PROJECT MANUAL FOR

Caliber Collision Proto 115

~~Belton, MO~~Lees Summit, MO

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PROJECT NO.: ~~2113~~2116
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SECTION 000110 - TABLE OF CONTENTS

SECTION TITLE PAGE NO

SECTION 00 3132
GEOTECHNICAL DATA

1.1 INVESTIGATION

A. An investigation of subsurface soil conditions at the building site was authorized by the Owner, A copy is attached as an appendix to these specifications.

B. The Geotechnical Investigation Report is for information only, and is not a warranty of subsurface conditions.

C. The Report is made available for information only, and is not a Contract Document.

D. The information contained in the Report represents design criteria, recommendations, and guidelines that were utilized as the basis of design for the engineering of the earthwork operations, paving design, and foundation design indicated in the Contract Documents. No changes in this design criteria will be considered or permitted.

1.2 RESPONSIBILITY

A. Bidders are expected to examine the site and subsurface investigation reports and then decide for themselves the character of the materials to be encountered.
The Architect and Owner assume no responsibility for variations in subsoil conditions, quality, or stability, or for the presence, level, and extent of underground water.

B. The Architect and Owner assume no responsibility for Bidder's interpretation of data contained in the Report.

DOCUMENT 00 7000
GENERAL CONDITIONS

1.1 GENERAL CONDITIONS

A. The "General Conditions of the Contract for Construction", AIA Document A201, Sixteenth Edition, 2007, Articles through 15 inclusive, is a part of this Contract, and is available for review from the Architect. The General Conditions and all modifications listed hereinafter shall apply to all various subcontracts and sub-subcontractor.

B. Refer to Document 008000 for Supplementary Conditions

SECTION 01 3100
PROJECT MANAGEMENT AND COORDINATION

1.1 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different sections, that depend on each other for proper installation, connection, and operation.

- 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.
- Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
- Make adequate provisions to accommodate items scheduled for later installation.

1.2 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI. All RFIs should be sent directly to the Architect via email or posted to project collaboration site (if one is being utilized). The Architect will redistribute to the appropriate reviewer.

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

1.3 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

- Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
- Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
- Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B Pre-construction Conference: Schedule and conduct a pre-construction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

- Conduct the conference to review responsibilities and personnel assignments.
- Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
- Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Pre-Installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
- 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 date Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
- Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
- 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: Conduct progress meetings at agreed upon intervals.
1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Construction Manager, and Architect, each contractor, 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 meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
   Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

E. Coordination Meetings: Conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, 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 meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

SECTION 01 3200
CONSTRUCTION PROGRESS DOCUMENTATION

1.1 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:
- PDF electronic file.

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

1.2 COORDINATION

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

1.3 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.
- Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work.

C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
D. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

1.4 CONTRACTOR'S CONSTRUCTIONSCHEDULE
A. Format:
- Submit a horizontal bar chart with separate line for each major section of Work identifying first work day of each week.
- Sequence of Listings: The chronological order of the start of each item of Work.
- Scale and Spacing: To provide space for notations and revisions.
- Sheet Size: Minimum 11 by 17 inches.

B. Content:
- Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- Identify each item by major Specification section number.
- Indicate the early and late start, early and late finish, float dates, and duration.
- Identify work of separate stages or separate floors or buildings, and other logically grouped activities.
- Provide sub-schedules to define critical portions of entire Schedule.
- Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner.
- Show delivery dates for Owner furnished products.
- Coordinate content Schedule of Values specified in Section 01290.

C. Revisions to Schedule
- Indicate progress of each activity to date of submittal, and projected completion date of each activity.
- Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- Provide narrative report to define problems areas, anticipated delays, and impact on schedule. Report corrective action taken, or proposed, and its effect.
- Update Regularly

SECTION 01 3300
SUBMITTAL PROCEDURES

1.1 SUBMITTAL ADMINISTRATIVE REQUIREMENTS
A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
- submittals are received.

B. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
- Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
- Name file with submittal number or other unique identifier, including revision identifier. For typical projects that do not require separate submittals for different buildings or sub the submittal file name shall use Specification Section number followed by a dash and then a sequential number. Resubmittals shall include a numerical suffix after another dash. Include brief description of submittal after sequential number or resubmittal suffix. (e.g., 061000-001-0 Rough Carpentry).
- For complex projects that require project identifier for separate buildings within a project or require individual submittals to be submitted by multiple subcontractors, the submittal file name shall follow the following. Specification Section number followed by a decimal point and then a sequential number. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.

C. Options: Identify options requiring selection by the Architect.
D. Deviations: Identify deviations from the Contract Documents on submittals.
E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
F. Use for Construction: Use only final submittals that are marked with 'Reviewed' , 'Furnish as Corrected' notation from Architect's action stamp. , or with approval notation from alternate reviewer.

1.2 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
- Email or upload electronic submittals as PDF electronic files directly to Architect.
- Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
- Action Submittals: For large format drawings and submittals (larger than 11 x 17), submit PDF file plus 2 hard copies. For smaller format drawings and submittals (11x17 or less), provide only PDF file. Architect will return only the marked-up PDF.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
- If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
- Mark each copy of each submittal to show which products and options are applicable.
- Submit Product Data in the following format:
- PDF electronic file.

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
- Preparation: Fully illustrate requirements in the Contract Documents.
- Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (but no larger than 30 by 42 inches.
- Submit Shop Drawings in the following format:
- For large format drawings and submittals (larger than 11 x 17), submit PDF file plus 2 hard copies. For smaller format drawings and submittals (11x17 or less), provide only PDF file. Architect will return only the marked-up PDF.

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

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

F. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

1.3 CONTRACTOR'S REVIEW

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

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

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

1.4 ARCHITECT'S ACTION

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

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
1. Reviewed
2. Revise and Resubmit
3. Rejected
4. Furnish As Corrected
5. No Action Taken.

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

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

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

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

SECTION 01 4000
QUALITY REQUIREMENTS

1.1 CONFLICTING REQUIREMENTS

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

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

1.2 QUALITY ASSURANCE

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

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

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

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

E. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
- NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
- NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

F. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

G. 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.

H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish indicated in the technical specifications.
- mockups when directed, unless otherwise indicated.

1.3 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
- 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.
- Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
- Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
- Notify testing agencies at least 24 hours in advance of time when work that requires testing or inspecting will be performed.
- Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
- Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. 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."

C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
- Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
- Determine the location from which test samples will be taken and in which in-situ tests are conducted.
- Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
- Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
- Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
- Do not perform any duties of Contractor.

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

1.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
- Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

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

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

SECTION 01 4200
REFERENCES

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 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.

1.3 INDUSTRY STANDARDS

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

SECTION 01 5300
MOLD PREVENTION MEASURES

1.1 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. Do not bring finish materials into building until building is in a conditioned state. Protect finish materials stored within building. Stage materials off the floor and cover with waterproof covering. Examples of these materials include, but are not limited to, insulation, gypsum products, wall coverings, carpet, ceiling tile, wood products, etc.
C. Remove from Project site damaged materials or materials that have become wet. Do not install such materials.

1.2 PROJECT CONDITIONS
A. Perform daily visual inspections of existing building for existing mold. Report sightings of mold to Owner's Representative.
B. Remove water found within building during construction immediately.
1. Energize lift stations and sump pumps as early in Project as possible. Use temporary pumps if necessary to get water out of building and drain lines.
C. Ventilation:
1. Verify that existing HVAC system is providing positive pressure in building.
2. Provide adequate air circulation and ventilation during demolition phase(s).
3. Seal off return air ducts and diffusers to prevent construction dust and moisture from entering occupied areas and HVAC system.
4. Provide temporary outside air ventilation as building becomes enclosed.
D. Maintain clean project site, free from hazards, garbage, and debris.
E. Eating, drinking, and smoking are not permitted within building.
F. Slope perimeter grades, both temporary and final grades, away from building structure.
G. Verify that condensate pans drain properly beginning with initial installation.
H. Flash roof penetrations immediately. Do not allow water to penetrate to floor below.
I. Seal window openings prior to window installation with plastic to prevent moisture entry.
J. Sprayed-on Fireproofing: Keep air moving throughout building when using sprayed-on fireproofing.
K. Cover stored and installed ductwork and installed duct openings with plastic to prevent dust, debris, and moisture from entering ductwork. Repair damaged plastic barrier.
L. Do not operate air handling equipment below 60 degrees F supply air temperature until building is 100 percent enclosed.
M. Monitor humidity and temperature for conformance to installation requirements defined by material and equipment manufacturers.
N. Check moisture content of gypsum board prior to applying finishes. Record findings.

1.3 INSTALLATION
A. Roof Drains: Connect roof drains to risers and storm drainage lines as soon as possible.
B. Floor Drains: Connect floor drains as soon as possible. Do not cover floor drains with tape or other obstructions during construction. Clean out floor drain lines to mains prior to Substantial Completion.
C. Wall Assemblies:
1. Install exterior wall insulation, vapor retarder, and gypsum board only after building is enclosed.
2. Keep bottom of installed gypsum board off floor 1/2 inch.
D. Cavity Conditions: Clean and inspect cavity conditions prior to covering, sealing, or restricting access. Vacuum clean cavity spaces prior to covering or enclosing.
E. Plumbing: Pressure test plumbing piping identified as insulated on Project prior to installation of insulation.
F. Roof Mounted Equipment: Inspect rooftop units and other roof-mounted equipment for signs of rain leaks immediately after first rain. Water test with hose immediately after installation. Seal leaks immediately.

G. Windows and Storefront: Water test windows to manufacturer's and Project Manual's specifications. Record findings and forward to Owner's Representative.
H. Sealants: Inspect exterior sealants for cracks, damage, or deterioration. Record findings and forward to Owner's Representative.
I. HVAC Equipment (Permanent HVAC Equipment Used for Temporary Conditioning of Building During Construction Phases): Change filters and clean ductwork interior to remove dirt, dust, debris, and moisture buildup prior to turning Project over to Owner.

1.4 ADJUSTING
A. Remove damaged materials or materials that have become wet. Replace with new materials.

SECTION 01 6000
PRODUCT REQUIREMENTS

1.1 NEW PRODUCTS
A. Provide new products unless specifically required or permitted by the Contract Documents.
B. Unless there is a significant cost difference, do not use products having any of the following characteristics:
   1. Made outside the United States, its territories, Canada, or Mexico.
   2. Made using or containing CFC's or HCFC's.
   3. Made of wood from newly cut old growth timber.
C. Provide interchangeable components of the same manufacture for components being replaced.
D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
E. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

1.2 PRODUCT OPTIONS
A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

1.3 MAINTENANCE MATERIALS
A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
B. Deliver to Project site; obtain receipt prior to final payment.

1.4 SUBSTITUTION PROCEDURES
A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
B. Architect will consider requests for substitutions only within 15 days after date of Agreement.
C. Substitutions will not be considered when a product becomes unavailable through no fault of the Contractor.
D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
E. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
G. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Architect will notify Contractor in writing of decision to accept or reject request.

1.5 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
B. Transport and handle products in accordance with manufacturer's instructions.
C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

1.6 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
B. Store and protect products in accordance with manufacturers' instructions.
C. Store with seals and labels intact and legible.
D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
E. For exterior storage of fabricated products, place on sloped supports above ground.
F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
I. Prevent contact with material that may cause corrosion, discoloration, or staining.
J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

1.1 QUALIFICATIONS

A. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located.

1.2 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
    1. Minimize amount of bare soil exposed at one time.
    2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
    3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
    4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.3 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

A. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

B. Coordinate completion and clean-up of work of separate sections.

C. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over- ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

1.5 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

1.6 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Control datum for survey is that established by Owner provided survey.

E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

H. Utilize recognized engineering survey practices.

I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, invert elevations, and items requested by Owner.
2. Grid or axis for structures.
3. Building foundation, column locations, and ground floor elevations.

K. Periodically verify layouts by same means.

L. Maintain a complete and accurate log of control and survey work as it progresses.

M. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

1.7 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

1.8 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 078400, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

1.9 PROGRESS CLEANING

A. Maintain areas free of waste materials. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

B. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

C. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

1.10 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

1.11 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

1.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.13 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

1.14 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

1. Provide copies to Architect and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Substantial Completion.

D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.

F. Notify Architect when work is considered finally complete.

G. Complete items of work determined by Architect's final inspection.

1.15 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longest.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 04 0513
Adhered Masonry Veneer Systems - Exterior Façade

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Waterproof coatings, setting materials, grouting materials and methods of installation for thin veneer over mortar bed.

1.2 RELATED SECTIONS

A. Section 06 16 00 - Sheathing

B. Section 07 90 00 - Joint Protection

C. Section 09 24 00 - Cement Plastering

1.3 REFERENCES

A. ANSI A108.01 General Requirements: Sub-surfaces and Preparations by Other Trades.

B. ANSI A108.02 General Requirements: Materials, Environmental, and Workmanship.

C. ANSI A108.10 Installation of Grout in Stonework.

D. ANSI A118.4 Specifications for Latex-Portland Cement Mortar.

E. ANSI A118.6 Specifications for Ceramic Stone Grouts.

F. ANSI A118.10 Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installations

G. ANSI A137.1 Specification for Ceramic Tile

H. ATSM C90 Standard Specification for Loadbearing Concrete Masonry Units
I. ASTM C270 Standard Specification for Mortar for Unit Masonry
J. ASTM C150 Standard Specification for Portland Cement
K. ASTM C979 Standard Specification for Pigments for Integrally Colored Concrete
L. ASTM C1088 Standard Specification for Thin Veneer Brick Units
M. ASTM C1670 Standard Specification for Adhered Manufactured Stone Masonry Veneer (AMSMV) Units
N. ASTM E2925 Standard Specification for Manufactured Polymeric Drainage and Ventilation Materials Used to Provide a Rainscreen Function

1.4 ASSEMBLY DESCRIPTION

A. Description:
1. Section includes waterproof coating, setting materials, grouting materials, and methods of installation for thin veneer over Portland cement plaster basecoat. Portland cement plaster basecoat is installed over a water resistive barrier on code- compliant sheathing.

B. Functional Criteria:
1. Performance Requirements - water-resistive barrier coating
   a. Shall meet the testing requirements of the Parex USA Product Performance Sheet.
2. Substrate Systems:
   a. Shall be engineered to withstand applicable design loads including required safety factor.
   b. Maximum deflection of substrate system shall be L/360
   c. Substrate dimensional tolerance: Flat as required by the thin veneer manufacturer but shall be maximum within 1/4 in (6 mm) in 10 feet (3050 mm).
   d. Surface irregularities: Sheathing not over 1/8 in (3 mm); masonry not over 3/16 in (4.8 mm).
3. Install control joints and expansion joints in adhered thin veneer work in accordance with [TCNA Detail EJ171] or manufacturer recommendation.
4. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control and isolation joints, where indicated during installation of setting materials, mortar beds, and thin veneer units. Do not saw-cut joints after installing units.
   a. Locate joints in thin veneer surfaces directly above joints in concrete substrates.
   b. Joint width and spacing depends on application - follow TCA "Handbook for Ceramic Tile Installation" Detail "EJ- 171 Expansion Joints" or consult veneer manufacturer for recommendation based on project parameters.
   c. Remove all contaminants and foreign material from joint spaces/surfaces, such as dirt, dust, oil, water, frost, setting/grouting materials, sealers and old sealant/backer. Install appropriate Backing Material (e.g., closed cell backer rod) based on expansion joint design and as specified in Section 07920.

1.5 SUBMITTALS

A. General: Submit Samples, and Certificates in accordance with Division 1 General Requirements Submittal Section.

B. Samples: Submit samples for approval. Samples shall be of materials specified and of suitable size as required to accurately represent each color and texture used on project. Prepare each sample using same tools and techniques for actual project application. Maintain and make available, at job site, approved samples.

1.6 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer: Shall have manufactured waterproofing and Portland cement plastering in United States for at least ten years.
2. Applicator: Completed thin veneer installations similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver Parex USA products in original packaging with manufacturer's identification.

B. Storage: Store materials supplied by Parex USA in a cool, dry location, out of sunlight, protected from weather and other harmful environment, and at a temperature above 40 □F (4 □C) and below 110 □F (43 □C) in accordance with manufacturer's instructions.

1.8 PROJECT / SITE CONDITIONS

A. Installation Ambient Air Temperature: Minimum of 40 □F (4 □C) and rising, and remain so for 72 hours thereafter

B. Substrate Temperature: Do not apply materials to substrates whose temperature are below 40 □F (4 □C) or contain frost or ice.

C. Inclement Weather: Do not apply materials during inclement weather, unless appropriate protection is employed.

D. Prior to installation, the wall shall be inspected for surface contamination, or other defects that may adversely affect the performance of the materials and shall be free of residual moisture.

E. Vent temporary heaters to outside to avoid carbon dioxide damage to new thin veneer application.

1.9 COORDINATION AND SCHEDULING:
Coordination: Coordinate Parex USA installation with other construction operations.

1.10 WARRANTY
Warranty: Upon request, at completion of installation, provide Parex USA Systems Warranty. See warranty schedule for available Warranties.

PART 2 - PRODUCTS
2.1 MANUFACTURERS
A. Manufacturer: Parex USA, Inc., 4125 E. La Palma Ave., Suite 250, Anaheim, CA 92807
1. Obtain components of Parex USA products from authorized distributors. No substitutions or additions of other materials are permitted without prior written permission from Parex USA for this project.
2. Source Limitations for: Obtain each veneer material color, grade, finish, type, composition, and variety from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties without delaying the Work.

2.2 MATERIALS
A. Water Resistive Barrier:
1. Parex USA WeatherSeal Spray & Roll-On water resistive and air barrier coating, fluid consistency, conforming to ASTM 2570, applied by roller, sprayer, or brush.
2. Parex USA 396 Sheathing Tape: Non-woven synthetic fiber tape to reinforce WeatherSeal Spray & Roll-On roll on water- resistive barrier at sheathing board joints, into rough openings and other terminations into dissimilar materials available in 4 in, 6 in and 9 in widths.
3. Parex USA 365 Flashing Membrane: Self-sealing, Polyester faced, rubberized asphalt membrane, 30 mils (0.76 mm) thick.
4. Parex USA WeatherFlash: Exterior waterproof filler and joint treatment. Single-component, non-sag, moisture curing sealant. Used in conjunction with Parex USA WRBs to fill penetrations and open joints upto 1/2 inch (13MM).
B. Drainage
1. Tyvek StuccoWrap
C. Stucco Base:
1. Parex USA family of brands stucco base coat sanded: Proprietary mixture of portland cement, and proprietary ingredients mixed with clean, cool, and potable water in the field.
D. Stucco Admix (Required): Parex USA Adacryl Admix & Bonding Agent: 100% acrylic emulsion additive for Portland cement-based products to enhance curing, adhesion, freeze-thaw resistance and workability and as an acrylic polymer bonding agent.
E. Waterproofing: Load Bearing, Bonded, Waterproof Membrane
1. Parex USA WeatherBlock; a waterproofing membrane.
F. Specialty Adhesive Mortar Latex-Portland Cement Stone Setting Mortar ANSI A118.4.
1. Parex USA Masonry Veneer Adhesive; a premium medium bed latex modified Portland cement dry set mortar for installations requiring a mortar to compensate for irregularities in the substrate or thin veneer stone.
G. Thin Veneer Materials
1. Thin brick conforming to ASTM C1088 and as follows:
- Refer to drawing set cover sheet for product specification.
2. Manufactured Thin stone masonry veneer as follows:
- Refer to drawing.
H. Grout for thin brick and manufactured stone masonry veneer joints:
1. Masonry mortar conforming to ASTM C270. Color: Refer to Drawings.
I. Grout for thin brick and manufactured stone masonry veneer joints:
1. Masonry mortar conforming to ASTM C270. Color: Refer to Drawings
J. Water repellant for manufactured stone masonry veneer
1. Parex USA ProTect siloxane based clear, non-yellowing water repellant for cementitious materials (Not for thin brick or ceramic tile). Protect shall be tested on a representative sample of the specified manufactured stone masonry veneer and joint mortar for acceptable appearance before specifying.

2.3 RELATED MATERIALS AND ACCESSORIES
A. Lath
1. Conforming to ASTM C847, minimum nominal weight 2.5 pounds per square yard, minimum G60 galvanizing, installed in accordance with ASTM C1063 and fastened in accordance with the building code.
B. Substrate Materials:
1. Sheathing shall be installed in accordance with its industry standards and applicable building code.

2. Gypsum Sheathing shall conform to ASTM C79, C1396, or C1177 glass mat gypsum sheathing, minimum thickness 1/2" (12.7 mm).
3. Plywood shall be not less than 15/32" (11 mm) thick, PS-1 Exposure 1 or Exterior grade.
4. Oriented strand board (OSB) shall be not less than 7/16" thick (11.1 mm), PS-2 Exposure 1.
5. For wood-based sheathing (Plywood and OSB), comply with APA-The Engineered Wood Association spacing recommendations for edge and end joints. Gap wood sheathing panels minimum 1/8".
6. Sheathing shall be protected from weather before application of the water-resistive barrier

E. Optional drainage mat installed between the water-resistive barrier and Portland cement basecoat:
1. Entangled polymeric monofilament mat conforming to ASTM E2925, minimum 6 mm thick.

F. Flashing: Refer to Division 7 Flashing Section for flashing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify project site conditions under provisions of Section 01 00 00.

B. Compliance: Comply with manufacturer's instructions for installation of Parex products

C. Substrate Examination: Examine prior to Parex product installation as follows:
1. Substrate shall be of a type approved by Parex USA.
2. Substrate shall be examined for soundness, and the presence of harmful conditions.
3. Substrate shall be within the flatness tolerances specified.
4. Substrate shall be free of dust, dirt, laitance, efflorescence, and other harmful contaminants.
5. Substrate construction in accordance with substrate material manufacturer's specifications and applicable building codes.

D. Sealants and Backer Rod: To be installed, where required, in accordance with the sealant manufacturer's specifications and published literature, and using the sealant manufacturer's recommended primers.

E. Advise Contractor of discrepancies preventing installation of the Parex products. Do not proceed with the work until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Protection: Protect surrounding material surfaces and areas during installation of materials.

B. Clean surfaces thoroughly prior to installation.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under
the project conditions.

3.3 MIXING: Follow the manufacturer's published mixing instructions.

A. Admix: Parex USA Adacryl
1. Mix up to 1 gal (3.8 L) per 1 bag of Parex USA family of brands stucco base coat concentrate. Mix up to 1 qt (1 L) per bag of Parex USA family of brands stucco base brown sanded. Add after dry components and the majority of the water has been mixed. Mix no longer than required to provide a uniform mixture. DO NOT OVER-MIX. Overmixing entrains excessive amounts of air which weaken the material. Do not re-temper mixes over 20 minutes old.

3.4 APPLICATION

A. General: Installation shall conform to this specification and Parex USA systems written instructions and drawing details.

B. Drainage Accessories and Water Resistive Barrier:
1. Treat all glass mat gypsum sheathing, cement board sheathing, OSB and plywood joints with either Parex USA WeatherSeal Spray & Roll-On or Parex USA WeatherSealTrowel-On water-resistive barrier and embed Parex USA 396 Sheathing Tape or Parex USA WeatherFlash.
2. Flash all rough openings with either Parex USA WeatherSeal Spray & Roll-On or Parex USA WeatherSeal Trowel-On water-resistive barrier and embedded Parex USA 396 Sheathing Tape or Parex USA WeatherFlash.
3. Flash heads of all openings with metal head flashing as shown in the project detail drawings.
4. Apply Parex USA WeatherSeal Spray & Roll-on to the surface of the substrate (2 coats may be required on plywood, OSB, and masonry). Over concrete and masonry, a skim coat Parex USA Stucco Level Coat may be use to fill porous surfaces and allowed to dry prior to Parex USA WeatherSeal Spray & Roll-on application. Center Parex USA 396 Sheating Tape on edges of all vertical legs of flashing and track and embed in Parex USA WeatherSeal Spray & Roll- on.

C. Install Drainage as specified

D. Install Intervening material such as building paper between the stucco base coat and the Weatherseal.

E. Install metal lath in accordance with ASTM C1063.

F. Portland cement plaster application:
1. For Thin Brick and veneer stone: Apply a coat of Portland cement plaster in accordance with ASTM C926 in one or two layers to and nominal thickness of 1/2" to 3/4"(12.7 mm to 19 mm) or in accordance with the stone manufacturers applicable evaluation service report.

2. For Ceramic Tile: Float of brush the brown coat so as to provide and "open" surface for bonding the tile.

G. Parex USA WeatherBlock application
1. Apply 2 liberal coats of Parex USA WeatherBlock over the entire field of the Stucco Base Coat

H. Thin Veneer Installation- General
1. Comply with applicable ANSI 108 series of the "American National Standard Specifications for the Installation of Ceramic Tile."
2. Comply with TCNA installation methods indicated or, if not other otherwise indicated, as applicable to installation conditions shown.
3. Extend thin veneer work into recesses an under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown.
4. Accurately form intersections and returns. Perform cutting and drilling of thin veneer without marring visible surfaces. Carefully grind cut edges of thin veneer abutting trim, finish or built-in items for straight aligned joints.
5. Unless otherwise shown:
   a. Lay out thin bricks in a running bond pattern.
   b. Layout ceramic tile in grid pattern.
   c. Lay out manufactured stone masonry veneer as specified for the stone type.
   d. Adjust to minimize thin veneer cutting. Provide uniform joint widths, unless otherwise shown.
6. Locate expansion joints and other sealant filled joints, including control, contraction and isolation joints, where indicated and approved by Designer.
7. Prepare joints and apply sealants to comply with referenced installation standards and sealant manufacturer's instructions.

I. Expansion joints:
1. Parex USA WeatherSeal Spray & Roll-On, Parex USA WeatherSeal Trowel-On and Parex USA WeatherBlock must be applied with Parex USA 396 Sheathing Tape embedded to bridge across expansion joints. Brush apply a heavy coat of the coating to the face of the tape to create a continuous membrane across the joint.

J. Thin Brick / Ceramic and Porcelain Tile / Manufactured Stone Masonry Veneer:
1. Ensure complete coverage of Parex USA Masonry Veneer Adhesive between the stucco basecoat/cement board with WRBs and the back side of the thin veneer units.
2. Install tile and thin brick with Parex USA Masonry Veneer Adhesive to comply with referenced Tile Council of North America (TCNA) TCA 202 and ANSI A108.5 installation standards.
3. Spread only as much adhesive as can be covered while the mortar surface is still wet and tacky.
4. Fit thin veneer units around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance.
5. Make cut edges smooth, even and free from chipping. Do not split veneer units
6. Thin Brick:
   a. Allowing for a mortar joint of 3/8"–1/2", calculate and mark off the number of courses required. Adjust joint size to minimize horizontal cutting. Run level guide lines to ensure proper placement of bricks. Mix brick from several boxes at a time to achieve a pleasing blend of color and texture.
   b. Use the appropriate trowel notch size to ensure proper bedding of the thin brick, work the Parex USA Masonry Veneer Adhesive into good contact with the substrate and comb with notched side of trowel. Completely cover back of thin brick with Parex USA Masonry Veneer Adhesive. Firmly press or tap thin brick into mortar or adhesive while maintaining joint width and coursing.
7. Manufactured stone masonry veneer:
   a. Use the appropriate trowel notch size to ensure proper bedding of the stone masonry veneer, work the Parex USA Masonry Veneer Adhesive into good contact with the substrate and comb with notched side of trowel. Completely cover back of stone masonry veneer with Parex USA Masonry Veneer Adhesive. Firmly press or tap stone masonry veneer into.
   b. Set stones so that joints generally average not more than 1/2" wide.
8. Expansion and Perimeter Joints: The veneer units are installed up to the joint leaving a gap the width of the joint. Keep all control and expansion joints free of setting materials
9. Curing time of veneer adhesive:
   72 hours before grouting when the temperature is low or the humidity is high. 48 hours before grouting when hot, dry conditions exist.
   Check the bond strength carefully before grouting.

K. Grouting:
1. Verify grout joints are free of dirt, debris or tile spacers. Sponge or wipe dust/dirt off veneer face and remove any water standing in joints. Surface and air temperature must be between 40-90°F (4-32°C).
2. Keep grout out of spaces to receive sealants.
3. Thin brick and manufactured stone masonry veneer grouting:
   a. Fill joints using a grout bag, mortar gun or other mortar delivery device. When thumbprint hard, rake out excess mortar, compact and seal edges around stones. A wet brush or

sponge should never be used to treat the mortar joints as this will cause staining that will be difficult or impossible to remove.

L. Soft joints that are in the veneer only, not through the EIFS:
   1. Thin brick: Joints spaced no more than 18 feet (5.5 m) in either direction. Maximum area between joints not over 144 ft2, longer dimension of the area not over 2 1/2 times the shorter dimension.
   2. Manufactured thin stone masonry veneer: Follow the thin veneer manufacturer's instructions for soft joints.

M. Water repellant
   1. If specified apply Protect to manufactured stone masonry veneer after joint grout has cured a minimum of 28 days.

3.5 CLEAN-UP

A. Removal: Remove and legally dispose of Parex USA and thin veneer component debris material from job site.

B. Clean exposed surfaces using materials and methods recommended by the manufacturer of the material or product being cleaned. Remove and replace work that cannot be cleaned to the satisfaction of the Project Designer/Owner.

C. Clean work area of foreign materials resulting from operations.

D. Acid Cleaning: Ceramic tile and clay thin brick may be cleaned with sulfamic acid solutions complying with the following:
   1. Never apply acid to manufactured stone masonry veneer or manufactured brick.
   2. Only if permitted by tile and/or thin brick and grout manufacturer's printed instructions.
   3. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning.
   4. Flush surface with clean water before and after cleaning.

3.6 PROTECTION

A. Provide protection of installed materials from water infiltration into or behind them.

B. Upon completion of setting and grouting, clean all stone surfaces so they are free of foreign matter.

C. Provide protection of installed finish from dust, dirt, precipitation, freezing and continuous high humidity until fully cured and dry.

D. When recommended by thin veneer/stone manufacturer, apply a protective coat of neutral protective cleaner. Protect installed thin veneer work with heavy covering during construction period to prevent damage.

E. Protective Coatings: Before final inspection, remove protective coverings and rinse neutral cleaner from stone surfaces.

F. Finished Thin Veneer Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective thin veneer work.

SECTION 04 2000
UNIT MASONRY ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Concrete Block and Split Face Block

B. Reinforcement and Anchorage.

C. Flashings.

D. Lintels.

E. Accessories.

F. Water Repellents for single wythe walls

1.2 RELATED REQUIREMENTS

A. Section 04 0500 - Mortar and Masonry Grout.

B. Section 07 9000 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.3 REFERENCE STANDARDS

A. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2010.

E. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2011.

F. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006.

G. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2010.

H. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2007.

I. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units; 2011.

J. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2008).
K. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2010.
L. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
2. Load-Bearing Units: ASTM C90, normal weight.
a. Hollow block, as indicated.
b. Exposed faces: Manufacturer's standard color and texture.
c. Pattern: As indicated on drawings.
3. Pre-Faced Units: ASTM C90, hollow block, with smooth resinous facing complying with ASTM C744.
a. Colors and styles: As indicated on drawings.
4. Integral Water Repellent: Concrete block units shall have polymeric liquid admixture added to concrete masonry units at the time of manufacture, unless noted otherwise.
a. Performance of Units with Integral Water Repellent:
1. Water Permeance: When tested per ASTM E514 and for a minimum of 72 hours.
a. No water visible on back of wall above flashing at the end of 24 hours.
b. No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
c. No more than 25% of wall area above flashing visibly damp at end of test.
2. Flexural Bond Strength: ASTM C1357; minimum 10% increase.
3. Compressive Strength: ASTM C1314; maximum 5% decrease.
4. Drying Shrinkage: ASTM C1148; maximum 5% increase in shrinkage.
b. Use only in combination with mortar and grout that also has integral water repellent admixture.

B. Split Face Concrete Block: Comply with referenced standards and as follows:
1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
2. Load-Bearing Units: ASTM C90, normal weight.
a. Hollow block, as indicated.
b. Exposed faces: Manufacturer's standard split texture.
c. Pattern: As indicated on drawings.
3. Pre-Colored Units: ASTM C90, hollow block, with integral color.
a. Colors: As indicated on drawings.
4. Integral Water Repellent: Concrete block units shall have polymeric liquid admixture added to concrete masonry units at the time of manufacture, unless noted otherwise.
a. Performance of Units with Integral Water Repellent:
1. Water Permeance: When tested per ASTM E514 and for a minimum of 72 hours.
a. No water visible on back of wall above flashing at the end of 24 hours.
b. No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
c. No more than 25% of wall area above flashing visibly damp at end of test.
2. Flexural Bond Strength: ASTM C1357; minimum 10% increase.
3. Compressive Strength: ASTM C1314; maximum 5% decrease.
4. Drying Shrinkage: ASTM C1148; maximum 5% increase in shrinkage.
b. Use only in combination with mortar and grout that also has integral water repellent admixture

2.3 MORTAR AND GROUT MATERIALS

A. Mortar and grout: As specified in Section 04 0500.
B. Hydrated Lime: ASTM C207, Type S.
C. Grout Aggregate: ASTM C404.

2.4 REINFORCEMENT AND ANCHORAGE

A. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
B. Single Wythe Joint Reinforcement: Truss or ladder type; ASTM A 82/A 82M steel wire, mill galvanized to ASTM A 641/A 641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
C. Multiple Wythe Joint Reinforcement: Truss type; fabricated with moisture drip; ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods;

width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

D. Adjustable Multiple Wythe Joint Reinforcement: Truss type with adjustable ties or tabs spaced at 16 in on center and fabricated with moisture drip; ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B; 0.1875 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire; width of components as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from each masonry face.
   1. Vertical adjustment: Not less than 2 inches.

E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.

F. Two-Piece Wall Ties: Formed steel wire, 0.1875 inch thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A 153/A 153M, Class B, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face and to allow vertical adjustment of up to 1-1/4 in.

G. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
   3. Vertical adjustment: Not less than 3-1/2 inches.
   4. Product: Thermal 2-Seal Wing Nut Anchor by Hohmann & Barnard or Equal

2.5 FLASHINGS

A. Self-Adhesive Flexible Flashing Membrane: Standard type, elastomeric and thermal plastic polymers reinforced with synthetic fibers and calendared into 40 mil thick sheets, Compatible with Urethane and Silicone sealants

B. Lap Sealant: Butyl type as specified in Section 07 9000.

2.6 ACCESSORIES

A. Preformed Control Joints: Neoprene material. Provide with corner and tee accessories, fused joints.

B. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Airspace Maintenance and Drainage Material: Polymer mesh panels for fitting between masonry ties to loosely fill masonry cavity. Min. 24" in height.

C. Weeps: Molded PVC grilles, insect resistant.

D. Multicomponent Cavity Wall Drainage System: Combination mortar diverter, flashing and weep system.
   1. Manufacturers:
      a. Mortar Net USA, Ltd: www.mortarnet.com.
      b. CavClear www.archovations.com/masonry-mat/

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.7 LINTELS

A. Steel angle sized to accommodate loading and material sizes if not indicated in the drawings.

2.8 WATER REPELLANTS FOR SINGLE WYTHE WALLS (OCCUPIED SPACES)

A. For use with colored split face units:
   1. PWS-15 Super by Professional Products of Kansas, Inc.:
      a. Matte finish – applied to exterior of block units per manufactures recommended rate.
      b. CMU should be clean, dry and free of dirt and grease.
      c. CMU should cure 28 days prior to application
      d. Damaged mortar should be repointed.

B. For use with units to receive a painted finish on the interior side:
   1. PrepRite Block Filler by Sherwin Williams:
      a. White finish – applied to interior of block units per manufactures recommended rate.
      b. CMU should be clean, dry and free of dirt and grease.
      c. CMU should cure 28 days prior to application
      d. Damaged mortar should be repointed.

C. For use with units to receive only a filler on the interior side:
   1. ProMar Block Filler & Finish by Sherwin Williams:
      a. White finish – applied to interior of block units per manufactures recommended rate.
      b. CMU should be clean, dry and free of dirt and grease.
      c. CMU should cure 28 days prior to application
      d. Damaged mortar should be repointed.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.
B. Verify that related items provided under other sections are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION
A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COURSING
A. Establish lines, levels, and coursing indicated. Protect from displacement.
B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
1. Coursing: One unit and one mortar joint to equal 8 inches.

3.4 PLACING AND BONDING
A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
C. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
D. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

3.5 WEEPS/CAVITY VENTS
A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

3.6 CAVITY MORTAR CONTROL
A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions. Verify that airspace width is no more than 3/8 inch greater than panel thickness. Install horizontally between joint reinforcement. Stagger end joints in adjacent rows. Fit to perimeter construction and penetrations without voids.

3.7 REINFORCEMENT AND ANCHORAGE - GENERAL
A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
C. Place continuous joint reinforcement in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6 inches.
E. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

3.8 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY
A. Install horizontal joint reinforcement 16 inches on center.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
C. Place continuous joint reinforcement in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6 inches.

3.9 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER
A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 36 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.10 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY
A. Install horizontal joint reinforcement 16 inches on center.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of openings.
C. Place continuous joint reinforcement in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6 inches.

3.11 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

A. Install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Lap joint reinforcement ends minimum 6 inches.

D. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 24 inches horizontally and 16 inches vertically.

3.12 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
2. Remove or cover protrusions or sharp edges that could puncture flashings.
3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Extend metal flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.

C. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

3.13 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.14 GROUTED COMPONENTS

A. Place and consolidate grout fill without displacing reinforcing.

B. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.15 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control and expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.16 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

3.17 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01400.

3.19 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.20 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 04 2113
BRICK MASONRY (NOT USED)

PART 1 GENERAL
1.1 SECTION INCLUDES
A. Clay Facing Brick.
B. Reinforcement and Anchorage.
C. Flashings.
D. Lintels.
E. Accessories.

1.2 RELATED REQUIREMENTS
A. Section 04 0500 - Mortar and Masonry Grout.
B. Section 07 9000 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.3 REFERENCE STANDARDS
A. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a.
D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2010.
E. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2011.
F. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006.
G. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2010.
H. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2007.
I. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units; 2011.
J. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2008).
K. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2010.
L. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.

PART 2 PRODUCTS
2.1 BRICK UNITS
A. Facing Brick: ASTM C216, Type FBS, Grade SW.
1. Color and texture: As indicated on drawings.
2. Nominal size: As indicated on drawings.
3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.2 MORTAR AND GROUT MATERIALS
A. Mortar and grout: As specified in Section 04 0500.
B. Hydrated Lime: ASTM C207, Type S.
C. Grout Aggregate: ASTM C404.

2.3 REINFORCEMENT AND ANCHORAGE
A. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
3. Vertical adjustment: Not less than 3-1/2 inches.
4. Product: Thermal 2-Seal Wing Nut Anchor by Hohmann & Barnard or Equal

2.4 FLASHINGS
A. Self-Adhesive Flexible Flashing Membrane: Standard type, elastomeric and thermal plastic polymers reinforced with synthetic
fibers and calendared into 40 mil thick sheets, Compatible with Urethane and Silicone sealants
B. Lap Sealant: Butyl type as specified in Section 07 9000.

2.5 ACCESSORIES
A. Preformed Control Joints: Neoprene material. Provide with corner and tee accessories, fused joints.
B. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.

1. Airspace Maintenance and Drainage Material: Polymer mesh panels for fitting between masonry ties to loosely fill masonry cavity. Min. 24" in height.

C. Weeps: Molded PVC grilles, insect resistant.

D. Multicomponent Cavity Wall Drainage System: Combination mortar diverter, flashing and weep system.
   1. Manufacturers:
      a. Mortar Net USA, Ltd: www.mortarnet.com.
      b. CavClear www.archovations.com/masonry-mat/

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.6 LINTELS

A. Steel angle sized to accommodate loading and material sizes if not indicated in the drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Coursing: One unit and one mortar joint to equal 8 inches.

D. Brick Units:
   1. Coursing: Three units and three mortar joints to equal 8 inches.

3.4 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

D. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

3.5 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

3.6 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions. Verify that airspace width is no more than 3/8 inch greater than panel thickness. Install horizontally between joint reinforcement. Stagger end joints in adjacent rows. Fit to perimeter construction and penetrations without voids.

3.7 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

E. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

3.8 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

3.9 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER
A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 36 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.10 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY
A. Install horizontal joint reinforcement 16 inches on center.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of openings.
C. Place continuous joint reinforcement in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6 inches.

3.11 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY
A. Install horizontal joint reinforcement 16 inches on center.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
C. Lap joint reinforcement ends minimum 6 inches.
D. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 24 inches horizontally and 16 inches vertically.

3.12 MASONRY FLASHINGS
A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.
B. Extend metal flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.
C. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

3.13 LINTELS
A. Install loose steel lintels over openings.
B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.14 GROUTED COMPONENTS
A. Place and consolidate grout fill without displacing reinforcing.
B. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.15 CONTROL AND EXPANSION JOINTS
A. Do not continue horizontal joint reinforcement through control and expansion joints.
B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.16 BUILT-IN WORK
A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
B. Install built-in items plumb, level, and true to line.

3.17 CUTTING AND FITTING
A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01400.

3.19 CLEANING
A. Remove excess mortar and mortar droppings.
B. Replace defective mortar. Match adjacent work.
C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.20 PROTECTION
A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 04 7300
MANUFACTURED STONE VENEER

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes: Manufactured stone veneer, thin brick and architectural trim products.

1.2 RELATED SECTIONS
A. Section 03 30 00 - Cast-In-Place Concrete
B. Section 04 20 00 - Masonry Units
C. Section 04 71 00 - Thin Brick Masonry Veneer
D. Section 05 40 00 - Cold-Formed Metal Framing
E. Section 06 10 00 - Rough Carpentry
F. Section 06 11 20 - Framing and Sheathing
G. Section 07 62 00 - Sheet Metal Flashing & Trim
H. Section 07 90 00 - Joint Protection

1.3 REFERENCES
A. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
B. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
C. ASTM C 177 - Standard Test Method for Steady-State Head Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
D. ASTM C 190 - Method of Test for Tensile Strength of Hydraulic Cement Mortars
E. ASTM C 192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
F. ASTM C 482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste
G. ASTM C 567 - Standard Test Method for Determining Density of Structural Lightweight Concrete
H. ASTM C 1329 - Standard Specification for Portland Cement
I. ASTM C 1670 - Standard Specification for Adhered Manufactured Stone Masonry Veneer Units.
J. ASTM C 1780 - Standard Practice for Installation Methods for Adhered Manufactured Stone Masonry Veneer
K. ICC AC 38 Acceptance Criteria for Water Resistive Barriers
L. ICC ESR 2598 Coronado Stone Products Evaluation Report
M. LEED: US Green Building Council's Leadership in Energy and Environmental Design Green Building Rating System
N. Texas Department of Insurance: Product Evaluation - EC101
O. UBC Standard No. 14-1, Kraft Waterproof Building Paper

1.4 SUBMITTALS
A. Submit following in accordance with Section 01 3300.
B. Product Data: Manufacturer's specification and data sheets for each product used, including:
   1. Preparation instructions.
   2. Storage and handling requirements and recommendations.
   3. Installation guidelines.
   4. Cleaning and maintenance methods.
C. Shop Drawings: Submit elevations and cross-section details showing proper installation methods.
D. LEED Submittals: Provide documentation of how the requirements of credit will be met.
E. Sample Selection
   1. Standard sample board with selected stone profile and color should be submitted for each product specification.
   2. Selection of approved grout colors and styles (if applicable).
F. Sample Verification: A field panel sample with the minimum size of 3' x 3' should be installed for every product selection showing: styles, colors, textures and grout colors.
G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
H. Closeout Submittals: Provide manufacturer's warranty and maintenance recommendations.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Coronado Stone Products
B. Installer Qualifications: Minimum 5 years' experience with similar scope of work and must be able to furnish list of previous jobs and references if requested by Architect.
C. Certifications: Products approved by ICC-ES Evaluation Service.
D. Mock-Up: Provide field panel sample to evaluate preparation and application techniques.
I. Pre-Installation Conference: Conduct a pre-installation meeting to verify all products, application methods, site conditions and warranty terms no less than thirty days prior to stone veneer installation.

1.6 DELIVERY, STORAGE & HANDLING
A. Coordination of on-site delivery and storage should be arranged in advance to avoid work delays.
B. Store and handle stone products in accordance with the manufacturer's recommendations.
C. All material stored on-site should be protected from the elements before and during the installation process. Store material under cover and in a dry location.
D. Store mortar, sealant and other installation material in compliance with the manufacturer's recommendations.

1.7 PROJECT CONDITIONS
A. Maintain manufacturer's recommended environmental conditions to ensure optimum results.
B. Cold Weather Requirements: Installations should be performed in temperatures exceeding 40 degrees Fahrenheit prior to, during and for 48 hours after completion of work. If temperatures are below 40 degrees Fahrenheit, masons should use heaters and tents during the installation process to regulate temperature.
C. Hot Weather Requirements: If temperatures exceed 90 degrees Fahrenheit during the installation, additional moisture will need to be added to the backs of the stone veneer and scratch coated surface. Shade and/or frequent misting of the wall and stone may be required.

1.8 WARRANTY
A. Provide manufacturer's 50-year limited warranty.

PART 2 – PRODUCTS
2.1 MANUFACTURER
A. Acceptable Manufacturer: Coronado Stone Products (Corporate Office), which is located at: 11191 Calabash Ave, Fontana, CA 92337; Toll Free Tel: 800-847-8663; Fax: 909-357-7362; Email: sales@coronado.com; Web: www.coronado.com
B. Acceptable Manufacturer: Eldorado Stone (Corporate Office), which is located at: 1370 Grand Avenue, Building B, San Marcos, California 92078; Toll Free Tel: 760-736-3232; Fax: 760-736-8890; Web: www.eldoradostone.com

2.2 MATERIALS CORONADO
A. Manufactured Stone Veneer:
1. Profile / Color: FREEDOM STONE SERIES – TEXAS CREAM
B. Stone Accessories:
1. Profile / Color: 900 SERIES – OFF-WHITE

ELDORADO
C. Manufactured Stone Veneer:
1. Profile / Color: WESTERN PROFILES – AUSTIN CREAM
D. Stone Accessories:
1. Profile / Color: CHISELED EDGE ACCENTS - BUCKSKIN
E. Manufactured Stone Veneer - Properties: Units consisting of Portland cement, lightweight aggregates and oxide pigments.
1. Compressive Strength: Tested in accordance with ASTM C39 and ASTM C192, greater than 1800 psi.
2. Shear Bond Test: Tested in accordance with ASTM C482, greater than 50 psi.
3. Water Absorption: Tested in accordance with section 3.1.4 and 4.6 of ICC-ES AC51.
4. Freeze / Thaw: Tested in accordance with ASTM C67, less than 3% mass loss.
5. Unit Weight: Shipping weight is less than 15 lbs. per sq ft, density is determined in accordance with ASTM C567.

PART 3 – EXECUTION
3.1 EXAMINATION
A. Do not begin the installation process until substrates have been properly prepared.
B. Notify architect of any unsatisfactory preparation of substrate before proceeding.
C. Correct all unsatisfactory substrate conditions before installation begins.
D. Verify roofs use proper water displacement methods to direct moisture away from the installed stone veneer.
E. If substrate surface is questionable, bonding tests should be performed before installation to assess adhesion and confirm proper bonding strength.

F. Flashing must be installed at wall penetrations and terminations of the stone veneer. Assure that all flashing and kickouts are corrosion resistant, integrated with the WRB properly (when used), and installed in accordance with the local building code requirements.

3.2 PREPARATION
A. Clean all surfaces thoroughly prior to installation.
B. Use manufacturer surface preparation recommendations to achieve best result.
3.3 INSTALLATION
A. Product should be pulled from a variety of boxes and blended on site during installation to ensure a consistent overall project color on the wall.
B. Install in accordance with manufacturer's installation instructions. Visit this page for detailed installation instructions - https://www.coronado.com/InstallationGuide
C. Application details and mortar recommendations may vary depending on the stone style. Consult manufacturer for proper installation instructions.
D. All dry-stacked and large format standard stones should be installed using a polymer-modified mortar meeting ANSI A118.4 or ANSI 118.15.
E. All Classic Series and WoodStone products must be applied with a polymer-modified thin set bonding mortar meeting ANSI A118.4 or ANSI 118.15.
F. All applications in freeze-thaw environments require a polymer-modified mortar.

3.4 CLEANING AND PROTECTION
A. Installed manufactured stone veneer can be cleaned with a mild soap and water solution.
B. Cleaning efflorescence can be done by lightly scrubbing the face of the stone with a soft bristle brush and water. In some cases, a 25% vinegar 75% water solution may need to be used. Do not use any harsh cleaning methods to remove efflorescence.
C. Touch-up, repair or replace damaged stone before completion of project.
D. Water repellents and enhancers can be used to further protect a finished project. Only breathable, penetrating water-based silane water repellents should be used.

SECTION 05 4000
COLD-FORMED METAL FRAMING

1.1 SUBMITTALS
A. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, and limitations.
B. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
1. Indicate stud and ceiling joist layout.
2. Describe method for securing studs to tracks and for bolted framing connections.
3. Provide design engineer's stamp on shop drawings.

1.2 QUALITY ASSURANCE
A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

1.3 MANUFACTURERS
A. Metal Framing, Connectors, and Accessories:
1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
2. Marino: www.marinoware.com.
3. The Steel Network, Inc: www.SteelNetwork.com.

1.4 FRAMING SYSTEM
A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
B. Design Criteria: Provide completed framing system having the following characteristics:
1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
3. Design Loads: In accordance with applicable codes.
4. Live load deflection meeting the following, unless otherwise indicated:

a. Exterior Walls: Maximum horizontal deflection under wind load of L/600 of span for masonry, and L/240 of span for metal wall panels and EIFS.

5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.5 FRAMING MATERIALS

A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
   1. Gage and depth: As required to meet specified performance levels, but not less than 16 gage at 16 inches on center.
   2. Galvanized in accordance with ASTM A653 G60 coating.
   3. Provide components fabricated from ASTM A1008/A1008M, Designation SS steel.

B. Canopy Framing
   1. Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, and as follows:
      a. Minimum Base-Metal Thickness: As required by design.
      b. Flange Width: 1-5/8 inches, minimum.
      c. Section Properties: As required by design.
   2. Built-up Members: Built-up members of manufacturer's standard C-shaped steel section, with stiffened flanges, nested into a U-shaped steel section joist track, with unstiffened flanges; unpunched; of web depths indicated; and as follows:
      a. Minimum Base-Metal Thickness: As required by design.
      b. Flange Width: 1-5/8 inches, minimum.
      C. Framing Connectors: Factory-made formed steel sheet, ASTM A653 SS Grade 50, with G60 hot dipped galvanized coating and factory punched holes.
   1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold Formed Steel Structural Members; minimum 16 gage, 0.06 inch thickness.
   2. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, screws and anti-friction bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
      a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
      b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2inch.
      c. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
   3. Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

1.6 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
B. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

1.7 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
B. Anchorage Devices: Powder actuated.
C. Anchorage Devices: Power actuated.
D. Welding: In conformance with AWS D1.1.

1.8 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.
B. Verify field measurements and adjust installation as required.

1.9 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.
B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.

C. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clip and tie method.
D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
E. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
F. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
H. Install intermediate studs above and below openings to align with wall stud spacing.
I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
J. Attach cross studs to studs for attachment of fixtures anchored to walls.
K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
L. Touch-up field welds and damaged galvanized surfaces with primer.

1.10 TOLERANCES
A. Maximum Variation from True Position: 1/4 inch.
B. Maximum Variation of any Member from Plane: 1/4 inch.

END OF SECTION

SECTION 05 5000
METAL FABRICATIONS

1.1 SUBMITTALS
A. 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.

1.2 PROJECT CONDITIONS
A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.3 COORDINATION
A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
B. Coordinate installation of anchorages. 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.

1.4 METALS, GENERAL
A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

1.5 FERROUS METALS
A. Steel Plates, Shapes, and Bars: ASTM A 36.
B. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

1.6 FASTENERS
A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1.7 MISCELLANEOUS MATERIALS
A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1.8 FABRICATION, GENERAL
A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch 1 mm unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
D. Form exposed work with accurate angles and surfaces and straight edges.
E. 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 so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
   1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

1.5 RAILINGS - GENERAL REQUIREMENTS
A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 50 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
D. Dimensions: See drawings for configurations and heights.
E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
   1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
   2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
   3. For anchorage to stud walls, provide backing plates, for bolting anchors.
   4. Posts: Provide adjustable flanged brackets.
F. Handrail extensions must extend 12" in the same direction of travel per section 1012.6 2009 IBC and ANSI A117.1 Section 505.10

1.6 STEEL RAILING SYSTEM
A. Steel Tube: ASTM A 500, Grade B cold-formed structural tubing.
B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
E. Exposed Fasteners: No exposed bolts or screws except at handrail bracket to wall.
F. Shop and Touch-Up Primer: SSPC-SP15, complying with VOC limitations of authorities having jurisdiction. Use primer compatible with shop primer and finish paint.

1.9 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.
   1. Fabricate units from slotted channel framing where indicated.
C. Fabricate supports for operable partitions from continuous steel beams of sizes [indicated] [recommended by partition manufacturer] with attached bearing plates, anchors, and braces as [indicated] [recommended by partition manufacturer]. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

1.10 STEEL AND IRONFINISHES

A. 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.
   1. Shop prime with universal shop primer unless zinc-rich primer is indicated.

1.11 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 so no roughness s how's after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
   1. Cast Aluminum: Heavy coat of bituminous paint.
   2. Extruded Aluminum: Two coats of clear lacquer.

1.12 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

1.13 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.
   1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

SECTION 06 1000
ROUGH CARPENTRY – NON-STRUCTURAL

1.1 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

1.2 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

1.3 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards and Shop Wall Protection Cladding: PS 1 A-D-EXT plywood, 3/4 inch thick. Provide FR (fire retardant) treated material where required by code.

1.4 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative- treated wood locations, unfinished steel elsewhere.
   2. Anchors: Toggle bolt type for anchorage to hollow masonry.

1.5 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Manufacturers:
      a. Arch Wood Protection, Inc : www.wolmanizedwood.com.
      b. Viance, LLC : www.treatedwood.com.
      c. Osmose, Inc : www.osmose.com.
   2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb./cu ft retention.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Treat lumber in contact with roofing, flashing, or waterproofing.
      c. Treat lumber in contact with masonry or concrete.
      d. Treat lumber in other locations as indicated.

1.6 PREPARATION

A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.

B. Coordinate installation of rough carpentry members specified in other sections.

1.7 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

1.8 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

1.9 INSTALLATION OF CONSTRUCTION PANELS

A. Plywood Wall Sheathing
   1. Install with long edge perpendicular to framing.
   2. Allow 1/8 inch open space between panel ends and edges for expansion and contraction.
   3. Place ends over framing members. Install over two or more spans with end joints staggered and face grain perpendicular to supports.
   4. Secure with galvanized nails to each support spacing fasteners at 12 inch o.c. for intermediate supports and 6 inch o.c. for ends supports (or at spacing as otherwise indicated on structural drawings), using 8d ring shank nails. Staples will be allowed as a substitution if allowed by governing codes, Architect, and Owner.
   5. Use edge clips at all unsupported edges at roof sheathing, spaced at 12" maximum on center.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.

1.10 TOLERANCES
A. Framing Members: 1/4 inch from true position, maximum.
B. Variation from Plane: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

SECTION 06 1600
SHEATHING

1.1 WALL SHEATHING
A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177.
1. Products: Subject to compliance with requirements, provide one of the following:
a. CertainTeed Corporation; GlasRoc.
b. G-P Gypsum Corporation; Dens-Glass Gold.
c. Temple-Inland Inc.; GreenGlass
d. United States Gypsum Co.; Securock.
2. Type and Thickness: Type X, 5/8 inch thick.
3. Size: 48 by 108 inches.

1.2 GYPSUM SHEATHING INSTALLATION
A. Comply with GA-253 and with manufacturer's written instructions.
1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
3. Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
C. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.
D. Space fasteners approximately 8 inches O.C. and set back a minimum of 3/8 inch from edges and ends of boards.

END OF SECTION

SECTION 06 4023
INTERIOR ARCHITECTURAL WOODWORK

1.1 SUBMITTALS
A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Show details in sufficient scale to determine compliance with the intent of the Quality Standard Grade specified.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for plumbing fixtures installed in architectural woodwork.
B. Samples for Initial Selection:
1. Plastic laminates.

1.2 PROJECT CONDITIONS
A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide

allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.3 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

1.4 MATERIALS

A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Products: Comply with the following:
   1. Hardboard: Tempered, AHA A135.4.
   2. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
      a. Type A (standard): MDF, MR10 – ANSI A208.2, Grade 130.
      b. Type B (where additional moisture resistance is needed): MDF, MR30 – ANSI A208.2, Grade 155.
      c. Type C (near sinks, splashes, and other high humidity locations): MDF, MR50 – ANSI A208.2, Grade 150
   3. Softwood Plywood: DOC PS 1, Medium Density Overlay.

C. Thermoset Decorative Laminate (melamine): Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.

D. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.
   1. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
      a. Abet Laminati, Inc.
      b. Formica Corporation.
      c. Lamin-Art, Inc.
      d. Nevamar Company, LLC; Decorative Products Div.
      e. Wilsonart International; Div. of Premark International, Inc.
   2. Colors/textures: As indicate in Finish Legend.

1.5 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."

B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.

C. Wire Pulls: Back mounted, solid metal, 5 inches long, 2-1/2 inches deep, and 5/16 inch in diameter.

D. Magnetic Catches: BHMA A156.9, B03141.

E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

F. Shelf Rests: BHMA A156.9, B04013; metal, equal to Hafele 282.04.711.

G. Drawer Slides: BHMA A156.9, B05091.
   1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball- bearing slides.
   2. File Drawer Slides: Grade 1HD-100; for drawers more than 6 inches 1high or 24 inches wide.
   3. Pencil Drawer Slides: Grade 2; for drawers not more than 3 inches high and 24 inches wide.

H. Door Locks: BHMA A156.11, E07121.

I. Drawer Locks: BHMA A156.11, E07041.

J. Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
   1. Product: Subject to compliance with requirements, provide "EDP series" by Doug Mockett & Company, Inc.

K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated, unless noted otherwise.
   1. Satin Stainless Steel: BHMA 630.

L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

1.6 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood 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 nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

C. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

1.7 FABRICATION, GENERAL

A. Interior Woodwork Grade: Unless otherwise indicated, provide Custom -grade interior woodwork complying with referenced quality standard.

B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch Thick or Less: 1/16 inch.
2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.
3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.

C. Complete fabrication, including assembly, finishing, 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.
1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

D. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
1. Seal edges of openings in countertops with a coat of varnish.

1.8 PLASTIC-LAMINATE CABINETS

A. Grade: Custom.

B. AWI Type of Cabinet Construction: Flush overlay.

C. Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
1. Horizontal Surfaces Other Than Tops: Grade HGS.
2. Post-formed Surfaces: Grade HGP.
3. Vertical Surfaces: Grade VGS.
4. Edges: Grade HGS.

D. Materials for Semi-exposed Surfaces:
1. Surfaces Other Than Drawer Bodies: Thermostet Decorative Laminate.
a. For semi-exposed backs of panels with exposed plastic-laminate surfaces, provide surface of high- pressure decorative laminate, Grade CLS.
2. Drawer Sides and Backs: Solid-hardwood lumber.
3. Drawer Bottoms: Hardwood plywood, ¼ inch thick.

E. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

F. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
1. As indicated by laminate manufacturer's designations.
2. Match Architect's sample.
3. As selected by Architect from laminate manufacturer's full range in the following categories:
a. Solid colors, matte finish.
b. Solid colors with core same color as surface, matte finish.
c. Wood grains, matte finish.
d. Patterns, matte finish.

G. Provide dust panels of 1/4-inch plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

1.9 PLASTIC-LAMINATE COUNTERTOPS

A. Grade: Custom.

B. High-Pressure Decorative Laminate Grade: HGS.

C. Grain Direction: Parallel to cabinet fronts.

D. Edge Treatment: Same as laminate cladding on horizontal surfaces.

E. Core Material: Medium density fiber board

F. Backer Sheet: Provide plastic-laminate backer sheet, Grade BKL, on underside of countertop substrate.

G. Paper Backing: Provide paper backing on underside of countertop substrate.

1.10 PREPARATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and back priming.

1.11 INSTALLATION

A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
   1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
   2. Maintain veneer sequence matching of cabinets with transparent finish.
   3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head screws sized for 1-inch 25-mm penetration into wood framing, blocking, or hanging strips or No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

G. 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. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

H. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

1.12 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.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 06 6400
PLASTIC PANELING

1.1 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: 25 or less.
   2. Smoke-Developed Index: 450 or less.

1.2 PLASTIC SHEET PANELING

A. General: Gelcoat-finished, glass-fiber reinforced plastic panels complying with ASTM D 5319.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Crane, Kemlite Company Inc.
      b. Marlite.
      c. Nudo Products, Inc.
   2. Nominal Thickness: Not less than 0.09 inch.
   3. Surface Finish: As selected by Architect from manufacturer's full range.

4. Color: As indicated in Finish Legend.

1.3 ACCESSORIES

A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
   1. Color: Match panels.

B. Concealed Mounting Splines: Continuous, H-shaped aluminum extrusions designed to fit into grooves routed in edges of factory-laminated panels and to be fastened to substrate.

C. Adhesive: As recommended by plastic paneling manufacturer.

D. Sealant: Single-component, mildew-resistant, neutral-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Division 07 Section "Joint Sealants."

1.4 PREPARATION

A. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.

B. Clean substrates of substances that could impair bond of adhesive, including oil, grease, dirt, and dust.

C. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.

D. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.
   1. Mark plumb lines on substrate at trim accessory locations for accurate installation.
   2. Locate trim accessories to allow clearance at panel edges according to manufacturer's written instructions.

1.5 INSTALLATION

A. Install plastic paneling according to manufacturer's written instructions.

B. Install panels in a full spread of adhesive.

C. Install panels with fasteners. Layout fastener locations and mark on face of panels so that fasteners are accurately aligned.
   1. Drill oversized fastener holes in panels and center fasteners in holes.
   2. Apply sealant to fastener holes before installing fasteners.

D. Install factory-laminated panels using concealed mounting splines in panel joints.

E. Install trim accessories with adhesive.

F. Fill grooves in trim accessories with sealant before installing panels and bed inside corner trim in a bead of sealant.

G. Maintain uniform space between panels and wall fixtures. Fill space with sealant.

H. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.

I. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION

SECTION 07 2100
INSULATION

1.1 MANUFACTURERS

A. Insulation:
   1. Owens Corning.
   2. Certainteed.
   3. USG.
   4. Johns Manville.
   5. Substitutions: See Section 016000 - Product Requirements.

1.2 APPLICATIONS

A. Insulation Over Metal Stud Framed Walls, Continuous: Polyisocyanurate board.

B. Insulation in Metal Stud Framed Walls: Batt insulation with no vapor retarder at exterior walls in office area and walls separating conditioned from non-conditioned areas and for acoustical purposes around restrooms.

C. Insulation in shop walls: Batt insulation with vinyl face

1.3 FOAM BOARD INSULATION MATERIALS

A. General: For use in exterior wall assemblies, product must have been tested to meet NFPA 285 for flame propagation.

B. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289; Type I, Class 2.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   3. Compressive Strength: 16 psi
   4. Board Size: 48 x 96 inch.
   5. Board Thickness: Refer to Drawings.
   6. Board Edges: Square.
   7. Manufacturers:
      a. Atlas Roofing Corporation: www.atlasroofing.com.
      b. Dow Chemical Co: www.dow.com.
      c. GAF Materials Corporation: www.gaf.com.
      d. Rmax Inc.: www.rmax.com.
   8. Substitutions: See Section 016000 - Product Requirements.

1.4 FIBERGLASS BATT INSULATIONMATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E13, except for facing, if any.
   4. Formaldehyde Content: Zero.
   5. Thermal Resistance: As indicated on Drawings.
   6. Facing:
      a. Unfaced (typical)
   7. Manufacturers:
      a. CertainTeed Corporation: www.certainteed.com.
      b. Johns Manville Corporation: www.jm.com.
      c. Knauf Insulation GmbH: www.knaufinsulation.us.
      d. Owens Corning Corp: www.owenscorning.com.
   8. Substitutions: See Section 016000 - Product Requirements

1.5 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

1.6 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.

B. Install boards horizontally on walls.
   1. Install in running bond pattern.
   2. Butt edges and ends tightly to adjacent boards and to protrusions.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

1.7 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall, floor and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Place insulation against baffles. Do not impede natural attic ventilation to soffit.

F. Coordinate work of this section with construction of air barrier seal specified in Section 072500.

1.8 PROTECTION

A. Do not permit installed insulation to be wet or damaged prior to its concealment.

END OF SECTION

SECTION 07 2418
WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

1.1 SYSTEM DESCRIPTION

A. Class PB EIFS: A non-load-bearing, exterior wall cladding system that consists of an insulation board attached adhesively, mechanically, or both to the substrate; an integrally reinforced base coat; and a textured protective finish coat.

B. Water-Drainage EIFS: EIFS with a means that allows water entering into an EIFS assembly to drain to the exterior.

1.2 PERFORMANCE REQUIREMENTS

A. EIFS Performance: Comply with the following:

1. Bond Integrity: Free from bond failure within EIFS components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.
2. Weathertightness: Resistant to water penetration from exterior into water-drainage EIFS and assemblies behind it or through them into interior of building that results in deterioration of thermal-insulating effectiveness or other degradation of EIFS and assemblies behind it, including substrates, supporting wall construction, and interior finish, and including a means that allows water entering into an EIFS assembly to drain to the exterior.

1.3 SUBMITTALS

A. Product Data: For each type and component of EIFS indicated.

B. Shop Drawings: For EIFS. Include plans, elevations, sections, details of components, details of penetration and termination, flashing details, joint locations and configurations, fastening and anchorage details including mechanical fasteners, and connections and attachments to other work.

C. Samples for Initial Selection: For each type of finish-coat color and texture indicated. Include similar Samples of joint sealants and exposed accessories involving color selection.

D. Field quality-control reports and special inspection reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An installer who is certified in writing by EIFS manufacturer as qualified to install manufacturer's system using trained workers.

B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution and set quality standards for fabrication and installation.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.

B. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.

1. Stack insulation board flat and off the ground.
2. Protect plastic insulation against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Maintain ambient temperatures above 40 deg F for a minimum of 24 hours before, during, and after adhesives or coatings are applied. Do not apply EIFS adhesives or coatings during rainfall. Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.

1.7 COORDINATION

A. Coordinate installation of EIFS with related Work specified in other Sections to ensure that wall assemblies, including sheathing, weather-resistant sheathing paper, flashing, trim, joint sealants, windows, and doors, are

protected against damage from the effects of weather, age, corrosion, moisture, and other causes. Do not allow water to penetrate behind flashing and drainage plane that is behind water-drainage EIFS.

1.8 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Dryvit Systems, Inc.
Finestone; Degussa Wall Systems, Inc. Parex, Inc.; a brand of ParexLahabra, Inc. Senergy; Degussa Wall Systems, Inc.
Sto Corp.

1.9 MATERIALS

A. Compatibility: Provide water-resistive coating, adhesive, fasteners, board insulation, reinforcing meshes, base- and finish- coat systems, sealants, and accessories that are compatible with one another and with substrates and approved for use by EIFS manufacturer for Project.

B. Water-Resistive Coatings: EIFS manufacturer's standard formulation and accessories for use as water/weather-resistive barriers, compatible with substrate, and complying with physical and performance criteria of ICC-ES AC209.
1. Sheathing Joint Tape: Type recommended by EIFS manufacturer for sealing joints between and penetrations through sheathing.
2. Acceptable Product: Stoguard with Goldcoat.
3. Application: Over sheathing behind EIFS systems.

C. Primer/Sealer: EIFS manufacturer's standard substrate conditioner with VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), designed to seal substrates from moisture penetration and to improve the bond between substrate of type indicated and adhesive used for application of insulation.

D. Flexible-Membrane Flashing: Cold-applied, fully self-adhering, self-healing, rubberized-asphalt and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.

E. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; compatible with substrate; and complying with one of the following:
Job-mixed formulation of portland cement complying with ASTM C 150, Type I, and polymer-based adhesive specified for base coat.

F. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with ASTM C 578, Type I; EIFS manufacturer's requirements; and EIMA's "EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board" for most stringent requirements for material performance and qualities of insulation, including dimensions and permissible variations, and the following:
1. Aging: Before cutting and shipping, age insulation in block form by air drying for not less than six weeks or by another method approved by EIMA that produces equivalent results.
2. Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, per ASTM E 84.
3. Dimensions: Provide insulation boards not more than 24 by 48 inches and in thickness indicated but not more than 4 inches thick or less than thickness allowed by ASTM C 1397.
4. Channeled Board Insulation: EIFS manufacturer's standard factory-fabricated profile with linear, vertical drainage channels, slots, or waves on the back side of board.
5. Board Insulation Closure Blocks: EIFS manufacturer's standard density, size, and configuration.
6. Foam Shapes: Provide with profiles and dimensions indicated on Drawings.

G. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multi-end strands with retained mesh tensile strength of not less than 120 lbf/in. per ASTM E 2098; complying with ASTM D 578 and the following:
1. Standard-Impact Reinforcing Mesh: Not less than 4.0 oz./sq. yd.
2. Intermediate-Impact Reinforcing Mesh: Not less than 10 oz./sq. yd.
3. High-Impact Reinforcing Mesh: Not less than 15 oz./sq. yd.
4. Strip Reinforcing Mesh: Not less than 3.75 oz./sq. yd.
5. Detail Reinforcing Mesh: Not less than 4.0 oz./sq. yd.
6. Corner Reinforcing Mesh: Not less than 7.2 oz./sq. yd.

H. Base-Coat Materials: EIFS manufacturer's standard mixture complying with one of the following requirements:

1. Job-mixed formulation of portland cement complying with ASTM C 150, Type I, white or natural color; and manufacturer's standard polymer-emulsion adhesive designed for use with portland cement.

I. Waterproof Adhesive/Base-Coat Materials: EIFS manufacturer's standard waterproof formulation with VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with one of the following:
1. Job-mixed formulation of portland cement complying with ASTM C 150, Type I, white or natural color; and manufacturer's standard polymer-emulsion adhesive designed for use with portland cement.
2. Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.

J. Finish-Coat Materials: EIFS manufacturer's standard acrylic-based coating with enhanced mildew resistance complying with the following:

1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.
2. Sealer: Manufacturer's waterproof, clear acrylic-based sealer for protecting finish coat.
3. Colors: Match Architect's samples.

K. Water: Potable.

L. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with EIFS manufacturer's written instructions; manufactured from UV-stabilized PVC; and complying with ASTM D 1784, manufacturer's standard Cell Class for use intended, and ASTM C 1063.
1. Drip Screed/Track: Prefabricated, one-piece type for attachment behind insulation with face leg extended to form a drip, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.
2. Weep Screed/Track: Prefabricated, one-piece type for attachment behind insulation with perforated face leg extended to form a drip and weep holes in track bottom, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg; designed to drain incidental moisture that gets into wall construction to the exterior at terminations of EIFS with drainage
3. Expansion Joint: Prefabricated, one-piece V profile; designed to relieve stress of movement.
4. Window Sill Flashing: Prefabricated type for both flashing and sloping sill over framing beneath windows; with end and back dams; designed to direct water to exterior.

1.10 ELASTOMERIC SEALANTS

A. Elastomeric Sealant Products: Provide EIFS manufacturer's listed and recommended chemically curing, elastomeric sealant that is compatible with joint fillers, joint substrates, and other related materials, and complies with requirements for products and testing indicated in ASTM C 1481 and with requirements in Division 07 Section "Joint Sealants" for products corresponding to description indicated below:
1. Multicomponent, non-sag urethane sealant.
2. Single-component, non-sag, neutral-curing silicone sealant.
3. Provide sealants, for use inside the weatherproofing system, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Sealant Color: Match Architect's samples.

1.11 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of EIFS.

B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Begin coating application only after surfaces are dry.
Application of coating indicates acceptance of surfaces and conditions.

1.12 PREPARATION

A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.

B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind drainage plane of EIFS and deterioration of substrates.

C. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.

1.13 EIFS INSTALLATION, GENERAL

A. Comply with EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.

1.14 SUBSTRATE PROTECTION APPLICATION

A. Primer/Sealer: Apply over gypsum sheathing substrates to protect substrates from degradation and where required by EIFS manufacturer for improving adhesion of insulation to substrate.

B. Water-Resistive Coatings: Apply over substrates to protect substrates from degradation and to provide water-/weather- resistive barrier.

C. Tape and seal joints, exposed edges, terminations, and inside and outside corners of sheathing unless otherwise indicated by EIFS manufacturer's written instructions.

D. Waterproof Adhesive/Base Coat: Apply over sloped surfaces and window sills.

E. Flexible-Membrane Flashing: Install over weather-resistive barrier, applied and lapped to shed water; seal at openings, penetrations, terminations, and where indicated by EIFS manufacturer's written instructions to protect wall assembly from degradation. Prime substrates, if required, and install flashing to comply with EIFS manufacturer's written instructions and details.

1.15 TRIM INSTALLATION

A. Trim: Apply trim accessories at perimeter of EIFS, at expansion joints, at window sills, and elsewhere as indicated, according to EIFS manufacturer's written instructions. Coordinate with installation of insulation.
   1. Weep Screed/Track: Use at bottom termination edges, at window and door heads of water-drainage EIFS unless otherwise indicated.
   2. Window Sill Flashing: Use at windows unless otherwise indicated.
   3. Expansion Joint: Use where indicated on Drawings.

1.16 INSULATION INSTALLATION

A. Board Insulation: Adhesively attach insulation to substrate in compliance with ASTM C 1397, EIFS manufacturer's written instructions.

B. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, and as follows:
   1. At expansion joints in substrates behind EIFS.
   2. Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.
   3. At floor lines in multilevel wood-framed construction.
   4. Where wall height or building shape changes.
   5. Where EIFS manufacturer requires joints in long continuous elevations.

1.17 BASE-COAT INSTALLATION

A. Base Coat: Apply to exposed surfaces of insulation and foam shapes in minimum thickness recommended in writing by EIFS manufacturer, but not less than 1/16-inch dry-coat thickness.

B. Reinforcing Mesh: Embed type indicated below in wet base coat to produce wrinkle-free installation with mesh continuous at corners and overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C 1397 and EIFS manufacturer's written instructions. Do not lap reinforcing mesh within 8 inches of corners.

C. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.
   1. Standard-impact reinforcing mesh unless otherwise indicated.
   2. Intermediate-impact reinforcing mesh at window sills and parapet caps.
   3. High-impact reinforcing mesh below 8 feet above grade or adjacent walking surfaces.

D. Double-Layer Reinforcing Mesh Application: Where indicated, apply second base coat and second layer of standard intermediate-impact reinforcing mesh, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with

E. ASTM C 1397 and EIFS manufacturer's written instructions in same manner as first application. Do not apply until first base coat has cured.

F. Additional Reinforcing Mesh: Apply strip reinforcing mesh around openings extending 4 inches beyond perimeter. Apply additional 9-by-12-inch strip reinforcing mesh diagonally at corners of openings (re-entrant corners). Apply 8- inch- wide strip reinforcing mesh at both inside and outside corners unless base layer of mesh is lapped not less than 4 inches on each side of corners.
At aesthetic reveals, apply strip reinforcing mesh not less than 8 inches wide.
Embed strip reinforcing mesh in base coat before applying first layer of reinforcing mesh.

G. Foam Shapes: Fully embed reinforcing mesh in base coat.

H. Double Base-Coat Application: Where indicated, apply second base coat in same manner and thickness as first application except without reinforcing mesh. Do not apply until first base coat has cured.

1.18 FINISH-COAT INSTALLATION

A. Finish Coat: Apply over dry base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by EIFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
Texture: Match Architect's samples.
Embed aggregate in finish coat according to EIFS manufacturer's written instructions to produce a uniform applied- aggregate finish of color and texture matching approved sample.

B. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by EIFS manufacturer.

1.19 INSTALLATION OF JOINT SEALANTS

A. Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements in Division 07 Section "Joint Sealants" and in ASTM C 1481.
   1. Apply joint sealants after base coat has cured but before applying finish coat.
   2. Clean surfaces to receive sealants to comply with indicated requirements and EIFS manufacturer's written instructions.
   3. Apply primer recommended in writing by sealant manufacturer for surfaces to be sealed.
   4. Install sealant backing to control depth and configuration of sealant joint and to prevent sealant from adhering to back of joint.
   5. Apply masking tape to protect areas adjacent to sealant joints. Remove tape immediately after tooling joints, without disturbing joint seal.
   6. Recess sealant sufficiently from surface of EIFS so an additional sealant application, including cylindrical sealant backing, can be installed without protruding beyond EIFS surface.

1.20 CLEANING ANDPROTECTION

A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.

SECTION 07 2500
WEATHER BARRIERS-SHEET

1.1 SUBMITTALS

A. Product Data: Provide data on material characteristics.

B. Manufacturer's Installation Instructions: Indicate preparation.

1.2 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

1.3 WARRANTY

A. Provide manufacturer's standard 10 year water-tightness warranty covering material and installation.

1.4 WATER RESISTIVE BARRIER

A. Air Barrier Sheet, Mechanically Fastened:

1. Air Penetration: 0.001 cfm/ft2 at 75 Pa, when tested in accordance with ASTM E2178. Type I per ASTM E1677.≤0.04 cfm/ft2 at 75 Pa, when tested in accordance with ASTM E2357.
2. Water Vapor Transmission: 28 perms, when tested in accordance with ASTM E96, Method B.
3. Water Penetration Resistance: Minimum 280 cm when tested in accordance with AATCC Test Method 127.
4. Basis Weight: Minimum 2.7 oz/yd2, when tested in accordance with TAPPI Test Method T-410.
5. Air Resistance: Air infiltration at >1500 seconds, when tested in accordance with TAPPI Test Method T-460.
6. Tensile Strength: Minimum 38/35 lbs./in., when tested in accordance with ASTM D882, Method A.
7. Tear Resistance: 12/10 lbs., when tested in accordance with ASTM D1117.
8. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 10, Smoke Developed: 10.
9. Manufacturers:
   a. DuPont Tyvek; www.dupont.com.
   b. Pactiv Corporation; greenguard.pactiv.com.
   c. VaproShield, LLC; www.vaproshield.com.
10. Acceptable Products:
    a. Behind masonry veneer:
       1. Tyvek Commercial Wrap, by E.I. Dupont.
    b. Self-Adhering Flexible flashing tape, DuPont™ FlexWrap™. and Self Adhering Straight flashing tape, DuPont™ StraightFlash™.

1.5 SEALANTS

A. Silicone Sealant: Type S-GP as specified in Section 079005.

1.6 ACCESSORIES

A. Self-Adhesive Sheet Flashing: ASTM D 1970.

B. Thinners and Cleaners: As recommended by material manufacturer.

C. Attachment Devices: Galvanized steel nails with weather resistant plastic caps.

1.7 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work of this section.

1.8 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

1.9 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Water-Resistive/Air Barriers: Install continuous barrier over surfaces indicated, with sheets lapped to shed water but with seams not sealed.

C. Mechanically Fastened Sheets - On Exterior:
1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
2. Overlap seams as recommended by manufacturer but at least 6 inches.
3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
4. Attach to framed construction with fasteners extending through sheathing into framing. Space fasteners at 12 to 18 inches on center along each framing member supporting sheathing.
5. For applications specified to be air-tight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
6. Install air barrier UNDER jamb flashings.
7. Install head flashings under weather barrier.
8. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

D. Openings and Penetrations in Exterior Weather Barriers:
1. Install self-adhesive flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with self-adhesive flashing at least 4 inches wide; do not seal sill flange.
3. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using self- adhesive flashing at least 9 inches wide, covering entire depth of framing.
4. At head of openings, install self-adhesive flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
6. Service and Other Penetrations: Form self-adhesive flashing around penetrating item and seal to weather barrier surface.

1.10 FIELD QUALITY CONTROL
A. Do not cover installed weather barriers until required inspections have been completed.
B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
C. Provide inspections as required by weather barrier manufacturer as required to secure warranty indicated.

1.11 PROTECTION
A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 07 2600
UNDER SLAB VAPOR BARRIER

1.1 PROJECT CONDITIONS
A. Close areas to traffic during application and for time period after application recommended in writing by manufacturer.
1.2 COORDINATION
A. Coordinate placement of sheet vapor barrier with Division 03 sections.
1.3 MATERIALS
A. Sheet Vapor Barrier:
1. Type: 15 mil polyolefin film meeting requirements of ASTM E 1745, Class A.
2. Water Vapor Transmittance (After mandatory condition per ASTM E154 sections 8,11,12,13): Maximum perm rating of 0.01 as tested in accordance with ASTM E 1745 Section 7.
3. Strength: ASTM E 1745: Class A. Acceptable Products:
B. Acceptable Products:
1. Subject to compliance with requirements, provide one of the following: Stego Wrap Vapor Barrier by Stego Industries, LLC, 15 Mils.
Zero-Perm Vapor Barrier by Alumiseal. Perminator by W.R. Meadows.
Xtreme by Tex-Trude
C. Accessories:
1. Bonding Agent: Manufacturer's approved or recommended vapor barrier bonding agent.

2. Sealing and Seaming Tape: High density polyethylene tape a minimum of 4 inches in width, compatible with vapor barrier membrane, and manufactured by or recommended by vapor barrier membrane manufacturer. Tape for joints shall have at least the same permeability rating as the vapor barrier specified.
3. Vapor Proofing Mastic: Manufacturer's approved or recommended vapor proofing mastic with the same permeability rating as the vapor barrier specified.
4. Pipe Boot: Construct pipe boots from vapor barrier material and pressure sensitive tape in accordance with manufacturer's instructions.

1.4 INSTALLATION
A. Vapor Barrier:
1. Place, protect, and repair vapor barrier sheets according to ASTM E 1643 and manufacturer's written instructions.
2. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete pour.
3. Install vapor barrier without tears, voids, and holes. Lap ends and edges as recommended by manufacturer, but not less than 6 inches over adjacent sheets. Seal laps with tape.
4. Turn up sheets at perimeter, at footings and vertical walls, and against penetrations, and seal joints with tape.
5. Seal joints, tears, holes, perimeter, and penetrations through vapor with tape in accordance with manufacturer's recommendations.
6. Point exposed edges with pointing mastic to prevent water from traveling under membrane.
7. Adhere membrane to vertical surfaces with adhesive.

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL
1.1 SECTION INCLUDES
A. Metal flashings and trim.
B. Copings.
C. Gutters, scuppers, conductor heads and downspouts.
D. Counter-flashings over membrane roof base flashings.
E. Counter-flashings at roof mounted equipment and utility penetrations.

1.2 RELATED REQUIREMENTS
A. Section 07 9000 Joint Sealers.
B. Roofing included in Section 07

1.3 REFERENCE STANDARDS
A. American Architectural Manufacturers Association (AAMA):
1. 611 - Voluntary Specification for Anodized Architectural Aluminum.
2. 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.
3. 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Architectural Extrusions and Panels.
4. 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Architectural Extrusions and Panels.
B. ASTM International (ASTM):
1. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
2. A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar.
3. A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Pre-painted by the Coil- Coating Process for Exterior Exposed Building Products.
4. A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
5. B32 - Standard Specification for Solder Metal.
6. B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
7. B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
8. B506 - Specification for Copper-Clad Stainless-Steel Sheet and Strip for Building Construction.
9. B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.

C. Sheet Metal and Air Conditioning Manufacturer's Association International (SMACNA) - Architectural Sheet Metal Manual.

1.4 ADMINISTRATIVE REQUIREMENTS
A. Coordinate with work of other sections that is to be installed in or adjacent to this system.

1.5 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
C. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention, and design questions.

1.6 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.

PART 2 PRODUCTS
2.1 MATERIALS
A. Galvanized Steel Sheet:
1. ASTM A653/A653M, Structural Quality, G60 galvanized coating class, 24 gage core steel unless noted otherwise.
2. Where sheet metal is to be painted, apply phosphate film at factory.
B. Precoated Aluminum-Zinc Alloy Coated Steel Sheet:
1. ASTM A792/A792M, Commercial Quality, AZ50 aluminum-zinc alloy coating, 24 gage core steel unless noted otherwise.
C. Aluminum Sheet:
1. ASTM B209, alloy 3003, temper H14, 0.032 inch thick.
2. Finish: AAMA 611, Architectural Class I anodized, color to be selected from manufacturer's full color range on the approval of the architect.
D. Self-Adhesive Flashing Membrane (with and without drip edge): Standard type, elastomeric and thermal plastic polymers, reinforced with synthetic fibers and calendared into 40 mil thick sheets: Widths as required.
1. Elongation: ASTM D 412; 175 percent
2. Tensile Strength: ASTM D 412; 650 psi.
3. Tear Strength: ASTM D 624; 280 psi.
4. Low Temperature Flexibility: ASTM D 146; minus 25 degrees F Pass.
5. Water Absorption: ASTM D 471; Less than 0.1 percent.
6. Compatible with Urethane and Silicone sealant
7. UV Stable

2.2 ACCESSORIES
A. Solder: ASTM B32
B. Fasteners: Same material and finish as sheet metal, with neoprene gasketed washers where exposed.
C. Mastic used to seal top edges of membranes.

2.3 FABRICATION
A. Fabricate components in accordance with SMACNA Manual.
B. Profiles:
1. Gutters: Square as shown on drawings.
2. Downspouts: Square as shown on drawings.
3. Fabricate end caps, downspout outlets and headers, straps, brackets, and downspout strainers in profile to suit gutters and downspouts.
C. Solder shop formed joints except pop rivet and seal joints at prefinished metal. After soldering, remove flux and wash clean.
D. Fabricate corners in single units with minimum 12 inch long legs
E. Fabricate vertical faces with bottom edge formed outward 1/2 inch and hemmed to form drip.
F. Form sections accurate to size and shape, square and free from distortion and defects.
G. Provide for thermal expansion and contraction in sheet metal:
1. Gutters: Min. 50 feet on center
2. Other Sheet Metal: Min 15 feet on center
3. Joint width: Consistent with types and sizes of material, minimum 1/4" width.
H. Fabricate expansion joints in metal copings edge flashings with backing and cover plates formed to flashing profile, minimum 8 inches long.
I. Unless otherwise indicated, provide minimum 3/4 inch wide flat lock seams; lap in direction of waterflow.
J. Fabricate cleats and starter strips of same material as sheet metal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install flashing and sheet metal as indicated and in accordance with SMACNA Manual.

B. Install cleats and starter strips before starting installation of sheet metal. Fasten at 6 inches on center maximum.

C. Expansion Joints in Metal Copings and Edge Flashings:
   1. Center backing plate between flashing pieces at end joints.
   2. Apply two continuous beads of joint sealer between backing plate and flashing sections at each end.
   3. Install flashing pieces with 1/2 inch expansion space at abutting ends; apply sealer to expansion space.
   4. Apply two continuous beads of joint sealer between cover plate and flashing sections at each end.

D. Secure flashings with concealed fasteners where possible.

E. Apply plastic cement between metal and bituminous flashings.

F. Fit flashings tight, with square corners and surfaces true and straight.

G. Seam and seal field joints

H. Separate dissimilar metals with bituminous coating or non-absorptive gaskets.
   I. Reglets:
   1. Install reglets true to line and level. Seal top of surface mounted reglet with joint sealer.
   2. Install flashings into reglets to form tight fit. Secure with lead or plastic wedges at 12 inches on center maximum. Seal remaining space with joint sealer.

J. Gutters: Secure with straps spaced maximum 36 inches on center and within 12 inches of ends.

K. Downspouts:
   1. Secure with straps spaced maximum 8 feet on center and within 2 feet of ends and elbows.
   2. Flash downspouts into gutters or conductor heads and fasten.
   3. Flash upper sections into lower sections minimum 2 inches at joints; fasten sections together.

L. Apply joint sealers as specified in Section 07 9200.

3.2 CLEANING

A. Clean sheet metal; remove slag, flux, stains, spots, and minor abrasions without etching surfaces.

SECTION 07 8413
PENETRATION FIRESTOPPING

1.1 SUBMITTALS

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

1.2 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:
   1. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
      a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
      b. Classification markings on penetration firestopping correspond to designations listed by the following:
      c. UL in its "Fire Resistance Directory."
      d. Intertek ETL SEMKO in its "Directory of Listed Building Products."

C. Products shall be provided by one manufacturer only.

1.3 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Grace Construction Products.
   2. Hilti, Inc.
   3. Nelson Firestop Products.
   4. RectorSeal Corporation.
   5. Specified Technologies Inc.
   6. 3M Fire Protection Products.

1.4 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
   1. Fire-resistance-rated walls include fire walls smoke-barrier walls and fire partitions.
   2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
   1. Horizontal assemblies include floors floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
   2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
   3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
   1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.

E. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

F. VOC Content: Provide penetration firestopping that complies with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
   1. Architectural Sealants: 250 g/L.
   2. Sealant Primers for Nonporous Substrates: 250 g/L.
   3. Sealant Primers for Porous Substrates: 775 g/L.

G. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

1.5 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds,

1.6 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1.7 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
   1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

1.8 INSTALLATION

A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

1.9 PENETRATION FIRESTOPPING SCHEDULE

A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHEZ.

B. Where Intertek ETL SEMKO-listed systems are indicated, they refer to design numbers in Intertek ETL SEMKO's "Directory of Listed Building Products" under "Firestop Systems."

C. Where FM Global-approved systems are indicated, they refer to design numbers listed in FM Global's "Building Materials Approval Guide" under "Wall and Floor Penetration Fire Stops."

D. Firestop Systems with No Penetrating Items (FS-1): Comply with the following:
   1. Pipes, plastic or metal, conduit in vertical runs, installed through cast-in-place firestop devices.
      a. Acceptable UL-Classified Systems with FA 1000 Series Systems equivalent to, but not limited to, the following:
      b. FA1016, FA1017, FA2053, FA2054 by Hilti.
      c. CP 680 Cast-in Firestop Device by Hilti.
      d. CP653 Speed Sleeve by Hilti.

E. Firestop Systems with No Penetrating Items (FS-2): Comply with the following:
   1. Acceptable UL-Classified Systems with CAJ 0000 Series Systems equivalent to, but not limited to, the following: CAJ0055, CAJ0070 by Hilti or CAJ0012, CAJ0102 by Grace.
   2. Type of Fill Materials: One or more of the following:
      a. Latex sealant.
      b. Silicone sealant.
      c. Acrylic sealant.
      d. Intumescent putty.
      e. Mortar.
      f. Preformed intumescent blocks.
      g. Pillows/Bags

F. Firestop Systems for Metallic Pipes, Conduit, or Tubing (FS-3): Comply with the following:
   1. Acceptable UL-Classified Systems with CAJ, WL, or FC 1000 Series Systems, equivalent to, but not limited to, the following: CAJ1184, CAJ1291, CAJ1277, CAJ1382, CAJ1388, WL1054, WL1249, FC1009 by Hilti or CAJ1403, CAJ1235, CAJ1406, WL1152, WL1207, FC1020 by Grace.
   2. Type of Fill Materials: One or more of the following:
      a. Latex sealant.
      b. Silicone sealant.
      c. Acrylic sealant.
      d. Intumescent putty.
      e. Mortar.
      f. Polyurethane firestop foam.

G. Firestop Systems for Nonmetallic Pipe, Conduit, or Tubing (FS-4): Comply with the following:
   1. Acceptable UL-Classified Systems with CAJ, FA, or WL 2000 Series Systems, equivalent to, but not limited to, the following: CAJ2109, FA2053, WL2078, WL2128 by Hilti or CAJ2212, CAJ2171, CAJ2210, WL2167, WL2185, WL2170, WL2259 by Grace.
   2. Type of Fill Materials: One or more of the following:
      a. Intumescent sealant.
      b. Intumescent putty.
      c. Intumescent wrap strips.
      d. Firestop device.
      e. Firestop sleeve device.
      f. Latex sealant.

H. Firestop Systems for Electrical Cables (FS-5): Comply with the following:
   1. Acceptable UL-Classified Systems with CAJ, FC, or WL 3000 Series Systems, equivalent to, but not limited to, the following: CAJ3095, FC3012, WL3065, WL3112 by Hilti or CAJ3185, CAJ3199, CAJ3234, FC3018, FC3060, WL3179 by Grace.
   2. Type of Fill Materials: One or more of the following:
      a. Intumescent sealant.
      b. Latex Sealant
      c. Pillows/bags
      d. Intumescent putty.
      e. Silicone foam.

I. Firestop Systems for Cable Trays (FS-6): Comply with the following:
   1. Acceptable UL-Classified Systems with CAJ or WL 4000 Series Systems equivalent to, but not limited to, the following: CAJ4035, CAJ4054, WL4011, WL4034 by Hilti or CAJ4035, CBJ4023, WL4025, WL4030 by Grace.
   2. Type of Fill Materials: One or more of the following:
      a. Intumescent sealant.
      b. Intumescent putty.
      c. Silicone foam.
      d. Pillows/bags.
      e. Foam blocks.
      f. Firestop mortar.
      g. Polyurethane firestop foam.

J. Firestop Systems for Insulated Pipes (FS-7): Comply with the following:

1. Acceptable UL-Classified Systems with CAJ or WL 5000 Series Systems, equivalent to, but not limited to, the following: CAJ5091, WL5029 by Hilti or CAJ5222, WL5171 by Grace.
2. Type of Fill Materials: One or more of the following:
   a. Intumescent sealant.
   b. Silicone foam.
   c. Intumescent wrap strips.
   d. Pre-formed intumescent blocks.
   e. Latex sealant.

K. Firestop Systems for Miscellaneous Electrical Penetrants (FS-8): Comply with the following:
1. Acceptable UL-Classified Systems with CAJ 6000 Series Systems equivalent to, but not limited to, the following: CAJ6006, CAJ 6017 by Hilti or CAJ6012, CAJ6013, CAJ6027 by Grace.
2. Type of Fill Materials: One or more of the following:
   a. Intumescent sealant.
   b. Latex sealant
   c. Intumescent putty.
   d. Mortar.

L. Firestop Systems for Miscellaneous Mechanical Penetrations (FS-9): Comply with the following:
1. Acceptable UL-Classified Systems with CAJ 7000 Series Systems equivalent to, but not limited to, the following: CAJ7046, CAJ7051, CAJ7040, CAJ7021 by Hilti or CAJ7067, CAJ7075, CAJ7082 by Grace.
2. Type of Fill Materials: One or both of the following:
   a. Intumescent sealant.
   b. Latex sealant.
   c. Mortar.
   d. Acrylic sealant.
   e. Silicone sealant.

M. Firestop Systems for Groupings of Penetrations (FS-10): Comply with the following:
1. Acceptable UL-Classified Systems with CAJ or WL 8000 Series Systems, equivalent to, but not limited to, the following: CAJ8056, CAJ8096, WJ8007, WL8014, WL8019 by Hilti or CAJ8042, CAJ8101, CAJ8133, WL8007 by Grace.
2. Type of Fill Materials: One or more of the following:
   a. Latex sealant.
   b. Mortar.
   c. Intumescent wrap strips.
   d. Firestop device.
   e. Intumescent composite sheet.
   f. Pre-formed intumescent blocks.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

1.1 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: 20 years from date of Substantial Completion for silicone sealants.

1.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

1.3 SILICONE JOINTSEALANTS

A. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant(S-S:) ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. BASF Building Systems; Omniplus.
   b. Dow Corning Corporation; 786 Mildew Resistant.
   c. GE Advanced Materials - Silicones; Sanitary SCS1700.
   d. Tremco Incorporated; Tremsil 200 Sanitary.

1.4 URETHANE JOINT SEALANTS

A. Multicomponent, Self-Levelling, Traffic-Grade, Urethane Joint Sealant (U-TB): ASTM C 920, Type M, Grade SL, Class 50, for Use T.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Polymeric Systems, Inc.; PSI-270.
   b. Tremco Incorporated; Dymeric 240 FC.
   c. Pecora; Dynatread.
   d. BASF Building Systems; Masterseal SL-2

1.5 LATEX JOINT SEALANTS

A. Latex Joint Sealant (AL): Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. BASF Building Systems; Sonolastic
   b. Bostik, Inc.; Chem-Calk 600.
   c. May National Associates, Inc.
   d. Pecora Corporation; AC-20+.
   e. Tremco Incorporated; Tremflex 834.

1.6 ACOUSTICAL JOINT SEALANTS (AC)

A. Acoustical Joint Sealant: Manufacturer's standard non-sag, paintable, non-staining 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: Subject to compliance with requirements, provide one of the following:
   a. Pecora Corporation; AC-20 FTR .
   b. USG Corporation; SHEETROCK Acoustical Sealant.

1.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

1.8 PREPARATION

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

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, and surface dirt

2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

1.9 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Non sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
   4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.

F. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with
ASTM C 919 and with manufacturer's written recommendations.

1.10 JOINT-SEALANT SCHEDULE

A. Sealant Schedule:
   1. Interior Joints:
      a. Wall and ceiling joints subject to movement: Designation U-MC.
      b. Wall and ceiling joints not subject to movement: Designation AL.
      c. Interior side of exterior openings: U-MC.
      d. Floor joints: Designation U-TB.
      e. Wall and ceiling joints between frames and their rough opening: Designation AL.
      f. Wall and ceiling joints between frames and adjoining surfaces: Designation AL.
      g. Interior Sanitary Joints; Joints Between Plumbing Fixtures and Adjoining Floor, Wall, and Ceiling Surfaces; Joints Between Shower Door Enclosure Components and Adjacent Finish Surfaces; Joints in Dietary and Food Preparation Areas, Kitchens, Food Storage Areas, and Areas Subject to Frequent Wet Cleaning, including joints between walls and floors, Joints Between Back Splashes and Wall Substrates: Designation S-S.
   2. Exterior locations:
      a. Wall joints:
         1. Bordered on both sides by porous building material (concrete, stone, masonry, cement plaster): Designation S-GP.
         2. Bordered on both sides by non-porous building material (coated and uncoated metals, anodized aluminum, porcelain tile, and glass): Designation S-GP.
         3. Bordered on one side by porous building material (concrete, stone, masonry) and other side by non- porous building material (coated and uncoated metals, anodized aluminum, porcelain tile, and glass): Designation S-GP.
      b. Perimeter of penetrations through walls: Designation S-GP
      c. Expansion joints in ceilings, soffits, and overhead surfaces: Designation S-GP
      d. Control joints and perimeter of penetrations in ceilings, soffits, and overhead surfaces: Designation S- GP
      e. Wall and ceiling joints between frames and their rough opening: Designation S-GP.
      f. Wall and ceiling joints between frames and adjoining surfaces: Designation S-GP.

g. Joints and perimeter of penetrations in horizontal pedestrian and vehicle traffic surfaces: Designation U- TB.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

1.1 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

1.2 MANUFACTURERS

A. Steel Doors and Frames:
1. Assa Abloy Ceco, Curries, or Fleming: www.assaabloydss.com.
2. Republic Doors: www.republicdoor.com.
3. Steelcraft: www.steelcraft.com.

1.3 DOORS AND FRAMES

A. Requirements for All Doors and Frames:
1. Accessibility: Comply with ANSI/ICC A117.1.
2. Door Top Closures: Flush with top of faces and edges.
3. Door Edge Profile: Beveled on both edges.
4. Door Texture: Smooth faces.
5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
7. Finish: Factory primed Dark Anodized Bronze, for field finishing. To match frame specified.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

1.4 STEEL DOORS

A. Exterior Doors:
1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
2. Core: Polystyrene foam.
3. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvanized) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
4. Insulating Value: U-value of 0.50, when tested in accordance with ASTMC1363.
5. Weatherstripping: Separate, see Section 087100.

B. Interior Doors, Non-Fire-Rated:
1. Grade: ANSI A250.8 Level 1, physical performance Level C, Model 1, full flush.
2. Core: Cardboard honeycomb.
3. Thickness: 1-3/4 inches.

C. Interior Doors, Fire-Rated:
1. Grade: ANSI A250.8 Level 2, physical performance Level B, Model 1, full flush.
2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C ("positive pressure").
   a. Provide units listed and labeled by UL.
   b. Attach fire rating label to each fire rated unit.
3. Core: Mineral fiberboard.

D. Interior Smoke and Draft Control Doors: Same construction as fire-rated doors with indicated fire rating, plus:
1. Gasketing: No added gasketing or seals allowed.
2. Label: UL "S" label.

1.5 STEEL FRAMES
A. General:
1. Comply with the requirements of grade specified for corresponding door, except:
a. ANSI A250.8 Level 1 Doors: 16 gage frames.
b. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 18 gage
2. Finish: Same as for door.
3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
4. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
5. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.
B. Exterior Door Frames: Face welded, seamless with joints filled.
1. Weatherstripping: Separate, see Section 087100.
C. Interior Door Frames, Non-Fire-Rated: Face welded, seamless with joints filled.
D. Interior Door Frames, Fire-Rated: Face welded, seamless with joints filled.
1. Fire Rating: Same as door, labeled.

1.6 ACCESSORY MATERIALS
A. Glazing: As specified in Section 08 8000, factory installed.
B. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
C. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

1.7 FINISH MATERIALS
A. Primer: Rust-inhibiting, complying with ANSI A250.10 , door manufacturer's standard.

1.8 INSTALLATION
A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840
B. In addition, install fire rated units in accordance with NFPA 80.
C. Coordinate frame anchor placement with wall construction.
D. Coordinate installation of hardware.
E. Coordinate installation of glazing.
F. Coordinate installation of electrical connections to electrical hardware items.

1.9 TOLERANCES
A. Clearances Between Door and Frame: As specified in ANSI A250.8.
B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

1.10 ADJUSTING
A. Adjust for smooth and balanced door movement.

SECTION 08 1216
ALUMINUM FRAMES

1.1 SUBMITTALS
A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, fire-resistance rating, and finishes.
B. Schedule: For interior aluminum frames. Use same designations indicated on Drawings. Coordinate with door hardware schedule and glazing.

1.2 QUALITY ASSURANCE
A. Source Limitations: Obtain interior aluminum frames from single source from single manufacturer.
B. Fire-Rated Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1.3 MANUFACTURERS
A. Manufacturers:
1. Frameworks Manufacturing.
2. Versatrac.

3. Wilson Partitions.
4. Aluma Pro L.P.
5. Modulex.
6. Raco (Basis of Design: Solutions).

1.4 COMPONENTS

A. Aluminum Framing: ASTM B 221, Alloy 6063-T5 or alloy and temper required to suit structural and finish requirements, not less than 0.062 inch thick. Billets shall be composed of at least 33% recycled aluminum.

B. Door Frames: Extruded aluminum, reinforced for hinges, strikes, and closers. Refer to Drawings for frame types.
   1. 90-Minute Fire-Protection Rating (where indicated in schedule): Fabricate aluminum frame assemblies with a cold- formed, primed, interior steel liner.

C. Glazing Frames: Extruded aluminum, for glazing thickness indicated.

D. Trim: Extruded aluminum, not less than 0.062 inch thick, with removable snap-in glazing stops and door stops without exposed fasteners.
   1. Trim Style: As selected by Architect.

1.5 ACCESSORIES

A. Fasteners: Aluminum, nonmagnetic, stainless-steel or other non-corrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.

B. Door Silencers: Manufacturer's standard continuous mohair, wool pile, or vinyl seals

C. Glazing Gaskets: Manufacturer's standard extruded or molded plastic, to accommodate glazing thickness indicated; black color.

D. Glazing: Comply with requirements in Division 08 Section "Glazing."

E. Hardware: Comply with requirements in Division 08 door hardware Sections.

1.6 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

1.7 ALUMINUM FINISHES

A. Dark Bronze Anodic Finish: AAMA 611, AA-M12C22A21, Class II, 0.010 mm or thicker.

1.8 INSTALLATION

A. General: Install interior aluminum frames plumb, rigid, properly aligned, and securely fastened in place; comply with manufacturer's written instructions.

B. Set frames accurately in position and plumbed, aligned, and securely anchored to substrates.
   1. At fire-protection-rated openings, install interior aluminum frames according to NFPA 80.

C. Install frame components in the longest possible lengths; components up to 96 inches long must be one piece.
   1. Fasten to suspended ceiling grid on maximum 48-inch centers, using sheet metal screws or other fasteners approved by frame manufacturer.
   2. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
   3. Secure clips to extruded main-frame components and not to snap-in or trim members.
   4. Do not leave screws or other fasteners exposed to view when installation is complete.

SECTION 08 1416
FLUSH WOOD DOORS

1.1 SUBMITTALS

A. Product Data:
   1. For each type of door indicated. Include details of core and edge construction, louvers, and trim for openings. 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.

1.2 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated" for veneers faces and WDMA I.S.1-A, "Architectural Wood Flush Doors" for performance of the door. along with "WI's "Manual of Millwork."

B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
   1. Temperature-Rise Limit: [At vertical exit enclosures and exit passageways], provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire- test exposure.
   2. Indicate rating and listing agent with permanently attached label on edge of door, if continuous hinge is used adhere label on top of door.

1.3 DELIVERY, STORAGE, AND HANDLING
A. Comply with requirements of referenced standard and manufacturer's written instructions.
B. Package doors individually in plastic bags or cardboard cartons and wrap bundles of doors in plastic sheathing.
C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.4 PROJECT CONDITIONS
A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.5 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.
   1. Failures include, but are not limited to, the following:
      a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
      b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
      c. Telegraphing of core construction and delamination of face in decorative laminated faced doors.
   2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
   3. Warranty Period for Solid-Core Interior Doors: Life of installation.

1.6 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Algoma Hardwoods, Inc.
   2. Eggers Industries.
   3. Graham; an Assa Abloy Group company.
   4. Marshfield Door Systems, Inc.
   5. VT Industries Inc.

1.7 DOOR CONSTRUCTION, GENERAL
A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
B. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.
C. Particleboard-Core Doors:
   1. Particleboard: ANSI A208.1, Grade LD-1.
   2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
      a. 8-inch top-rail blocking, in doors indicated to have closers.
      b. 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
      c. 5-inch midrail blocking, in doors indicated to have exit devices.
   3. Provide doors with structural-composite-lumber (SCL) cores instead of particleboard cores for the following door types:
      a. Indicated to receive exit devices.
      b. Doors with more than 40 percent of core removed.
      c. Lock and Light cutout stiles less than 5 1/2 inches between cutouts.
      d. Shipping and receiving doors.
D. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
   1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
   2. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. [Provide stiles with concealed intumescent seals.] Comply with specified requirements for exposed edges.
E. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire- protection ratings indicated as needed to eliminate through-bolting hardware.
   a. 8-inch top-rail blocking.
   b. 5-inch bottom-rail blocking, in doors indicated to have protection plates.
   c. 5-inch midrail blocking, in doors indicated to have armor plates.
   d. 4-1/2-by-10-inch lock blocks, in doors indicated to have exit devices.

3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges exceeding WDMA

1.8 PLASTIC-LAMINATE-FACED DOORS

A. Interior Solid-Core Doors:
1. Grade: Custom
2. Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS
3. Colors, Patterns, and Finishes: As scheduled
4. Exposed Vertical and Top Edges:
5. Core: Particleboard.
6. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before faces and crossbands are applied.
7. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.

1.9 LOUVERS AND LIGHT FRAMES

A. Metal Louvers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Air Louvers Inc.
   b. Anemostat; a Mestek company.
   c. Hiawatha Incorporated.
   d. McGill Architectural Products.
   e. Pemko Manufacturing Company, Inc.
2. Blade Type: Vision-proof, inverted V or inverted Y.
3. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked-enamel- or powder-coated finish.

B. Metal Frames for Light Openings in Fire-Rated Doors over 20-minute rating: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; with factory baked-enamel or powder-coated finish; and approved for use in doors of fire-protection rating indicated.

1.10 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
1. Comply with requirements in NFPA 80 for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
2. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
3. Pre-drill hinge screw holes at factory for templated hinges.
4. Factory drill raceways for power cords to electrified hardware as scheduled in Door Hardware Sets.
5. Where armor plates are specified in Door Hardware Sets, ensure blocking and labeling is sufficient in door and fire label approves the attachment of the listed armor plate.

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 Division 08 Section "Glazing."
3. Louvers: Factory install louvers in prepared openings.

1.11 EXAMINATION

A. Examine doors and installed door frames before hanging doors.
1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1.12 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware."
B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
   1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

1.13 ADJUSTING
A. Operation: Rehang or replace doors that do not swing or operate freely.
B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

SECTION 08 3113
ACCESS DOORS AND FRAMES

1.1 COORDINATION
A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed plumbing, mechanical, or other concealed work, and indicate in the schedule specified in "Submittals" Article. Size and final location of access doors to be coordinated with Architect.

1.2 STEEL MATERIALS
A. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS) with A60 zinc-iron-alloy (galvannealed) coating or G60 mill-phosphatized zinc coating; stretcher-leveled standard of flatness; with minimum thickness indicated representing specified thickness according to ASTM A 924.
B. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Surface Preparation for Metallic-Coated Steel Sheet: Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
      a. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20.
   2. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked- enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.
   C. Drywall Beads: Edge trim formed from 0.0299-inch zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.
1.3 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS
A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Accudor Products, Inc.
   2. Babcock-Davis; A Cierra Products Co.
   3. Jensen Industries.
   4. J. L. Industries, Inc.
   5. Karp Associates, Inc.
   6. Larsen's Manufacturing Company.
   7. Milcor Inc.
   8. Nystrom, Inc.

1.4 INSTALLATION
A. Comply with manufacturer's written instructions for installing access doors and frames.
B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

1.5 ADJUSTING AND CLEANING
A. Adjust doors and hardware after installation for proper operation.

SECTION 08 3323
COILING DOORS AND GRILLES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Service Doors:
   1. Insulated Service Door. (Model CESD20).
   2. Service Door. (Model CESD10) – Detail Bay

1.2 RELATED SECTIONS

A. Section 05 50 00 - Metal Fabrications. Door opening jamb and head members.
B. Section 06 10 00 - Rough Carpentry. Door opening jamb and head members.
C. Section 08 31 16 - Access Panels and Frames. Access doors.
D. Section 08 70 00 - Hardware.
E. Division 26 - Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm system.

1.3 REFERENCES

A. American Society of Civil Engineers (ASCE) 7 - Minimum Design Loads for Buildings and Other Structures.
B. ASTM International (ASTM):
   1. ASTM A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   2. ASTM A 653/A 653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   3. ASTM A 924/A 924M - Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
   4. ASTM B 209/209M - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   5. AST) B 221/221M - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   6. ASTM C 612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
   7. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   8. ASTM D 3363 - Standard Test Method for Film Hardness by Pencil Test.
C. National Electric Manufacturers Association (NEMA).
D. National Fire Protection Association (NFPA) 80 - Standard for Fire Doors and Other Opening Protectives.
E. National Fire Protection Association (NFPA) 105 - Standard for the Installation of Smoke Door Assemblies and Other Opening Protectives.
F. Underwriters Laboratory (UL) 1784 - Air Leakage Tests of Door Assemblies.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Operation and maintenance data.
C. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
D. Quality Assurance/Control Submittals:
   1. Provide proof of manufacturer ISO 9001:2008 registration.
   2. Provide proof of manufacturer and installer qualifications.
E. Closeout Submittals:
   1. Operation and Maintenance Manual.
   2. Certificate stating that installed materials comply with this specification.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer Qualifications: ISO 9001:2008 registered and a minimum of five years' experience in producing units of the type specified.
   2. Installer Qualifications: Manufacturer's approval.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
B. Do not store products in location with conditions outside manufacturer's absolute limits.

Commented [AB1]: Added 2. Service Door. (Model CESD10) – Detail Bay

C. Materials delivered to the site shall be examined for concealed damage or defects in shipping. Defects shall be noted and reported to the Owner's Representative in writing.

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. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

B. Extended Warranty: Two year warranty against defects in materials and workmanship and five year finish warranty against fading, peeling, cracking, blistering, flaking or delaminating.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Clopay Building Products Company, which is located at: 8585 Duke Blvd.; Mason, OH 45040; Contact Clopay National Accounts 1-800-526-4301 option 5 csi@clopay.com for material and installation proposal

B. No substitutions

2.2 SERVICE DOORS

A. Product:

1. Insulated Service Door (Shop Only): Model CESD20 as manufactured by Clopay Building Products. Factory finish white color

2. Non-Insulated Service Door (Detail Only): Model CESD10 as manufactured by Clopay Building Products. Factory finish white color.

B. Design Requirements:

1. Wind Loading: To meet local code per structural drawings

2. Cycle Life: Design doors of standard construction for normal use of up to 20 cycle per day maximum.

C. Construction:

1. Curtain Configuration: Standard Curtain configuration.

2. Bottom Bar Configuration: Standard Bottom Bar Configuration.

3. Slat Finish: Coating System to include an ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation of a chemical bonding, light gray baked-on polyester base coat and a white baked-on polyester finish coat. Components include a limited two year finish warranty.

4. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.

5. Counterbalance Shaft Assembly:

   a. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.

   b. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

6. Hood Finish: GalvaNex Coating System to include an ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation of a chemical bonding, light gray baked-on polyester base coat and a light gray baked-on polyester finish coat. The scientific organic material composition and chemical bonding process of GalvaNex produces a superior finish against corrosion and abrasion. GalvaNex components include a limited two year finish warranty.

D. Weatherstripping:

1. Bottom Bar: Replaceable, bulb-style, compressible EDPM gasket extending into guides.

E. Locking:

1. Pad lockable slide bolt on coil side of bottom bar at each jamb extending into slots in guides. Provide interlock switches on motor operated units.

F. Manual Operation/Non-Labeled Doors:

1. Manual Chain Hoist: Provide chain hoist operator with endless steel chain, chain pocket wheel and guard, geared reduction unit, and chain keeper secured to guide.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine wall and overhead areas, including opening framing and blocking, with installer present, for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of Work in this Section.

B. If preparation is the responsibility of another installer, notify Architect of deviations from manufacturer's recommended installation tolerances and conditions.

C. Do not proceed with installation until substrates have been properly prepared and deviations are corrected.

Commented [AB2]: Added (Shop Only)

Commented [AB3]: Added Non-Insulated Service Door (Detail Only): Model CESD10 as manufactured by Clopay Building Products. Factory finish white color.

D. Commencement of installation constitutes acceptance of conditions.

3.2 INSTALLATION
A. General: Install unit and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
B. Comply with NFPA 80 and follow manufacturer's installation instructions.
C. Comply with NFPA80 and NFPA 105 and follow manufacturer's installation instructions.

3.3 ADJUSTING
A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 DEMONSTRATION
A. Demonstrate proper operation to Owner's Representative.
B. Instruct Owner's Representative in maintenance procedures.

3.5 CLEANING
A. Clean surfaces soiled by work as recommended by manufacturer.
B. Remove surplus materials and debris from the site.

3.6 PROTECTION
A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 08 3611
SECTIONAL DOORS

Commented [AB4]: This entire section changed.

PART 1 GENERAL
1.1 SECTION INCLUDES
A. Sectional overhead doors of the following types:
1. Flush steel doors, thermally-broken, polyurethane insulated. (Model 3728)

1.2 RELATED SECTIONS
A. Section 05 5000 - Metal Fabrications: Steel channel opening frame.
B. Section 06 1000 - Rough Carpentry: Rough wood framing and blocking for door opening.
C. Section 08 7100 - Door Hardware: Lock cylinders.
D. Division 26 Sections: Electrical service and connections for powered operators.

1.3 REFERENCES
A. ASTM A 653/A 653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
B. ASTM A 924/A 924M - Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
C. ASTM B 209/209M - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
D. ASTM B 221/221M - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 SUBMITTALS
A. Submit under provisions of Section 01 3300.
B. Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.
4. Operation and maintenance data.
5. Nameplate data and ratings for motors.
C. Shop Drawings: Include opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
D. Selection Samples: For each finish specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each finish specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 WIND PERFORMANCE REQUIREMENTS

A. Design doors to withstand positive and negative wind loads as calculated in accordance with applicable building code. Doors supplied will have a minimum:
1. Design Wind Load:13.5lb/sf
2. Safety Factor: 1.5 times design wind load.
3. Design wind loads must be verified as indicated on structural drawings or otherwise determined.

1.6 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the types of doors specified in this section, with not less than ten years of documented experience.
B. Installer Qualifications: Company specializing in installing the types of products specified in this section, with minimum of five years of documented experience, and approved by the door manufacturer.

1.7 WARRANTY
A. Finish Warranty: Provide manufacturer's standard finish warranty against rust through.
1. Warranty period: 10 years.
B. Delamination Warranty: Provide manufacturer's standard warranty against delamination.
1. Warranty period: 10 years.

PART 2 PRODUCTS
2.1 MANUFACTURERS
A. Acceptable Manufacturer: Clopay Building Products Company, which is located at: 8585 Duke Blvd. Mason, OH 45040-3101; Contact Clopay National Accounts, csi@clopay.com 1-800-526-4301 option 5 for material and installation quotes
B. Substitutions: Not permitted

2.2 FLUSH RIBBED STEEL DOORS, THERMALLY-BROKEN, POLYURETHANE INSULATED
A. Door Construction:
1. Panels: Foamed in place Polyurethane core construction between exterior and interior steel skins.
2. Steel Skins: Formed from roll formed commercial or drawing quality steel sheet, hot-dip galvanized per ASTM A 924/A 924M and ASTM A 653/A 653M, pre-painted with primer and baked-on polyester topcoat; sections formed to create weather tight tongue-in-groove meeting joint.
3. Reinforcing: Galvanized and primed steel reinforcement located under each hinge location, pre-punched for hinge attachment.
4. Handle: High impact polymer step plate/lift handle on bottom panel section.
B. Premium Duty 2-inches (51 mm) Door: Clopay Model 3728.
1. Maximum Door Size: 20ft, 2 inches (6.2 m) wide by 18 ft (5.5 m) high.
2. Overall Panel Thickness: 2-inches (51 mm).
3. Steel Skin Thickness: Minimum 27 gauge 0.016 inch (0.40 mm) exterior; minimum 28 gauge 0.015 inch (0.38 mm) interior.
4. End Stiles: Galvanized steel end stiles, engineered for easy hardware attachment through pre-punched holes. Minimum 18 gauge, 0.045 inch (1.14 mm) thick for single end hinge style and 16 gauge .056 inch (1.42 mm) minimum for double end hinge style.
5. Astragal: U-shaped flexible PVC in retainer of full-length 0.055 inch (1.4 mm) rigid PVC.
6. Thermal Resistance (R-value): 18.4 deg F hr sq ft/Btu (3.0 (K sq m)/W); calculated door section R-value in accordance with DASMA TDS-163.
7. Glazing: LowE 270 Insulated Tempered or impact resistant in windborne debris areas
8. Finish: Flush exterior design with stucco embossment, white interior and exterior to be manufacturers standard color as selected by the architect
9. Locking: Inside spring loaded slide bolt lock on end stile that engages slot in track.
10. Weatherstripping: Provide complete perimeter seals. Provide flexible top seal, flexible jamb seal and U shaped bottom seal.
11. Tracks: Vertical tracks minimum 0.061 inch (1.55 mm) galvanized steel tapered and mounted for wedge type closing. Horizontal tracks minimum 0.075 inch (1.91 mm) galvanized steel, reinforced with minimum 0.0897 inch (2.28 mm) galvanized steel angles as required:
Track Width: 3 inches (75 mm).
Provide track configuration to maximize headroom available per plans and site check using 1:12 follow the roof pitch track
12. Spring Counterbalance: Torsion spring counterbalance mechanism sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of die cast aluminum with high strength galvanized aircraft cable with minimum 7 to 1 safety factor.
Standard Cycle Spring: 25,000 cycle.
Chain hoist operation. Chain hoist to be Clopay Safe-T-Stop chain hoist with integral braking mechanism

2.3 Opening Requirements
All spring and chain hoist supports must be in place prior to installation and is the responsibility of the general contractor. Please refer to submitted shop drawings for location.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine wall and overhead areas, including opening framing and blocking, with installer present, for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of Work in this Section.

All spring supports and chain hoist supports to be installed by GC before installation

1. Proceed with installation only after unsatisfactory conditions have been corrected.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

D. Install overhead doors and track in accordance with approved shop drawings and the manufacturer's printed instructions.

3.4 PROTECTION

E. Protect installed products until completion of project.

F. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

1.1 SUBMITTALS

A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details.

B. Shop Drawings: Provide Engineered, sealed shop drawings indicating system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

1.2 MANUFACTURERS

A. Acceptable Manufacturers:
   1. YKK AP America Inc: www.ykkap.com.
   2. Kawneer North America: www.kawneer.com.
   3. United States Aluminum Corp: www.usalum.com.
   4. Oldcastle Building Envelope Products: www.oldcastlebe.com.

1.3 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Glazing Rabbet: For 1 inch insulating glazing.
   2. Glazing Position: Center-set.
   3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
   4. Water Leakage Test Pressure Differential: 2.86 lbf/sqft.
   5. Air Infiltration Test Pressure Differential: 1.57 psf.
   6. Condensation Resistance Factor: As required to meet energy code in effect.

B. Performance Requirements:
   1. Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

3. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
4. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12-hour period without causing detrimental effect to system components, anchorages, and other building elements.

1.4 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Glazing stops: Flush.
2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
3. Subsills: Provide manufacturer's standard subsills for all storefront framing.

B. Doors: Glazed aluminum, heavy duty (1/8 inch wall thickness; with fully welded internal joints).
1. Thickness: 1-3/4 inches.
2. Top Rail: 4 inches wide.
3. Vertical Stiles: 4-1/2 inches wide.
4. Bottom Rail: 10 inches wide.
5. Glazing Stops: Square.
6. Finish: Same as storefront.

1.5 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).
B. Fasteners: Stainless steel.
C. Concealed Flashings: 0.018 inch thick galvanized steel.
D. Perimeter Sealant: Type S-GP specified in Section 07 9005.
E. Glass: As specified in Section 088000.
F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
G. Glazing Accessories: As specified in Section 088000.

1.6 FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
1. Color: Dark Anodic Bronze.

1.7 HARDWARE

A. Door Hardware: Refer Drawings.
B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

1.8 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
C. Prepare components to receive anchor devices. Fabricate anchors.
D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
E. Arrange fasteners and attachments to conceal from view.
F. Reinforce components internally for door hardware.
G. Reinforce framing members for imposed loads.
H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

1.9 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form watertight dam.
G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
H. Coordinate attachment and seal of perimeter air and vapor barrier materials.

I. Fill shim spaces with low rise urethane foam sealant at perimeter of assembly to maintain continuity of thermal barrier.
J. Set thresholds in bed of mastic and secure.
K. Install hardware using templates provided.
L. Install glass and infill panels in accordance with Section 088000, using glazing method required to achieve performance criteria.
M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

1.10 TOLERANCES
A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

1.11 ADJUSTING
A. Adjust operating hardware and sash for smooth operation.

SECTION 08 7100
HARDWARE

PART 1 – GENERAL
1.1 SUMMARY
A. Section includes furnishing, installation and commissioning of mechanical door hardware for doors specified in "Hardware Sets" and required by actual conditions: including screws, bolts, expansion shields, electrified door hardware, and other devices for proper application of hardware.
B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
C. Related Divisions:
1. Division 03 Concrete
2. Division 06 Rough & Finish Carpentry
3. Division 07 Joint Sealants
4. Division 08 Openings
5. Division 09 Finishes

1.2 REFERENCES
A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI):
1. ANSI/BHMA A156.1 Butts & Hinges (2016)
2. ANSI/BHMA A156.2 Bored & Preassembled Locks & Latches (2011)
3. ANSI/BHMA A156.3 Exit Devices (2014)
4. ANSI/BHMA A156.4 Door Controls – Closers (2013)
5. ANSI/BHMA A156.5 Cylinders and Input Devices for Locks (2014)
6. ANSI/BHMA A156.6 Architectural Door Trim (2015)
7. ANSI/BHMA A156.7 Template Hinge Dimensions (2016)
8. ANSI/BHMA A156.8 Door Controls – Overhead Stops and Holders (2015)
9. ANSI/BHMA A156.13 Mortise Locks & Latches (2012)
10. ANSI/BHMA A156.18 Materials & Finishes (2016)
11. ANSI/BHMA A156.21 Thresholds (2014)
12. ANSI/BHMA A156.22 Door Gasketing Systems (2012)
13. ANSI/BHMA A156.26 Continuous Hinges (2012)
14. ANSI/BHMA A156.28 Keying Systems (2013)
15. ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames (2014)
16. ANSI/BHMA A156.115W Hardware Preparation in Wood Doors with Wood or Steel Frames (2016)
B. International Code Council/American National Standards Institute(ICC/ANSI)/ADA:
1. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities
C. Underwriters Laboratories, Inc. (UL):
1. UL 10C Positive Pressure Fire Test of Door Assemblies.
2. UL 1784 Air Leakage Test of Door Assemblies.
3. UL 294 Access Control System Units
D. Door and Hardware Institute (DHI):
1. DHI Publications – Keying Systems and Nomenclature (1989).
2. DHI Publication – Abbreviations and Symbols.
3. DHI Publication – Installation Guide for Doors and Hardware.
4. DHI Publication – Sequence and Format of Hardware Schedule (1996).
E. National Fire Protection Agency (NFPA)
1. NFPA 80 Standard for Fire Doors and Other Opening Protectives

2. NFPA 101 Life Safety Code
3. NFPA 105 Standard for the Installation of Smoke Door Assemblies

1.3 SUBMITTALS

A. Submit in accordance with Conditions of the Contract and Division 1 Administrative Requirements and Submittal Procedures Section.

B. Shop Drawings:
1. Organize hardware schedule in vertical format as illustrated in DHI Publications Sequence and Formatting for the Hardware Schedule. Include abbreviations and symbols page according to DHI Publications Abbreviations and Symbols. Complete nomenclature of items required for each door opening as indicated.
2. Coordinate final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of hardware.
3. Architectural Hardware Consultant (AHC), as certified by DHI, who will affix seal attesting to completeness and correctness, including the review of the hardware schedule prior to submittal.

C. Submit manufacturer's catalog sheet on design, grade, and function of items listed in hardware schedule. Identify specific hardware item per sheet, provide an index, and cover sheet.

D. Templates:
1. Upon final approval of the architectural hardware schedules, submit one set of complete templates for each hardware item to the door manufacturers, frame manufacturers, and the installers. Date and index these 8-1/2 inch x 11 inch papers in a three ring binder, including detailed lists of the hardware location requirements for mortised and surface applied hardware within fourteen days of receiving approved door hardware submittals.

E. Closeout Submittals: Submit to Owner in a three-ring binder or CD if requested.
1. Warranties.
2. Maintenance and operating manual.
3. Maintenance service agreement.
4. Record documents.
5. Copy of approved hardware schedule.
6. Copy of approved keying schedule with bidding list.
7. Door hardware supplier name, phone number, and fax number.

1.4 QUALITY ASSURANCE

A. Listed and labeled electrified door hardware as defined in NFPA 70, Article 100, by a testing agency acceptable to authority having jurisdiction.

B. Hardware supplier will employ an Architectural Hardware Consultant (AHC) as certified by DHI and a member of the seal program who will be available at reasonable times during course of work for Project hardware consultation.

C. Door hardware conforming to ICC/ANSI A117.1: Handles pulls, latches locks and operating devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.

D. Fire Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and/or labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL 10C, unless otherwise indicated.

E. Fire Door Inspection: Prior to receiving certificate of occupancy have fire rated doors inspected by an independent Certified Fire and Egress Door Assembly Inspector (FDAI), as certified by Intertek (ITS), a written report be submitted to Owner and Contractor. Doors failing inspection must be adjusted, replaced or modified to be within appropriate code requirements. (Use for a building under IBC 2009 or newer.)

F. Smoke and Draft Control Door Assemblies: Where smoke and draft control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

G. Door hardware certified to ANSI/BHMA standards as noted, participate and be listed in BHMA Certified Products Directory.

H. Substitution request: create a comparison chart that includes the testing information as well as the warranty for both the specified product and the proposed substitution. Include the reason for requesting the substitution, clear catalog copy highlighting the proposed product and options, compliance statement, technical data, product warranty and lead time, to show how the proposed can meet or exceed established level of design, function, and quality. Approval of request is at the discretion of the owner, architect, and their designated consultants and will be addressed via addendum prior to bid date.
1. Items listed with no substitute manufacturers have been requested by the Owner to meet existing standard and will not be reviewed for substitution, unless the product is no longer available.

I. Meetings: Comply with requirements in Division 1 Section "Project Meetings."
1. Keying Meeting
a. Within fourteen days of receipt of approved door hardware submittals, contact Owner with representative from hardware supplier to establish a keying conference. Verify keyway,

visual key identification, number of master keys and keys per lock. Provide keying system per Owner's instructions.

2. Pre-installation Meeting
   a. Convene meeting within fourteen days of receipt of approved door hardware submittals. Participants required to attend: Contractor, installer, material supplier, manufacturer representatives.
   b. Include in-conference decisions regarding proper installation methods and procedures for receiving and handling hardware.
   c. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

J. Installer Qualifications: Specialized in performing installation of this Section and have five years minimum documented experience.

K. Hardware listed in 3.07 – Hardware Schedule is intended to establish minimum level of design, type, function and grade of hardware to be used.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Provide clean, dry and secure room for hardware delivered to Project but not yet installed. Shelve hardware off of the floor and with larger items of hardware being stored on wooden pallets. Arrange locksets and keyed cylinders by opening number. Organize the balance of hardware by brand, model of hardware, and hardware set number. Leave the door markings of the hardware visible for installers.

B. Furnish hardware that is not bulk packed with each unit marked and numbered in accordance with approved finish hardware schedule. Include architect's opening number, hardware set number, and item number for each type of hardware. Include keyset symbols and corresponding hardware component for keyed products.

C. Pack each item complete with necessary parts and fasteners in manufacturer's original packaging.

D. Deliver architectural hardware to the job site according to the phasing agreed upon in the pre-installation meeting. Inventory the delivery with the supplier's assistance. Immediately note shortages and damages on the shipping receipts and bill of ladings. Coordinate replacement or repair with the supplier.

E. Deliver permanent keys, cores, and related accessories directly to Owner via registered mail or overnight

F. Waste Management and Disposal: Separate waste materials for use or recycling in accordance with Division 1.

1.6 WARRANTY

A. General Warranty: Owner may have under provisions of the Contract Documents and be an addition and run concurrently with other warranties made by Contractor under requirements of the Contract documents.

B. Special Warranty: Warranties specified in this article will not deprive Owner of other rights.
   1. Ten years for manual door closers.
   2. Five years for mortise, auxiliary and bored locks.
   3. Five years for exit devices.

C. Replace or repair defective products during warranty period in accordance with manufacturer's warranty at no cost to Owner. There is no warranty against defects due to improper installation, abuse, and failure to exercise normal maintenance.

D. Maintenance Tool and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, removal and replacement of door hardware.

PART 2 – PRODUCTS

2.1 HINGES

A. Hinges, electric hinges, and self-closing hinges of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Products to be certified and listed by the following:
   1. Butts and Hinges: ANSI/BHMA A156.1.
   2. Template Hinge Dimensions: ANSI/BHMA A156.7.
   3. Self-Closing Hinges: ANSI/BHMA A156.17.

C. Butt Hinges:
   1. Hinge weight and size unless otherwise indicated in hardware sets:
      a. Doors up to 36" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .134" and a minimum of 4-1/2" in height.
      b. Doors from 36" wide up to 42" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .145" and a minimum of 4-1/2" in height.
      c. For doors from 42" wide up to 48" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .180" and a minimum of 5" in height.
      d. Doors greater than 1-3/4" thick provide hinges with a minimum thickness of .180" and a minimum of 5" in height.
      e. Width of hinge is to be minimum required to clear surrounding trim.
   2. Base material unless otherwise indicated in hardware sets:
      a. Exterior Doors: 304 Stainless Steel, Brass or Bronze material.
      b. Interior Doors: Steel material.
      c. Fire Rated Doors: Steel or 304 Stainless Steel materials.

d. Stainless Steel ball bearing hinges to have stainless steel ball bearings. Steel ball bearings are unacceptable.

3. Quantity of hinges per door unless otherwise stated in hardware sets:
   a. Doors up to 60" in height provide 2 hinges.
   b. Doors 60" up to 90" in height provide 3 hinges.
   c. Doors 90" up to 120" in height provide 4 hinges.
   d. Doors over 120" in height add 1 additional hinge per each additional 30" in height.
   e. Dutch doors provide 4 hinges.
4. Hinge design and options unless otherwise indicated in hardware sets:
   a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
   b. Out-swinging exterior and out-swinging access-controlled doors are required to have Non-Removable Pins (NRP) to prevent removal of pin while door is in closed position.
   c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
   d. When shims are necessary to correct frame or door irregularities, provide metal shims only.
5. Acceptable Manufacturers:

	Standard Weight	Heavy Weight
Hager	BB1279/BB1191	BB1168/BB1199
Bommer	BB5000/BB5002	BB5004/BB5006
McKinney	TA2714/TA2314	T4A3786/T4A3386

2.2 CONTINUOUS HINGES

A. Continuous hinges of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Products to be certified and listed by ANSI/BHMA A156.26 Grade 1.

C. Continuous Geared Hinges:
   1. Determine model number by door and frame application, door thickness, frequency of use, and fire rating requirements according to manufacturer's recommendations.
      a. Size length of hinge to equal the actual door height unless otherwise stated in hardware sets.

D. Material and Design:
   1. Base material: Anodized aluminum manufactured from 6063-T6 material; unexposed working metal surfaces be coated with TFE dry lubricant.
   2. Bearings:
      a. Vertical loads be carried on Lubriloy RL bearings for non-fire rated doors.
      b. Continuous hinges are to have a minimum spacing between bearings of 2-9/16". Typical door from 80" to 84" in height to have a minimum of 32 bearings.
   3. Options:
      a. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
      b. At fire rated openings provides hinges that carry a UL certification, up to and including 90-minute applications for wood doors and up to 3-hour applications for metal doors.

E. Acceptable Manufacturers:

	Heavy Duty
Hager	780-112HD/780-224HD
Bommer	
Zero	

2.3 LOCKS AND LATCHES

A. Locks and latches of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Product to be certified and listed by following:
   1. ANSI/BHMA A156.2 Series 4000 Certified to Grade 1.
   2. ANSI/BHMA A250.13 Certified for a minimum design load of 1150 lbf (100 psf) for single out-swinging doors measuring 36" in width and 84" in height and a minimum design load of 1150lbf (70psf) for out-swinging single doors measuring 48" in width and 84" in height.
   3. UL/cUL Labeled and listed for functions up to 3 hours for single doors up to 48" in width and up to 96" in height.
   4. UL10C/UBC 7-2 Positive Pressure Rated.
   5. ICC/ANSI A1117.1

C. Lock and latch function numbers and descriptions of manufacturer's series as listed in hardwaresets.

D. Material and Design:
   1. Lock and latch chassis to be zinc dichromate for corrosion resistance.
   2. Keyed functions to be of a freewheeling design to help resist against vandalism.
   3. Non-handed, field reversible.
   4. Thru-bolt mounting with no exposed screws.
   5. Levers, zinc cast and plated to match finished designation in hardware sets.

6. Roses, wrought brass or stainless steel material.

E. Latch and Strike:
1. Stainless Steel latch bolt with minimum of 1/2" throw and deadlocking for keyed and exterior functions. Provide 3/4" latch bolt for pairs of fire-rated doors where required by door manufacturer. Standard backset to be 2-3/4" and adjustable faceplate to accommodate a square edge door or a standard 1/8" beveled edge door.
2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4" x 4-7/8" with proper lip length to protect surrounding trim.

F. Options:
1. Doors requiring lead line protection – provide locks with 1/16" lead applied to lock and 1/16" lead wrapped around latch bolt.
2. Provide knurled levers on entry side of doors that are potentially dangerous to visually impaired persons.

G. Acceptable manufacturers:
Hager 3400 Series
Schlage ND Series
Best 9K Series

2.4 LOCKS AND LATCHES (SINGLE STALL RESTROOMS)

A. Locks and latches of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Product to be certified and listed by following:
1. ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
2. UL/cUL Labeled and listed up to 3 hours for single doors up to 48" in width and up to 96" in height.
3. UL10C/UBC 7-2 Positive Pressure Rated.
4. ICC/ANSI A117.1.

C. Lock and latch function numbers and descriptions of manufacturer's series as listed in hardware sets.

D. Material and Design:
1. Lock cases from fully wrapped, 12-gauge steel, zinc dichromate for corrosion resistance.
2. Non-handed, field reversible without opening lock case.
3. Break-away spindles to prevent unlocking during forced entry or vandalism.
4. Levers, zinc cast, forged brass or stainless steel and plated to match finish designation in hardware sets.
5. Sectional Roses, solid brass or stainless-steel material and have a minimum diameter rof 2-7/16".
6. Armor fronts, self-adjusting to accommodate a square edge door or a standard 1/8" beveled edge door.

E. Latch and Strike:
1. Stainless steel latch bolt with minimum of 3/4" throw and deadlocking for keyed and exterior functions.
2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4" x 4-7/8" with proper lip length to protect surrounding trim.
3. Deadbolts to be 1-3/4" total length with a minimum of a 1" throw and 3/4" internal engagement when fully extended and made of stainless-steel material.

F. Acceptable Manufacturers:
Hager 3800 Series
Best 45H Series
Sargent 8200 Series

2.5 DEADBOLT FOR ALUMINUM STILE DOORS

A. Deadbolts for aluminum doors of one manufacturer as listed for continuity of design and consideration of warranty. At Pairs of doors incorporate a threshold and header bolt. Turning key 360 degrees will retract or throw deadbolt for single doors and retract or throw threshold and header bolt for pairs of doors.

B. Standards: Auxiliary Locks and Associated Products: ANSI/BHMA Certified A156.5 Grade 1.

C. Material and Design:
1. Lock chassis: Zinc dichromate for corrosion resistance.
2. Armored faceplate 1" x 6" and to match aluminum door edge.

D. Latches and Strike:
1. Deadbolt 1-3/8" throw eight ply laminated stainless steel. Center ply alumina-ceramic core to defeat hacksaw attach.

E. Acceptable Manufacturers:
Adams Rite MS1850S Series

2.6 CYLINDERS AND KEYING

A. Cylinders of one manufacturer as listed for continuity of design and consideration of warranty.

B. Products to be certified and listed by the following:
1. Auxiliary Locks: ANSI/BHMA A156.5

C. Cylinders:

1. Provide cylinders matched to the types required for hardware that has a locking function and for keyed electronic functions. Furnish with appropriate collars, cams, and tailpieces to fit and operate associated hardware. Stacking collars is not acceptable, a single collar of proper size is required.
2. Manufacturer's standard tumbler type, seven-pin IC core.
3. Manufacturer's six-pin seven-pin small format interchangeable core (SFIC).
4. Provide concealed key control (CKC) at cylinder by stamping or permanently marking the keyset symbol in a location on the cylinder that is concealed when installed.

D. Keying:
1. Provide a new factory registered key system.
2. Provide a bitting list to Owner of combinations as established, and expand to twenty-five percent for future use or as directed by Owner.
   a. Include all of the keysets and bittings of the original key system creating one clean version of the entire key system.
3. Keys to be shipped directly to the Owner's Representative as established during the keying conference.
   a. Package the keys in individual envelopes, grouped by keyset symbol, and label envelopes with project name, factory registry number, and keyset symbol.
4. Stamp large bow key blanks with visual key control (keyset symbol) and "Do Not Duplicate".
5. Provide interchangeable cores with construction cores as required per the keying meeting.

E. Acceptable Manufacturers:
Hager
Schlage
Sargent

2.7 PUSH/PULL PLATES AND BARS

A. Push/Pull plates and bars of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Manufacturer to be certified by the following:
1. Architectural Door Trim: ANSI/BHMA A156.6.
2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

C. Push plates: .050" thick, square corner and beveled edges with countersunk screw holes. Width and height as stated in hardware sets.

D. Acceptable Manufacturers:
Hager 30S
Rockwood
Trimco

E. Pull Plates: .050" thick, square corner and beveled edges. Width and height as stated in hardware sets, 3/4" diameter pull, with clearance of 2-1/2" from face of door.

F. Acceptable Manufacturers:
Hager H33J
Rockwood
Trimco

G. Push Pull Bar Sets: 1" round bar stock with 2 –1/2" clearances from face of door. Offset 3", 90-degree standard. Center to center size should be door width less 1 stile width.

H. Acceptable Manufacturers:
Hager H10L
Rockwood
Trimco

I. Pull Bar Sets: 1" round bar stock with 2 –1/2" clearances from face of door.

J. Acceptable Manufacturers:
Hager H22J
Rockwood
Trimco

2.8 CLOSERS

A. Closers of one manufacturer as listed for continuity of design and consideration of warranty. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendations for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating.

B. Standards: Manufacturer to be certified by the following:
1. BHMA Certified ANSI A156.4 Grade 1.
2. ADA Complaint ANSI A117.1.
3. UL/cUL Listed up to 3 hours.
4. UL10C Positive Pressure Rated.
5. UL10B Neutral Pressure Rated.

C. Material and Design:
1. Provide aluminum non-handed bodies with full plastic covers.

2. Closers will have separate staked adjustable valve screws for latch speed, sweep speed, and back check.
3. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting.
4. Double heat-treated steel, tempered springs.
5. Precision machined heat-treated steel piston.
6. Triple heat-treated steel spindle.
7. Full rack and pinion operation.

D. Mounting:
1. Out-swing doors surface parallel arm mount closers except where noted on hardware schedule.
2. In-swing doors surface regular arm mount closers except where noted on hardware schedule.
3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.

E. Size closers in compliance with requirements for accessibility (ADAAG). Comply with following maximum opening force requirements.
1. Interior hinged openings: 5.0 lbs.
2. Fire-rated and exterior openings are to be adjusted to have minimum opening force allowable by authority having jurisdiction.

F. Fasteners: Provide self-reaming, self-tapping wood and machine screws, and sex nuts and bolts for each closer.

G. Acceptable manufacturers:
Hager 5200 Series
Norton 8000 Series
Sargent 1330 Series

2.9 PROTECTIVE TRIM

A. Protective trim of one manufacturer as listed for continuity of design and consideration of warranty.

B. Size of protection plate: single doors, size two inches less door width (LDW) on push side of door, and one inch less door width on pull side of door. For pairs of doors, size one inch less door width (LDW) on push side of door, and 1/2 inch on pull side of door. Adjust sizes to accommodate accompanying hardware, such as, edge guards, astragals and others.
1. Kick Plates 8" high or sized to door bottom rail height.
2. Mop Plates 4" high.

C. Products to be certified and listed by the following:
1. Architectural Door Trim: ANSI/BHMA A156.6.
2. UL.

D. Material and Design:
1. 0.050" gage stainless steel.
2. Corners square, polishing lines or dominant direction of surface pattern so they run across door width of plate.
3. Bevel top, bottom, and sides uniformly leaving no sharp edges.
4. Countersink holes for screws. Space screw holes so they are no more than eight inches CTC, along a centerline not over 1/2" in from edge around plate. End screws maximum of 0.53" from corners.

E. UL label stamp required on protection plates when top of plate is more than 16 inches above bottom of door on fire rated openings. Verify door manufacturer's UL listing for maximum height and width of protection plate to be used.

F. Acceptable Manufacturers:
Hager 190S
Trimco
Burns

2.10 STOPS AND HOLDERS

A. Stops and holders of one manufacturer as listed for continuity of design and consideration of warranty.

B. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted in concrete floor or masonry walls have stainless steel machine screws and lead expansion shields.

C. Products to be certified and listed by the following:
1. Auxiliary Hardware: ANSI/BHMA A156.16.

D. Acceptable Manufacturers:
Convex Concave
Hager 232W 236W
Rockwood
Burns

E. Overhead Stops and Holders: Provide overhead stops and holders for doors that open against equipment, casework sidelights and other objects that would make wall stops/holders and floor stops/holders inappropriate. Provide sex bolt attachments for mineral core wood door applications.

F. Products to be certified and listed by the following:

1. Overhead Stops and Holders: ANSI/BHMA A156.8 Grade 1.

G. Acceptable Manufacturers:
Heavy Duty Surface
Hager 7000 SRF Series
Glynn Johnson 90 SRF Series
Sargent 590 Series

2.11 THRESHOLDS

A. Thresholds of one manufacturer as listed for continuity of design and consideration of warranty.

B. Set thresholds for exterior and acoustical openings in full bed of sealant with lead expansion shields and stainless-steel machine screws complying with requirements specified in Division 7 Section "Joint Sealants: Notched in field to fit frame by hardware installer. Refer to Drawings for special details.

C. Standards: Manufacturer to be certified by the following:
1. Thresholds: ANSI/BHMA A156.21.
2. American with Disabilities Act Accessibility Guidelines (ADAAG).

D. Acceptable Manufacturers:
Hager 413S/520S
K.N. Crowder
Reese

2.12 DOOR GASKETING AND WEATHERSTRIP

A. Door gasketing and weatherstrip of one manufacturer as listed for continuity of design and consideration of warranty.

B. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide noncorrosive fasteners for exterior applications.
1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
3. Door bottoms: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.
5. Drip Guard: Apply to exterior face of frame header. Lip length to extend 4" beyond width of door.

C. Products to be certified and listed by the following:
1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22.
2. BHMA certified for door sweeps, automatic door bottoms, and adhesive applied gasketing.

D. Smoke-Labeled Gasketing: Comply with NFPA 105 listed, labeled, and acceptable to Authorities Having Jurisdiction, for smoke control indicated.
1. Provide smoke-labeled gasketing on 20-minute rated doors and on smoke rated doors.

E. Fire-Rated Gasketing: Comply with NFPA 80 listed, labeled, and acceptable to Authorities Having Jurisdiction, for fire ratings indicated.

F. Refer to Section 08 1416 Wood Doors for Category A or Category B. Comply with UBC 7-2 and UL10C positive pressure where frame applied intumescent seals are required.

G. Acceptable Manufacturers:
1. Perimeter Gasketing:
Stop Applied Adhesive Applied
Hager 881S 726
K.N. Crowder
Reese
2. Door Bottom Sweeps:
Hager 750S
K.N. Crowder
Reese
3. Overhead Drip Guard
Hager 717S/718S
K.N. Crowder
Reese

2.13 LATCH PROTECTORS

A. Latch protectors of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Manufacturer to be listed by the following: Auxiliary Hardware: ANSI/BHMA A156.16.

C. Design:
1. 12 ga. steel, stainless-steel material.
2. Size: 3" x 11".
3. Non-handed.
4. Frame pin prevents prying of door.
5. Use with 1-3/4" thick door.
6. Use with cylindrical locksets with a 2-3/4" backset at exterior out swinging doors.

7. Fasteners: Two 5/16-18 x 1-1/2" carriage bolts with sex nuts.

D. Acceptable Manufacturers:
Cylindrical
Hager 341D
Rockwood
Trimco

2.14 SILENCERS

A. Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame and four per Dutch door frame.

B. Products to be certified and listed by the following:
1. Auxiliary Hardware: ANSI/BHMA A156.16

C. Acceptable Manufacturers:
Hollow Metal Frame
Hager 307D
Rockwood
Trimco

2.15 KEY CABINET

A. Provide key cabinet; surface mounted to wall.

B. Key control system:
1. Include two sets of key tags, hooks, labels, and envelopes.
2. Contain system in metal cabinet with baked enamel finish.
3. Capacity will be able to hold actual quantities of keys, plus 50 percent.
4. Provide tools, instruction sheets, and accessories required to complete installation.

C. Acceptable Manufacturers:
Lund Equipment
Telkee Incorporated
Key Control

2.16 FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved samples.

B. Comply with base material and finish requirements indicated by ANSI/BHMA A156.18 designations in hardware schedule.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installers present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify Architect via a prepared written report and endorsed by Installer of any discrepancies between the door schedule, door types, drawings and scheduled hardware. Report will have a list of conditions detrimental to application, to the proper and timely completion of the work and performance of the hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 INSTALLATION

A. Install hardware using manufactures recommended fasteners and installation instructions, at height locations and clearance tolerances that comply with:
1. NFPA 80
2. NFPA 105
3. ICC/ANSI A117.1
4. ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames
5. ANSI/BHMA A156.115W hardware Preparation in Wood Doors with Wood or Steel Frames
6. DHI Publication – Installation Guide for Doors and Hardware
7. Approved shop drawings
8. Approved finish hardware schedule

B. Install soffit mounted gaskets prior other soffit mounted hardware to provide a continuous seal around the perimeter of the opening without cutting or notching.

C. Install door closers so they are on the interior of the room side of the door. Stairwell doors will have closers mounted on the stair side and exterior doors will be mounted on the interior side of the building.

D. In drywall applications provide blocking material of sufficient type and size for hardware items that mount directly to the wall.

E. Locate wall mounted bumper to contact the trim of the operating trim.

F. Mount mop and kick plates flush with the bottom of the door and centered horizontally on the door.

G. Set thresholds for exterior, and acoustical doors at sound control openings in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants" forming a tight seal between threshold and surface to which set.
H. Anchor all components firmly into position and use anchoring devices furnished with the hardware item, unless otherwise specified.
I. Do not install surface mounted items until finishes have been completed on substrates involved. Set unit level, plumb and true to line location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

3.3 FIELD QUALITY CONTROL
A. Material supplier to schedule final walk through to inspect hardware installation ten (10) business days before final acceptance of Owner. Material supplier will provide a written report detailing discrepancies of each opening to General Contractor within seven (7) calendar days of walk through.

3.4 ADJUSTMENT, CLEANING, AND DEMONSTRATING
A. Adjustment: Adjust and check each opening to ensure proper operation of each item of finish hardware. Replace items that cannot be adjusted to operate freely and smoothly or as intended for application at no cost to Owner.
B. Cleaning: Clean adjacent surfaces soiled by hardware installation. Clean finish hardware per manufacturer's instructions after final adjustments have been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no cost to Owner.
C. Conduct a training class for building maintenance personnel demonstrating the adjustment, operation of mechanical and electrical hardware. Special tools for finish hardware to be turned over and explained usage at the meeting. Record all training and provide to the Owner for future reference.

3.5 PROTECTION
A. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from the manufacture until Owner accepts project as complete.

3.6 HARDWARE SET SCHEDULE
A. Intent of Hardware Groups
   1. Should items of hardware not specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
   2. Where items of hardware aren't correctly specified and are required for completion of the Work, a written statement of such omission, error, or other discrepancy is required to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
B. Guide: Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, performance, exposure, and like characteristics of door hardware, and may not be complete. Provide door hardware required to make each set complete and operational.
C. Hardware schedule does not reflect handing, backset, method of fastening, and like characteristics of door hardware and door operation.
D. Review door hardware sets with door types, frames, sizes and details on drawings. Verify suitability and adaptability of items specified in relation to details and surrounding conditions.

3.7 HARDWARE SCHEDULE
A. Refer to drawings.

SECTION 08 8000
GLAZING

1.1 PERFORMANCE REQUIREMENTS
A. General: Installed glazing systems shall withstand normal thermal movement and wind loads without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

1.2 SUBMITTALS
A. Product Data: For each glass product and glazing material indicated.

1.3 QUALITY ASSURANCE
A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating- glass manufacturer who is approved and certified by coated-glass manufacturer.
B. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

1.4 DELIVERY, STORAGE, AND HANDLING
A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.5 WARRANTY
A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
1. Warranty Period: 10 years from date of Substantial Completion.
B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
1. Warranty Period: 10 years from date of Substantial Completion.

1.6 GLASS PRODUCTS, GENERAL
A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat- treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

1.7 GLASS PRODUCTS
A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
2. For uncoated glass, comply with requirements for Condition A.
3. For coated vision glass, comply with requirements for Condition C (other coated glass).

1.8 GLAZING GASKETS
A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
1. Neoprene complying with ASTM C 864.
2. EPDM complying with ASTM C 864.

3. Silicone complying with ASTM C 1115.
4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

1.9 GLAZING SEALANTS

A. General:
1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under
2. Conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
3. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
4. VOC Content: For sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Dow Corning Corporation; 795.
b. GE Advanced Materials - Silicones; SilGlaze II SCS2800.
c. Pecora Corporation; 864.
d. Tremco Incorporated; Spectrem 2.

1.10 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; non-staining and non-migrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

1.11 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
G. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire- resistant glazing product with which it is used for application and fire-protection rating indicated.

1.12 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
C. Grind smooth and polish exposed glass edges and corners.

1.13 GLASS SCHEDULE

A. Interior Glazing: ¼ inch clear fully tempered glass.
B. Exterior Glass Low-e-coated, tinted insulating glass.
1. Overall Unit Thickness: 1 inch.
2. Thickness of Each Glass Lite: 6.0 mm.
3. Outdoor Lite: Float glass; fully tempered where required by code.
a. Interspace Content: Air.
b. Indoor Lite: Float glass; fully tempered where required by code.
c. Low-E Coating: Sputtered on second surface.
d. Maximum SHGC and U Value: As required to meet energy code.
4. Acceptable Product: PPG Solarban 60 (2) Solargray on Clear unless noted otherwise to comply with energy code.

C. Provide safety glazing labeling

1.14 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

1.15 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

1.16 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

SECTION 09 2216
NON-STRUCTURAL METAL FRAMING

1.1 ACTION SUBMITTALS
A. Product Data: For each type of product.

1.2 PERFORMANCE REQUIREMENTS
A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

1.3 FRAMING SYSTEMS
A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized unless otherwise indicated.
B. Studs and Runners: Comply with ASTM C 645.
1. Steel Studs and Runners: Minimum base-metal thickness:
a. 25 gage unless indicated otherwise on Drawings or below.
b. Interior Metal Stud/Gypsum Board Assemblies, Typical Locations: Withstand lateral loading (air pressure) of 5 psf with deflection limit not more than L/240 of partition height.
c. Where wall mounted equipment, woodwork, and casework items are indicated or elsewhere as shown on Drawings, provide minimum 22 gage studs
d. At partitions scheduled to receive tile backing panels or ceramic tile finish, provide minimum 22 gage studs
e. Refer to Division 5 for stud framing for studs carrying heavy vertical loads (manufactured stone masonry, stone tile thicker than ¾ inch, etc)
f. Depth: As indicated on Drawings.
C. Head Joints: Provide one of the following at all partitions that extend to underside of structure:
1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
a. Products: Subject to compliance with requirements, provide one of the following:
b. Manufacturer's standard deep leg track for non fire rated partitions.
c. Dietrich Metal Framing; SLP-TRK Slotted Deflection Track (for non-rated partitions)
d. Fas Track, CEMCO (for fire rated partitions only).

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: 0.012 inch.
E. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.
1. Depth: As indicated on Drawings.
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches , 0.068-inch- thick, galvanized steel.
F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: 0.018 inch.
2. Depth: 7/8 inch
G. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges.
1. Depth: 3/4 inch
2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.0312 inch
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.

1.4 AUXILIARY MATERIALS
A. 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: Provide the following:
1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

1.5 INSTALLATION, GENERAL
A. Installation Standard: ASTM-C754.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM-C840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
C. Install bracing at terminations in assemblies.
D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

1.6 INSTALLING FRAMED ASSEMBLIES
A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
    1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
    2. Openings: Screw vertical studs at jambs to jamb anchor clips on opening frames; install runner track section (for cripple studs) at head and secure to jamb studs.
        a. Install two studs at each jamb unless otherwise indicated.
        b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    3. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
    4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
    5. Curved Partitions:
        a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
        b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches o.c.
D. Direct Furring:
    1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

END OF SECTION

SECTION 09 2236
METAL LATH

PART 1 GENERAL
1.1 SECTION INCLUDES
A. Metal lath for Portland cement plaster.

1.2 RELATED REQUIREMENTS
A. Section 092423 – Cement Stucco.

1.3 REFERENCE STANDARDS
A. ASTM C847 - Standard Specification for Metal Lath; 2010a.
B. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2007.

PART 2 PRODUCTS
2.1 LATH
A. Diamond Mesh Metal Lath: ASTM C847, galvanized; self-furring.
    1. Weight: To suit application, comply with deflection criteria, and as specified in ASTM C841 for framing spacing.
    2. Weight: 2.5 lb/sq yd.
B. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, maximum possible lengths.
    1. Material: Formed galvanized sheet steel with rust inhibitive primer, expanded metal flanges.
    2. Control Joints: 1 piece accordion profile with factory-installed protective tape, 3/8" in-line, ½" inside corner M-Type unless noted otherwise.
    3. Expansion Joints: 2-piece M-slide with factory-installed protective tape unless noted otherwise.

2.2 ACCESSORIES
A. Fasteners: ASTM C1002 self-piercing tapping screws.

PART 3 EXECUTION
3.1 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that substrates are ready to receive work and conditions are suitable for application.
C. For exterior plaster and stucco on stud walls, verify that water-resistive barrier has been installed over sheathing substrate completely and correctly.
D. Do not begin until unacceptable conditions have been corrected.
E. If substrate preparation is the responsibility of another installer, notify NCA Partners-Architecture of unsatisfactory preparation before proceeding.

3.2 INSTALLATION - GENERAL
A. Install interior lath and furring in accordance with ASTM C841.

3.3 CEILING AND SOFFIT FRAMING
A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
B. Install furring independent of walls, columns, and above-ceiling work.
C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
F. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.
H. Laterally brace suspension system.

3.4 CONTROL AND EXPANSION JOINTS
A. Control Joint Spacing: 20 feet on center and as indicated on drawings.
B. Expansion Joint Spacing: 40 feet on center and as indicated on drawings.

3.5 LATH INSTALLATION
A. Apply metal lath taut, with long dimension perpendicular to supports.
B. Lap ends minimum 1 inch. Secure end laps with tie wire where they occur between supports.
C. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.
D. Place corner bead at external wall corners; fasten at outer edges of lath only.
E. Place base screeds at termination of plaster areas; secure rigidly in place.
F. Place 4 inch wide strips of metal lath centered over junctions of dissimilar backing materials. Secure rigidly in place.
G. Place lath vertically above each top corner and each side of door frames to 6 inches above ceiling line.
H. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.
I. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

END OF SECTION

SECTION 09 2423
CEMENT STUCCO

PART 1 GENERAL
1.1 SUMMARY
A. Portland cement plaster for installation over metal lath, masonry, concrete, and solid surfaces Manufacturer
1. Dryvit
2. Merlex
3. Lahabra

1.2 RELATED REQUIREMENTS
A. Section 092236 - Metal Lath: Metal furring and lathing for plaster.
B. Section 054000 - Cold Formed Metal Framing
C. Section 061600 – Sheathing

1.3 REFERENCE STANDARDS
A. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2006.

1.4 SUBMITTALS
A. Submittal requirements by the contractor are to be indicated in the construction documents as required, including:
1. Product literature, samples or mock up.
2. Finish sample indicating color and texture for approval by architect/owner

1.5 DESCRIPTION
1. Design Requirements:
a. Substrates shall comply with local code requirements and practices for use under cement plaster and shall be wood or metal framed wall assemblies sheathed with approved substrates as follows:
1. Exterior grade gypsum sheathing meeting ASTM C 1396 (formerly C 79) requirements for water resistant core or Type X core at the time of application
2. Exterior sheathing having a water-resistant core with fiberglass mat facers meeting ASTM C 1177.
3. Exterior fiber reinforced cement or calcium silicate boards.
4. APA Exterior or Exposure 1 Rated Plywood, Grade C-D or better, nominal 1/2 in (12.7 mm), minimum, installed with the C face out.
5. APA Exterior or Exposure 1 Fire Retardant Treated (FRT) Plywood, Grade C-D or better, nominal 1/2 in (12.7 mm), minimum, installed with the C face out.
b. Deflection of substrate systems shall not exceed L/360.
c. The slope of inclined surfaces shall not be less than 6:12 (27°) and the length shall not exceed 12 in (305 mm).
d. Slopes on windowsills projecting 4 in (102 mm) or less, shall not be less than 3:12.
e. Expansion joints:
1. Design and location of expansion joints shall be determined by the project design professional and indicated on the contract documents. As a minimum, expansion joints are required at the following locations:
a. Where expansion joints occur in the substrate system.
b. Where building expansion joints occur.
c. At floor lines in wood frame construction.
d. Where Cement Stucco abuts dissimilar materials.
e. Where the substrate changes.
f. Where significant structural movement occurs such as changes in roofline, building shape or structural system.
g. Control joints:
1. Design and location of control joints shall be determined by the project design professional in accordance with ASTM C 1063 and indicated on the contract drawings. As a minimum, control joints shall be located at the following locations:
a. Corners of openings
b. Such that monolithic wall areas do not exceed 144 ft2 (13.4 m2)
c. Length to width ratios of wall areas shall not exceed 2.5:1
d. Maximum spacing of control joints shall not exceed 18 ft (5.5 m)
h. Sealants
1. Refer to Section 07 90 00
2. Shall meet ASTM C 920
3. Refer to Manufacturer publications for a list of sealants that have been tested for compatibility with chosen product.

i. Flashing shall be provided at all roof-wall intersections, windows, doors, chimneys, decks ,balconies, and other areas as necessary to prevent water penetration behind Cement Stucco

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer:
   a. Dryvit
   b. Merlex
   c. Lahabra

All materials shall be obtained from respective manufacturer or its authorized distributors.

2. Plastering Contractor:
   a. Shall be knowledgeable in the proper installation of exterior lathing and cement plaster products.
   b. Shall have qualified and properly trained people to perform work.
   c. Shall be licensed, bonded and insured.
   d. Shall have experience in application of cement plaster products on projects of comparable ®scope.

B. Mock-Up

1. The contractor shall, before the project commences, provide the owner/architect with a mock-up for approval.
2. The mock-up shall be of suitable size as required to accurately represent each color and texture to be utilized on the project.
3. The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual applications. The finish used shall be from the same batch as that being used for the project.
4. The approved mock-up shall be available and maintained at the job site.

PART 2 PRODUCTS

2.1 PORTLAND CEMENT PLASTER ASSEMBLIES

A. Exterior Stucco: Portland cement plaster system, made of finish, brown, and scratch coat and reinforcing mesh.

1. Provide weather resistive barrier and air barrier as part of the system, by the same manufacturer or approved manufacturer products.

2.2 MATERIALS

A. Water-Resistive Barrier (by others):

1. Shall comply with all local building code requirements. Minimum 2 layers are required over wood-based substrates.

B. Lath (by others):

1. Self-Furring Diamond Mesh metal lath shall be galvanized, minimum 2.5 lbs/sq yd (1.4 kg/m2) or 3.4 lbs/yd2 (1.9 kg/m2) and comply with ASTM C 847.
2. Self furring welded wire lath, minimum 16 gauge, shall be galvanized with openings not exceeding 2 in x 2 in (51 mm x 51 mm), and comply with ASTM C 933.
3. 3/8 in (9.5 mm) galvanized rib lath shall comply with ASTM C 847.
4. Self furring woven wire lath, minimum 17 gauge, shall be galvanized with openings not exceeding 1 ½ in x 1 ½ in meeting ASTM C 1063.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of Cement Stucco, it is the contractor's responsibility to ensure that:

1. The surfaces to receive plaster are free of dust, loose particles, oil and other conditions that would affect the adhesion, installation or performance of product.
2. The lath is of the proper type, installed tight, properly fastened, and meets the requirements ofASTM C 1063, ASTM C 847 (expanded metal), ASTM C 933 (Welded Wire), or ASTM C 1032 (Woven Wire), and local building code requirements.
3. All accessories including corner aids, control and expansion joints, casing beads, etc. are properly fastened and positioned according to contract drawings and local building code requirements.
4. Doors, windows, decks, and other openings and penetrations have been properly flashed in accordance with building code and contract documents.
5. Metal roof flashing has been installed in accordance with the manufacturer's requirements
6. The substrate is flat within 1/4 in (6.4 mm) in 10 ft (3.0 m).
7. The contractor shall notify the general contractor and/or owner and/or architect of all discrepancies. Do not proceed until unsatisfactory conditions are resolved.

3.2 PREPARATION

A. Protection

1. Chosen Cement Stucco material shall be protected by permanent or temporary means from weather and other damage prior to, during, and following application, until dry.
2. Protect adjoining work and property.

B. Solid surfaces such as precast or cast-in-place concrete or masonry, shall have adequate suction and surface roughness to provide bond.
Smooth or non-absorptive surfaces shall be prepared by the following methods:
1. Sandblasting, wire brushing, acid etching, chipping or any combination thereof. Refer to ASTM D 4258, ASTM D 4259 ASTM D 4260, or ASTM D 4261 as applicable.
2. Application of an approved bonding agent.
3. Where effective bond cannot be achieved, the entire surface shall be covered with furred metal lath in accordance with ASTM C 1063 and building code requirements.

3.3 INSTALLATION
A. Mixing and Application Instructions – refer to specific product literature for mixing and application instructions of each product.
B. Cement Stucco Base shall be moist cured for a minimum of 48 hours following application.
C. Cement Stucco Base shall be completely dry and cured for a minimum of 7 days prior to application of primer and finish.

3.4 FIELD QUALITY CONTROL
A. The lath and water-resistive barrier installation shall be inspected as required by the local building department prior to plaster materials being applied.
B. The contractor shall be responsible for the proper application of the Cement Stucco materials.

3.5 CLEANING
A. All excess Cement Stucco materials shall be removed from the job site by the contractor in accordance with contract provisions.
B. All surrounding areas, where the Cement Stucco has been applied, shall be left free of debris and foreign substances resulting from the contractor's work.

3.6 PROTECTION
A. The Cement Stucco materials shall be protected from weather and other damage until permanent protection in the form of flashings, sealants, etc. are installed

SECTION 09 2900
GYPSUM BOARD

PART 1: GENERAL
1.1 SCOPE
A. Perform work required to complete the Gypsum Drywall indicated by the Contract Documents including supplementary items necessary for its installation.
B. Applicable requirements of the following parts of this Project Manual apply to work required for this Section.
1. Contract Requirements
2. Division 1 - General Requirements
3. Building Insulation
C. Insulation for gypsum drywall work is specified in the BUILDING INSULATION SECTION.
D. Installation of lathing channels for suspended gypsum drywall ceilings is specified in the LATHING SECTION.
E. Installation of the tape and bedding of gypsum drywall is specified in the PAINTING SECTION.

1.2 STANDARDS
A. ASTM shall mean the appropriate Specification of The American Society for Testing and Materials.
B. Gypsum Association GA-216, recommended specifications for the application and finishing of gypsum board.

PART 2: PRODUCTS
2.1 ACCEPTABLE MANUFACTURERS
A. Products of the following manufacturers are acceptable, provided they comply with the Contract Documents.
1. Gypsum Drywall:
The Celotex Corporation Flintkote Division of Genstar Georgia-Pacific Corporation National Gypsum Company United States Gypsum Company

2. Ceiling Suspension System: Chicago Metallic Corporation Donn Products, Inc.
National Rolling Mills, Inc.

2.2 MATERIALS
A. Non-Rated Gypsum Wallboard: ASTM C36, 5/8" thick, tapered edge
B. Fire-Rated Gypsum Wallboard: ASTM C36, Type "X", UL 5/8" thick, tapered edges.
C. Moisture-Resistant Gypsum Wallboard (Greenboard): ASTM C630, Type "X", 5/8" thick, tapered edge, to be installed in all areas where ceramic tile is specified.
D. Interior Metal Studs: 25 gauge (unless noted otherwise), electrogalvanized, screw type, width as required for partition width indicated.
E. Exterior Metal Studs and Runners: 18 gauge (unless noted otherwise), electrogalvanized, screw type, width as required for partition width indicated.
F. Metal Runners: 25 gauge (unless noted otherwise), electrogalvanized, channel type, screw type; width as required by stud width.
G. Zee Furring Channels: USG Z-Furring channels, 1".
H. Metal Furring Channels: 25 gauge (unless noted otherwise), electrogalvanized, screw type.
I. Lathing Channels: 16 gauge cold rolled steel, black asphaltum painted, 3/4" and 1-1/2".
J. Resilient Channels: 25 gauge, galvanized steel.
K. Main Beam: Donn RMX 1-1/2".
L. Main Tee: Donn RMX 1-1/2".
M. Furring Cross Flat Channel: Donn RCX.
N. Perimeter Wall Angle: Donn RAX.
O. Furring Channel Clip: Galvanized, standard of furring channel manufacturer.
P. Screws: Self-drilling, self-tapping, cadmium plated.
Q. Nails: ASTM C380 annular ring type.
R. Corner Bead: Galvanized steel, perforated flange, USG Dur-A-Bead.
S. Edging and Casing: Galvanized steel for painting. USG 200B, size as required for gypsum wallboard thickness.
T. Control Joint Casing: USG 093.
U. Adhesive: As recommended by gypsum board manufacturer, ASTM C475.
V. Acoustical Sealant: USG Acoustical sealant.
W. Wire: Galvanized, 9 gauge hanger wire, 16 gauge tie wire.
X. Neoprene Fillers: R-431-N Black closed cell neoprene, manufactured by Rubatex Corporation, size as indicated, compressed 50 percent.
Y. Exterior Sheathing: Dens Glass Gold 1/2", Type 'X', ASTM C-1177, As manufactured by Georgia Pacific.

PART 3: EXECUTION
3.1 GENERAL
A. Install gypsum board in accordance with GA-216 unless otherwise specified.

3.2 PREPARATION
A. Examine spaces and correct defects that could interfere with proper installation. Starting work shall be construed as acceptance of spaces.
B. Maintain uniform temperature between 55 degrees F. to 70 degrees F. during the installation. Provide adequate ventilation to eliminate excessive moisture.

3.3 INSTALLATION
A. Furred Ceiling Framing:
1. I nstall drywall furring in accordance with ATSM C 636-76. Deflection of components shall not exceed 1/360 of the span.
2. Space main beams 48" o.c. and suspend from the overhead construction with steel hanger wires, spaced 48" o.c. along the length of the main beams.
3. Space cross tees 24" o.c. thus forming a module of 24" x 48".
4. Install perimeter channel molding at the specified ceiling height at the intersection of the suspended ceiling and vertical surfaces.
5. Attach 5/8" gypsum board panels to drywall furring system using bugle head drywall screws spaced in accordance with the recommendations of the gypsum board manufacturer. (For fire rated assembly). Gypsum board panel placement and spacing of drywall screws shall be per U.L. design.
B. Furred Wall Framing:
1. Erect furring channels vertically, spaced 24" on centers. Attach to surface with nails spaced 24" on centers, staggered on flanges.
2. Splice ends by nesting channels 8" and securely anchoring to surface.
3. Miter 24" long horizontal furring channels at corners and space 24" on centers vertically.
4. Locate furring channels around perimeter of openings and secure to surfaces.
C. Metal Stud Framing:
1. Align partitions accurately according to partition layout.

2. Align top and bottom tracks and secure to concrete slab with concrete stub nails or power driven anchors spaced 24" on centers unless otherwise noted.
3. Secure tracks to suspended ceilings with screws, toggle or molly bolts spaced 12" on centers or as required to attach to suspension system.
4. Apply two continuous beads of sealant to ceiling track and under floor track before fastening to surface.
5. Position studs in track by rotating into place for friction fit.
6. Locate studs no more than 2" from partition intersections and corners and secure with screws through both flanges of studs and tracks.
7. Lap studs a minimum of 8" where splicing is necessary and secure with screws.
8. Place two metal studs back-to-back on each side of door and window frames. Fasten studs securely to anchors on each side of frame with bolts or screws. Locate third stud 6" from double studs.
9. Locate section of runner across frame head at doors and other openings and screw slit flanges to vertical studs. Erect short intermediate studs 24" on centers between ceiling runner and door frame head runner.

D. Chase Wall Framing:
1. Align partitions accurately according to partition layout and after ceiling grillages are in place.
2. Align double row of floor and ceiling tracks and secure to concrete slab with concrete stub nails or power-driven anchors spaced 24" on centers.
3. Secure top track to ceilings with screws, toggle or molly bolts, spaced 21" on centers or as required to attach to suspension system.
4. Apply sealant to ceiling track and under floor track before fastening to surface.
5. Position double row of metal studs vertically in runners, opposite each other in pairs with flanges pointing in the same direction.
6. Space studs 24" on centers and attach with screws through each stud flange and runner flange.
7. Cross brace between rows of studs with 5/8" wallboard, 12" by chase width. Screw-attach to stud webs at quarter points in partition height with minimum of three screws per web.

E. Wallboard:
1. Apply wallboard to ceilings and soffits before applying to vertical surfaces.
2. Install wallboard to ceilings with long edge perpendicular to supports using longest pieces practicable. Stagger end joints and provide support for edges. Apply sealant at joint between edge of wallboard at floor and at ceiling.
3. Install wallboard to walls with long edge parallel to supporting members. Use full length sheets, floor to ceiling. Stagger joints on opposite sides of partition. Provide support for edges. Apply sealant to perimeter of wallboard at floor and ceiling.
4. Butt joints loosely, maximum gap 1/4". Sand edges that have been cut.
5. Attach wallboard to metal supports with self-drilling screws, using an electric screw driving gun and Phillips bit. Drive screws to slightly dimple surface but not to break paper.
6. Space screws 12" on centers in the field and 8" on centers staggered along the vertical abutting edges. Start field screwing near center and work toward edges. Space screws not less than 3/8" from wallboard edges. Space screws for fire rated partitions as required by U.L.
7. Attach wallboard on one side of partition by screwing to every other stud. Complete wallboard application to entire side of partition in this manner.
8. Cut first panel 2 foot wide on opposite side so joints will be staggered. Fasten wallboard panels to studs on this side of panel.
9. Return to first side and complete attaching screws to previously unattached studs.
10. Apply face layer in laminated construction vertical with adhesive per manufacturer's recommendations. Hold in place with supplemental fastening until adhesive is dry. Offset face layer joints so they do not fall over backing board joints.
11. Fit wallboard snugly into steel door frames. Cut wallboard neatly to fit around outlets and switch boxes.
12. Install metal edge trim along top edge of wallboard at ceiling and wherever wallboard edge is exposed and abuts another material. Install corner bead at exterior corners.
13. Use moisture resistant gypsum wallboard on walls scheduled to receive ceramic tile, and in toilet room walls. Install with long edge perpendicular to supports with end joints staggered.

G. Control Joints:
1. Locate control joints as indicated but not to exceed 30'-0" on center for partitions.
2. Locate control joints where wallboard abuts dissimilar wall and ceiling assembly and where wallboard construction changes within the same plane.
3. Install control joint casing where control joints occur in continuous wall surface. Make joint 1/4" wide with supports non-continuous over joint.
4. Install metal edging where wallboard abuts structural element and dissimilar material. Make joint 1/8" wide and fill with sealant.

3.4 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   3. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
   4. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.5 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.6 INSULATION

A. Acoustical Insulation:
   1. Apply acoustical insulation at ceilings where indicated with joints butted tightly. Cover entire surface with blankets free from wrinkles, sags, tears and ruptures. Lay blankets flat on the ceiling without being compressed. Leave no space between blankets during placement.
   2. Install acoustical insulation at partitions to inside face of first side of partition with staples or mastic. Anchor blanket in each corner and in center. Fit joints snugly against adjoining blankets and framing member.

B. Insulated Furred Wall:
   1. Erect insulation vertically and hold in place with Z-Furring channels spaced 24" on center. Attach narrow flange of channel to wall with concrete stub nails spaced 24" on center.
   2. Locate furring channels 3" from exterior corners and 12" from interior corners.

3.7 CLEANING AND PATCHING

A. Remove excess materials and debris from site as work progresses.

B. Clean exposed surfaces of wallboard free from soil and stain that would affect finish.

C. Repair defective work. Replace defective work which cannot be repaired.

END OF SECTION

SECTION 09 3000
TILING

1.1 QUALITY ASSURANCE

A. Maintain one copy of the Tile Council Of North America Handbook And ANSI A108 Series/A118 Series on site.

B. Manufacturer qualifications: company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.

C. Installer qualifications: company specializing in performing tile installation, with minimum of 5 years of documented experience.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.3 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.4 TILE

A. Manufacturers: All products by the same manufacturer.
   1. American Olean: www.Americanolean.Com.
   2. Dal-Tile Corporation: www.Daltile.Com.
   3. Summitville Tiles, Inc: www.Summitville.Com.
   4. Thorntree: www.Thorntreestate.Com.

5. Substitutions: See Section 016000 - Product Requirements.

1.5 TRIM ANDACCESSORIES

A. Thresholds: marble, white or gray, honed finish; 2 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.

1. Applications: provide at the following locations:

A. At doorways where tile terminates.

1.6 Setting materials

A. Latex-portland cement mortar bond coat: ansi a118.4.

1. Application(s): use this type of bond coat where indicated and where no other type of bond coat is indicated.
2. Products:

A. Custom Building Products; Megalite: www.Custombuildingproducts.Com.

B. Laticrete International, Inc ; Laticrete 254 Platinum: www.Laticrete.Com.

C. Prospec, An Oldcastle Brand ; Permalastic System: www.Prospec.Com.

a. Substitutions: See Section 016000 - Product Requirements.

1.7 GROUTS

A. Manufacturers:

1. Custom building products: www.custombuildingproducts.com.
2. Laticrete international, inc: www.laticrete.com.
3. Mapei corporation: www.mapei.com.
4. Substitutions: see section 016000 - Product Requirements.

B. Standard grout: ANSI A118.6 standard cement grout.

1. Applications: use this type of grout where indicated and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use un-sanded grout for joints less than 1/8 inch wide.
3. Color(s): as scheduled.

1.8 THIN-SET ACCESSORY MATERIALS

A. Concrete floor slab crack isolation membrane: material complying with ANSI A118.12.

1. Thickness: 20 mils, maximum.
2. Crack resistance: no failure at 1/16 inch gap, minimum.

1.9 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub- floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

1.10 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

1.11 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and the tile council of north america handbook recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Install thresholds where indicated.

H. Sound tile after setting. Replace hollow sounding units.
I. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
J. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
K. Grout tile joints. Use standard grout unless otherwise indicated.
L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

1.12 INSTALLATION - FLOORS - THIN-SET METHODS
A. Over interior concrete substrates, install in accordance with the Tile Council Of North America Handbook Method F113, dry-set or latex-portland cement bond coat, with standard grout, unless otherwise indicated.

1.13 INSTALLATION - WALL TILE
A. Over coated glass mat backer board on studs, install in accordance with the Tile Council Of North America Handbook Method W245.

END OF SECTION

SECTION 09 5113
ACOUSTICAL PANEL CEILINGS

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

1.2 QUALITY ASSURANCE
A. Source Limitations:
1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
2. Suspension System: Obtain each type through one source from a single manufacturer.
B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.
C. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
1. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:
a. Smoke-Developed Index: 450 or less.

1.3 DELIVERY, STORAGE, AND HANDLING
A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.4 PROJECT CONDITIONS
A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.5 COORDINATION
A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.6 EXTRA MATERIALS
A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Acoustical Ceiling Panels: Full-size panels equal to 3.0 percent of quantity installed.

1.7 ACOUSTICAL PANELS, GENERAL

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.
   1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15- 3/4 inches away from test surface per ASTM E 795.

B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
   1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

1.8 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

B. Products: Subject to compliance with requirements, provide one of the following:
   1. Armstrong World Industries, Inc.
   2. Cetainteed.
   3. Chicago Metallic Corporation.
   4. USG Interiors, Inc.

C. Basis-of-Design Product: Refer to Finish Legend.

1.9 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.
   1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of
   2. type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641, Class 1 zinc coating, soft temper.
   2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.

E. Hold-Down Clips: Where indicated, and at exterior locations, and with 10 feet of an exterior door, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

1.10 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

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. Armstrong World Industries, Inc.
   2. Certainteed.
   3. Chicago Metallic Corporation.
   4. USG Interiors, Inc.

B. Unless noted otherwise in schedule, provide Wide-Face, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, pre-painted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653, not less than G30 coating designation, with prefinished 15/16-inch- wide metal caps on flanges.
   1. Structural Classification: Intermediate -duty system.
   2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
   3. Face Design: Flat, flush.

1.11 ACOUSTICAL SEALANT

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

B. Products: Subject to compliance with requirements, provide one of the following:
   1. Acoustical Sealant for Exposed and Concealed Joints:
      a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
      b. USG Corporation; SHEETROCK Acoustical Sealant.

1.12 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

1.13 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counters playing, or other equally effective means.
   3. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counters playing, or other equally effective means.
   4. 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.
   5. 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.
   6. 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 structure to which hangers are attached and 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.
   7. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post-installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
   8. 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.
   9. Do not attach hangers to steel deck tabs.
   10. Do not attach hangers to steel roof deck. Attach hangers to structural members.
   11. 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.
   12. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
   1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
   2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
   3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
   1. Arrange directionally patterned acoustical panels as follows:
      a. As indicated on reflected ceiling plans.
   2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
   3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
   4. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.
   5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

6. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire- resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.
7. Install clean-room gasket system in areas indicated, sealing each panel and fixture as recommended by panel manufacturer's written instructions.
8. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

SECTION 09 6116
CONCRETE FLOOR SEALING

1.1 SUBMITTALS
A. Product Data: Submit manufacturer's technical literature, including chemical properties and percentage of solids, for each product.

1.2 ENVIRONMENTAL REQUIREMENTS
A. Do not apply materials when ambient or substrate surface temperatures are below 40 degrees F or higher than 100 degrees F.
B. Do not apply during inclement weather or when forecasted conditions will not permit compliance with manufacturer's printed instructions.
C. Provide mechanical ventilation during and after application to dissipate fumes if natural ventilation is insufficient.

1.3 MATERIALS
A. Liquid Membrane-Forming Sealer (for use on concrete floor slabs intended to be left exposed):
1. Acceptable products:
a. Miracote- Miragard Drylook Sealer

1.4 PREPARATION
A. Remove loose particles, foreign matter, and oil by method which will not affect sealer application.
B. Prepare surfaces in accordance with manufacturer's directions.
C. Provide protection as necessary to protect adjacent materials and surfaces from dirt, dust, spillage, overspray and other surface or physical damage.

1.5 APPLICATION
A. General:
1. Provide finishes to match approved samples at locations indicated.
2. Apply materials in accordance with manufacturer's printed instructions.
B. Liquid Membrane-Forming Sealer:
1. Apply sealer using low pressure airless sprayer in single coat at 250 ft/gal (6.0-7.0 WFT) coverage unless greater amount is recommended by manufacturer to obtain penetration and full coverage.
2. Do not allow flooding or puddling of material on surface.
3. Do not dilute or alter material as packaged.
4. Locations: As indicated on plans and on all exposed concrete flooring inside of building.

END OF SECTION

SECTION 09 6513
RESILIENT BASE AND ACCESSORIES

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

1.2 DELIVERY, STORAGE, AND HANDLING
A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.3 PROJECT CONDITIONS
A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.
B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
C. Install resilient products after other finishing operations, including painting, have been completed.

1.4 EXTRA MATERIALS
A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Furnish not less than 2% of each type, color, pattern, and size of resilient product installed.

1.5 RESILIENT BASE
A. Resilient Base:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allstate Rubber Corp.; Stoler Industries.
      b. Armstrong World Industries, Inc.
      c. Johnsonite.
      d. Mannington Commercial.
      e. Roppe Corporation, USA.
      f. VPI, LLC; Floor Products Division.
B. Basis of Design: Refer to Finish Legend.
C. 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).
D. Minimum Thickness: 0.125 inch.
E. Height: Refer to Finish Legend.
F. Lengths: Coils in manufacturer's standard length.
G. Outside Corners: Job formed.
H. Inside Corners: Job formed.
I. Finish: Satin.
J. Colors and Patterns: Refer to Finish Legend

1.6 RESILIENT MOLDINGACCESSORY
A. Resilient Molding Accessory:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
      b. Flexco, Inc.
      c. Johnsonite.
      d. R.C.A. Rubber Company (The).
      e. Roppe Corporation, USA.
      f. VPI, LLC; Floor Products Division.
B. Description: Cap for cove resilient floor covering, Carpet edge for glue-down applications, Reducer strip for resilient floor covering, Joiner for tile and carpet, Transition strips.
C. Material: Rubber.
D. Profile and Dimensions: As indicated.
E. Colors and Patterns: Refer to Finish Legend

1.7 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.

1.8 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.
   1. 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.

1.9 RESILIENT BASEINSTALLATION

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.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:
   1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
   2. Inside Corners: Use straight pieces of maximum lengths possible.

1.10 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet and resilient floor covering that would otherwise be exposed.

1.11 CLEANING ANDPROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from resilient stair treads before applying liquid floor polish.
   1. Apply two coat(s).

SECTION 09 6519
RESILIENT TILE FLOORING

1.1 SUBMITTALS

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

1.2 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.3 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

1.4 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Floor Tile: Furnish 2% of each type, color, and pattern of floor tile installed.

1.5 VINYL COMPOSITION FLOOR TILE

A. Products: Subject to compliance with requirements, provide products by one of the following:
   1. Armstrong World Industries, Inc.
   2. Congoleum Corporation.
   3. Mannington Mills, Inc.
   4. Tarkett, Inc.

B. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch.

E. Size: 12 by 12 inches.

F. Colors and Patterns: Refer to Finish Legend.

1.6 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 floor tile and substrate conditions indicated.

C. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

1.7 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

1.8 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
   4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
      a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
      b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are same temperature as space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

1.9 FLOOR TILE INSTALLATION
A. Comply with manufacturer's written instructions for installing floor tile.
B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles in pattern indicated on Drawings..
C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles in direction per manufacturer's recommendation.
D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, non-staining marking device.
G. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

1.10 CLEANING ANDPROTECTION
A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
B. Perform the following operations immediately after completing floor tile installation:
1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.
C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.
1. Apply per manufacturer's recommendation.

END OF SECTION

SECTION 09 6816
SHEET CARPETING

1.12 ACTION SUBMITTALS
A. Product Data: For the following, including installation recommendations for each type of substrate:
1. Carpet: For each type indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance.

1.13 DELIVERY, STORAGE, AND HANDLING
A. Comply with CRI 104.

1.14 FIELD CONDITIONS
A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
B. Environmental Limitations: Do not deliver or install carpet and carpet cushion until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
C. Do not install carpet over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

1.15 ATTIC STOCK
A. Provide not less than 2% of materials provided for project. Store in location determined by Owner.

1.16 CARPET

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Shaw Industries.
B. Basis of Design: Refer to Finish Legend.

1.17 INSTALLATION ACCESSORIES
A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet cushion manufacturer.
B. Adhesives: Water-resistant, mildew-resistant, non-staining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet and carpet cushion manufacturers.
C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.
   1. Acceptable Product: Schluter, Deco AE, size to match height of carpet to create flush exposed edge material.

1.18 EXAMINATION
A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.
B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
   1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet cushion manufacturer.
   2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in-Place Concrete" for slabs receiving carpet.
   3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

1.19 PREPARATION
A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.
B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch 3 mm wide or wider, and protrusions more than 1/32 inch, unless more stringent requirements are required by manufacturer's written instructions.
C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet cushion manufacturer.
D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

1.20 INSTALLATION
A. Comply with CRI 104 and carpet manufacturer's written installation instructions for the following:
   1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-Down Installation."
B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.
C. Do not bridge building expansion joints with carpet.
D. Cut and fit carpet 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 manufacturer.
E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
F. 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, non-staining marking device.
G. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.

SECTION 09 9100
PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior paint and coatings systems including surface preparation.

B. Exterior paint and coatings systems including surface preparation.

1.2 RELATED SECTIONS

A. Section 03 3000-Cast-in-Place Concrete.

B. Section 04 2000-Unit Masonry: Concrete Masonry Units (CMU)

C. Section 05 5000-Metal Fabrications.

D. Section 08 1113-Hollow Metal Doors and Frames.

1.3 REFERENCES

A. Steel Structures Painting Council (SSPC):

1 SSPC-SP 1 - Solvent Cleaning.

2 SSPC-SP 2 - Hand Tool Cleaning.

3 SSPC-SP 3 - Power Tool Cleaning.

4 SSPC-SP5/NACE No. 1, White Metal Blast Cleaning.

5 SSPC-SP6/NACE No. 3, Commercial Blast Cleaning.

6 SSPC-SP7/NACE No. 4, Brush-Off Blast Cleaning.

7 SSPC-SP10/NACE No. 2, Near-White Blast Cleaning.

8 SSPC-SP11, Power Tool Cleaning to Bare Metal.

9 SSPC-SP12/NACE No. 5, Surface Preparation and Cleaning of Metals by Water-jetting Prior to Recoating.

10 SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete.

B. Material Safety Data Sheets / Environmental Data Sheets: Per manufacturer's MSDS/EDS for specific VOCs (calculated per 40 CFR 59.406). VOCs may vary by base and sheen.

C. South Coast Air Quality Management District (SCAQMD): Rule 1113 - Architectural Coatings.

D. Green Seal, Inc.:

1 GS-11 Standard for Paints and Coatings (1st Edition, May 20,1993).

2 GC-03 - Environmental Criteria for Anti-Corrosive Paints.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: For each paint system indicated, including.

1 Product characteristics.

2 Surface preparation instructions and recommendations.

3 Primer requirements and finish specification.

4 Storage and handling requirements and recommendations.

5 Application methods.

6 Cautions for storage, handling and installation.

C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.

D. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.

E. Only submit complying products based on project requirements (i.e. LEED). One must also comply with the regulations regarding VOCs (CARB, OTC, SCAQMD, LADCO). To ensure compliance with district regulations and other rules, businesses that perform coating activities should contact the local district in each area where the coating will be used.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Paint exposed surfaces. If a color of finish, or a surface is not specifically mentioned, Architect will select from standard products, colors and sheens available.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels unless indicated.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1 Finish surfaces for verification of products, colors and sheens.

2 Finish area designated by Architect.

3 Provide samples that designate primer and finish coats.

4 Do not proceed with remaining work until the Architect approves the mock-up.

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1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.

1 Product name, and type (description).

2 Application and use instructions.

3 Surface preparation.

4 VOC content.

5 Environmental handling.

6 Batch date.

7 Color number.

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

D. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

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 recommended limits.

1.8 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

B. Furnish Owner with an additional one percent of each material and color, but not less than 1 gal (3.8 l) or 1 case, as appropriate.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Sherwin-Williams, which is located at: 101 Prospect Ave.; Cleveland, OH 44115; Toll Free Tel: 800-524-5979; Tel: 216-566-2000; Fax: 440-826-1989; Email: request info specifications@sherwin.com; Web: www.swspecs.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 APPLICATIONS/SCOPE

A. Interior Paints and Coatings:

1 Wood: Walls.

2 Drywall: Walls, Ceilings, Gypsum Board and similar items

3 Metal: Aluminum, galvanized steel, Miscellaneous and Ornamental Iron.

B. Exterior Paints and Coatings:

1 Masonry: Concrete masonry units, cinder or concrete block.

2 Metal: Aluminum, galvanized steel.

3 Metal: Miscellaneous iron, ornamental iron, ferrous metal.

4 EIFS, synthetic stucco.

2.3 PAINT MATERIALS - GENERAL

A. Paints and Coatings:

1 Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

2 For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color. Or follow manufactures product instructions for optimal color conformance.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

D. Color: Refer to Finish Schedule for paint colors, and as selected.

2.4 INTERIOR PAINT SYSTEMS

A. METAL: Aluminum, Galvanized.

1 Latex Systems:

a. Gloss Finish High Performance:

1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial DTM Acrylic Gloss, B66 Series.
3) 3rd Coat: S-W Pro Industrial DTM Acrylic Gloss, B66 Series (6-10 mils wet, 2.5-4.0 mils dry per coat).
b. Semi-Gloss Finish High Performance:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss, B66 Series.
3) 3rd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss, B66 Series (6-10 mils wet, 2.5-4.0 mils dry per coat).
c. Eg-Shel / Satin Finish High Performance:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel, B66 Series.
3) 3rd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel (6-10 mils wet, 2.5-4.0 mils dry per coat).
2 Epoxy Systems (Water Based):
a. Gloss Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series.
3) 3rd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series (5.0 mils wet, 2.0 mils dry per coat).
b. Semi-Gloss Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46- Series.
3) 3rd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46- Series (4 mils wet, 1.5 mils dry per coat).
c. Eg-Shel/Low Luster Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-360 Series.
3) 3rd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-360 Series (5.0 mils wet, 2.0 mils dry per coat).
B. METAL - (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous and Ornamental Iron, Structural Iron, Ferrous Metal)
1 Latex Systems:
a. Gloss Finish High Performance:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial DTM Acrylic Gloss, B66 Series.
3) 3rd Coat: S-W Pro Industrial DTM Acrylic Gloss, B66 Series (6-10 mils wet, 2.5-4.0 mils dry per coat).
b. Semi-Gloss Finish High Performance:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss, B66 Series.
3) 3rd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss, B66 Series (6-10 mils wet, 2.5-4.0 mils dry per coat).
c. Eg-Shel / Satin Finish High Performance:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel, B66 Series.
3) 3rd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel B66 Series (6-10 mils wet, 2.5-4.0 mils dry per coat).
2 Epoxy Systems (Water Based):
a. Gloss Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series.
3) 3rd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series (5.0 mils wet, 2.0 mils dry per coat).
b. Semi-Gloss Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46- Series.
3) 3rd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46- Series (4 mils wet, 1.5 mils dry per coat).
c. Eg-Shel/Low Luster Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-360 Series.
3) 3rd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-360 Series (5.0 mils wet, 2.0 mils dry per coat).
3 Dryfall Waterborne Topcoat:
a. Semi-Gloss Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Waterborne Acrylic Dryfall, B42-80 Series.
b. Eg-Shel Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Waterborne Acrylic Dryfall, B42-80 Series.
c. Flat Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0 mils wet, 2.0 mils dry).
2) 2nd Coat: S-W Pro Industrial Waterborne Acrylic Dryfall, B42-80 Series.
C. WOOD - (Walls):
1 Latex Systems:
a. Gloss Finish:
1) 1st Coat: S-W Premium Wall and Wood Primer, B28W8111 (4 mils wet, 1.8 mils dry).

2) 2nd Coat: S-W ProClassic Waterborne Acrylic Gloss, B21-51 Series.
3) 3rd Coat: S-W ProClassic Waterborne Acrylic Gloss, B21-51 Series (4 mils wet, 1.5 mils dry per coat).
b. Semi - Gloss Finish:
1) 1st Coat: S-W Premium Wall and Wood Primer, B28W8111 (4 mils wet, 1.8 mils dry).
2) 2nd Coat: S-W ProClassic Waterborne Acrylic Semi-Gloss, B31 Series.
3) 3rd Coat: S-W ProClassic Waterborne Acrylic Semi-Gloss, B31 Series (4 mils wet, 1.3 mils dry per coat).
c. Eg-Shel / Satin Finish:
1) 1st Coat: S-W Premium Wall and Wood Primer, B28W8111 (4 mils wet, 1.8 mils dry).
2) 2nd Coat: S-W ProClassic Waterborne Acrylic Satin, B20 Series.
3) 3rd Coat: S-W ProClassic Waterborne Acrylic Satin, B20 Series (4 mils wet, 1.2 mils dry per coat).
D. DRYWALL - (Walls, Ceilings, Gypsum Board and similar items)
1 Latex Systems:
a. Semi-Gloss Finish:
1) 1st Coat: S-W ProMar200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
2) 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series.
3) 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series (4 mils wet, 1.6 mils dry per coat).
b. Eg-Shel / Satin Finish:
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
2) 2nd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series.
3) 3rd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series (4 mils wet, 1.7 mils dry per coat).
c. Low Sheen Finish:
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
2) 2nd Coat: S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series.
3) 3rd Coat: S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series (4 mils wet, 1.6 mils dry per coat).
d. Flat Finish:
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
2) 2nd Coat: S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series.
3) 3rd Coat: S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series (4 mils wet, 1.6 mils dry per coat).
2 Epoxy Systems (Water Based):
a. Gloss Finish:
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
2) 2nd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series.
3) 3rd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series (5.0 mils wet, 2.0 mils dry per coat).
b. Semi-Gloss Finish:
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
2) 2nd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46- Series.
3) 3rd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46- Series (4 mils wet, 1.5 mils dry per coat).
c. Eg-Shel/Low Luster Finish:
1) 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
2) 2nd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45- Series.
3) 3rd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45- Series (4 mils wet, 1.5 mils dry per coat).

2.5 EXTERIOR PAINT SYSTEMS
A. MASONRY: Concrete Masonry Units (CMU)- Cinder, Concrete Block, or Split Face (if not integral color).
1 Latex Systems:
a. Gloss Finish - Early Moisture Resistant Finish:
1) 1st Coat: S-W PrepRite Block Filler, B25W25 (75-125 sq ft/gal).
2) 2nd Coat: S-W Resilience Exterior Latex Gloss, K44 Series.
3) 3rd Coat: S-W Resilience Exterior Latex Gloss, K44 Series (4.0 mils wet, 1.6 mils dry per coat).
b. Satin Finish - Early Moisture Resistant Finish:
1) 1st Coat: S-W Loxon Block Surfacer, A24W00200 (16.0 mils wet, 8.8 mils dry).
2) 2nd Coat: S-W Resilience Exterior Latex Satin, K43 Series.
3) 3rd Coat: S-W Resilience Exterior Latex Satin, K43 Series (4.0 mils wet, 1.6 mils dry per coat).
c. Flat Finish - Early Moisture Resistant Finish:
1) 1st Coat: S-W Loxon BlockSurfacer, A24W00200 (16.0 mils wet, 8.8 mils dry).
2) 2nd Coat: S-W Resilience Exterior Latex Flat, K42 Series.
3) 3rd Coat: S-W Resilience Exterior Latex Flat, K42 Series (4.0 mils wet, 1. 6 mils dry per coat).
d. High Build Coating:
1) 1st Coat: S-W Loxon XP Waterproofing System, A24-1400 Series (14.0-18.0 mils wet; 6.4-8.3 mils dry).
2 Clear Water Repellant:
a. Clear Finish:
1) 1st Coat: S-W Loxon 7% Siloxane Water Repellant, A10T7.
2) 2nd Coat: S-W Loxon 7% Siloxane Water Repellant, A10T7 (50-200 sq ft/ gal).
B. METAL: Aluminum, Galvanized.
1 Latex Systems:
a. Gloss Finish - Early Moisture Resistant Finish:

1) 1st Coat: S-W Resilience Exterior Latex Gloss, K44 Series.
2) 2nd Coat: S-W Resilience Exterior Latex Gloss, K44 Series (4.0 mils wet, 1.6 mils dry per coat).
b. Satin Finish - Early Moisture Resistant Finish:
1) 1st Coat: S-W Resilience Exterior Latex Satin, K43 Series.
2) 2nd Coat: S-W Resilience Exterior Latex Satin, K43 Series (4.0 mils wet, 1.6 mils dry per coat).
c. Flat Finish - Early Moisture Resistant Finish:
1) 1st Coat: S-W Resilience Exterior Latex Flat, K42 Series.
2) 2nd Coat: S-W Resilience Exterior Latex Flat, K42 Series (4.0 mils wet, 1.6 mils dry per coat).
C. METAL: Misc. Iron, Ornamental Iron, Structural Iron and Steel, Ferrous Metal.
1 Latex Systems:
a. Semi-Gloss Finish:
1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series (5.0-10.0 mils wet, 1.8-3.6 mils dry).
2) 2nd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series.
3) 3rd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series (4.0-11.0 mils wet, 1.5-4.0 mils dry per coat).
D. EIFS, SYNTHETIC STUCCO:
1 Latex Systems:
a. Gloss Finish - VinylSafe Early Moisture Resistant Finish:
1) 1st Coat: S-W Resilience Exterior Latex Gloss, K44 Series.
2) 2nd Coat: S-W Resilience Exterior Latex Gloss, K44 Series (4.0 mils wet, 1.6 mils dry per coat).
b. Satin Finish - VinylSafe Early Moisture Resistant Finish:
1) 1st Coat: S-W Resilience Exterior Latex Satin, K43 Series.
2) 2nd Coat: S-W Resilience Exterior Latex Satin, K43 Series (4.0 mils wet, 1.6 mils dry per coat).
c. Flat Finish - VinylSafe Early Moisture Resistant Finish:
1) 1st Coat: S-W Resilience Exterior Latex Flat, K42 Series.
2) 2nd Coat: S-W Resilience Exterior Latex Flat, K42 Series (4.0 mils wet, 1.6 mils dry per coat).

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared; notify Architect of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

B. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

C. Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead-based paints, notify Architect immediately if lead based paints are encountered.

3.2 SURFACE PREPARATION

A. General: Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.

1 Prior to attempting to remove mildew, it is recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions are advised.

2 Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

3 Remove items including but not limited to thermostats, electrical outlets, switch covers and similar items prior to painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

4 No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50 degrees F (10 degrees C), unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50 degrees F (10 degrees F) or higher to use low temperature products.

B. Aluminum: Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.

C. Block (Cinder and Concrete): Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75 degrees F (24 degrees C). The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.

D. Concrete, SSPC-SP13 or NACE 6: This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared

concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.

E. Drywall - Interior: Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting.

F. Galvanized Metal: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP16 is necessary to remove these treatments.

G. Steel: Structural, Plate, And Similar Items: Should be cleaned by one or more of the surface preparations described below. These methods are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Society of Protective Coatings. A brief description of these standards together with numbers by which they can be specified follow.

1 Solvent Cleaning, SSPC-SP1: Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.

2 Hand Tool Cleaning, SSPC-SP2: Hand Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Beforehand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

3 Power Tool Cleaning, SSPC-SP3: Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

4 White Metal Blast Cleaning, SSPC-SP5 or NACE 1: A White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.

5 Commercial Blast Cleaning, SSPC-SP6 or NACE 3: A Commercial Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 33 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.

6 Brush-Off Blast Cleaning, SSPC-SP7 or NACE 4: A Brush-Off Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust, and paint may remain on the surface. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.

7 Power Tool Cleaning to Bare Metal, SSPC-SP11: Metallic surfaces that are prepared according to this specification, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted. Prior to power tool surface preparation, remove visible deposits of oil or grease by any of the methods specified in SSPC-SP1, Solvent Cleaning, or other agreed upon methods.

8 Near-White Blast Cleaning, SSPC-SP10 or NACE 2: A Near White Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 5 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.

9 High- and Ultra-High Pressure Water Jetting for Steel and Other Hard Materials: SSPC-SP12 or NACE 5: This standard provides requirements for the use of high- and ultra-high pressure water jetting to achieve various degrees of surface cleanliness. This standard is limited in scope to the use of water only without the addition of solid particles in the stream.

10 Water Blasting, SSPC-SP12/NACE No. 5: Removal of oil grease dirt, loose rust, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 psi at a flow of 4 to 14 gallons per minute.

H. EIFS: Clean thoroughly by scrubbing with a warm, soapy water solution. Rinse thoroughly. Do not paint with any color darker than the original color, unless the paint system features Sherwin-Williams VinylSafe technology. Painting with darker colors that are not Sherwin-Williams VinylSafe may cause siding to warp. Follow all painting guidelines of the manufacturer when painting. Only paint properly installed materials. Deviating from the manufacturer's painting guidelines may cause the warranty to be voided.

I. Stucco: Must be clean and free of any loose stucco. If recommended procedures for applying stucco are followed, and normal drying conditions prevail, the surface may be painted in 30 days. The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments such as Loxon.

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J. Wood: Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

3.3 INSTALLATION

A. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendations.

B. Do not apply to wet or damp surfaces. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days. Test new concrete for moisture content. Wait until wood is fully dry after rain or morning fog or dew.

C. Apply coatings using methods recommended by manufacturer.

D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

E. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.

F. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.

G. Inspection: The coated surface must be inspected and approved by the Architect just prior to the application of each coat.

3.4 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION

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SECTION 10 2113
TOILET COMPARTMENTS

1.1 SECTION INCLUDES

A. High Pressure Laminate (HPL) with Particle Board Substrate
   1. Toilet partitions.
   2. Urinal privacy screens.
   3. Dressing compartments.

1.2 RELATED SECTIONS

A. Section 05 50 00 - Metal Fabrications.
B. Section 06 10 00 - Rough Carpentry.
C. Section 09 51 23 - Acoustical Tile Ceilings.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. USGBC LEED Submittals:
   1. For Bobrick Classic Series, Designer Series and DuraLine Series: Materials and Resource Credits MR4.1 and MR4.2 - Recycled Content; submit manufacturer's calculation of value of recycled content for specified products, calculated in accordance with USGBC LEED certification requirements.
   2. For Bobrick Classic Series, Designer Series and TrimLine Series: Materials and Resource Credit MR6 - Rapidly Renewable Materials; submit manufacturers certification that products contain raw materials that are derived from plants that are harvested within a 10 year cycle or shorter
D. USA Certificate of Origin: Manufacturer shall supply with first submittal, an example of their Certificate of Origin declaring toilet compartments are wholly manufactured and assembled specifically in the United States, including city and state locations. A notarized Certificate of Origin shall be provided with closeout documents.
E. Shop Drawings: Submit manufacturer's shop drawings for each product specified, including the following:
   1. Plans, elevations, details of construction and attachment to adjacent construction.
   2. Show anchorage locations and accessory items.
   3. Verify dimensions with field measurements prior to final production of toilet compartments.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 10 year experience manufacturing similar products.

B. Installer Qualifications: Minimum 2 year experience installing similar products.

C. Single Source Requirements: To the greatest extent possible provide products from a single manufacturer.

D. Accessibility Requirements: Comply with requirements applicable in the jurisdiction of the project, including but not limited to ADA and ICC/ANSI A117.1 requirements as applicable.

E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship is approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.5 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handling: Handle materials to avoid damage.

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 recommended limits.

1.8 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Bobrick Washroom Equipment, Inc., which is located at: 6901 Tujunga Ave.; North Hollywood, CA 91605-6213; Tel: 818-764-1000; Fax: 818-765-2700; Email:info@bobrick.com; Web:www.bobrick.com

B. Basis of Design Products: Based on the quality and performance requirements of the project, specifications are based solely on the products of Bobrick Washroom Equipment, Inc. www.bobrick.com. Location of manufacturing shall be the United States.

C. Substitutions: The Architect will consider products of comparable manufacturers as a substitution, pending the Contractor's submission of adequate documentation of the substitution in accordance with procedures in Division 1 of the Project Manual. Documentation shall include a list of five similar projects of equivalent size where products have been installed for a minimum of two years, and manufacturer's certification that products are fabricated in the United States.

D. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 HIGH PRESSURE LAMINATE WITH PARTICLE BOARD SUBSTRATE

A. High Pressure Laminate Toilet Partitions:
   1. Design:
      a. Standard Height.
         1. Door/Panel Height: 58 inches (147 cm).
         2. Floor Clearance: 12 inches (30 cm).
   2. Mounting Configuration:
      a. Floor-mounted.
         1. Stile Height: 69 inches (175 cm).
      b. Floor-mounted, overhead-braced with satin finish, extruded anodized aluminum headrails, 0.065 inch (1.65 mm) thick with anti-grip profile.
         1. Stile Height: 83 inches (211 cm).
      c. Ceiling-hung.
         1. Stile Height:8 feet 0 inches (244 cm) or as required 10 feet 0 inches (305 cm) maximum.

B. High Pressure Laminate Urinal Screens:
   1. Mounting Configuration:
      a. Floor-to-ceiling.
         1. Screen Height: 58 inches (178 cm) with floor clearance: 12 inches (30 cm).
      b. Post-to-ceiling.
         1. Screen Height: 58 inches (178 cm).
         2. Floor Clearance: 12 inches (30 cm).

3. Post Height: Up to 10 feet 0 inches (305 cm) maximum.
c. Wall-hung.
1. Screen Height: 42 inches (107 cm) with 18 inches (46 cm) floor clearance.
2. Screen Height: 48 inches (122 cm) with 12 inches (30 cm) floor clearance.

C. High Pressure Laminate Dressing Compartments:
1. Design Type:
a. Standard Height.
1. Door/Panel Height: 58 inches (178 cm).
2. Floor Clearance: 12 inches (30 cm).
2. Mounting Configuration:
a. Floor-mounted, overhead-braced with satin finish, extruded anodized aluminum headrails, 0.065 inch (1.65 mm) thick with anti-grip profile and integral curtain tracks and hooks for compartments without doors.
1. Bobrick vinyl curtains.
2. Stile Height: 83 inches (211 cm).

D. Finished Thickness: 1 inch (25 mm) for stiles, doors, screens and panels.

E. Materials: 3-ply, stiles, panels, doors, and screens.
1. Cores: 45 lb (20.4 kg) density, industrial grade, resin-impregnated, particle board.
2. Surfaces: High-pressure laminated plastic NEMA LDS-1985 minimum thickness 0.050 inch (1.33 mm) with matte finish.
3. Fabrication: Bonded high-pressure plastic laminate to core material with adhesive specially formulated to prevent delamination. Edges bonded prior to bonding face sheets. Splices or joints in faces or edges are not acceptable except in the case of laminate material limitations.
4. Stainless Steel Edge Option:
a. Edge Trim: 18-8, Type 304 stainless steel channel with satin finish.
b. Stainless Steel Channels: Mortised for flush fit with routed substrate.
c. Corners: Mitered.
5. Color:
a. As selected by Architect from manufacturer's standard Plastic Laminate range.
b. As indicated on Drawings.

F. Fire Resistance:
1. National Fire Protection Association/International Building Code Interior Wall and Ceiling Finish: Class B / Uniform Building Code: Class II.
a. Flame Spread Index (ASTM E 84): 60 for panels and stiles.
b. Smoke Developed Index (ASTM E 84): 265 for panels and stiles.

G. Stiles: Floor-anchored stiles furnished with expansion shields and threaded rods
1. Stile Leveling Device:
a. Standard:
1. Overhead-Braced: 12 gauge (2.8 mm), 3 inches x 1-1/4 inches (75 x 32 mm) plated steel stile bracket factory installed to bottom of stile. Furnished with leveling bolt, shoe retainer, floor L-bracket, plastic anchor #14-16, #14 x 5/8 inches (M6.3 x 16 mm) stainless steel sheet-metal screws and #14 x 1-3/4 inches (M6.3 x 45 mm) stainless steel sheet-metal floor screws.
2. Floor-Anchored: 3/8 inches x 1 inches (10 x 25 mm) steel bar, zinc-chromate plated, bolted to stile using 6 inches x 3/8 inches (152 x 10 mm) diameter carbon steel lag bolt. Furnished with 3/8 inches (10mm) diameter threaded rods, hex nuts, washers, spacer sleeve (ceiling-hung only), expansion shield and shoe retainer.
3. Ceiling-Hung: 3/8 inches x 1 inches (10 x 25 mm) steel bar, zinc-chromate plated, bolted to stile using 6 inches x 3/8 inches (152 x 10 mm) diameter carbon steel lag bolt. Furnished with 3/8 inches (10mm) diameter threaded rods, hex nuts, washers, spacer sleeve (ceiling-hung only), expansion shield and shoe retainer.
b. Steel Core Stile Option:
1. Leveling Devices: 3/8 inch x 7/8 inch (10 mm x 22 mm) steel bar welded to 11 gauge (3 mm) steel- reinforcing core; chromate-treated and double zinc-plated; welded to sheet-steel core of stiles.
2. Stile Shoes: One-piece, 22 gauge (0.8 mm), 18-8, Type 304 stainless steel, 4 inch (102 mm) height; tops with 90 degree return to stile. One-piece shoe capable of adapting to 3/4 inch (19 mm) or 1 inch (25 mm) stile thickness and capable of being fastened (by clip) to stiles starting at wall line.

H. Wall Posts: Pre-drilled for door hardware, 18-8, Type 304, 16 gauge (1.6 mm) stainless steel with satin finish; 1 inch (25 mm) x 1-1/2 inches (38 mm) x 58 inches high (1473 mm).

I. Anchors: Expansion shields and threaded rods at floor connections as applicable. Threaded rods secured to supports above ceiling as applicable. Supports above ceiling furnished and installed as Work of Section 05 50 00 - Metal Fabrications.

J. Hardware:
1. Compliance: Operating force of less than 5 lb (2.25 kg).

2. Emergency Access: Hinges, latch allow door to be lifted over keeper from outside compartment on inswing doors.
3. Materials:
   a. Chrome-Plated Zamak (Standard for MetroSeries).

1, Hinges: Pivot hinges constructed of polished stainless steel.
2. Door Hardware: Latches, keepers, coat hooks constructed of chrome-plated Zamak.
   b. Stainless Steel (Optional for MetroSeries, Standard for AccentSeries).
      1. Hinges: Pivot hinges constructed of stainless steel with satin finish.
      2. Door Hardware: Latches, keepers, coat hooks constructed of stainless steel with satin finish.
      3. Mounting Brackets: Constructed of 18-8, Type-304, heavy-gauge stainless steel with satin finish.

PART 3 PRODUCTS

3.1 PREPARATION

A. Prepare substrates including but not limited to blocking and supports in walls and ceilings at points of attachment using methods recommended by the manufacturer for achieving the best result for the substrates under the project conditions.
   1. Inspect areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.
   2. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.

B. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

C. Do not proceed with installation until substrates have been properly prepared with blocking and supports in walls and ceilings at points of attachment and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

3.2 INSTALLATION

A. Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
   1. Verify blocking and supports in walls and ceilings has been installed properly at points of attachment.
   2. Verify location does not interfere with door swings or use of fixtures.
   3. Use fasteners and anchors suitable for substrate and project conditions
   4. Install units rigid, straight, plumb, and level.
   5. Conceal evidence of drilling, cutting, and fitting to room finish.
   6. Test for proper operation.

3.3 ADJUSTING, CLEANING AND PROTECTION

A. Adjust hardware for proper operation after installation. Set hinge cam on in-swinging doors to hold doors open when unlatched. Set hinge cam on out-swinging doors to hold unlatched doors in closed position.

B. Touch-up, repair or replace damaged products

C. Clean exposed surfaces of compartments, hardware, and fittings.

SECTION 10 2800
TOILET ACCESSORIES

1.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Steel Sheet: ASTM A 1008, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.

C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

D. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

1.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Refer to Schedule on Drawings.

1.3 UNDERLAVATORY GUARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. Plumberex Specialty Products, Inc.
   2. Truebro by IPS Corporation.
C. Under-lavatory Guard:
   1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
   2. Material and Finish: Antimicrobial, molded plastic, white.

1.4 INSTALLATION
A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
B. Grab Bars and Baby Changing Stations: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

END OF SECTION

SECTION 10 4400
FIRE PROTECTION SPECIALTIES

1.1 SUBMITTALS
A. Product Data: Provide extinguisher operational features and anchorage details.

1.2 MANUFACTURERS
A. Fire Extinguishers:
   1. Ansul, Inc : www.ansul.com.
   2. JL Industries, Inc: www.jlindustries.com.
   3. Pyro-Chem : www.pyrochem.com.
B. Fire Extinguisher Cabinets and Accessories:
   1. JL Industries, Inc : www.jlindustries.com.
   2. Larsen's Manufacturing Co : www.larsensmfg.com.
   3. Potter-Roemer : www.potterroemer.com.

1.3 FIRE EXTINGUISHERS
A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL for the purpose specified and indicated.
   2. Provide #10 ABC.

1.4 FIRE EXTINGUISHER CABINETS
A. Metal: Formed prefinished sheet steel, 0.036 inch thick.
B. Cabinet Configuration: Semi-recessed type.
   1. Sized to accommodate accessories.
   2. Trim: Returned to wall surface, with 2-1/2 inch projection.
C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.
D. Door Glazing: Glass, clear, 1/8 inch thick float. Set in resilient channel gasket glazing.
E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
F. Weld, fill, and grind components smooth.
G. Finish of Cabinet Exterior Trim and Door: Baked enamel, color as selected.
H. Finish of Cabinet Interior: White enamel.

1.5 INSTALLATION
A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings, from finished floor to height as needed to meet accessibility requirements.
C. Secure rigidly in place.
D. Place extinguishers and accessories in cabinets.

SECTION 10 7313
ALUMINUM CANOPY

PART 1 – GENERAL
1.1 SUMMARY
A. Section Includes: Helios Canopy.
B. Related Requirements: Division 1 – General Requirements

1.2 REFERENCES
A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
B. American Welding Society (AWS):
i. Standard D1.2 – Structural Welding Code – Aluminum
C. American Architectural Manufacturers Association (AAMA):
i. Aluminum finishes AAMA 2603 Powder Coat
ii. Aluminum finishes AAMA 2605 Kynar
iii. Aluminum finishes AAMA 611 Anodize

1.3 SUBMITTALS
A. Submit within 15 days after contract award.
B. Shop Drawings: Indicate size, material and finish. Include plan elevation pages to clearly outline canopy locations. Include installation procedures, details of joints, attachments and clearances. Provide lead time for product and note possible conflicts with standard line.
C. Color charts showing manufacturer's full range of colors from standard line.

PART 2 – PRODUCTS
2.1 APPROVED MANUFACTURERS
A. Specifications are based on Architectural Fabrication, Inc. – Helios Canopy. Architectural Fabrication, Inc. – Manufacturer and Installer is located at 2100 E. Richmond Avenue, Fort Worth, TX 76104. 800.962.8027. www.arch-fab.com
B. Substitutions are acceptable assuming they comply with these specifications, are submitted based on Section 01XXX – Substitution Requirements and have a minimum 10 years' experience.

2.2 MATERIALS
A. Framing: Gutter fascia, tube, angles: 6063-T6 alloy extruded aluminum
B. Decking: 6063-T6 or 6063-T5 alloy extruded aluminum (Roll form is NOT acceptable)
C. Hanger Rods: Zinc plated steel and powder coat (Prime and paint are not acceptable)
D. Connections: Wall plates and canopy mounting brackets are to be aluminum.
E. Hardware and Fasteners: Nuts, bolts, washers, clevis pins, screws, anchors and pipe spacers to be zinc plated or galvanized steel required to suit application and per pre-engineered canopy load requirements.
F. Flashing: Shall be minimum 0.040-inch aluminum, fabricated to prevent leakage and sealed with Novaflex metal roof sealant in clear or color match. Other equivalent sealant is acceptable.
G. Finish: Powder coat finish per ASTM D 3451, complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking and minimum dry film thickness. Color to be selected from standard color line.

PART 3 – EXECUTION
3.1 FABRICATION
A. Fabricate and preassemble canopies in the shop to greatest extent possible. Disassemble units only as necessary for shipping and
handling limitations. Clearly mark units for reassembly and coordinated installation.

3.2 INSTALLATION
A. Install canopies per manufacturer's written instructions and as indicated on drawings.

B. Locate and place canopies level, plumb and at indicated alignment with adjacent work.
C. Use concealed anchors where possible.
D. Repair damaged finishes so no evidence remains of corrective work. Return items to the factory that cannot be refinished in the field. Make required alterations and refinish entire unit or provide new units.
E. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a coating of bituminous paint or elastomeric coating on surfaces that will be in contact with concrete, masonry or dissimilar metals.

SECTION 10 9900
MISCELLANEOUS SPECIALTIES

1.1 SUBMITTALS
A. Product Data: Including all pertinent performance characteristics and criteria.

1.2 PRODUCTS
A. Fire Control Key Box: Provide recessed fire department key control box, equal to model 3500 and 4500 series by Knox Box. Refer to Drawings for locations.
1. Provide Knox Locks as required by local fire department.
B. Fans for Shop Area: Powerfoil 8 by Delta T Corporation, dba Big Ass Fans, PO Box 11307, Lexington, Kentucky.

SECTION 12 2413
ROLLER WINDOW SHADES

1.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Draper Inc.
2. Hunter Douglas Contract.
3. Lutron Electronics Co., Inc.
4. MechoShade Systems, Inc.
5. Nysan Solar Control Inc.; Hunter Douglas Company.
6. Silent Gliss USA, Inc.
7. Sol-R-Veil.
8. Solarflective.
9. Timberblend.
10. Signature Solar (Basis of Design: Monterey 5% openness; Color: Night Sky N901).

1.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS
A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
1. Bead Chains: Manufacturer's standard.
a. Loop Length: Full length of roller shade.
b. Limit Stops: Provide upper and lower ball stops.
2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.
a. Provide for shade bands that weigh more than 10 lb. or for shades as recommended by manufacturer, whichever criteria are more stringent.
B. Spring Operating Mechanisms: Roller contains spring sized to accommodate shade size indicated. Provide with positive locking mechanism that can stop shade movement at each half-turn of roller and with manufacturer's standard pull.
1. Pole: Manufacturer's standard type in length required to make operation convenient from floor level and with hook for engaging pull.
C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
F. Shade bands:
    1. Shade band Material: Light-filtering fabric.
    2. Shade band Bottom (Hem) Bar: Steel or extruded aluminum.
        a. Type: Exposed with endcaps.
        b. Color and Finish: See basis of design.
G. Installation Accessories:
    1. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
        a. Height: Manufacturer's standard height required to enclose roller and shadeband when shade is fully open, but not less than 4 inches.
        b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
    2. Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.
    3. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.
    4. Bottom (Sill) Channel or Angle: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.

SECTION 12 3600
COUNTERTOPS

1.1 SUBMITTALS
A. Product Data: Manufacturer's data sheets on each product to be used, including:
B. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

1.2 QUALITY ASSURANCE
A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
B. Installer Qualifications: Fabricator.

1.3 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.4 FIELD 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.

1.5 COUNTERTOP ASSEMBLIES
A. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
    1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3 Grade HGS, 0.048 inch nominal thickness.
        a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E 84.
        b. NSF approved for food contact.
        c. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
        d. Laminate Core Color: Same as decorative surface.
        e. Finish: Matte or suede, gloss rating of 5 to 20.
        f. Surface Color and Pattern: Refer to Finish Legend.
        g. Manufacturers:
            1. Formica Corporation: www.formica.com.
            2. Lamin-Art, Inc: www.laminart.com.
            3. Panolam Industries International, Inc\Nevamar: www.nevamar.com.
            4. Panolam Industries International, Inc\Pionite: www.pionitelaminates.com.

5. Wilsonart International, Inc: www.wilsonart.com.
6. Substitutions: See Section 016000 - Product Requirements.

2. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch thick; covered with matching laminate.
3. Back and End Splashes: Same material, same construction.
4. Fabricate in accordance with AWI/AWMAC Quality Standards Illustrated Premium Grade.

B. Natural Stone Countertops: Stone slabs bonded to substrate; use as large pieces as possible with inconspicuous adhesive joints.
1. Stone: Granite without cracks, voids, or pin holes; filling with matching epoxy resin is acceptable.
2. Stone Thickness: 3 cm.
3. Surface Finish: Polished.
4. Exposed Edge Treatment: Refer to Finish Legend.
Back and End Splashes: Same material, same thickness; for field attachment

1.6 ACCESSORY MATERIALS

A. Plywood for Supporting Substrate (stone): PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

B. Particleboard for Supporting Substrate (plastic laminate): ANSI A208.1 Grade 2-M-2, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

D. Cove Molding for Top of Splashes: Rubber with semi-gloss finish and T-spline to fit between splash and wall; 1/2 inch by 1/2 inch.

E. Joint Sealant: Mildew-resistant silicone sealant, white.

1.7 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
1. Join lengths of tops using best method recommended by manufacturer.
2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
2. Height: 4 inches, unless otherwise indicated.

1.8 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

1.9 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.

1.10 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.

C. Seal joint between back/end splashes and vertical surfaces.
1. Where indicated use rubber cove molding.
2. Where applied cove molding is not indicated use specified sealant

SECTION 13 3419
METAL BUILDING SYSTEMS

1.1 SUBMITTALS

A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
   1. Structural-steel-framing system.
   2. Metal roof panels.
   3. Flashing and trim.

B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.
   1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
   2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
      a. Show provisions for attaching roof curbs and pipe racks.
   3. Metal Roof Panel Layout Drawings: Show layouts of metal panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
      a. Show roof-mounted items including equipment supports, pipe supports and penetrations, lighting fixtures, and items mounted on roof curbs.
      b. Show wall-mounted items including doors, windows, louvers, and lighting fixtures.
   4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
      a. Flashing and trim.

C. Samples: For each type of exposed finish required, prepared on Samples of sizes indicated below:
   1. Metal Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
   2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.

D. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Metal Building System Certificates: For each type of metal building system, from manufacturer.
   1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
      a. Name and location of Project.
      b. Order number.
      c. Name of manufacturer.
      d. Name of Contractor.
      e. Building dimensions including width, length, height, and roof slope.
      f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
      g. Governing building code and year of edition.
      h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, and auxiliary loads.
      i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
      j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
      k. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.

F. Warranties: Sample of special warranties.

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
   1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
   2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

D. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1, "Structural Welding Code - Steel."

E. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

1.3 PROJECT CONDITIONS

A. Field Measurements:
   1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
   2. Established Dimensions for Metal Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal panels without field measurements, or allow for field trimming metal panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.4 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."

B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.5 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
   1. Warranty Period: 20 years from date of Substantial Completion.

1.6 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide a metal building system by Butler Manufacturing Company; a BlueScope Steel company, or comparable product by one of the following:
   1. CBC Metal Buildings.

1.7 METAL BUILDING SYSTEMS

A. Description: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
   1. Provide metal building system of size and with bay spacings, roof slopes, and spans indicated.

B. Primary-Frame Type:
   1. Rigid Modular: Solid-member, structural-framing system with interior columns as indicated.

C. Bay Spacing: As indicated.

D. Roof Slope: As indicated.

1.8 METAL BUILDING SYSTEM PERFORMANCE

A. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
   1. Design Loads: Design structural building frame members to withstand dead loads, collateral loads, snow loads, lateral pressure and suction "up-lift" loads due to wind loads and design loads as indicated on Drawings in accordance with applicable code.
   2. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
      a. Purlins and Rafters: Vertical deflection of L/360 of the span.
      b. Girts: Horizontal deflection of L/360 of the span.
      c. Metal Roof, Wall, and Soffit Panels: Vertical deflection of L/360 of the span.
      d. Building Frame: Deflection due to crane loads of L/360.

e. Design secondary-framing systems to accommodate deflection of primary framing and construction tolerances to maintain clearances at openings, and accommodate deflection requirements for architectural cladding and finish materials indicated on the Drawings.

3. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:
   a. Lateral Drift: Maximum of L/360 of the building height.
4. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.

B. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

C. Air Infiltration for Metal Roof and Wall Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at negative test-pressure difference of 1.57 lbf/sq. ft..

D. Water Penetration for Metal Roof and Wall Panels: No water penetration when tested according to ASTM E 1646 at test- pressure difference of 2.86 lbf/sq. ft.

E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90.

F. Thermal Performance: Provide insulated metal panel assemblies with the following maximum U-factors and minimum R- values for opaque elements when tested according to ASTM C 1363 or ASTM C 518:
   1. Metal Roof Panel Assemblies:
      a. R-Value: 38.
   2. Metal Wall Panel Assemblies:
      a. R-Value: 19.

1.9 STRUCTURAL-STEEL FRAMING

A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
   1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field- bolted assembly. Provide frame span and spacing indicated.
      a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.
   2. Rigid Modular Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural- steel shapes. Provide interior columns fabricated from round steel pipes or tubes, or shop-welded, built-up steel plates.
   3. Long-Bay Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural- steel shapes. Provide interior columns fabricated from round steel pipes or tubes, or shop-welded, built-up steel plates.
   4. Frame Configuration: Single gable and lean to, with high side connected to and supported by another structure.
   5. Exterior Column Type: Tapered.
   6. Rafter Type: Tapered.

B. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, pre-painted with coil coating, to comply with the following:
   1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch- wide flanges.
      a. Depth: As required to comply with system performance requirements.
   2. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch- wide flanges.
      a. Depth: As required to comply with system performance requirements.
   3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural- steel shapes; to provide adequate backup for metal panels.
   4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch diameter, cold-formed structural tubing to stiffen primary-frame flanges.
   5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
   6. Base or Sill Angles: Minimum 3-by-2-inch zinc-coated (galvanized) steel sheet.
   7. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
   8. Secondary End-Wall Framing: Manufacturer's standard sections fabricated from structural-steel sheet.
   9. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.

10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural- steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

C. Bracing: Provide adjustable wind bracing as follows:
1. Rods: ASTM A 36; ASTM A 572, Grade 50; or ASTM A 529, Grade 50; minimum 1/2-inch- diameter steel; threaded full length or threaded a minimum of 6 inches at each end.
2. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
3. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
4. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
5. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.
6. Bracing: Provide wind bracing using any method specified above, at manufacturer's option.

D. Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide zinc-plated or hot-dip galvanized bolts for structural-framing components that are galvanized.

E. Materials:
1. W-Shapes: ASTM A 992/A 992M; ASTM A 572, Grade 50 or 55; or ASTM A 529, Grade 50 or 55.
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36; ASTM A 572, Grade 50 or 55; or ASTM A 529, Grade 50 or 55.
3. Plate and Bar: ASTM A 36; ASTM A 572, Grade 50 or 55; or ASTM A 529, Grade 50 or 55.
4. Steel Pipe: ASTM A 53, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011, Structural Steel (SS), Grades 30 through 55, or High-Strength Low- Alloy Steel (HSLAS), Grades 45 through 70; or cold-rolled, ASTM A 1008, Structural Steel (SS), Grades 25 through 80, or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70.
7. Metallic-Coated Steel Sheet: ASTM A 653, Structural Steel (SS), Grades 33 through 80 or High-Strength Low- Alloy Steel (HSLAS), Grades 50 through 80; with G60 coating designation; mill phosphatized.
8. Metallic-Coated Steel Sheet Pre-painted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755.
    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80; with G90 coating designation.
9. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.
    a. Finish: Plain or mechanically deposited zinc coating, ASTM B 695, Class 50.
10. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
    a. Finish: Plain or mechanically deposited zinc coating, ASTM B 695, Class 50.
11. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.
    a. Finish: Plain or mechanically deposited zinc coating, ASTM B 695, Class 50.
12. Unheaded Anchor Rods: ASTM A 572, Grade 50.
    a. Configuration: Straight.
    b. Nuts: ASTM A 563 heavy-hex carbon steel.
    c. Plate Washers: ASTM A 36 carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Plain or mechanically deposited zinc coating, ASTM B 695, Class 50.
13. Headed Anchor Rods: ASTM F 1554, Grade 36.
    a. Configuration: Straight.
    b. Nuts: ASTM A 563 heavy-hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Plain or mechanically deposited zinc coating, ASTM B 695, Class 50.
14. Threaded Rods: ASTM A 572, Grade 50.
    a. Nuts: ASTM A 563 heavy-hex carbon steel.
    b. Washers: ASTM A 36 carbon steel.
    c. Finish: Plain or mechanically deposited zinc coating, ASTM B 695, Class 50.

F. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.
1. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.
    a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.
2. Primer: SSPC-Paint 15, Type I, red oxide.

1.10 METAL ROOF, WALL, LINER, AND SOFFIT PANELS

A. Trapezoidal-Rib, Standing-Seam Metal Roof Panels: Formed with raised trapezoidal ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.
   1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: Fluoropolymer.
      b. Color: As selected from manufacturer's full range.
   2. Clips: Manufacturer's standard, floating type to accommodate thermal movement; fabricated from zinc-coated (galvanized) steel sheet.
   3. Joint Type: Panels snapped together.
   4. Joint Type: Mechanically seamed, folded according to manufacturer's standard.
   5. Panel Coverage: 24 inches.
   6. Panel Height: 3 inches.
   7. Uplift Rating: UL 90.
   8. Basis of Design: Equal to Butler model MR-24.

B. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
   1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: Fluoropolymer.
      b. Color: As selected from manufacturer's full range.
   2. Major-Rib Spacing: 12 inches o.c.
   3. Panel Coverage: 36 inches.
   4. Panel Height: 1.50 inches.
   5. Basis of Design: Equal to Butlerib II by Butler.

C. Flush-Profile, Metal Liner Panels: Solid panels formed with vertical panel edges and flat pan between panel edges; with flush joint between panels; designed for interior side of metal wall panel assemblies and installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
   1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: Siliconized polyester
      b. Color: As selected by Architect from manufacturer's full range.
   2. Panel Coverage: 12 inches.
   3. Panel Height: 1.5 inches.
   4. Basis of Design: Manufacturer's standard

D. Concealed-Fastener Metal Soffit Panels: Formed with vertical panel edges and flush surface; with flush joint between panels; with 1-inch- wide flange for attaching interior finish; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
   1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: Fluoropolymer.
      b. Color: As selected by Architect from manufacturer's full range.
   2. Panel Coverage: 12 inches.
   3. Panel Height: 1 inch.
   4. Basis of Design: Manufacturer's standard.

E. Exposed-Fastener Metal Panels Around Perimeter of Shop Area as Wainscote: Corrugated profiles, 1/2 inch deep x 24 inch wide x 26 gage; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
   1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: Fluoropolymer.
      b. Color: As selected by Architect from manufacturer's full range.

F. Materials:
   1. Metallic-Coated Steel Sheet: Restricted-flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755.
      a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation; structural quality.
      b. Surface: Smooth, flat finish.

G. Finishes:
   1. Exposed Coil-Coated Finish:
      a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

1.11 THERMAL INSULATION

A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch-wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.

B. Acceptable Product: Thermaliner Insulation System by Butler.

C. R Values: R-19 at walls; R-38 at roofs.

D. Provide horizontal wires or strapping at 24 inches on center to hold insulation in place at walls.

1.12 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
   1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
   1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
   2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
   3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from stainless-steel sheet or nylon- coated aluminum sheet.
   4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
   5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or pre-molded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
   6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch standoff; fabricated from extruded polystyrene.

C. Flashing and Trim: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy- coated steel sheet pre-painted with coil coating; finished to match adjacent metal panels.
   1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
   2. Opening Trim: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy- coated steel sheet pre-painted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.

D. Gutters: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet pre-painted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
   1. Gutter Supports: Fabricated from same material and finish as gutters.
   2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

E. Downspouts: Formed from 0.022-inch nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy- coated steel sheet pre-painted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- long sections, complete with formed elbows and offsets.
   1. Mounting Straps: Fabricated from same material and finish as gutters.

F. Pipe Flashing: Pre-molded, EPDM pipe collar with flexible aluminum ring bonded to base.

G. Roof Ventilators: Gravity type, complete with hardware, flashing, closures, and fittings.
   1. Continuous Ridge Type: Factory-engineered and -fabricated, continuous unit; fabricated from 0.022-inch nominal- thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet pre-painted with coil coating; finished to match metal roof panels. Fabricated in minimum 10-foot- long sections. Provide throat size and total length indicated, complete with side baffles, ventilator assembly, end caps, splice plates, and reinforcing diaphragms.
      a. Bird Screening: Galvanized steel, 1/2-inch- square mesh.
      b. Throat Size: 9 or 12 inches, as standard with manufacturer, and as required to comply with ventilation requirements.

H. Materials:
   1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
      a. Fasteners for Metal Roof Panels: Self-drilling, Type 410 stainless-steel or self-tapping, Type 304 stainless- steel or zinc-alloy-steel hex washer head, with EPDM washer under heads of fasteners bearing on weather side of metal panels.

b. Fasteners for Metal Wall Panels: Self-drilling, Type 410 stainless-steel or self-tapping, Type 304 stainless- steel or zinc-alloy-steel hex washer head, with EPDM sealing washers bearing on weather side of metal panels.
c. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.

1. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
3. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.
4. Metal Panel Sealants:
   a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape of manufacturer's standard size.
   b. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

I. Suspended Canopies: Provide suspended metal canopies in locations indicated.

1.13 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.
   1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
   2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
   1. Make shop connections by welding or by using high-strength bolts.
   2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
   3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
   4. Weld clips to frames for attaching secondary framing.
   5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
   1. Make shop connections by welding or by using non-high-strength bolts.
   2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

1.14 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
   1. Engage land surveyor to perform surveying.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

1.15 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads.

Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

1.16 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
   3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base- line elevation. Moist-cure grout for not less than seven days after placement.
   1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.
      a. Joint Type: Snug tightened or pretensioned.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
   1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
   2. Locate and space wall girts to suit openings such as doors and windows.
   3. Locate canopy framing as indicated.
   4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
   1. Tighten rod and cable bracing to avoid sag.
   2. Locate interior end-bay bracing only where indicated.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

1.17 METAL PANEL INSTALLATION, GENERAL

A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
   1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
      a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
   2. Install metal panels perpendicular to structural supports unless otherwise indicated.
   3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self- tapping screws.
   4. Locate and space fastenings in uniform vertical and horizontal alignment.
   5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
   6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

C. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

E. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

1.18 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
1. Install ridge caps as metal roof panel work proceeds.
2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.
1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures at peaks, rake edges, rake walls and each side of ridge caps.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

D. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

1.19 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

C. Installation Tolerances: Shim and align metal wall panels within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and on location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

1.20 METAL SOFFIT PANEL INSTALLATION

A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

1.21 THERMAL INSULATION INSTALLATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
   1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
   2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
   3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
   4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Blanket Roof Insulation: Comply with the following installation method:
   1. Between-Purlin Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Hold in place with bands and crossbands below insulation.

C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.
   1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
   2. Sound-Absorption Insulation: Where sound-absorption requirement is indicated for metal liner panels, cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.

1.22 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
   1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
   2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet- type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eaves with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
   1. Provide elbows at base of downspouts to direct water away from building.
   2. Tie downspouts to underground drainage system indicated.

1.23 ADJUSTING

A. Doors: After completing installation, test and adjust doors to operate easily, free of warp, twist, or distortion.

B. Door Hardware: Adjust and check each operating item of door hardware and each door to ensure proper operation and function of every unit. Replace units that cannot be adjusted to operate as intended.

C. Windows: Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and at weather stripping to ensure smooth operation and weathertight closure. Lubricate hardware and moving parts.

1.24 CLEANING ANDPROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
B. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
   1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
   2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
C. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
   1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 31 1000
SITE CLEARING

1.1 SECTION INCLUDES
A. Clearing and protection of vegetation.
B. Removal of existing debris.

1.2 SITE CLEARING
A. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

1.3 EXISTING UTILITIES AND BUILT ELEMENTS
A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction.
D. Protect existing structures and other elements that are not to be removed.

1.4 VEGETATION
A. Do not remove or damage vegetation beyond the following limits:
   1. 40 feet outside the building perimeter.
   2. 10 feet each side of surface walkways, patios, surface parking, and utility lines less than 12 inches in diameter.
   3. 15 feet each side of roadway curbs and main utility trenches.
   4. 25 feet outside perimeter of pervious paving areas that must not be compacted by construction traffic.
B. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
   1. At vegetation removal limits.
C. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.
D. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
   1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
   2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
   3. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.
E. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

1.5 DEBRIS
A. Remove debris, junk, and trash from site.
B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

SECTION 31 2000
EARTHWORK

1.1 SECTION INCLUDES
A. Provide complete earthwork including:
1. General excavation, excavation for structures and footings.
2. Rough grading
3. Fill and backfill
4. Finish grading.
5. Shoring and bracing excavations with temporary shoring, sheeting or retention system as required by code law or ordinance to protect excavation area, workers, nearby streets and structures.
B. Note: Refer to the soils investigation report and to recommendations of the soils engineer. If anything contained herein is contradictory to such report or recommendations, the report and recommendations of the soils engineer shall govern.

1.2 SUBMITTALS
A. Samples: Submit data on each type of fill material to be used as requested by Civil Engineer and Owner.

1.3 BASIS FOR BIDS
A. Bids shall be based on excavating and filling with materials encountered at site except where special fill or backfill materials are specified herein or indicated on Drawings. No allowance or extra payments will be made by reason of variation in types of soil encountered or variations in their moisture contents.

1.4 QUALITY ASSURANCE
A. Shoring, sheeting, bracing and retention plans, details and other provisions necessary in order to safely excavate trenches for this project shall be prepared by a Professional Engineer registered in the State where the project is constructed and employed by Contractor. The Contractor shall be solely responsible for retention plans, details, accessories and execution.

1.5 STOCKPILING
A. Material cut or excavated from building areas which is suitable for backfilling may be stored on site to be distributed later. Fill material required to be hauled in may be stockpiled at site until used, provided it is properly handled to prevent contamination with undesirable materials. Stockpile topsoil separate from excavated sub-soil.

1.6 SURPLUS MATERIALS
A. Excavated materials not to be used in fills and backfills on this project shall be removed from site immediately. Materials containing rubbish, debris or rocks shall be removed.

1.7 MATERIALS
A. General Fill and Backfill: Suitable existing excavated on-site soil free from vegetation, debris, and other deleterious matter, unless otherwise noted.
B. Fill Beneath Structures: Inert and non-expansive, having a plasticity index, liquid limit, and other characteristics in accordance with the soil investigation report.
C. Top Soil
1. Clean natural topsoil free of vegetation, debris and other deleterious matter.
2. Provide topsoil free from weeds, nutgrass, lumps, stones larger than 1 inch, roots, or similar substances.

1.8 SHORING AND BRACING
A. Contractor shall design and provide as necessary to prevent cave-ins and slides, or as a protection for workmen in trenches and other excavation. Shoring and bracing shall remain in place as long as required for safety and shall be removed only as backfill is placed. Comply with all Municipal, State, and Federal requirements.

1.9 PREPARATION
A. Before starting excavation, establish location and extent of underground utilities occurring inwork area.
B. Notify utility companies to remove and relocate lines which are in way of excavation.
C. Maintain, reroute or extend as required, existing utility lines to remain which pass through work area.

D. Protect utility services uncovered by excavation.
E. Remove abandoned utility service lines from areas of excavation; cap, plug or seal such lines and identify at grade.
F. Accurately locate and record abandoned and active utility lines rerouted or extended on Project Record Documents.
G. Upon discovery of unknown utility or concealed condition, discontinue affected work and notify Architect and Owner.

1.10 ROUGH GRADING
A. Excavation and rough grade to lines and grades shown.
B. Overcut new planting and lawn areas to allow a layer of topsoil not less than 4" thick.
C. Maintain excavations to drain and be free of excess water.
D. Remove objectionable and excess materials from site when excavated.

1.11 STRUCTURAL EXCAVATION
A. Locate and mark all existing underground utilities and services before beginning structural excavation.
B. Provide excavation for structures and footings, as required for construction, bracing and removal of forms, applying waterproofing, and to permit inspection.
C. Machine slope banks to angle of repose or less until shored. Excavation shall not interfere with normal 45 degree angle bearing splay of any foundation.
D. Bottom of excavating shall be reasonably level.
E. Maintain excavations in as near their natural moisture conditions as possible.
F. Fill over-excavated areas under structure bearing surfaces in accordance with Soil Engineer's direction.
G. Do not allow construction equipment to create "pumping" of soils.
H. Stockpile excavated clean fill for reuse where directed. Remove excess or unsuitable excavated fill from site.
I. Remove boulders or cobbles. Use of explosives will not be permitted.
J. Coordinate with drilled pier work for special requirements and arrangements regarding excavation to rough out elevations.
K. If presence of perched water is encountered, provide interior drainage.

1.12 EXCAVATION BENEATH FLOOR SLABS
A. Beneath Floor Slab on Grade: Refer to recommendations of the soils engineer.

1.13 FILLS AND BACKFILLS - GENERAL
A. Verify areas to be backfilled are free of debris, snow, ice or water, and ground surfaces are not frozen.
B. Proofroll exposed subgrade in building and paving areas to detect unsuitable soil conditions. Commence proof rolling operations after a suitable period of dry weather to avoid degrading acceptable subgrade surfaces. Make four passes over each section with proof rolling equipment, with the last two perpendicular to the first two.
C. Cut out soft areas of subgrade not readily capable of in- situ compaction. Backfill and compact to density equal to requirements for subsequent backfill material.
D. Site backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet or spongy subgrade surfaces.
E. Use a placement method that will not disturb or damage utilities in trenches.
F. Maintain optimum moisture content of backfill materials to attain required compaction density.
G. Make gradual changes in grade. Blend slopes into level areas.
H. Refer to soils investigation report for additional requirements.

1.14 FILLS (WITHIN STRUCTURE)
A. Select Fill Beneath Slabs on Grade: (refer to soils report for specific fill placement criteria)
   1. Scarify exposed sub-grade and recompact to an appropriate density determined using Standard Proctor Compaction Test, at moisture content as indicated in soil report.
   2. Place appropriate fill in loose lifts and compact each lift to an appropriate density determined using Standard Proctor Compaction Test, at moisture content as indicated in soil report.
   3. Place select fill to a minimum depth indicated on drawings.
   4. Prevent excessive loss of moisture during construction.
B. Refer to soils investigation report for additional requirements.

1.15 FILLS (OUTSIDE STRUCTURE)
A. Roughen and loosen filled areas before placing of fill materials.
B. Spread suitable fill materials in uniform layers over area not to exceed 8" thick compaction.
C. Wet and work materials as required for proper compaction and thoroughly mix. Compaction shall be by tamping rollers or by utilizing excavation equipment to spread and compact fill to a uniform density equal to natural density of material before excavating.
D. Areas adjacent to building, or where compacting equipment cannot work, shall be compacted with hand tampers.

E. Scarify upper 6 inches of exposed sub-grade and compact filled areas to density as indicated in the soils report, to lines and grades shown, with allowances for a final layer of topsoil at least 4 inches thick in lawn and planter areas.
F. Plant Beds: Refer to landscape drawings Beds shall be prepared to a minimum of 4 inches of depth.

1.16 BACKFILL (OUTSIDE STRUCTURE)
A. Ensure areas to be backfilled are free from debris, snow, ice and water and that ground surfaces are note in frozen condition.
B. Do not backfill over existing subgrade surfaces which are porous, wet or spongy.
C. Backfill areas to grades, contours, levels and elevations indicated.
D. Backfill systematically and as early as possible to allow maximum time for natural settlement and compaction.
E. After permanent construction is in place, forms and trash removed, sub-soil drainage and water-proofing complete and inspections complete, backfill with approved materials and compact to approximate density of natural ground.
F. Place backfill in layers not exceeding 8" loose depth, and hand or machine tamp to compaction required.
G. Water may be added to backfill material as an aid to compaction; however, material shall not be wet to form a mud or paste.

1.17 FINISH GRADING
A. After rough grading has been completed and site cleared of construction debris, cover areas disturbed by construction or graded to provide new finish grades with a layer of topsoil not less than 4" thick.
B. Reuse stockpiled topsoil, cleaned of foreign matter, or provide additional approved topsoil as required.
C. Final grades shall be as shown or as directed by Landscape Architect and shall slope away from building and shall provide drainage for area.
D. Degree of finish shall be that ordinarily obtainable with blade grader or scraper operations.
E. Finish surfaces shall be not be more than 0.10 feet above or below established grade elevation.
F. Provide uniform roundings at top and bottom of slopes and other breaks in grade. Correct irregularities and areas where water will stand.
G. Uniformly distribute topsoil to required grades; feather back to where grades remain unchanged.
H. Finish lawn and unpaved areas to 1" below top of walk and curbs.

1.18 PROTECTION, CLEAN-UP AND EXCESS MATERIALS
A. Protect grades from construction and weather damage, washing, erosion and rutting, and repair such damage that occurs.
B. Correct any settlement below established grades to prevent ponding of water.
C. At locations where lime, concrete or other foreign matter has penetrated or been mixed with earth, remove damaged earth and replace with clean material.
D. Remove excess stockpiled material, debris, waste, and other material from site and leave work in clean finished condition for final acceptance. Contractor is responsible for disposal of debris and excess materials.

1.19 QUALITY CONTROL
A. Paving Subgrade Stabilization: Perform one subgrade in-place density test per 7,500 S.F. of subgrade, after subgrade preparation is complete at locations determined by the soils engineer, in accordance with ASTM D2922 and ASTM D3017. Perform tests within 48 hours of placement of pavement construction.
B. Building Subgrade Stabilization: Make necessary soil tests (Atterberg Limit Series and ASTM D698 Standard Proctor for each type of fill specified) to determine the moisture content and density of existing subgrade and inspect and test the placement of additional fill lifts to verify that all fill materials used are in accordance with the specifications for that use. Perform one field density test (ASTM D2922) for each 5,000 S.F. of area within the building footprint on each lift prior to placement of additional fill material.

SECTION 31 3116
TERMITE CONTROL

1.1 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing this type of work and:

1. Having minimum of 2 years documented experience.
2. Approved by manufacturer of treatment materials.
3. Licensed in the State in which the Project is located.

1.2 WARRANTY

A. Provide five year installer's warranty against damage to building caused by termites.
1. Include coverage for repairs to building and to contents damaged due to building damage. Repair damage and, if required, re-treat.
2. Inspect annually and report in writing to Owner. Provide inspection service for [1 (one)] years from Date of Substantial Completion.

1.3 MATERIALS

A. Manufacturers:
1. Bayer Environmental Science Corp : www.backedbybayer.com/pest-management.
2. FMC Professional Solutions: www.fmcprosolutions.com.
3. Syngenta Professional Products: www.syngentaprofessionalproducts.com.
4. Substitutions: See Section 016000 - Product Requirements.

B. Toxicant Chemical: EPA approved; synthetically color dyed to permit visual identification of treated soil.

C. Diluent: Recommended by toxicant manufacturer.

1.4 MIXES

A. Mix toxicant to manufacturer's instructions.

1.5 APPLICATION

A. Comply with requirements of U.S. EPA and applicable state and local codes.

B. Spray apply toxicant in accordance with manufacturer's instructions.

C. Apply toxicant at following locations:
1. Under Slabs-on-Grade.
2. At Both Sides of Foundation Surface.

D. Under slabs, apply toxicant immediately prior to installation of vapor barrier.

E. At foundation walls, apply toxicant immediately prior to finish grading work outside foundations.

F. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.

G. Re-treat disturbed treated soil with same toxicant as original treatment.

H. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

1.6 PROTECTION

A. Do not permit soil grading over treated work.

SECTION 32 1216
ASPHALT PAVING

1.1 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types"; and complying with the following requirements:
1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Base Course: Equivalent to TXDOT Type A mix.
3. Surface Course: Equivalent to TXDOT Type D mix.

B. Emulsified-Asphalt Slurry: ASTM D 3910, Type 1.

1.2 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.
1. Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.

2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd.
1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

1.3 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
1. Clean cracks and joints in existing hot-mix asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

1.4 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

SECTION 32 1313
CONCRETE PAVING

1.1 SUBMITTALS

A. Product Data: Provide data on joint filler, admixtures, and curing compound.

B. Design Data: Indicate pavement thickness, designed concrete strength, reinforcement, and typical details.

1.2 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

1.3 ENVIRONMENTAL REQUIREMENTS

A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

1.4 FORM MATERIALS

A. Form Materials: Conform to ACI 301.

B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D 1751) or sponge rubber or cork (ASTM D 1752)

1.5 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.
B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60Grade 420; deformed.
C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1.6 CONCRETE MATERIALS
A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
1. Portland Cement: ASTM C 150, gray portland cement Type I.
a. Fly Ash: ASTM C 618, Class C or Class F.
D. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size: 1-1/2 inches38 mm nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
E. Water: Potable and complying with ASTM C 94/C 94M.
F. Air-Entraining Admixture: ASTM C 260.
G. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain no more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

1.6 ACCESSORIES
A. Curing Compound: ASTM C 309, Type 1, Class A.
B. Joint Sealer: Type U-TB as specified in Section 079005.
C. Pigmented Mineral Dry-Shake Hardener (for HC ramps and decorative concrete): Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, non- fading mineral oxides inter-ground with cement.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Dayton Superior Corporation; Quartz Tuff.
b. L&M Construction Chemicals, Inc.; QUARTZPLATE FF.
c. Scofield, L. M. Company; LITHOCHROME Color Hardener.
2. Color: As selected by Architect from manufacturer's full range.
D. Stamp Mats (for decorative concrete): Semirigid polyurethane mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Bomanite Corporation.
b. Brickform.
c. Butterfield Color.
d. Scofield, L. M. Company.
E. Stamp Tools (for decorative concrete): Open-grid, aluminum or rigid-plastic stamp tool capable of imprinting joint patterns on plastic concrete.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
e. Matcrete Precision Stamped Concrete Tools.
f. Scofield, L. M. Company.
g. SuperStone, Inc.

1.7 CONCRETE MIX DESIGN
A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
D. Concrete Properties:
1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 3,000 lbs for sidewalks; Refer to civil engineering drawings for vehicular pavement strengths.
2. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
4. Water-Cement Ratio: Maximum 40 percent by weight.
5. Total Air Content: 4 percent, determined in accordance with ASTM C 173/C 173M.
6. Maximum Slump: 4 inches.

1.8 MIXING
A. Transit Mixers: Comply with ASTM C 94/C 94M.

1.9 EXAMINATION
A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
B. Verify gradients and elevations of base are correct.

1.10 PREPARATION
A. Moisten base to minimize absorption of water from fresh concrete.
B. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement.
C. Notify Architect minimum 24 hours prior to commencement of concreting operations.

1.11 FORMING
A. Place and secure forms to correct location, dimension, profile, and gradient.
B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

1.12 REINFORCEMENT
A. Place reinforcement at top of slabs-on-grade.
B. Interrupt reinforcement at contraction joints.
C. Place dowels to achieve pavement and curb alignment as detailed.

1.13 PLACING CONCRETE
A. Place concrete in accordance with ACI 304R.
B. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

1.14 JOINTS
A. Align curb, gutter, and sidewalk joints.
B. Place 3/4 inch wide expansion joints at 60 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
   1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
   2. Secure to resist movement by wet concrete.
C. Provide scored joints:
   1. At 5 feet intervals in walks.
   2. Between sidewalks and curbs.
   3. Between curbs and asphaltic pavement.
D. Provide keyed joints as indicated.
E. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Locate at maximum 15 feet on center. Cut 1/3 into depth of slab.

1.15 FINISHING
A. Area Paving: Light broom, texture perpendicular to pavement direction.
B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
E. Texture and color accessible ramps to meet requirements of authorities having jurisdiction.

1.16 PIGMENTED MINERAL DRY-SHAKE HARDENER
A. Pigmented Mineral Dry-Shake Hardener Finish: After initial floating, apply dry-shake materials to paving surfaces according to manufacturer's written instructions and as follows:
   1. Uniformly apply dry-shake hardener at a rate of 100 lb/100 sq. ft. unless greater amount is recommended by manufacturer to match paving color required.
   2. Uniformly distribute approximately two-thirds of dry-shake hardener over the concrete surface with mechanical spreader; allow hardener to absorb moisture and embed it by power floating. Follow power floating with a second application of pigmented mineral dry-shake hardener, uniformly distributing remainder of material at right angles to first application to ensure uniform color, and embed hardener by final power floating.
   3. After final power floating, apply the following finish:
      a. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.

b. Pigmented Powder Release Agent: Uniformly distribute onto dry-shake-hardened and still-plastic concrete at a rate of 3 to 4 lb/100 sq. ft.

1.17 STAMPING
A. Mat Stamping: After floating and while concrete is plastic, apply mat-stamped finish.
B. Pigmented Powder Release Agent: Uniformly distribute onto concrete at a rate of 3 to 4 lb/100 sq. ft.
C. Liquid Release Agent: Apply liquid release agent to the concrete surface and the stamp mat. Uniformly mist surface of concrete at a rate of 5 gal/1000 sq. ft..
D. After application of release agent, accurately align and place stamp mats in sequence.
E. Uniformly load mats and press into concrete to produce required imprint pattern and depth of imprint on concrete surface. Gently remove stamp mats. Hand stamp edges and surfaces unable to be imprinted by stamp mats.
F. Remove residual release agent according to manufacturer's written instructions, but no fewer than three days after stamping concrete. High-pressure-wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.
G. Tool Stamping: After floating and while concrete is plastic, apply tool-stamped finish.
1. Cover surface with polyethylene film, stretch taut to remove wrinkles, lap sides and ends 3 inches, and secure to edge forms. Lightly broom surface to remove air bubbles.
2. Accurately align and place stamp tools in sequence and tamp into concrete to produce ired imprint pattern and depth of imprint on concrete surface. Gently remove stamp tools. Hand stamp edges and surfaces unable to be imprinted by stamp tools.
3. Carefully remove polyethylene film immediately after tool stamping.

1.18 JOINT SEALING
A. See Section 079005 for joint sealer requirements.

1.19 TOLERANCES
A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
B. Maximum Variation From True Position: 1/4 inch.

1.20 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 014000.
1. Provide free access to concrete operations at project site and cooperate with appointed firm.
2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations
3. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
B. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
2. Perform one slump test for each set of test cylinders taken.
C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

1.21 PROTECTION
A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

SECTION 32 1713
PRECAST CONCRETE SITE ACCESSORIES

1.1 SECTION INCLUDES
A. Precast concrete parking bumpers.
B. Precast concrete splash blocks.

C. Precast concrete mechanical unit support pads.

1.2 PRECAST CONCRETE WHEEL STOPS

A. Qualities: Precast concrete wheel stops, reinforced, and having 2 pre-drilled pin holes and having 2 cast-in anchor pins.
   1. Concrete: Normal weight concrete, minimum 4000 psi 28-day compressive strength.
   2. Reinforcing: 2 continuous No. 3 deformed reinforcement bars.
   3. Size: 8-1/2 inch wide by 6 inch high by 72 inch length.
   4. Anchor Pins: 5/8 inch deformed bar, 2 for each wheel stop, extending a minimum of 3 inches below bottom of wheel stop.

B. Standards
   1. Concrete: ASTM C 94.
   2. Reinforcing: ASTM A 615, Grade 40.

1.3 PRECAST CONCRETE SPLASH BLOCKS AND MECHANICAL UNIT PADS

A. Precast concrete, reinforced with manufacturer's standard mesh or deformed bars.
B. Concrete: Normal weight, minimum 4000 psi 28 day compressive strength.
C. Size: As indicated on Drawings.

1.4 PREPARATION - WHEEL STOPS

A. Verify layout of wheel stop locations with pavement marking layout.
B. Thoroughly clean surfaces to receive wheel stops free of dirt, sand, oil, grease or other foreign matter.

1.5 INSTALLATION - WHEEL STOPS

A. Install a precast wheel stop at each parking space indicated on drawings.
B. Install wheel stops with anchors [adhesive] in accordance with manufacturer's instructions.

C. Leave wheel stops securely anchored and in proper alignment.

1.6 INSTALLATION - SPLASH BLOCKS AND MECHANICAL UNIT PADS

A. Place blocks and pads on smooth, even topsoil. Place level and solidly supported.

SECTION 32 1723
PAINTED PAVEMENT MARKINGS

1.1 MATERIALS

A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint; color(s) as indicated.
   1. Roadway Markings: As required by authorities having jurisdiction.
   2. Parking Lots: White.
   3. Handicapped Symbols: Blue.

B. Temporary Marking Tape: Preformed, reflective, pressure sensitive adhesive tape in color(s) required; Contractor is responsible for selection of material of sufficient durability as to perform satisfactorily during period for which its use is required.

1.2 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

1.3 PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Clean surfaces thoroughly prior to installation.
   1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.
E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.

1.4 INSTALLATION

A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.
C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
D. Comply with FHWA MUTCD manual (http://mutcd.fhwa.dot.gov) for details not shown.
E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
   1. Apply paint in one coat only.
   2. Wet Film Thickness: 0.015 inch, minimum.
   3. Width Tolerance: Plus or minus 1/8 inch.
G. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
   1. Mark the International Handicapped Symbol at indicated parking spaces.
   2. Hand application by pneumatic spray is acceptable.
H. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

1.5 DRYING, PROTECTION, AND REPLACEMENT
A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.
B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.
C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.
D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.
E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.
F. Replace removed markings at no additional cost to Owner.

SECTION 32 3113
CHAIN LINK FENCES AND GATES

PART 1 GENERAL
1.1 SECTION INCLUDES

A. Fence framework, fabric, and accessories.
B. Excavation for post bases; concrete foundation for posts.
C. Manual gates and related hardware.

1.2 REFERENCE STANDARDS
A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2009.
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
C. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2011.
D. CLFMI CLF 2445 - Product Manual; Chain Link Fence Manufacturers Institute; 1997.
E. ASTM F668/F934- Standard Specification for Coating Color of Fence Fabric and all Framework

1.3 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.

1.4 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

PART 2 PRODUCTS
2.1 MANUFACTURERS

A. Chain Link Fences and Gates:
   1. Master-Halco, Inc.: www.fenceonline.com.
   2. Merchants Metals: www.merchantsmetals.com.
   3. Substitutions: See Section 01600 - Product Requirements.
   4. Ameristar Fence: www.ameristarfence.com

2.2 MATERIALS AND COMPONENTS
A. Materials and Components: Conform to CLFMI Product Manual.
B. Fabric Size: CLFMI Standard Industrial, Heavy Residential service.
C. Intermediate Posts: Type I round.
D. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round.

2.3 ACCESSORIES
A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.
B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.
C. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.
D. Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.
E. Privacy Slats: Vinyl strips, sized to fit fabric weave.

2.4 FINISHES
A. Components (Other than Fabric): Galvanized in accordance with ASTM A123/A123M, at 1.7 oz/sq ft.
B. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.
C. Accessories: Same finish as framing.
D. Color(s): As shown on drawings. Powder Coated Black

PART 3 EXECUTION
3.1 INSTALLATION
A. Install framework, fabric, accessories and gates in accordance with ASTM F567.

3.2 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch.
B. Maximum Offset From True Position: 1 inch.
C. Components shall not infringe adjacent property lines.

SECTION 32 3119
DECORATIVE METAL FENCES AND GATES

1.1 SUBMITTALS
A. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
B. Shop Drawings:
   1. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
   2. Foundation details, concrete design mix and reinforcing schedule for anti-ram barrier system.

1.2 MANUFACTURERS
A. Decorative Metal Fences:
   1. Ameristar Fence Products, Inc: www.ameristarfence.com.
   2. Substitutions: Submit in accordance with Section 016000.

1.3 FENCES
A. Fences: Complete factory-fabricated system of posts and panels, accessories, fittings, and fasteners;
   1. Capable of resisting vertical load, horizontal load and infill performance requirements for fence categories defined in ASTM F2408.

a. Impact Resistance: ASTM D2794; 60 inch pounds.
b. Weathering Resistance: ASTM D523, D 822 and D 2244; less than 60 percent loss of gloss.

B. Steel: ASTM A653/A653M; yield strength 45,000 psi, minimum.
1. Hot-dip galvanized; A 653/A653M, G60.
2. 62 percent recycled steel, minimum.

1.4 WELDED STEEL FENCE

A. Provide fence meeting requirements for Industrial class as defined by ASTM F2408.

B. Fence Panels: Fusion welded; 6 feet high by 6 feet long.
1. Panel Style: Refer to Drawings.
2. Attach panels to posts with manufacturer's standard panel brackets.

C. Posts:
1. Size: 2-1/2 inches square by 12 gage, with manufacturer's standard cap.

D. Rails: Manufacturer's standard, double-wall steel channel 1-3/4 inch square by 12 gage with pre-punched picket holes.
1. Picket Retaining Rods: 0.125 inch galvanized steel.
2. Picket-to-Rail Intersection Seals: PVC grommets.

E. Pickets: Steel tube.
1. Spacing: 3-3/4 inch clear.
2. Size: 1 inch square by 18 gage.
3. Style: Pickets with finial extend above top rail.
4. Finial: Spear point.

F. Flexibility: Capable of following variable slope of up to 1:2.

G. Gates: Same material as fence construction.

H. Sliding Operators: Basis of Design: Elite model SL3000U.

1.5 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Set fence posts in accordance with the manufacturer recommended spacing.

C. When cutting rails immediately seal the exposed surfaces by:
1. Removing all metal shavings from cut area.
2. Apply zinc-rich primer to thoroughly cover cut edge and drilled hole; allow to dry.
3. Apply 2 coats of custom finish spray paint matching fence color.
4. Failure to seal exposed surfaces in accordance with manufacturer's instructions will negate manufacturer's warranty.

D. Space gate posts according to the manufacturers' drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected.
1. Base type and quantity of gate hinges o the application; weight, height, and number of gate cycles.
2. Identify the necessary hardware required for the application on the manufacturer's gate drawings.
3. Provide gate hardware by the manufacturer of the gate and install per manufacturer's recommendations

1.6 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From Indicated Position: 1 inch.

C. Minimum distance from property line: 6 inches.

SECTION 32 3129
WOOD FENCES AND GATES

1.1 MATERIALS

A. Posts: ASTM A 120; Schedule 40 steel pipe, standard weight, one piece without joints; galvanized finish.

B. Wood Rails and Pickets: Western Red Cedar, No. 1 clear grade, smooth surface. Seal with Readyseal per manufacturer's instructions – color: pecan.

1.2 CONCRETE MIX

A. Concrete: ASTM C 94; normal Portland Cement; 2,500 psi at 28 days; 3 inch slump; 3/4 inch maximum sized aggregate.

1.3 COMPONENTS

A. Line Posts: 2.38 inch diameter steel pipe.
B. Corner and Terminal Posts: 3.5 inch steel pipe.
C. Gate Posts: 3.5 inch diameter steel pipe.
D. Gate Frame: 1.66 inch diameter steel pipe for welded fabrication. Provide with standard mounting and hinging hardware.
E. Caps: Cast steel or malleable iron, galvanized; sized to post dimension, set screw retained.
F. Fittings: Sleeves, bands, clips, rail attachment devices, fasteners and fittings; galvanized steel.
G. Gate Hardware: Latch with gravity drop; two 180-degree gate hinges per leaf and hardware for padlock.
H. Rails: 2 by 4 nominal size.
I. Pickets: 1 by 4 nominal size, flat top.
J. Heavy Gauge Wheel Casters: 8" Zero Maintenance Flat Free Gate-Caster.
To be welded to Mtl. Gate framing and adjusted to work with slab-on-grade slope variance.

1.4 FINISHES

A. Galvanized: ANSI/ASTM A123; 1.8 ounces per square foot coating. Dark Anodic Bronze Finish. Verify finish with Architect
B. Accessories: Same finish as framing.

1.5 INSTALLATION

A. Provide fence 6 feet nominal height.
B. Space line posts at intervals not exceeding 8 feet.
C. Set terminal, gate and line posts plumb, in concrete footings with top of footing 2 inches above and 6 inches below finish grade. Slope top of concrete for water runoff.
D. Footing depth below finish grade: 36 inches. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads.
E. Provide 3 rails (4 rails on fences over 6' in height), with top and bottom spaced 12" center line from end of pickets.
F. Attach rails to posts with pre-manufactured, radiused, steel devices. Use minimum 2 lag bolts per device.
G. Attach pickets to each rail with two galvanized nails. If power actuated nailers are used, adjust to make sure fasteners are not driven past face of picket.

END OF SECTION