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes 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, provide steel doors and frames from a SDI Certified manufacturer:

1. Amweld International, LLC.
2. Ceco Door Products; an Assa Abloy Group company.
3. Curries Company; an Assa Abloy Group company.
4. Deansteel.
5. Mesker Door Inc.
6. Republic Doors and Frames.
7. Steelcraft; an Ingersoll-Rand company.

2.2 REGULATORY REQUIREMENTS

A. Tornado-Rated Safe Room Door and Frame Assemblies: Complying with testing requirements of FEMA P-361 and FEMA P-320, and ICC 500, latest editions, and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for tornado ratings indicated.

1. Assemblies must have been tested and passed tests proving resistance to wind speeds not less than 250 mph.
2. Extra-Heavy-Duty doors and frames alone are not permitted.
3. Wood doors are not permitted.

2.3 STANDARD HOLLOW METAL DOORS

A. General: Comply with ANSI/SDI A250.8.

1. Design: Flush panel.
2. Vertical Edges for Single-Acting Doors: Beveled edge, 1/8 inch in 2 inches.
3. Top and Bottom Edges: Closed with flush top edges, and flush or inverted 0.042-inch-thick, end closures or channels of same material as face sheets on bottom edge.

4. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

B. Exterior Doors: Face sheets fabricated from cold-rolled steel sheet. Comply with ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Level 3 and Physical Performance Level A (Extra Heavy Duty).
2. Core Construction: Manufacturer's standard polystyrene insulation core.

a. Thermal-Rated (Insulated) Doors: R-value of not less than 6.0 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

C. Hardware Reinforcement: ANSI/SDI A250.6.

2.4 STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8.

B. Exterior and Storm-Rated Interior Frames: Fabricated from metallic-coated steel sheet.

1. Fabricate frames as full frame welded.
2. Frames for Level 3 Steel Doors: 0.067-inch- (18 ga) thick steel sheet.
3. Frame Dimensions: 2 inch face by 5-3/4 inch for both head and jamb.
4. Rabbet: Unequal.
5. Thermal-Rated (Insulated) Exterior Doors: Provide doors with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.
6. Exposed Finish: Factory primed.

C. Interior Frames: Fabricated from cold-rolled steel sheet.

1. Fabricate frames as knock-down.
2. Frames for Wood and Interior Hollow Metal Doors: 0.053-inch- (16 ga.) thick steel sheet, unless otherwise indicated.
3. Frames for Borrowed Lights: Same as adjacent door frame.
4. Exposed Finish: ***Pre-finished, color selected by Architect from full range of colors.***

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

E. Jamb Anchors:

1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

2.5 TORNADO-RESISTANT RATED DOORS AND FRAMES

A. Tornado-resistant assemblies shall be a complete assembly including frame, frame-to-wall anchors, doors, hinges, and latching hardware.

B. Provide permanently affixed labels on both the door and frame from Warnock-Hersey or UL certifying that the components have been tested in accordance with recognized standards listed above and passed.

2.6 FABRICATION

A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

B. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
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 from 60 to 90 inches high.
        2) Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
4. Postinstalled Expansion Type for In-Place Concrete: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
5. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch), and as follows:

    a. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

6. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.

    a. Single-Door Frames: Three door silencers.
    b. Double-Door Frames: Two door silencers.

C. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware 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 with Division 26 electrical Sections.

2.7 ACCESSORIES

A. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

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. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

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.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb that extends to floor, and secure with post-installed expansion anchors.
3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.

4. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
6. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
2. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
3. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
4. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

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. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 081113

SECTION 081416
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Sections:

1. Section 088000 "Glazing" for glass view panels in flush wood doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door indicated. Include factory-finishing specifications.

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. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.

C. Samples: For factory-finished doors.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Algoma Hardwoods, Inc.
2. Buell Door Company Inc.
3. Chappell Door Co.
4. Eggers Industries.
5. Marshfield Door Systems, Inc.
6. Oshkosh Architectural Door Company.
7. Poncraft Door Company.
8. Vancouver Door Company.
9. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

A. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2 , made with binder containing no urea-formaldehyde resin.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
3. Provide doors with either glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

B. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Custom (Grade A faces or better).
2. Species: Select white birch.
3. Cut: Plain sliced.
4. Match between Veneer Leaves: Slip match.
5. Assembly of Veneer Leaves on Door Faces: Center and balance match.
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Core: Particleboard.
8. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.

2.4 LIGHT FRAMES

A. Provide view light frames of sizes and in locations shown on Drawings.

B. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads as follows unless otherwise indicated.

1. Wood Species: Same species as door faces.
2. Profile: Flush rectangular beads.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied.

C. Openings: Cut and trim openings through doors in factory.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

D. Factory-finish doors indicated for transparent finish with stain and manufacturer's standard finish complying with WDMA TR-6, catalyzed polyurethane for grade specified for doors.

1. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

END OF SECTION 081416

SECTION 087100
DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hinges and Pivots.
2. Mortise Locksets and Deadbolts.
3. Cylindrical Locksets and Deadbolts.
4. Dead Bolts.
5. Cylinders.
6. Keying.
7. Exit Devices.
8. Surface Door Closers.
9. Concealed Door Closers.
10. Low Energy Operators.
11. Fire/Life Safety Devices.
12. Miscellaneous Trim.

1.2 REFERENCES

A. ANSI A117.1 - American National Standard for Accessible and Useable Buildings and Facilities.

B. ANSI/BHMA A156.1, "Butts and Hinges" (copyrighted by BHMA, ANSI approved).

C. ANSI/BHMA A156.3 - American National Standard for Exit Devices.

D. ANSI/BHMA A156.4 - American National Standard for Door Controls - Closers.

E. ANSI/BHMA A156.6, "Architectural Door Trim" (copyrighted by BHMA, ANSI approved).

F. ANSI/BHMA A156.7, "Template Hinge Dimensions" (copyrighted by BHMA, ANSI approved).

G. ANSI/BHMA A156.13 - American National Standard for Mortise Locks and Latches Series 1000.

H. ANSI/BHMA A156.15 - Life Safety Closer/Holder/Release Devices.

I. ANSI/BHMA A156.16 - Auxiliary Hardware.

J. ANSI/BHMA A156.18 - Materials and Finishes.

K. ANSI A156.25 - American National Standard for Electrified Locking Devices

L. ANSI A156.28 - American National Standard for Keying Systems

M. ANSI A156.31 - American National Standard for Electric Strikes and Frame Mounted Actuators

N. NFPA 80 - Standard for Fire Doors, Fire Windows.

O. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

P. Underwriters Laboratories (UL). - Fire Resistance Directory.

Q. ANSI/UL 10C - Standard for Safety for Positive Pressure Fire Tests of Door Assemblies.

1.3 PERFORMANCE REQUIREMENTS

A. Local building code, and Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's catalog cuts on each product to be used.

C. Shop Drawings: Indicate locations and mounting heights of each type of hardware, schedules, electrical characteristics and connection requirements.

D. Schedule:

1. Submit schedule indicating each type of hardware for each door.
2. List manufacturer's name with each manufacturer's hardware number together with finishes in US standards.
3. Show door number/location, handing, door and frame material, manufacture and catalog numbers, all finishes and keying information. Explain fully all abbreviations.

E. Shop Drawings:

1. Indicate locations and mounting heights of each type of hardware.
2. Supply templates to door and frame manufacturer(s) to enable proper and accurate sizing and locations of cut-outs for hardware.
3. Detail any conditions requiring custom extended lip strikes, or any other special or custom conditions.
4. Wiring diagrams including point to point and riser diagrams, function statements and system descriptions for all electrical hardware

F. Verification Samples: For each finish product specified.

1. If required by the Architect, submit one sample of each type of typical hardware required illustrating style, color, and finish.
2. Approved samples may be incorporated into Work.

G. Closeout Submittals:

1. Project Record Documents: Schedule showing actual locations of installed cylinders and their master key code.
2. Parts lists and maintenance instructions including data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
3. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer with a minimum of ten years experience manufacturing door hardware.

B. Supplier Qualifications: A supplier with a minimum of two years demonstrated experience in the sale and distribution of builders' hardware for commercial projects and who has successfully completed at least three projects of similar complexity to the project specified.

C. Hardware Supplier Personnel: Employ Architectural Hardware Consultant (AHC) or equally qualified person to supervise and prepare all schedules, details, and services required for the project.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually with necessary fasteners and installation templates when necessary; label and identify each package with door opening code to match hardware schedule.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

D. Store materials in a dry, warm, ventilated weathertight location.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Provide factory warranty against defects in material and workmanship as follows:

1. Mortise locks, Grade 1, 10 Year War`ranty.
2. Cylindrical locks, Grade 1, 10 Year Warranty.
3. Standard and Interchangeable Cylinders, 2 Year Warranty.
4. Electrical components 2 Year Warranty.
5. Exit devices 10 year mechanical / 2 years electrical

1.9 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to each different or special hardware component.

1.10 COORDINATION

A. Coordinate work with other directly affected components involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

B. Coordinate work with other directly affected components involving electrical wiring and components.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: DORMA,:www.dorma.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 HINGES AND PIVOTS

A. Hinges: ANSI A156.1, full mortise template type complying with following general requirements unless otherwise scheduled.

1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
2. Number: Furnish minimum three hinges to 90 inches (2 286 mm) high, four hinges to 120 inches (3 048 mm) high for each door leaf.
    a. Residential Wood Doors: Furnish minimum two hinges.
3. Size and Weight: 4-1/2 inch (114 mm) heavy weight typical for 1-3/4 inch (44 mm) doors.
    a. Doors Over 40 inches (1 016 mm) Wide: Extra heavy weight ball or oilite bearing hinges.
    b. Doors 1-3/8 inch (35 mm) Thick: 3-1/2 inch (89 mm) size.
    c. Doors 2 inch (50 mm) Thick: 5 inch (125 mm) extra heavy weight ball or oilite bearing.
    d. Doors Over 48 inches (1 220 mm) Wide: 5 inch (125 mm) extra heavy weight ball or oilite bearing.
4. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior and locked outswinging doors, non-rising pins at interior doors.
5. Tips: Furnish with matching plug.
6. Material: Stainless Steel

7. Material: Steel - Polished and plated.

2.3 MORTISE LOCKSETS AND DEADBOLTS

A. Lockset: DORMA ML9000 Series.

1. Standards:

a. ANSI Conformance - ANSI A156.13, Operational Grade 1, Security Grade 1.
b. U.L. and C.U.L. listed for use on 3-hour fire-rated doors and for all positive pressure applications.
c. U.L. and C.U.L. listed for UL 10B/10C.
d. Lever trim meets A117.1 and ADA requirements.

2. Features:

a. Stainless steel latch.
b. Stainless steel dead bolt.
c. Hardened steel rollers in dead bolt.
d. Security spacer between inside and outside lever.
e. Steel lock case and internal components.
f. Full length face plate.
g. All trim through-bolted through the lock case.
h. Accepts standard and interchangeable core cylinders.

3. Function: As noted on the hardware schedule attached to this section.
4. Trim: As noted on the hardware schedule attached to this section.
5. Lock Cylinder: As noted on the hardware schedule attached to this section.
6. Finish: As noted on the hardware schedule attached to this section.

2.4 CYLINDERS

A. Interchangeable Core Lock Cylinder: ANSI A156.5.

1. Pin Count: 7 nickel-silver pins.

B. Patented Key Control Cylinders:

1. DORMA SKC (Serialized Key Control) Cylinders, ANSI A156.5, Grade 1.
2. Best Patented ANSI A156.5, Grade 1.

2.5 KEYING

A. Keying:

1. Keying: Factory Keyed as directed by Architect.
2. Keying: Factory Master keyed.
3. Interchangeable Core with temporary construction cores.

B. Keys:

1. Nickel silver. Stamp keys with "DO NOT DUPLICATE".
2. Supply keys in the following minimum quantities:

    a. Control keys 2.
    b. Change keys 2 per cylinder.
    c. Master keys 2.
    d. Construction Control keys 2.
    e. Construction keys 10.

C. Key Cabinet:

1. Construction: Sheet steel or aluminum construction, piano hinged door with cylinder type lock master keyed to building system.
2. Size: Size for Project keys plus sufficient space for 10 percent growth.
3. Key and key hook labeling system.
4. Finish: Manufacturer's standard as selected by the Architect.

2.6 EXIT DEVICES

A. General:

1. DORMA exit devices are listed by U.L. and C.U.L. under their continuing reinspection programs and conform to standards U.L. 10C and U.B.C. 7-2 (1997) positive pressure testing. They are BHMA certified to the requirements of ANSI A156.3 for Grade 1 exit devices.
2. Exit Devices: Exit devices shall be type and function as listed in hardware sets. Use fire exit hardware where exit devices are scheduled for fire door assemblies. Where lever handle trim is specified, match lever trim on locksets. Furnish free wheeling lever trim as standard. Construct device touchbar, rail and cover assemblies of heavy gauge solid wrought materials for true architectural finishes. Provide cylinder dogging on all non-rated devices. Furnish all devices with stainless 3/4 inch (19 mm) throw deadlocking latchbolts.

B. 9000 Series, Heavy Duty Exit Device: ANSI A156.3, Grade 1, heavy duty exit devices. Heavy duty RIM devices shall maintain a minimum latch bolt static load rating of 3,000 lbs.

1. Function: As noted on the hardware schedule attached to this section.
2. Strikes: Provide types suitable for opening.
3. Finish: As noted on the hardware schedule attached to this section.

C. 9000 Series Narrow Stile, Heavy Duty Exit Device: ANSI A156.3, Grade 1, heavy duty exit devices. Narrow Stile RIM devices shall maintain a minimum latch bolt static load rating of 1,500 lbs.

1. Model: As noted on the hardware schedule attached to this section.
2. Function: As noted on the hardware schedule attached to this section.

3. Trim: As noted on the hardware schedule attached to this section.
4. Strikes: Provide types suitable for opening.
5. Finish: As noted on the hardware schedule attached to this section.

2.7 SURFACE DOOR CLOSERS

A. Closers used in conjunction with overhead stops and holders shall be templated and coordinated to function properly. Properly detail closers to meet application requirements by providing drop plates, brackets, etc. to meet application and installation requirements as indicated.

B. 8900 Series: ANSI A156.4, Grade 1, heavy duty surface door closer.

1. Model 8916 for interior and exterior applications features adjustable spring sizes from 1 to 6 and meets ANSI A117.1 and ADA for barrier-free accessibility.
2. Model 8956 features adjustable spring sizes from 5 to 6 plus 50 percent adjustment for wide, tall or heavy doors.
3. Compliant with UL10C for positive pressure.
4. Certified to 10 million cycles by a recognized test lab.
5. Non-handed.
6. Featuring full range spring power adjustment and backcheck, with a narrow projection full cover and flatform style arm.
7. Door control also features a backcheck positioning adjustment for parallel arm applications, to maintain an ANSI backcheck range similar to regular and top jamb applications.
8. Independent sweep and latch non-critical closing speed adjustment.
9. Finish: As specified in the Door Hardware Schedule.

C. 8600 Series: ANSI A156.4, Grade 1, surface door closer.

1. Model 8616 for interior and exterior applications and meets ANSI A117.1 and ADA for barrier-free accessibility.
2. Model 8616 features adjustable spring sizes from 1 to 6.
3. Compliant with UL10C for positive pressure.
4. Non-handed.
5. Door control also features a backcheck positioning adjustment for parallel arm applications, to maintain an ANSI backcheck range similar to regular and top jamb applications.
6. Independent sweep and latch non-critical closing speed adjustment.
7. Finish: As specified in the Door Hardware Schedule.

2.8 MISCELLANEOUS TRIM

A. Push/Pulls: ANSI A156.6; push plates minimum 0.050 inch (1.27 mm) thick.

1. Type: As noted on the hardware schedule attached to this section.
2. Size: Push plates shall be ANSI J302, thickness .050 inch.
3. Size: Pull plates shall be ANSI J405, thickness .050 inch.

4. Cut plates for cylinder or thumb piece when used with deadlock.
5. Provide with through bolts to secure from opposite door face.
6. Finish: As specified in the Door Hardware Schedule.

B. Flush Bolts: ANSI A156.16 Grade 1 top and bottom flush bolts, with dust-proof floor strike.

1. Manual.
2. Automatic.
3. Provide as indicated on the Schedule.
4. Finish: As specified in the Door Hardware Schedule.

C. Protection Plates, ANSI A156.6.

1. Kickplates, 2 inches (51 mm) less than door width.
2. Mop Plate, 1 inch (25 mm) less than door width:
3. Armor Plates, 2 inches (51 mm) less than door width:
4. Height, indicated in Schedule
5. Minimum 0.050 inch (1.27 mm) thick stainless steel.
6. Provide as indicated on the Schedule.

D. Weatherstripping and thresholds as specified in the Door Hardware Schedule.

E. Stops: Provide for all doors to control the desired limit of opening helping to prevent damage to adjacent walls, columns, equipment, the door or its hardware

1. Provide wall stops or floor stops(except in areas where their location would impede traffic) or overhead stops. Stops of correct height shall be used on exterior and interior doors.
2. Doors with surface closers may be provided with S-DS or S-IS dead stop arms, ILO the above.
3. Wall Stops: ANSI A156.1, Grade 1, with no visible screws:
   a. Provide as indicated on the Schedule.
   b. Finish: As specified in the Door Hardware Schedule.

4. Floor Stops: ANSI A156.1 Grade 1:

   a. Provide as indicated on the Schedule.
   b. Finish: As specified in the Door Hardware Schedule.

5. Use roller type stops in areas where the interfering swing of one door may cause damage through contact with another door.
6. Roller Latch Angle Stops: Special angle stop ANSI A156.16 Type E19111.

F. Silencers for Metal Door Frames: ANSI A156.16, Type L03011; grey rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame, specifically designed to form an air pocket to absorb shock and reduce noise of door closing. Provide 2 silencers for each pair of doors, 3 silencers for each single door.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify doors and frames are ready to receive door hardware and dimensions are as indicated on shop drawings.

C. Verify electric power is available to power operated devices and is of correct characteristics.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.

C. Install with fasteners provided by hardware item manufacturer.

D. Adjust hardware for smooth operation.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.4 DOOR HARDWARE SCHEDULE

A. Refer to Section 087101 DOOR HARDWARE SCHEDULE

END OF SECTION 087100

SECTION 092216
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
2. Suspension systems for interior gypsum ceilings and soffits.
3. Refer to Section 054000- Cold-formed Metal Framing for non-load bearing interior wall framing extending to roof structure, ceiling joists and header for accordion style partition

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 METAL FRAMING AND SUPPORTS

A. Steel Framing Members, General: ASTM C 754.

1. Steel Sheet Components: ASTM C 645. Thickness specified is minimum uncoated base-metal thickness.
2. Protective Coating: ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.

B. Framing Systems:

1. Studs and Runners: In depth indicated in Interior Partition Legend on the Drawings, and of following thicknesses unless otherwise indicated.

    a. 0.018 inch (25 gauge). Standard for all framing unless noted
    b. 0.033 inch (20 gauge) at door leafs and openings exceeding 3 feet-6 inches wide, at ceramic or porcelain tile-clad walls, and as indicated.

2. Flat Strap and Backing: 0.040 thick (20 gauge).
3. Hat-Shaped, Rigid Furring Channels: In depth indicated and 0.018 inch thick (25 gauge).
4. Resilient Furring Channels: 1/2 inch deep, with single- or double-leg configuration.
5. Cold-Rolled Furring Channels: 0.053 inch thick, 3/4 inch deep.
6. Z-Furring: In depth required by insulation, 1-1/4-inch face flange, 7/8-inch wall-attachment flange, and 0.018 inch thick.

C. Slip-Type Head Joints: Where indicated, provide one of the following in thickness not less than indicated for studs and in width to accommodate depth of studs:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch-deep flanges, with continuous bridging located within 12 inches of the top of studs for lateral bracing.
2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch-deep flanges 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 due to deflection of structure above.

D. Suspension Systems:

1. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch diameter, or double strand of 0.048-inch-diameter wire.
2. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, and 0.162-inch diameter.
3. Carrying Channels: Cold-rolled steel, 0.053 inch thick, 1-1/2 inches deep.
4. Furring Channels: 3/4-inch-deep, cold-rolled channels, 0.053 inch thick
5. Resilient furring channels, 1/2 inch deep, with single- or double-leg configuration.
6. Grid Suspension System for Gypsum Board Ceilings: Interlocking, direct-hung system, ASTM C 645, direct-hung.

    a. Products: Provide one of the following:

        1) Armstrong World Industries, Inc.; “Shortspan” Drywall Framing System.
        2) Chicago Metallic Corporation; 640-C Drywall Furring System.
        3) USG Corporation; Drywall Suspension System.

2.2 ACCESSORIES

A. General: 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.

B. Isolation Strip at Exterior Walls: Asphalt felt or foam gasket.

C. Sill Sealer Gaskets: Install at acoustically rated walls, or where indicated on Drawings.

1. Closed-cell neoprene foam, ¼ inch (6.4 mm) thick, manufacturer’s standard width to match width of sill member.
2. Glass-fiber resilient insulation, strip form, for use as a sill sealer; 1-inch (25.4) mm nominal thickness, compressible to 1/32 (0.8 mm); manufacturer’s standard widths to match width of sill member.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install steel framing to comply with ASTM C 754.

1. Gypsum Board Assemblies: Also comply with ASTM C 840.

B. Install studs so flanges within framing system point in same direction.

1. Single-Layer Application: 16 inches o.c., unless otherwise indicated.
2. Multilayer Application: 16 inches o.c., unless otherwise indicated.
3. Single-Layer Construction Receiving Ceramic Tile (Glass-Mat Tile Backer Boards): 12 inches o.c., or as recommended in "Handbook for Ceramic Tile Installation," latest edition. Install of 20 gauge members.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Isolate steel framing from building structure, except at floor, to prevent transfer of loading imposed by structural movement.

1. Where studs are installed directly against exterior walls, install isolation strip between studs and wall.

E. Install suspension systems level to within 1/8 inch in 12 feet.

F. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

G. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
2. Splay hangers to miss obstructions and offset resulting horizontal forces by bracing, countersplaying.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
4. Coordinate location of hangers beneath ducts and piping so that hangers do not block access to, resetting of, operation or, or opening of duct access panels or dampers, or access to and operation of valves and similar piping controls.
5. Do not attach hangers to steel roof deck.
6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit.

H. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

END OF SECTION 092216

SECTION 092900
GYPSUM BOARD

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product data.

B. Samples: Trim Accessories: Full-size Sample, 12-inches-long length for each trim accessory.

1.2 QUALITY ASSURANCE

A. Mockups: Before beginning installation, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for each level of gypsum board finish indicated for use in exposed locations.
2. Apply or install final decoration indicated, including painting, on exposed surfaces.
3. Simulate finished lighting conditions for review of mockups.
4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.3 PROJECT CONDITIONS

A. Environmental Limitations: ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged. Indications that panels are wet or moisture damaged include discoloration, sagging, or irregular shape. Indications that panels are mold damaged include fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANEL PRODUCTS

A. Available Manufacturers:

1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
5. National Gypsum Company.
6. Temple-Inland.

7. USG Corporation.

B. Provide in maximum lengths available to minimize end-to-end butt joints.

C. Interior Gypsum Board: ASTM C 1396/C 1396M, in thickness indicated, with manufacturer's standard edges.

1. 5/8 inch regular type. Long edges tapered.
2. 1/2-inch sag-resistant type for ceiling surfaces. Long edges tapered.

D. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M.

1. 5/8-inch Regular type (MR). Long edges tapered.

2.2 ACCESSORIES

A. Trim Accessories: ASTM C 1047, paper-faced galvanized steel sheet.

1. Provide cornerbead at outside corners unless otherwise indicated.
2. Provide LC-bead (J-bead) at exposed panel edges.
3. Provide control joints where indicated.

B. Joint-Treatment Materials: ASTM C 475/C 475M.

1. Joint Tape, Interior Boards: Paper unless otherwise recommended by panel manufacturer.
2. Joint Tape for Glass-Mat Water-Resistant Backing Panels: Type recommended by panel manufacturer.
3. Joint Compounds:

a. Prefilling, and Embedding and First Coat: Setting-type compounds
b. Fill Coat and Finish Coats: Drying-type, ready-mixed, all-purpose compounds.
c. Exterior Soffits: Setting-type compounds.

C. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

D. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant complying with ASTM C 834.

E. Thermal and Acoustic Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install gypsum board to comply with ASTM C 840.

1. Isolate gypsum board assemblies from abutting structural and masonry work. Provide edge trim and acoustical sealant.
2. Single-Layer Fastening Methods: Fasten gypsum panels to supports with screws.
3. Multilayer Fastening Methods: Fasten base layers and face layer separately to supports with screws.

B. Finishing Gypsum Board: ASTM C 840.

1. At concealed areas, unless a higher level of finish is required for fire-resistance-rated assemblies, provide Level 1 finish: Embed tape at joints.
2. At substrates for tile, provide Level 2 finish: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges.
3. Unless otherwise indicated, provide Level 4 finish: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges.

C. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.

3.2 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.

END OF SECTION 092900

SECTION 095113
ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data and Samples.

B. Samples: For each exposed product and for each color and texture specified.

1.2 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 2.0 percent of amount installed.
2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store acoustical panels and suspension systems in a fully enclosed, conditioned space protected from damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

B. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Standard: Acoustical panel ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 ACOUSTICAL PANELS

A. Manufacturers: United States Gypsum (USG).

1. Radar Basic R2110, white

B. Classification: As follows, per ASTM E 1264:

1. ACT 1: Type III, Form 2, Pattern CE (perforated, small holes and lightly textured. Wet-formed mineral fiber with factory-applied latex paint. Color: white.

a. 24 by 24 inches by 15/16 inch thick.

b. Edge: Square.

2.3 CEILING SUSPENSION SYSTEM

A. Manufacturers: Armstrong World Industries.

B. Ceiling Suspension System: Armstrong “Prelude XL,” Wide-face, 15/16 inch. direct-hung system; ASTM C 635, intermediate-duty structural classification.

1. Face Design: Flat, flush.
2. Face Finish: Painted white.
3. For Ceiling Panels: All designations.
4. Provide Black tile and grid in Studio Area corridors.
5. Provide Black Gypsum board panels and grid in studio

C. Attachment Devices: Sized for 5 times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated. Comply with seismic design requirements.

D. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

1. Size: Provide yield strength at least 3 times the hanger design load (ASTM C 635, Table 1, Direct Hung), but not less than 0.106-inch- (2.69-mm-) diameter wire.

2.4 SEALANT

A. Sealant at Edge Molding: For sealants installed at joint between edge molding and painted wall surfaces, refer to Section 099123 “Interior Painting.”

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install acoustical 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. Layout ceiling grid such that no main runners are installed beneath mechanical ductwork fire damper access doors. Only easily removable cross-tees may be installed beneath access doors. Coordinate work with mechanical trades and, where possible, from mechanical ductwork shop drawings. Inform Architect before installing any ceiling grid which appears to have a conflict, so adjustments can be made in ceiling grid, lighting fixture, and diffuser designs and layout.

C. 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 and, if permitted with fire-resistance-rated ceilings, 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 steel roof deck tabs. Attach to structural members.
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. 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.
9. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

D. 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.

E. Arrange directionally patterned acoustical units as indicated on Drawings.

3.2 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096513
RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient base.
2. Aluminum transition accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches (300 mm) long, of each resilient product color, texture, and pattern required.

1.3 QUALITY ASSURANCE

A. 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.

1.4 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive resilient products.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

A. Resilient Base:

1. Basis-of-Design Manufacturer: Tarkett.

2. Other Available 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. Armstrong World Industries, Inc.
    b. Johnsonite.

B. Resilient Base Standard: ASTM F 1861.

1. Material Requirement: Type TS (rubber, vulcanized thermoset).
2. Manufacturing Method: Group I (solid, homogeneous).
3. Style: Cove (base with toe).

C. Physical Requirements:

1. Minimum Thickness: Indicated by manufacturer’s standard for product listed.
2. Height: 4 inches.
3. Lengths: Coils in manufacturer's standard length.
4. Outside Corners: Job formed.
5. Inside Corners: Job formed.
6. Finish: As selected by Architect from manufacturer's full range.
7. Colors and Patterns: As indicated in Finish Legend.

2.2 MOLDING ACCESSORY

A. Aluminum Transition Strips: Ceramic or Porcelain Tile to Carpet Tile; Ceramic tile to vinyl tile.

1. Manufacturer: Schluter.
2. Material: Anodized aluminum, brushed chrome finish.
3. Profile and Dimensions: RENO-U.
4. Selected exact profile to suit floor materials heights and thicknesses.

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. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. 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.

C. Do not install resilient products until they are same temperature as the space where they are to be installed. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.2 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

3.3 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Cover resilient products until Substantial Completion.

END OF SECTION 096513

SECTION 096813
TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modular carpet tile.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 SUBMITTALS

A. Action Submittals:

1. Product Data: For each type of product indicated.
2. Shop Drawings: Show layout and pattern type, location, and direction:
3. Samples: For each exposed product and for each color and texture specified.

B. Informational Submittals: Product test reports; Sample warranty.

C. Closeout Submittals: Maintenance data.

1.4 MAINTENANCE MATERAILS SUBMITTAL

A. Extra Materials: Deliver to Owner carpet tiles equal to 5 percent of each type and color installed, packaged with protective covering for storage.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An installer with a proven, successful record of installations of the same type and size as this Project.

B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.7 FIELD CONDITIONS

A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."

B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

1.8 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within 10 years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Products: Subject to compliance with requirements, provide the products listed in the Finish Legend and Room Finish Schedule:

B. Colors and Patterns: Indicated in the Finish Legend.

C. Primary Backing/Backcoating: Manufacturer's standard composite materials.

D. Applied Soil-Resistance Treatment: Manufacturer's standard material.

E. Antimicrobial Treatment: Manufacturer's standard material.

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Carpet Tile Adhesives: Pressure-sensitive type that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for conditions indicated for releasable installation.

1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Edge/Transition Strips: Rubber transition strips, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints. Refer to Division 09 Section “Resilient Base and Accessories.” Provide resilient edge/transition strips if and as indicated in the Room Finish Schedule.

D. Provide TEC - Liquidam EZ Moisture Vapor Barrier over existing floor slab in Open Office A022 and Office A021.

PART 3 - EXECUTION

3.1 INSTALLATION

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 tile performance. Examine carpet tile for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710.

C. 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.

D. 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 tile manufacturer.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

F. Installation: Comply with CRI 104, Section 14, "Carpet Modules."

G. Maintain dye lot integrity. Do not mix dye lots in same area.

H. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

I. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

J. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

K. Install pattern parallel to walls and borders, unless otherwise indicated in the Drawings.

L. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

M. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

END OF SECTION 096813

SECTION 099123
INTERIOR PAINTING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals:

1. Product Data:
2. Samples.

B. Extra Materials: 1 gal. of each color and type of finish-coat paint, sealed and labeled. Deliver to Owner.

PART 2 - PRODUCTS

2.1 PAINT

A. Basis of Design Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Sherwin-Williams Company (The).

B. Steel: Applications: Hollow metal doors and door frames, miscellaneous metal fabrications.

1. Primer, Galvanized: Sherwin-Williams; Galvite HS Paint B50WZ30.
2. Intermediate and Topcoat: Sherwin-Williams; Pro Industrial Water-Based Alkyd Urethane. MDF per coat: 3.0 to 3.5 mils (0.07 to 0.13 mm).

C. Gypsum Board, Standard Use:

1. Primer: Latex (Flat): (Gloss Level 1): Sherwin-Williams: ProMar 2
2. Intermediate and top Coat Latex (Eggshell): (Gloss Level 3): Sherwin-Williams; ProMar 200

D. Gypsum Board , Wet Wall Areas:

1. Primer: Latex (Flat): (Gloss Level 1): Sherwin-Williams: ProMar 2
2. Intermediate and top Coat (Eggshell): (Gloss Level 3): Sherwin-Williams; Pre-Catalyzed Epoxy.

E. Material Compatibility: Provide materials that are compatible with one another and with substrates.

F. Colors: As scheduled in Room Finish Legend on Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove hardware, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.

C. Clean and prepare surfaces in an area before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.

3.2 APPLICATION

A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Paint exposed surfaces unless otherwise indicated.

1. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
2. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint the back side of access panels.
4. Color-code mechanical piping in accessible ceiling spaces.
5. Do not paint prefinished items, items with an integral finish, operating parts, and labels unless otherwise indicated.

C. Apply paints using:

1. Use brushes only where the use of other applicators is not practical.
2. Use rollers for finish coat on interior walls and ceilings.

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. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

3.3 INTERIOR PAINT APPLICATION SCHEDULE

A. Steel, Galvanealed (Hollow Metal Door Frames):

1. Semigloss, Alkyd Enamel: Two coats over alkyd anticorrosive primer: MPI INT 5.1E.
2. (Option) Epoxy, High Build, Low-Gloss: Two coats over epoxy anti-corrosive metal primer: MPI INT 5.1F.

B. Gypsum Board:

1. Institutional Low Odor/Low VOC Latex Gloss Level 1 (Flat): Two coats over latex primer/sealer: MPI INT 9.2K.
2. Institutional Low Odor/Low VOC Latex Gloss Level 3 (Egg-shell): Two coats over latex primer/sealer: MPI INT 9.2K.

END OF SECTION 099123

SECTION 101423
PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Wall-mounted panel signs.

1.2 DEFINITIONS

A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for signs.

1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.

C. Samples: For each sign type and for each color and texture required.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.1 PANEL SIGNS

A. Manufacturer and Series: Innerface Architectural Signage. Inc. www.innerfacesign.com

1. Series: INNERFACE SIGNATURE.
2. Size 7 inches by 7 inches.
3. Square, no perimeter stripe.
4. Plaque Material: Removable PVC plastic. Color selected by Owner.
5. Use Owner’s standard graphic font and logo for size and color.

6. Text:

   a. Refer to schedule prepared by Owner.
   b. Include Braille text on all signs.

B. ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1 require tactile and Braille characters to be raised a minimum of 1/32 inch (0.8 mm) from face of sign.

C. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
3. For doors where sidelites may occur on strike side of door, prepare specially sized panels to fit on strike stile of wood doors which may have full-view glass lites. If no lite in installed on door which are adjacent to sidelites, install standard size panel on door itself within 3 inches of edge of door unless otherwise directed by the Owner.

B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.

1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.

3.2 SIGNAGE SCHEDULE

A. Refer to Signage Schedule prepared by Owner for text, quantities, installation details and locations

END OF SECTION 101423

SECTION 102600
WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Corner guards.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each impact-resistant wall protection unit. Include sections, details, and attachments to other work.

C. Samples: For each exposed product and for each color and texture specified, 12 inches long.

1.3 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Preinstallation Conference: Conduct conference at Project site.

1.6 WARRANTY

A. Special Warranty: 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: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. PVC Plastic: ASTM D 1784, Class 1, textured, chemical- and stain-resistant, high-impact-resistant PVC or acrylic-modified vinyl plastic with integral color throughout.

1. Impact Resistance: Minimum 25.4 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
2. Self-extinguishing when tested according to ASTM D 635.
3. Flame-Spread Index: 25 or less.
4. Smoke-Developed Index: 450 or less.

B. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.2 CORNER GUARDS

A. Corner Guards (CG-1): Fabricated from continuous vinyl with formed edges mounted on continuous aluminum retainer; in dimensions and profiles indicated on Drawings.

1. Fabricated with 90- turns.
2. Provide top closures if guards do not extend to ceiling.
3. Provide bottom closures if guards do not extend to floor but instead are mounted starting at top of wall base.

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. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.

1. For impact-resistant wall protection units attached with adhesive or foam tape, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prior to installation of gypsum board on walls, identify and locate positions for in-wall support for wall and door protection items which require mechanical attachment, other than by adhesive. Coordinate with installation of in-wall blocking specified in Division 09 Section “Non-Structural Metal Framing.”

B. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.

C. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102600

SECTION 134800
SOUND CONTROL ACCESS SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Provide sound control door and frame assemblies where shown on the Drawings, as specified herein, and listed on the Door Schedule. The work includes door and frame assemblies complete with acoustical seals, cam-lift hinges, and all finish hardware factory supplied and installed. Door leaf and frame is factory assembled and shipped complete as one unit.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

A. Sound Rating: Provide door and frame assemblies that have been fabricated as sound-retardant units, tested according to ASTM E 90 and have the following certified Sound Transmission Class (STC) rating as determined according to ASTM E 413.

1. STC Rating 55

1.03 SUBMITTALS

A. Comply with pertinent provisions of the Contract and Division 1.

B. Product Data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Material lists of items provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation and anchorage.

4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

5. Test Reports from a qualified independent testing agency indicating and interpreting test results from Part 3 of this Section relative to compliance of sound ratings with the indicated requirements.

6. Material certificates in lieu of laboratory test reports when permitted by Architect signed by the manufacturer certifying that each sound control door complies with the project requirements,

7. Field test reports from qualified independent testing agency indicating and interpreting test results relative to compliance with performance requirements of installed sound control doors.

C. Photographs and quality control inspection reports will be provided prior to shipment. Photograph including doors with all pertinent hardware installed and hanging, in the completed position. Door open and door closed photographs will be provided for each door.

1.04 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Acoustical Performance

1. The acoustical door manufacturer will be required to submit acoustical performance data in the form of up-to-date test reports from an independent testing laboratory indicating the doors to be provided will have the required Sound Transmission Class Rating (ASTM E-90-90).

2. For the required STC rating, refer to door schedule drawing.

3. Owner may at his option order performance tests of installed door assemblies by an independent consultant to verify compliance with the specifications. Any discrepancies shall be repaired or replaced without cost to the Owner.

C. Single-Source Responsibility: Provide sound control doors and frames, including gaskets, hinges and other hardware items essential for sound control as an assembly and by a single firm specializing in producing this type of work for a minimum of ten (10) years.

1.05 DELIVERY, STORAGE AND HANDLING

A. Use all means necessary to protect the materials of this section before, during and after installation and to protect the installed work and materials of all other trades.

1.06 WARRANTY

A. Acoustic door materials and hardware shall be guaranteed against defective workmanship for one (1) year from date of shipment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide [single] and/or [double] leaf, "Noise Lock" acoustic door(s) and frame(s) with cam lift hinges and split frames as manufactured by IAC Acoustics, A Division of Sound Seal 401 Airport Road, North Aurora, IL 60542 630-270-1790. Equivalent products will be considered, when submitted for approval prior to the bid opening, and meet or exceed the requirements of this specification.

2.02 MANUFACTURED ASSEMBLIES (NOISE LOCK DOORS)

A. Door leaf(s) minimum thickness:

STC 54 thru STC 61 Rating, 3 ½" (89 mm)

Door leaf(s) and door stiffeners are to be fabricated from 14 gauge (2 mm) cold rolled, galvannealed steel with an A60 coating weight, and filled with 6 lb density, sound absorbing, and damping elements.

B. Frame(s) shall be fabricated from 14 gauge cold rolled, galvannealed steel with an A60 coating weight and furnished "split" in two (2) pieces, inside and outside, that are mitered and welded together allowing for easy installation into either existing or new construction openings.

C. Acoustic seals: Doorjambs, meeting stiles of double doors and at the head of the door and frame shall receive self-aligning magnetic, [fire resistant (if UL rated)] compression seals. Door(s) to be held in closed position by magnetic force of perimeter seals.

Acoustic labyrinth shall be created when door is in closed position. Bottom of door leaf shall contain continuous, adjustable, gravity-activated seal that shall compress against the floor as the door is closed. Raised sills and threshold drop seals will not be acceptable.

Acoustic Seal assemblies as follows:
STC 55 Rating, Double magnetic type

D. Jamb anchors: Provide jamb anchors as determined by wall construction. Anchors are to be spaced at 12" (305 mm) on center (max) and are to be of a corrosion resistant material.

E. Hardware

Hinges: IAC, cam-lift, butt-type, hinges, US26D finish (Hinge manufacturer to furnish laboratory test data certifying that hinges of identical design have been cycled a minimum of 125,000 times while supporting a door leaf weighing a minimum of 350 lbs.)

Quantities of hinges as follows:
For door leaf thickness less than or equal to 2 ½" (64):
Two (2) hinges required per leaf for openings up to and including 96" (2438 mm) high
Three (3) hinges required per leaf for openings up to and including 120" (3048 mm) high

For door leaf thickness greater than 2 ½" (64):
Three (3) hinges required per leaf for openings up to and including 96" (2438 mm) high
Four (4) hinges required per leaf for openings up to and including 120" (3048 mm) high

Closers: "LCN" or "Norton", factory installed.

Pull Handles: 1" (25 mm) diameter x 9" (229 mm) overall length, 3" (76 mm) projection, US28 finish, factory installed.

Push Plates: 4" (102 mm) wide x 16" (406 mm) high x .050" (1 mm) thick, US32D finish, factory installed.

SELECT ALL THAT APPLY

Latchsets/Locksets: Provided and installed by door manufacturer. Refer to finish hardware section for manufacturer, type and details.

F. Hardware Reinforcement

1. Hinges: Minimum of ¼" (6 mm) thick x 2" (51 mm) wide x 7 ½" (191 mm) lg.

2. Frames: Minimum of 3/16" (5 mm) thick for strikes and #11 (3 mm) gauge for closers.

3. Doors: Minimum of #11 (3 mm) gauge for lock boxes and closers.

H. Glazing

Non-Fire Rated: Provide factory-installed, aluminum extruded stops and moldings with true mitered corners for double, glazed assemblies. Size of vision lite is to be determined from the door schedule. Safety glass or fire-resistive glazing product meeting doors' sound control and labeling requirements is acceptable.

2.03 PRE-HUNG

A. Assembly and adjustment of door leaf, frame, acoustic seals, hinges and associated finish hardware shall take place at the factory to insure ease of installation, reliable operation and acoustic performance. The entire manufactured assembly shall be shipped to the job site ready to install and operate.

2.04 FABRICATION

A. General: Fabricate units to be rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Wherever practical, fit and assemble units in the manufacturer's plant. Identify work that is not permanently factory-assembled before shipment to ensure proper assembly at the Project site. Weld exposed joints continuously: grind, fill dress and make smooth flush and invisible.

2.05 FINISHES (FACTORY)

A. Doors and frames shall receive a shop coat of a rust-inhibitive primer. The primer shall be applied over properly prepared metal, in accordance with the manufacturer's standard shop prime coat procedure and oven-baked dry.

B. Others, as required, will perform finish painting, staining and/or varnish, under the painting section 0990 of this Specification.

C. [Oak, mahogany, birch, cherry, maple or walnut] paper-backed, wood veneer shall be applied as a finish, on [one, both] side(s) of the doors: [list doors requiring wood veneer]

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

3.02 PREPARATION

A. Adjacent Surfaces Protection: Protest adjacent work areas and finish surfaces from damage during product installation.

B. Adjacent Construction: Coordinate door assembly details with details of adjacent work to ensure proper attachments and clean junctions.

3.03 INSTALLATION

A. Install work in accordance with reviewed shop drawings and these specifications using only factory-trained personnel as required by the Manufacturer and approved by the Architect.

1. Hang doors and adjust for free swinging operation without binding, sticking, sagging or excessive clearances.

2. During installation, solidly pack acoustic insulation around frames that are installed in stud and gypsum-wallboard partitions.

3. Caulk exterior joint prior to painting.

4. Install sound control door assemblies during finish phase of construction to protect units from damage.

5. When installation is otherwise complete, adjust operating hardware for proper operation and function.

3.04 FIELD QUALITY CONTROL

A. Upon completion of this portion of work, and prior to its acceptance by the Owner, secure a visit to the job site by a qualified representative of the manufacturer of the acoustical door system(s) to confirm that installation is in conformance with the manufacturer's recommendations.

3.05 FIELD TESTING

A. Testing Agency: Owner will employ and pay an independent testing agency to perform sound control field testing.

B. Testing Agency: Provide the service of an independent testing agency experienced in testing sound control doors and is acceptable to architect to perform sound control field-testing.

C. Selection: Randomly selected by Owner, except not-completely installed sound doors.

D. Testing Requirements: Conduct field tests according to ASTM E336 with results calculated according to ASTM E413 to confirm that the operating field NIC values are within 5 dB of laboratory STC values.

E. Test results shall be reported promptly and in writing by testing agency to Owner, Contractor and Architect.

F. Repair or replace components of sound control doors where test results indicate STC rating does not meet requirements.

3.06 DEMONSTRATION

A. Instruct the Owner's maintenance personnel regarding operation and maintenance of all acoustic doors.

END OF SECTION

SECTION 144216
ENCLOSURE VERTICAL PLATFORM WHEELCHAIR LIFT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Enclosed, self-contained vertical platform wheelchair lift.

1.2 REFERENCES

A. ASME A17.1 - Safety Code for Elevators and Escalators.

B. ASME A17.5 - Elevator and Escalator Electrical Equipment.

C. ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.

D. CSA B44 - Safety Code for Elevators and Escalators.

E. CSA B355 - Lifts for Persons with Physical Disabilities.

F. ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities.

G. NFPA 70 - National Electric Code.

H. CSA - National Electric Code.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Submit manufacturer’s installation instructions, including preparation, storage and handling requirements.
2. Include complete description of performance and operating characteristics.
3. Show maximum and average power demands.

C. Shop Drawings:

1. Show typical details of assembly, erection and anchorage.
2. Include wiring diagrams for power, control, and signal systems.
3. Show complete layout and location of equipment, including required clearances and coordination with shaftway.

D. Selection Samples: For each finished product specified, provide two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finished product specified, two samples, minimum size 1-3/4” x 2-1/4” inches, representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm with minimum 20 year’s experience in manufacturing of vertical platform wheelchair lifts, with evidence of experience with similar installations of type specified.

B. Installer Qualifications: Licensed to install equipment of this scope, with evidence of experience with specified equipment. Installer shall maintain an adequate stock of

replacement parts, have qualified people available to ensure fulfillment of maintenance and callback service without unreasonable loss of time in reaching project site.

1.5 REGULATORY REQUIREMENTS

A. Provide platform lifts in compliance with:

1. ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.
2. ASME A17.1 - Safety Code for Elevators and Escalators.
3. ASME A17.5 - Elevator and Escalator Electrical Equipment.
4. NFPA 70 - National Electric Code.

B. Provide platform lifts in compliance with:

1. CSA B355 - Lifts for Persons with Physical Disabilities.
2. CSA B44.1/ASME A17.5 - Elevator and Escalator Electrical Equipment.
3. CSA - National Electric Code.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.7 PROJECT CONDITIONS

A. Do not use wheelchair lift for hoisting materials or personnel during construction period.

1.8 WARRANTY

A. Warranty: Manufacturer shall warrant the wheelchair lift materials and factory workmanship for two years following completion of installation.

B. Extended Warranty: Provide an extended manufacturer's warranty for the entire warranty period covering the wheelchair lift materials and factory workmanship for the following additional extended period beyond the initial two-year warranty. Preventive Maintenance agreement required.

1. Five additional years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Garaventa Lift;
United States - P.O. Box 1769, Blaine, WA 98231-1769.
Canada – 18920 – 36th Ave., Surrey, BC V3Z 0P6. ASD.
Toll Free: 800-663-6556. Tel: (604) 594-0422. Fax: (604) 594-9915.
Email: productinfo@garaventalift.com Web: www.garaventalift.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 ENCLOSED VERTICAL WHEELCHAIR LIFT

A. Capacity: 750 lbs. (340 kg) rated capacity.

B. Mast Height:

1. Model GVL-EN-168; 171 inches (4343 mm) maximum lifting height, using hydraulic drive, only.

C. Nominal Clear Platform Dimensions:

1. Large: 42 inches (1067 mm) by 60 inches (1524 mm).

D. Platform Configuration:

1. 90 Degree Entry/Exit: Front and side openings.
2. On/Off Same Side Entry/Exit: One front opening only.

E. Landing Openings:

1. Lower Landing: Door.
2. Upper Landing: Door.

F. Doors and Gates: Doors and gates shall be self-closing type.

1. Door Height: Flush mount, 80 inches (2032 mm).
2. Door Construction: Aluminum frame with:
   a. Panels of 1/4 inch (6 mm) laminated safety glass with 16 gauge (1.5 mm) galvanized steel kick plate.
   b. D-Handle Pull: 12 inch (305 mm) offset D-Handle.
3. Power Door/Gate Operator: Automatically opens the door/gate when platform arrives at a landing. Will also open at landing by pressing call button.
   a. ADA Compliant and obstruction sensitive.
   b. Low voltage, 24 VDC with all wiring concealed.
   c. Location:
      1) Lower Landing: Door.
      2) Intermediate Landing: Door.
      3) Upper landing: Door or Gate.

G. Lift Components:

1. Machine Tower: Extruded aluminum.
2. Base Frame: Structural steel.
3. Platform Side Wall Panels: 42-1/8 (1070 mm) inches high. 16 gauge (1.5 mm) galvanized steel sheet. Custom aluminum extrusion tubing frame.
4. Enclosure Panels:
   a. 1/4 inch (6 mm) laminated safety glass.

H. Enclosure Height Above Upper landing:

1. Enclosure shall extend 42-1/8 inches (1070 mm) above the upper landing level
2. Enclosure shall extend 83-3/4 inches (2127 mm) above the upper landing level.

I. Infill Panel Kit: Provide 16 gauge (1.5 mm) galvanized panels and mounting hardware to cover void between side of enclosure, drive mast and adjacent wall at the following locations:

1. Lower landing.
2. Upper landing.

J. Base Mounting and Access to Lift at Lower Landing:

1. Floor Mount: Base of lift shall be mounted on the floor surface of the lower landing. For access onto the platform provide a ramp of 16 gauge (1.5 mm) galvanized steel sheet with a slip resistant surface.

K. Options:

1. Ventilation System: Two exhaust fans, thermostatically controlled with a 12 VDC battery backup. Requires continuous mains power for Hydraulic Drive.

L. Leadscrew Drive:

1. Drive Type: Self-lubricating acme screw drive.
2. Emergency Operation: Manual handwheel device to raise or lower platform.

3. Battery Powered Emergency Lowering: Battery powered platform lowering device that automatically activates in the event of power failure. Allows passenger to drive platform downward to lower landing. Does not operate lift in up direction.

4. Safety Devices:

   a. Integral safety nut assembly with safety switch.

5. Travel Speed: 10 fpm (3.0 m/minute).

6. Motor: 2.0 hp (560 W).

7. Power Supply:

   a. 208/240 VAC, single phase; 50 Hz on a dedicated 16-amp circuit.

M. Hydraulic Drive:

1. Drive Type: Chain hydraulic.

2. Emergency Operation: Manual device to lower platform and use auxiliary battery power to raise or lower platform.

3. Safety Devices:

   a. Slack chain safety device.

   b. Shoring device.

4. Travel Speed: 17 fpm (5.2 m/minute).

5. Motor: 3.0 hp (2.2 kW); 24 volts DC.

6. Power Supply:

   a. Powered by building continuous mains converted to 24 VDC and equipped with auxiliary battery backup power system capable of running lift up and down for a minimum of 5 trips with rated load. Required for high use lifts and lifts equipped with a fan and ventilation system.

   b. system.

N. Platform Controls: 24 VDC control circuit with the following features.

1. Direction Control: Continuous pressure rocker switch.

2. Direction Control: Illuminated tactile and continuous pressure push buttons with dual platform courtesy lights and safety light.

3. Illuminated and audible emergency stop switch shuts off power to lift and activates audio alarm equipped with battery backup.
4. Keyless operation.
5. Keyed operation.
6. Emergency Telephone: Platform shall be equipped with ADA compliant autodialer telephone with a stainless-steel faceplate. Telephone shall operate in the event of power failure. A telephone line shall be supplied to the lift site as specified under Division 16.
7. Arrival Gong and Digital Floor Display.

O. Call Station Controls: 24 VDC control circuit with the following features.

1. Direction Control: Constant pressure rocker switch.
2. Direction Control: Illuminated tactile and constant pressure push buttons with illuminated "In Use" indicator.
3. Keyless operation.
4. Keyed operation.
5. Call Station Mounting:
   a. Lower:
      1) Frame mounted.
   b. Upper:
      1) Frame mounted.

P. Safety Devices and Features:

1. Grounded electrical system with upper, lower, and final limit switches.
2. Tamper resistant interlock to electrically monitor that the door is in the closed position and the lock is engaged before lift can move from landing.
3. Pit stop switch mounted on mast wall.
4. Electrical disconnect shall shut off power to the lift.

Q. Finishes

1. Extruded aluminum electrostatically applied baked powder finish semi matte Silver Moon.
2. Ferrous Components: Electrostatically applied baked powder finish.
   a. Color: Semi matte Silver Moon.
3. Lift Finish: Baked powder coat finish, color as selected by the Architect from manufacturers optional RAL color chart.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify shaft and machine space are of correct size and within tolerances.

C. Verify required landings and openings are of correct size and within tolerances.

D. Verify electrical rough-in is at correct location.

E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install platform lifts in accordance with applicable regulatory requirements including ASME A 17.1, ASME A 18.1 and the manufacturer's instructions.

B. Install platform lifts in accordance with applicable regulatory requirements including CSA B355, and manufacturer's instructions.

C. Install system components and connect to building utilities.

D. Accommodate equipment in space indicated.

E. Startup equipment in accordance with manufacturer’s instructions.

F. Adjust for smooth operation.

3.4 FIELD QUALITY CONTROL

A. Perform tests in compliance with ASME A17.1 or A18.1 and as required by authorities having jurisdiction.

B. Perform tests in compliance with CSA B355 and required by authorities having jurisdiction.

C. Schedule tests with agencies and Architect, Owner, and Contractor present.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION