CONSTRUCTION SPECIFICATIONS

XCEL SPORTS COMPLEX
JEFFERSON, WISCONSIN

AUGUST 14, 2015

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PART 1 - GENERAL

1.1 DESCRIPTION

A. A geotechnical investigation report titled:

TITLE

has been prepared by (FIRM NAME)., (ADDRESS) dated (DATE OF PUBLICATION). The geotechnical investigation data represents information available on the subsurface conditions.

B. A copy of the report may be viewed at the office of the Architect and Owner.

C. The soils investigation report is not part of the Contract Documents.

END

1.1 GENERAL REQUIREMENTS

A. The Owner will furnish testing and inspection services for the above Project. Requirements herein are intended as basic descriptions of required tests and may be waived or expanded without impact on the Contract price, except as necessary to accommodate substantial changes in coordination requirements.

B. Reference to "testing laboratory" in singular shall not be construed to limit work under this document to a single testing agency.

C. Comply with requirements of the International Building Code as amended by the jurisdictional code authority.

D. Personnel employed in the inspection of soil, rock, concrete, and steel, specified under Divisions 3, and 5, and 31 of these specifications shall be qualified under the requirements of ASTM E329 - Standard Specification for Agencies engaged in the Testing and/or Inspection of Materials Used in Construction.

E. Inspection and Test Reports: Prepare reports giving results and observations of tests, and stating compliance or noncompliance with Contract Documents. Include records of observations and tests performed, and other items as specified, herein.

F. Duties and Responsibilities of the Testing Laboratory.
   1. Submit written reports of inspections and tests to the Owner, Architect, and other parties designated by the Owner.
   2. Submit copies of inspection reports to the jurisdictional building department, as required.
   3. Submit copies of inspection reports to the Architect’s Structural Engineer of items specified in Divisions 3, 4, and 5.
   4. Upon request, provide interpretation of test results.
   5. Submit final signed report stating whether the work requiring special inspection was, to the best of the testing and inspection agency inspector’s knowledge, in conformance with the Contract Documents and the applicable workmanship provisions of the governing code.

G. Testing Laboratory is not authorized to:
   1. Release, revoke, alter or enlarge on requirements of Contract Documents.
   2. Approve or accept any portion of the work.
   3. Perform any duties of the Contractor.

1.2 EQUIPMENT

A. Furnish all equipment to perform the required tests and inspections, except as required to be furnished by the General Contractor as described in the Contract Documents.

1.3 REQUIRED TESTS AND INSPECTIONS

A. Earthwork:
   1. Inspect spread footing excavations for conformance to the Contract Documents.
   2. Fill Materials: Perform tests to determine acceptability for use.
   3. Compaction: Perform density tests to determine compliance with specified compaction requirements.

B. Trenching and Piping:
   1. Perform compaction tests for bedding at one test per 100 linear feet of pipe bedding.
   2. Perform compaction tests at one compaction test per lift per 100 linear feet of fill over pipe.

C. Asphalt Paving:
   1. Perform in place density tests with a nuclear gage.
   2. Record ambient and asphalt temperatures.
   3. Perform Marshal Analysis tests to determine asphalt composition. Perform one test per day.

D. Concrete Formwork:
   1. Inspect forms for location, design, configuration, and seal of form joints and ties.
   2. Check condition of bond surfaces, locations and sizes of all embedment items, and anchorage for prevention of displacement.

E. Steel Concrete Reinforcement:
   1. Obtain a copy of approved reinforcing steel placement drawings from the General Contractor.
   2. Check reinforcement in place prior to the placement of concrete.
   3. Testing procedure shall conform to ASTM A615.

F. Concrete:
   1. Analyze concrete mix design.
   2. Aggregate: Review source of aggregate to verify that supplier can furnish concrete of consistent quality.
   3. Require mill reports for cement used. Perform tests on cement[, at Contractor's expense,]if reports cannot be furnished.
   4. Inspect consolidation methods and finishing for conformance with contract requirements.
   5. Slump and Air Content:
      a. ASTM C 172, except modified for slump to comply with ASTM C94.
      b. Test when strength specimens are made, and as often, in the professional opinion of the testing agency, as is necessary for control checks and acceptance proposed.
   6. Concrete Temperature: Test hourly when air temperature is 40 degrees F. and below, and when 80 degrees F. and above; and each time a set of compression test specimens is made.
   7. Compressive Strength Tests: Test in accordance with ASTM C 39.Compression Test Specimens:
         1) Collect in accordance with ASTM C31; mold and store cylinders for laboratories cured test specimens, except when field-cured test specimens are required.
         2) Provide one set of 5 cylinders of each concrete class placed in any one day, or for each 5,000 sq. ft. of surface area placed, unless otherwise indicated. Utilize cylinders in testing procedures as follows: 1 cylinder tested at 7 days, 1 cylinder tested at 14 days,2 cylinders tested at 28 days, and 1 cylinder retained in reserve for later testing if required. Special Requirements for Early Strength Concrete: Provide 2 additional cylinders (for a total of 7 per set) while placing concrete that will be post-tensioned. Test the 2 additional cylinders at 14 day.
         4) Special Requirements for Drilled Piers: Provide one set of 5 cylinders per 50 cubic yards or fraction of drilled pier concrete
      c. When the frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
      d. When the strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, notify all parties immediately by use of faxed test reports.
   8. Concrete Reports shall include:
      a. Weather and date of pour.
      b. Name of concrete supplier and truck number.
      c. Exact mix used and maximum size of aggregate.
      d. Location in building where placed.
      e. Cylinder identification.
      f. Date cylinder received in laboratory.
      g. Slump data.
      h. Brand and type of cement used.
      i. Entrained air content (if required).
      j. Amount of water added after batching, if any.
      k. Sequential numbering of reports.
      l. Compressive strengths.
   9. Report test results in writing to the Architect and the Contractor on the same day that tests are made.

G. Concrete Floor Flatness/Levelness
   1. Measure flatness and levelness of concrete floor slabs to ascertain compliance with specified tolerance requirements after slabs are sufficiently cured to support traffic.
   2. Test in accordance with ASTM E1155 - Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System. Use Type I apparatus (Floor Profilometer)
      a. F_F (Flatness) defines the maximum floor curvature allowed over 24 inches computed on the basis of successive 12 inch elevation differentials.

$F_F = 4.572 / \Delta_F$

Where ΔF = Max difference in elevation, in decimals of inches between successive 12 inch sample points.

b. F_L (Levelness) defines the relative conformity of the floor surface to a horizontal plane, as measured over a 10 foot distance.

$F_L = 12.5 / \Delta_L$

Where ΔL = Max difference in elevation in inches between two points separated by 10 feet.

H. Drilled in Anchors, Anchor Bolts, Headed Studs, and Epoxy or Cement Grouted Dowels or Anchors:
1. Provide periodic inspection of installation, including drilled holes after cleaning.
2. Confirm proper edge distances, depths, and spacings.
3. Provide tension testing. Test anchors indicated on Structural Drawings in accordance with the Structural Notes.

I. Structural Welding:
1. Perform periodicvisual inspection of all field fillet welding, including stud anchor welds. Inspection of fillet welds shall be in accordance with AWS D1.1. 15 percent of all fillet welds shall be inspected by magnetic particle or dry penetrant methods. All full penetration welds shall be tested by ultrasonic methods in accordance with the requirements of AWS D1.1, Section 6, part III, by ASNT Level II technicians. Any size frequency (1.0, 2.35, 5.0 MHz) and angle (45, 60, 70, and 90) may be used to indicate the size, orientation, and type of discontinuity more accurately.
2. Verify welding materials, equipment, and welder qualifications.
3. Inspection reports shall include the following:
   a. Item inspected.
   b. Welder's name, certificate expiration date, certified positions.
   c. Electrode used.

J. Structural Steel
1. Mill reports are required for all structural steel materials. Perform tests to verify strength of steel if mill reports cannot be furnished by the supplier to the laboratory for certification. Notify the Owner of extra services performed.
2. Shop Fabrication: Furnish visual inspection during fabrication of structural steel and components (AISC certified fabricators exempt from inspection requirement). Shapes, sizes, classes, and types of steel and threaded fasteners shall be verified for conformance with Contract Documents.
3. Field Assembly: Perform visual inspection of the installation of structural steel. Verify locations of all anchorages and inserts. Where adjustments are required, reinspect to confirm compliance with Contract Document requirements.

K. Structural Bolting:
1. All high strength bolting is subject to inspection and testing. Test a minimum of 10 percent of all bolts, and at least 2 bolts in each connection a calibrated wrench to verify that minimum required bolt tension was achieved.
2. Verify that the installation procedure for structural bolting meets contract requirements.
3. Mill reports are required for structural high strength bolts. Perform testing if mill tests are unavailable. Notify the Owner if the extra service is performed.

L. Roofing: Inspect roof deck before roofing is started; perform inspection while roofing is being installed to verify compliance with Contract Documents and roofing materials manufacturer’s specifications. Inspect all roof related flashing.

END OF SECTION

XCEL SPORTS COMPLEX
JEFFERSON, WISCONSIN

RFI NO.___

REQUEST FOR INFORMATION FORM

Date:

To:

From:

OPENINGDESIGN

Spec Section / para:

Drawing / Detail:

Request:

Signed:

Response:

☐ Attachments:

Response From: _____ To: _____ Rec'd: _____ Replied: _____

Signed:

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

NO.___

SECTION 006325 - SUBSTITUTION REQUEST FORM

TO: **OPENINGDESIGN** DATE: _____

ATTN:_____

We hereby submit the following for your consideration in lieu of the specified item(s) for the above project:

Specification Section_____ . Paragraph _____ . Referenced Drawing(s) _____

Specified Item: _____

Proposed Substitution: _____

Reason for Substitution: _____

.....

COMPLETE THE FOLLOWING (Use back or additional sheets if necessary).

1. Does the substitution affect dimensions shown on Drawings? Yes _____. No _____.
   If yes, indicate changes: _____
2. What effect does the substitution have on other trades? _____
   _____
3. What effect do applicable code requirements have on substitution? _____
   _____
4. Describe the differences between the proposed substitution and the specified item(s):
   _____
   _____
5. How do manufacturer guarantees compare between proposed and specified items?
   ☐ Same ☐ Different (Explain on back.)

Attachments: _____

.....

What is projected lump sum installed cost difference between proposed substitution and least expensive specified item? $_____. [Ø; (decrease); increase]

The undersigned hereby

- Certifies that the proposed substitute item has been fully investigated and has been determined to be equal or superior to that specified in all respects; that the same or greater warranty will be furnished, that required maintenance service and source for replacement parts are available, and that incorporation of the proposed substitute item will not affect functional clearances.
- Warrants that coordination, installation, and changes to the project as necessary to accommodate the proposed substitution shall be the Contractor's responsibility, that use of the substitute item(s) will not delay project completion, and that claims for additional costs related to its incorporation which may become subsequently apparent will be borne by the Contractor.

Approved For Architect Review: _____
Signature Title

Signature shall be by a person having authority to legally bind the Contractor to the above terms.

.....

☐ Substitution Allowed ☐ Substitution Allowed As Noted ☐ Substitution Not Allowed Date:_____

By: _____ CALLISON
Signature Title

END OF SUBSTITUTION REQUEST FORM

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Special work requirements.
   2. Separate work.
   3. Owner-furnished Contractor installed products.
   4. Coordination.
   5. Reference standards.
   6. Applicable codes.
   7. Field engineering.
   8. Applications for payment
   9. Request for information

B. This Section applies to all Technical Specification Sections, and supplements the General and Supplementary Conditions.

1.2 SPECIAL WORK REQUIREMENTS

A. Limit use of premises to allow for construction operations, and to allow for Work by other Contractors.

B. Smoking is prohibited on site, except for areas designated by the Contractor. No smoking is allowed within enclosed areas.

C. Owner Occupancy:
   1. Owner will occupy premises during certain stages of construction for the installation of Owner-provided materials or equipment. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.
   2. Coordinate use of premises under direction of Owner.
   3. Maintain free and safe passage to and from occupied portions of the existing building, in accordance with Code and the Owner's occupancy requirements.

D. Noise Producing Activities:
   1. Use saws and hydraulic impactor equipment instead of pneumatic tools and compressors to reduce noise.
   2. Equipment shall be muffled for quiet operation not to exceed 50 decibels at a distance of 20 feet from the source.

E. Select materials, utilize personnel, perform preparatory work, and sequence work in an area as required so that the work may be completed in the least amount of time possible.

F. All work shall be performed in a manner to maintain a normal business environment to the greatest extent possible.

1.3 SEPARATE WORK

A. Items noted "NIC" (Not In Contract), will be furnished and installed by Owner.

1.4 OWNER-FURNISHED CONTRACTOR INSTALLED PRODUCTS

A. Coordinate work to facilitate installation of products furnished by the Owner for Installation by the Contractor, as directed, and as indicated "FOIC," on the Drawings.

B. Owner's Responsibilities:
   1. Arrange for and deliver shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for product delivery to site.
   3. Upon delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage.
   5. Arrange for replacement of damaged, defective, or missing items.
   6. Arrange for manufacturers' warranties, inspections, and service.

C. Contractor's Responsibilities:
   1. Review shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness, for damage, jointly with Owner.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged by Work of this Contract.

1.5 COORDINATION

A. Coordinate work of the various Sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practical; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Execute cutting and patching to integrate elements of Work, uncover ill-timed, defective, and non-conforming work, provide openings for penetrations of existing surfaces, and provide samples for testing. Seal penetrations through floors, walls, and ceilings.

1.6 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is specified, or when a specific date is required under the applicable building code.

C. Obtain copies of standards when required by Contract Documents. Maintain copy at jobsite during progress of the specific work.

1.7 APPLICABLE CODES

A. Conform to the codes listed on the Drawings.

1.8 FIELD ENGINEERING

A. Provide field engineering services; establish grades, lines, and levels, by use of recognized engineering survey practices.

B. Control points are those shown on Drawings. Locate and protect control and reference points. Notify the Architect if reference points cannot be located.

1.9 APPLICATIONS FOR PAYMENT

A. Submit 3 copies of each application under procedures of Section 013300 on a form approved by the Architect.

B. Content and Format: As specified for Schedule of Values in Section 013300.

1.10 REQUEST FOR INFORMATION

A. A Request for Information (RFI) is a request from the Contractor directed to the Architect for clarification, interpretation, or direction regarding the Work as described by Contract Documents.

B. Coordinate and submit in timely manner so as not to impede delivery, work, and other conditions that may be detrimental to construction progress.

C. Use a "Request for Information" form provided in Division 00.

D. Allow sufficient time in construction schedule for Architect's response to the RFIs.

END OF SECTION

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Identification and description of Alternate work.

B. Related Sections:
   1. Owner-Contractor Agreement: Alternates accepted by Owner for incorporation into the Work.
   2. Sections of Specifications identified in each Alternate.

C. This Section supplements the General and Supplementary Conditions.

1.2 PROCEDURES

A. Alternates will be exercised at the option of Owner.

B. Coordinate related work and modify surrounding work as required to complete the Work, including changes under each Alternate, when acceptance is designated in Owner-Contractor Agreement.

1.3 ALTERNATE DESCRIPTIONS

A. ALTERNATE NO. 1 -
   1. **Under Basic Bid:**
   2. **Under Alternate**:

END OF SECTION

SECTION 013113 - PROJECT COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General coordination provisions.
   2. Requirements for coordination of space.

B. This Section applies to all Technical Specification Sections, and supplements the General and Supplementary Conditions.

1.2 GENERAL COORDINATION PROVISIONS

A. Coordinate work of various specification sections to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of work. Promptly advise Architect of any error, inconsistency, omission, or apparent discrepancy discovered.

C. Allot time in construction scheduling for liaison with Owner and Architect. Establish procedures for handling queries and clarifications. Use Contractor's standard "Request for Information" form to initiate clarifications. Allow sufficient time in construction schedule for Architect's response to the request.

D. In addition to meetings specified in Section 013119, hold coordination meetings and conferences with personnel and subcontractors to assure coordination of the work.

E. Coordinate scheduling, submittals, and work of various specification sections to ensure efficient and orderly sequence of installation of independent construction elements.

F. Verify that characteristics of operating equipment are compatible with building utilities and services.

G. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various specification sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

H. In finished areas, except as otherwise indicated, conceal pipes, conduit and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

I. Execute cutting and patching to integrate elements of work, uncover ill-timed, defective, and non-conforming work, provide openings for penetrations of existing surfaces, and provide samples for testing. Seal penetrations through floors, walls, and ceilings.

1.3 COORDINATION OF SPACE

A. The Contractor shall be responsible for coordinating the actual layout of plumbing, fire protection, HVAC, electrical, and other similar elements, as necessary to avoid interference, maintain the configurations of architectural elements, and maintain minimum ceiling and clearance heights as required by code.

B. Layouts shown on the Drawings are diagrammatic. Follow routings shown for pipes, ducts, and conduit as closely as practical. Where routing changes are required in exposed locations within public spaces, or will affect architectural elements, verify modifications with the Architect prior to proceeding.

C. Develop coordination drawings, and other preinstallation coordination methods as necessary to coordinate layouts prior to installation. Coordination drawings shall be based on the approved structural steel framing shop drawings, and shall consist of overlay drawings, or other similar methods to graphically indicate plumbing, fire protection, HVAC, electrical, and other similar elements in a single location in order to identify conflicts.

D. Where coordination drawings, or other preinstallation coordination methods show that available space is inadequate or that modifications will affect architectural elements, request information from the Architect before proceeding with work. No additional payment will be made for installation conflicts which could have been identified by coordination drawings or other preinstallation coordination methods.

E. Provide clear access to control points, valves, strainers, control devices, and specialty items of every nature to such systems and equipment to obtain maximum head room. Provide adequate clearances as necessary for operation and maintenance.

F. Make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

PART 2 - PRODUCTS

A. Not Used.

PART 3 - EXECUTION

A. Not Used.

END OF SECTION

SECTION 013119 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Contractor participation in pre-construction conferences.
   2. Contractor administration of progress meetings and pre-installation conferences.

B. This Section applies to all Technical Specification Sections, and supplements the General and Supplemental Conditions.

1.2 GENERAL MEETING REQUIREMENTS

A. Make physical arrangements for meetings; notify participants, prepare agenda with copies for each attendee.

B. Take meeting minutes, and distribute copies within 2 days to the Owner, Architect, and all attendees. Distribute copies to other parties as appropriate.

C. All representatives attending meetings shall be authorized to act on behalf of the entity each represents.

D. Architect will attend meetings to ascertain the work is expedited consistent with Contract Documents and construction schedules.

1.3 PROGRESS MEETINGS

A. Schedule and administer progress meetings throughout the Work at maximum bi-monthly intervals.

B. Attendance: Job superintendent, major subcontractors and suppliers, Owner, Architect, and others as appropriate to the meeting agenda.

C. Suggested Agenda:
   1. Review of Work progress.
   2. Status of progress schedule and adjustments.
   3. Delivery schedules.
   4. Submittals.
   5. Maintenance of quality standards.
   6. Pending changes and substitutions
   7. Other items affecting progress of Work.

1.4 PRE-INSTALLATION CONFERENCES

A. Where required in a specification Section, schedule and administer a pre-installation conference prior to commencing work of the Section.

B. Unless otherwise required, notify the Architect a minimum of 7 calendar days prior to each scheduled meeting.

C. Require the attendance of entities directly affecting, or affected by, the work of the Section.

D. Review conditions of installation, preparation and installation procedures, and coordination with related work.

END OF SECTION

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Submittal form requirements.
   2. Submittal schedule.
   3. Contractor responsibilities.
   4. Requirements for each type of submittal.

B. Related Sections:
   1. 007200 - General Conditions of the Contract: Additional submittal requirements.
   2. 016000 - Product Requirements: Substitution submittals.
   3. 017700 - Closeout Procedures: Closeout submittals.

C. This Section applies to all Technical Specification Sections, and supplements the General and Supplementary Conditions.

1.2 SUBMITTAL FORM REQUIREMENTS

A. Provide the following, as applicable, on each submittal:
   1. The Project title and number.
   2. Present and Previous submittal dates.
   3. Contractor's submittal number.
   4. Subcontract identification.
   5. The names of:
      a. Contractor.
      b. Supplier.
      c. Manufacturer.
   6. Identification of revisions on resubmittals.
   7. For each product, reference corresponding specification section and paragraph number.
   8. A 6 x 4 inch blank space for Contractor and Architect stamps.

B. Deliver submittals to the Architect. Include name of contact person identified at the time of Agreement.

C. Transmit submittals under AIA form G810 or other transmittal form as accepted by the Architect.

D. Submittals in graphic form shall be clear readable copies with Contractor's original stamp. Facsimile submittals will not be accepted.

1.3 SUBMITTAL SCHEDULE

A. Make submittals to the Architect as required, causing no delay in the work.

B. Require each subcontractor to make submittals within 30 days of the subcontract date, unless specified or approved otherwise, or required to meet the work schedule.

C. Allow a minimum of 10 working days from receipt, for the Architect to review each submittal. Allow additional time for large and complex submittals representing major portions of the Work, such as fire protection, structural steel, or curtain wall.

D. Schedule submittals to allow sufficient time for possible revision and resubmittal of the rejected submittals, without affecting the construction schedule.

E. Make the following submittals to the Owner and Architect prior to starting construction and within 10 working days of the Notice to Proceed:
   1. Certificates of insurance.
   2. List of subcontractors and suppliers.
   3. Construction schedule.
   4. Submittal log.
   5. Products list.

F. Submit Schedule of Values prior to first application for payment.

1.4 GENERAL REQUIREMENTS FOR SUBMITTALS

A. Make submittals to the Architect, unless otherwise specified.

B. Review submittals prior to submittal to the Architect. Verify specified requirements for products, field measurements, and field construction requirements.

C. Stamp and sign each submittal as certification that the submittal has been reviewed by the Contractor. Submittals not stamped and signed by the Contractor will be returned by the Architect without review for resubmittal.

D. Notify the Architect in writing, at time of submission, of all deviations in the submittals from requirements of the Contract Documents.

E. Make additional copies of approved submittals as necessary to implement the Work.

F. Review and approval of a submittal by the Architect shall not relieve the Contractor from responsibility for the proper fitting, finishing, quantities, and erection of the work in strict accordance with the Contract requirements.

G. Review and approval of a submittal by the Architect shall not relieve the Contractor from the responsibility for providing work not indicated on the submittal, but otherwise required for the completion of the work.

H. Do not fabricate or erect work prior to approval of the submittals.

I. Should discrepancies become evident, immediately notify Architect for resolution before proceeding with shop work.

J. Incorporation of substitutions into submittals will be considered cause for rejection of the submittal.

K. Submittals will be reviewed by the Architect for conformance to the design concept, only. Architect's review of vendor designed items shall not relieve the Contractor of responsibility for compliance with specified performance requirements.

L. If the Contractor fails to review Shop Drawings, Product Data, or Samples to determine their responsiveness to the Contract Documents, or fails to substantially respond to Architect's review comments prior to resubmittal, or if he makes submittals which substantially alter the Contract Documents, the Contractor shall reimburse the Owner for the charges of the Architect for extra services required to review such submittals.

1.5 CONSTRUCTION SCHEDULE

A. Prepare schedule in the form of a network planning system (CPM) for scheduling and controlling the work. Note the critical path.

B. Show commencement and completion dates proposed for each subdivision of work.

C. Update and submit monthly. Indicate actual start and completion of all completed activities. Graphically indicate changes from previously issued schedule.

D. Incorporate remedial construction into schedule when remedial work is required.

E. Show submittal dates required for shop drawings, product data, and samples, and product delivery dates, including those furnished by Owner and those under Allowances.

F. Coordinate with the Owner's schedule, showing all Contract activities to be performed by the Owner including their start, duration, completion, float and critical path.

1.6 SUBMITTAL LOG

A. List each type of submittal, and the date that the submittal will be made. Indicate Architect review time proposed.

1.7 PRODUCTS LIST

A. Complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

1.8 SCHEDULE OF VALUES

A. Submit Schedule of Values prior to first Application for payment.

B. Submit schedule on AIA Form G703. Contractor's standard form or media-driven printout will be considered on request.

C. Format: Table of Contents of this Project Manual. Identify each line item with number and title of the major Specification Sections.

D. Include in each line item amount of Allowances. For unit cost Allowances, give quantities measured from Contract Documents multiplied by the unit cost equal to the total for the item.

E. Include in each line item a directly proportional amount of Contractor's overhead and profit.

F. Revise schedule to list change orders, for each application for payment.

G. Provide a sub-schedule for each separate stage of Work specified in Section 011000.]

1.9 SHOP DRAWINGS

A. Submit Shop Drawings required by individual Sections of the Specifications, and as otherwise required for proper performance of the work.

B. Illustrate fully the requirements of the Specifications and the Contract Drawings, and accurately show quantities, kinds of materials, methods of assembly, and all data required for fabrication, erection, and installation.

C. Show the relationship of adjoining work, relevant field conditions and dimensions; coordinate with affected subcontractors and suppliers if in conflict.

D. Number of Copies: Unless otherwise specified, submit 2 legible copies to the Architect for review.

E. The Architect will return one copy to Contractor with corrections, notations and Architect's stamp indicating action to be taken.

1.10 PRODUCT DATA

A. Mark each copy to identify applicable products, models, options, and other data. Include manufacturer's printed installation instructions.

B. Submit the number of copies which Contractor requires, plus 1 copy which will be retained by Architect.

C. Modify product data and installation instructions to delete information which is not applicable to the work.

D. Supplement standard information to provide information specifically applicable to the work.

1.11 SAMPLES

A. Submit samples as specified in the technical Sections.

B. Include identification on each sample, giving full information.

C. Submit the number of samples specified in the technical Sections. Where quantity is not specified, submit 3 samples. One will be retained by the Architect.

D. Unless specified otherwise, submit full range of manufacturers' standard colors, textures, and patterns for Architect's selection. Submit samples for selection of finishes within 30 days after date of Contract.

E. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.

END OF SECTION

SECTION 014500 - QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General requirements.
   2. Workmanship.
   3. Special installation procedures
   4. Manufacturer's instructions.
   5. Manufacturer's certificates.
   6. Mock-ups.
   7. Manufacturers' field services.
   8. Testing laboratory services.
   9. Contractor tests and inspections.

B. Related Sections:
   1. 003152 - Testing and Inspecting Services: List of Owner paid tests and inspections.
   2. 011000 - Summary: Applicability of specified reference standards.
   3. 013300 - Submittal Procedures: Submittal of manufacturer's instructions.

C. This Section applies to all Technical Specification Sections, and supplements the General and Supplemental Conditions.

1.2 GENERAL QUALITY CONTROL

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.3 WORKMANSHIP

A. Comply with industry standards, except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform work with persons qualified to produce workmanship of specified quality.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.4 SPECIAL INSTALLATION PROCEDURES

A. Make no attachment to structural concrete or steel members in the building in such a way as to overload or impair the structural integrity of the member.

1.5 MANUFACTURERS' INSTRUCTIONS

A. Unless specified otherwise, comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Architect before proceeding.

1.6 MANUFACTURERS' CERTIFICATES

A. When required by individual Specifications Section, submit, in duplicate, manufacturer's certification that products meet or exceed specified requirements.

1.7 MOCK-UPS

A. Provide mock-ups as specified in the individual specification sections. When the initial mock-up is unacceptable to the Architect, provide additional mock-ups until approval is obtained.

B. Unless specified or approved otherwise, schedule mock-ups for completion a minimum of 10 working days prior to actual commencement of the work represented by the mock-up.

C. Notify the Architect and Owner a minimum of 5 working days prior to mock-up.

D. For each mock-up, provide conditions which will replicate the conditions of the actual installation, including lighting, to the greatest reasonable extent.

E. Approved mock-up shall be the standard of workmanship and materials for the remainder of the related work.

F. Contractor may proceed with the work upon Architect's approval of the mock-up

G. Maintain mock-up in approved condition, until directed otherwise.

H. Disposition of Mock-Ups:
   1. Rejected mock-ups shall be selectively demolished to accommodate new mock-ups, or completely removed as appropriate.
   2. Mock-ups constructed as part of the proposed work, and which have been approved by the Architect, may be incorporated into the work.
   3. Unless specified or directed otherwise, approved mock-ups which are not incorporated into the work shall be removed upon project completion.

1.8 MANUFACTURERS' FIELD SERVICES

A. When specified, require product manufacturer to furnish qualified personnel to observe field conditions and quality of workmanship, and to provide recommendations, certifications, and other specified services.

B. Representative shall submit written report to Architect listing observations and recommendations.

1.9 TESTING LABORATORY SERVICES

A. The Owner will arrange for the services of an Independent Testing Laboratory to inspect and test the Work in accordance with regulatory requirements and to verify compliance with the contract documents.

B. Contractor's Responsibilities:
   1. Cooperate with Testing Laboratory personnel, and furnish access, tools, samples, certifications, test reports, design mixes, equipment, storage, and assistance as requested by the Testing Laboratory.
   2. Notify Architect and Testing Laboratory 48 hours prior to expected time for operations requiring inspection and testing. When tests or inspections cannot be performed, through the fault of the Contractor, reimburse the Owner for the additional costs incurred.
   3. Remove and replace all work found not complying with the Contract Documents. Remedies shall be in accordance with the Contract Documents and code requirements.
   4. If initial tests and inspections indicate deficient work, the Contractor shall reimburse the Owner for the costs of all subsequent tests and inspections related to the deficiency.
   5. All damage which may occur to the work as a result of normal testing operations shall be repaired to match surrounding surfaces.
   6. Schedule testing and inspection so that the work of testing and inspection personnel will be as continuous and brief as possible.
   7. Reimburse the Owner for travel and lodging expenses incurred for testing and inspection services performed outside a radius of 100 miles of the site.

C. The Owner may have the tests and inspections performed as listed in Section 003152.

D. Tests and inspections shall be in accordance with code requirements and as otherwise required to verify conformance to Contract requirements.

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. General requirements.
2. Electricity, lighting.
3. Heat, ventilation, cooling.
4. Telephone service.
5. Water.
6. Sanitary facilities.
7. Barriers.
8. Closures.
9. Protection of installed work.
10. Security.
11. Safety.
12. Site water control.
13. Cleaning during construction.
14. Project identification.
15. Field offices and sheds.
16. Removal.

B. Related Sections:
1. 011000 - Summary: Contractor use of premises.
2. 017421 – Construction Waste Management and Disposal: Construction waste management plan.
3. 017700 - Closeout Procedures: Final cleaning.

C. This Section applies to all Technical Specification Sections, and supplements the General and Supplemental Conditions.

1.2 GENERAL REQUIREMENTS

A. Temporary facilities and controls shall conform to the requirements of the jurisdictional code authorities.

1.3 ELECTRICITY, LIGHTING

A. Provide service required for construction operations, with branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords.

B. Provide lighting for construction operations.

C. Permanent lighting may be used during construction. Maintain lighting and make routine repairs.

1.4 HEAT, VENTILATION

A. Provide temporary heating and cooling as necessary to maintain specified conditions for Construction operations, to protect materials and finishes from damage due to temperature or humidity.

B. Provide temporary ventilation of enclosed areas to cure materials, disperse humidity, and prevent accumulations of dust, fumes, vapors, or gases.

C. Prior to operation of permanent facilities for temporary purposes, verify that installation is approved for operation, and that filters are in place.

D. Provide and pay for operation, maintenance, and utilities.

E. Take measures to conserve energy.

1.5 WATER

A. Provide service required for construction operations. Extend branch piping with outlets located so that water is available by use of hoses.

1.6 SANITARY FACILITIES

A. Provide and maintain required portable facilities and enclosures.

1.7 BARRIERS

A. Provide as required to prevent public entry to construction areas, to provide for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks. Construction: Contractor's option.

C. Provide barricades and covered walkways as required by governing authorities for public rights-of-way and for public access to existing building.

D. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

E. Provide barricades around openings in floors and roof decks.

1.8 CLOSURES

A. Exterior Closures:
   1. Provide temporary weather-tight closures as necessary to create proper interior environmental conditions, protection of materials, and to prevent entry of unauthorized persons.
   2. Where doors are necessary for access by construction personnel, provide self-closing hardware and locks.
   3. Except as necessary for construction access, do not remove exterior closures until permanent construction is ready to be installed and made weathertight.
   4. Enclosures shall be constructed to prevent blow off during inclement weather, and shall be sealed to prevent water penetration and excessive air infiltration.

B. Interior Closures:
   1. Provide temporary closures to prevent penetration of dust and moisture into occupied areas separate from work areas, damage to operating systems and components, and to create environmental conditions necessary for the proper installation of materials and systems.

C. Installed construction which has been damaged due to lack of protection shall be replaced or restored to original or new condition.

1.9 PROTECTION OF INSTALLED WORK

A. Provide temporary protection for installed work, including protection from impact, water, dust contamination, overspray, and similar damage.

B. Secure temporary protections as necessary to prevent blow off during inclement weather.

C. Provide protective coverings at exposed exterior walls and horizontal surfaces, projections, and window and door openings.

D. Protect finished surfaces from damage caused by traffic, movement of heavy objects, and storage of materials. Where necessary, control traffic in immediate area as necessary to minimize the risk of impact damage.

E. Prohibit traffic and storage on waterproofed and roofed surfaces, on lawn and landscaped areas.

F. Installed construction which has been damaged due to lack of protection shall be replaced or restored to original or new condition.

1.10 SECURITY

A. Provide security program and facilities to protect Work, materials stored off-site, and Owner's operations from unauthorized entry, vandalism, and theft. Coordinate with Owner's security program.

1.11 SAFETY

A. Furnish safety program and facilities to protect the safety of workers and other persons affected by the Work.

1.12 SITE WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide and operate pumping equipment.

1.13 TEMPORARY CONTROLS

A. Fire Sprinkler Supervision/Control:
   1. Prior to the time of installation of finish materials such as carpet, wall panels, delivery of case work to the site, and other similar conditions, provide temporary tamper and water flow supervision monitoring of the fire sprinkler system.
   2. System shall be monitored, via temporary telephone lines, by a UL listed central station. Contractor shall be responsible to make arrangements for monitoring the system.
   3. Perform temporary monitoring up to time of building acceptance by the Owner, or building turn-over, whichever is later.

B. Dust Control:
   1. Provide positive methods and apply dust control materials to minimize raising dust from construction operations, and provide positive means to prevent airborne dust from dispersing into the atmosphere.
   2. Provide temporary dust-proof partitions to protect public areas, occupied spaces, and adjacent mall areas.

C. Water Control:
   1. Comply with applicable jurisdictional requirements regarding water usage, conservation, detention, pollution, and permits.
   2. Provide methods to control surface water to prevent damage to the Project, the site, or adjoining properties.
   3. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff.
   4. Provide, operate and maintain pumping equipment of adequate capacity to control surface water, including water accumulated during excavation operations, below grade.
   5. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

D. Construction Waste Control:
   1. Maintain all areas under Contractor's control free of debris.
   2. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and haul routes.
   3. Schedule periodic collection and disposal of debris to a legal off-site location.
   4. Provide additional collections and disposals of debris whenever the periodic schedule is inadequate to prevent excessive accumulation.
   5. Clean interior areas prior to start of the finish work. Maintain the areas free of dust and other contaminants during finishing operations.
   6. Comply with requirements of Section 017421.

E. Pollution Control: Provide methods, means and facilities required by law to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.

F. Noise Control:
   1. Construction operations must be performed in accordance with local regulations, ordinances, and jurisdictional Code authorities.
   2. Use of private radios and other similar portable sound equipment is prohibited.

G. Smoking, Eating, and Drinking: These activities shall be permitted only in designated locations selected by the Contractor; these activities are not permitted in interior spaces after carpeting and fixtures arrive on site.

1.14 CLEANING DURING CONSTRUCTION

A. Control accumulation of waste materials and rubbish on a daily basis, and dispose of off-site or in a designated container on site. Conform to Construction Waste Management and Disposal requirements specified in Section 017421.

B. Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

C. Remove excess debris from cavities which are to be concealed in the finished Work.

1.15 PROJECT IDENTIFICATION

A. Provide 8 x 6 foot Project identification sign of wood frame and exterior grade plywood construction, painted, with exhibit lettering by professional sign painter, or pre-cut vinyl self-adhesive letters, to Architect's design and colors. List title of Project, names of Owner, Architect, professional consultants, Contractor and major subcontractors. Erect on site at location established by Architect.

1.16 FIELD OFFICES AND SHEDS

A. Field Office:
   1. Office: Weather-tight, with lighting, electrical outlets, heating, cooling, and ventilating equipment, and equipped with furniture. Provide, in addition, space for Project meetings, with table and chairs to accommodate 6 persons.
   2. Equipment:
      a. Copier: Contractor's option; 11 x 17 inch size capability.
      b. Facsimile Machine: Contractor's option. Connect to public phone lines as required for communication with Architect’s office and Contractor's home office.
      c. Communication Service
         1) Minimum one dedicated telephone line with instrument.
         2) Minimum one dedicated telephone line for facsimile machine.
         3) An Internet Service Provider (ISP) account.
         4) Com ISDN LAN modem or Office Connect
         5) Remote Dual Analog Router (analog or ISDN depending on telephone company service), or approved, for use and communication with Internet Service Provider (ISP).
      d. Computer: Minimum one Pentium PC with minimum 128 MB of RAM, including the following.
         1) Windows XP and Microsoft Office 2003, or later; Internet Explorer V6.0 or later.
         2) Adobe Acrobat Exchange 6.0, or later, at least one station for initiating documents.
         3) Adobe Acrobat Reader.
      e. Printer: Minimum 11x17 inch graphics capability.

B. Storage Sheds for Tools, Materials, and Equipment: Weather-tight, with heat and ventilation for Products requiring controlled conditions, with adequate space for organized storage and access, and lighting for inspection of stored materials.

1.17 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required. Conform to Construction Waste Management and Disposal requirements specified in Section 017421.

B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of 2 feet; grade site as indicated.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Products.
   2. Transportation and handling.
   3. Storage and protection.
   4. General installation requirements.
   5. Product options.
   6. Substitutions.

B. Related Sections:
   1. 011000 - Summary: Owner-furnished products.
   2. 014500 - Quality Control: Submittal of manufacturers' certificates.
   3. 006325 - Substitution Request Form.
   4. 017700 - Closeout Procedures: Systems demonstration, operation and maintenance data, warranties and guarantees, spare parts and maintenance materials.

C. This Section applies to all Technical Specification Sections, and supplements the General and Supplementary Conditions.

1.2 PRODUCTS

A. Products include material, equipment, and systems.

B. Comply with size, make, type, and quality specified, unless otherwise approved in writing by the Architect. Specifications and referenced standards are minimum requirements.

C. All components required to be supplied in quantity shall be identical, whether furnished under one or several Sections of the specifications.

D. Unless specified or indicated otherwise, materials employed for construction purposes, such as formwork, scaffolding, and temporary lighting, shall not be incorporated into the work.

E. Unless indicated or specified otherwise, all products incorporated into the Work shall be of the most suitable grade of their respective kinds for the intended use.

1.3 TRANSPORTATION AND HANDLING

A. Transport by methods to avoid product damage.

B. Deliver products in manufacturer's original containers or packaging, with identifying labels intact and legible. Where options exist, select container or packaging systems that can be recycled or reused.

C. Furnish equipment and personnel to handle products by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

E. Immediately replace non-conforming products with new conforming products, at no additional cost to the Owner.

1.4 STORAGE AND PROTECTION

A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.

B. Store sensitive products in weather-tight enclosures. Maintain within temperature and humidity ranges required by manufacturer's instructions, and as otherwise required to prevent damage.

C. For exterior storage of fabricated products, place on sloped supports above ground. Protect from soiling or staining through ground contact. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

E. Arrange storage of products to furnish convenient access for inspection and inventory.

1.5 GENERAL INSTALLATION REQUIREMENTS

A. Unless indicated or specified otherwise, install each product in accordance with the product manufacturer's instructions.

B. Distribute copies of manufacturer's instructions to parties involved in the installation.

C. Maintain one set of complete instructions at the job site during installation and until completion.

1.6 PRODUCT OPTIONS

A. Product Specified by Reference Standards or by Description Only: Provide product meeting those standards.

B. Product Specified by Naming One or More Manufacturers with an "or approved" provision: Use specified product or submit a request for substitution in accordance with the specified substitution requirements. When approved a substitute product may be used.

C. Product Specified by Naming One or More Manufacturers, without a provisions for Substitution: No substitution will be allowed, except as specified under the Article on Substitutions.

1.7 SUBSTITUTIONS

A. Timing: Substitution requests will be considered to 15 days after date Notice to Proceed only for the following reasons:
   1. A product becomes unavailable due to no fault of the Contractor.
   2. Subsequent information or changes indicate that the specified product will not perform as intended.
   3. A substitute product will be in the Owner's best interest.

B. Substitution requests shall be submitted only through the General Contractor.

C. Documentation:
   1. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
   2. Requests for substitution shall be made on Document 006325 - Substitution Request Form.
   3. Limit each request to one proposed product or system.
   4. For substitutions prior to Agreement, signature and projected cost data are not required.

D. Request for substitution constitutes a representation that the proposer:
   1. Certifies that the proposed substitute item has been fully investigated and has been determined to be equal or superior to that specified in all respects.
   2. Certifies that the same or greater warranty will be furnished
   3. Certifies that required maintenance service and source for replacement parts are available
   4. Certifies that incorporation of the proposed substitute item will not affect functional clearances.
   5. Warrants that coordination, installation, and changes to the project as necessary to accommodate the proposed substitution shall be the Contractor's responsibility, that use of the substitute item(s) will not delay project completion
   6. Warrants that claims for additional costs related to its incorporation which may become subsequently apparent will be borne by the Contractor.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals.

F. Review: The Architect will be the judge of the acceptability of the proposed substitution; in the judgment of Architect the product shall meet the following criteria:
   1. It is equal or superior in quality and serviceability to the specified product.
   2. Its use will not entail unacceptable changes in details and construction of related work.
   3. Its design and artistic effect complies with design concept.

G. The Architect will review requests for substitutions with reasonable promptness, and request additional information, documentation, or samples, as necessary for evaluation of the request. Within two weeks of receipt of the completed request, the Architect will take one of the following actions.
   1. If the substitution is allowed by the Architect prior to the cutoff date, an Addendum to the Bid Documents will be issued by the Architect.
   2. If the substitution is allowed by the Architect after the cutoff date, the Architect will notify the General Contractor and issue the appropriate Construction Change Authorization, Supplemental Instruction, or Proposal Request.
   3. If the request for substitution is denied, the proposer will be notified of the rejection. If a decision on the substitution request cannot be made or obtained within the time allocated, use the specified product.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Construction waste management requirements.

B. Related Sections:
1. 015000 – Construction Facilities and Controls.

C. This Section applies to all Technical Specification Sections, and supplements the General and Supplementary Conditions.

1.2 DEFINITIONS

A. Commingled or Off-site Separation: Collecting all material types into a single bin or mixed collection system and separating the waste materials into recyclable material types in an off-site facility.

B. Construction, Demolition and Land Clearing Waste (CDL): For purpose of this section, includes all non-hazardous solid wastes such as building materials, packaging, rubbish, debris and rubble resulting from construction, remodeling, alterations, repair, deconstruction, demolition and land clearing.

C. Deconstruction; The process of removing existing building materials from renovation and demolition projects for the purposes of reuse, and recycling, in as efficient and safe manner as possible.

D. Hazardous Waste: As defined by the state where the Project is located.

E. Proper Disposal: As defined by the jurisdiction receiving the waste.

F. Recyclable Materials: Products and materials that can be recovered and remanufactured into new products.

G. Recycling: The process of sorting, cleaning, treating and reconstituting materials for the purpose of using the material in the manufacture of a new product. Can be conducted on site (as in the grinding of concrete for reuse on site).

H. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of a new product. Recycling facilities have their own specifications for accepting materials.

I. Salvage and Reuse: Existing usable product or material that can be saved and reused in some manner on the project site. Materials that can be salvaged and reused on site must comply with the applicable technical specifications.

J. Salvage for Resale: Existing usable product or material that can be saved and removed intact (as is) from the project site to another site for resale to others without remanufacturing.

K. Source-Separated Materials: Materials that are sorted at the site for the purpose of reuse or recycling.

L. Sources Separation: Sorting the recovered materials into specific material types with no or a minimum amount of contamination on site.

M. Time-Based Separation: Collecting waste during each phase of construction or deconstruction that results in primarily one major type of recovered material. The material is removed before it becomes mixed with the material from the next phase of construction.

N. Trash: Product or material unable to be salvaged for resale, salvaged and reused, returned, or recycled.

O. Waste: Excess materials generated by the construction and demolition operations of the Project that are produced on site or brought to the site. Waste includes, without limitation, packaging materials such as banding, crates, pallets, plastic film, polystyrene, and cardboard. Waste does not include excavated soils, rocks, vegetation, and hazardous waste removed from the site

1.3 WASTE MANAGEMENT REQUIREMENTS

A. Salvage, recycle, and reuse a minimum of 50% of construction and demolition waste material generated by the Project.

B. Minimize the creation of construction and demolition waste on the job site. Minimize factors that contribute to waste, such as excess packaging, improper storage, ordering errors, poor planning, breakage, mishandling, and unnecessary contamination.

C. The following waste materials may be diverted from landfill to the greatest extent possible to meet the specified requirements:
   1. Clean dimensional wood, pallet wood, plywood, OSB, and particleboard
   2. Asphalt.
   3. Concrete
   4. Concrete masonry units
   5. Brick
   6. Ferrous and non-ferrous metals
   7. Gypsum products.
   8. Acoustical ceiling tile.
   9. Glass, both window and bottle.
   10. Plastics, including plastic film.
   11. Carpet and pad.
   12. Cardboard, paper, paper-based packaging
   13. Insulation
   14. Batteries.
   15. Paint.

D. Hazardous materials such as paints, solvents, adhesives, batteries, and fluorescent light bulbs and ballasts which cannot be reused shall be disposed of at authorized hazardous waste outlets.

1.4 CONSTRUCTION WASTE MANAGEMENT PLAN

A. Develop and submit to the Architect a Construction Waste Management Plan narrative. Revise and resubmit the Plan until approval is obtained.

B. Unless approved otherwise, no waste generating construction work may proceed until the Construction Waste Management Plan is approved. Approval of the Contractor's Construction Waste Management Plan will not relieve the Contractor of responsibility for meeting the waste management goals specified.

C. The Construction Waste Management Plan shall include the following:
   1. A list of waste materials that will be salvaged for resale, salvaged for reuse, recycled, and disposed.
   2. Estimated quantities of each waste material.
   3. Description of waste handling methods to be used, including one or more of the following:
      a. Requiring subcontractors to take their waste to a recycling facility.
      b. Contracting with diversion/recycling hauler to haul recyclable waste to an approved recycling or material recovery facility.
      c. Processing and reusing materials on-site.
      d. Self hauling to a recycling or material recovery facility.
   4. Name, address and phone number and qualifications of each proposed diversion/recycling hauler that will be used in the Project.
   5. Identification of each recycling or material recovery facility to be utilized.
   6. Description of the method to be employed in collecting, and handling, waste materials, including a description of the methods that will be used to protect recycled materials from contamination.
   7. Description of the means of transportation of waste materials.
   8. Description of methods to communicate waste management plan to personnel and subcontractors.

D. Calculation shall be done by weight (tons) or by volume (cubic yards) but shall be consistent throughout.

E. Include the Construction Waste Management Plan with the Submittal Template to obtain the LEED credits specified below.

F. Implement procedures to communicate the construction waste management plan to personnel and subcontractors.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with applicable requirements of the jurisdictional authorities, local ordinances and regulations concerning management of construction waste, clearing, and inert materials.

B. Preconstruction Meeting:
   1. Prior to beginning work at the site, schedule and conduct a meeting to review the Waste Management Plan and discuss procedures, schedules, coordination and specific requirements for waste materials recycling and disposal.
   2. Discuss coordination and interface between Contractor, sub-contractors, architect, engineers, project manager, Owner, and other C&D activities. Identify and resolve problems of compliance with requirements.
   3. Record minutes of the meeting, identifying conclusions reached and matters requiring further resolution. Maintain waste management as an agenda item at future construction meetings.
   4. Attendees: Contractor and related contractor personnel associated with work of this section, including personnel in charge of the waste management program; C&D Quality Manager; architect; engineers; material and equipment suppliers where appropriate; and such additional Owner personnel as Owner deems appropriate.
   5. Plan Revision: Make revisions to C&D Waste Management Plan agreed upon during the meeting and incorporate resolutions agreed to be made subsequent to the meeting. Submit revised plan to architect or the Owner personnel, as Owner deems appropriate for approval.

C. Progress Meetings: Waste management goals and issues shall be discussed at regularly scheduled progress meetings as specified in Section 013119 Project Meetings.

D. Disposal Site, Recyclers and Waste Materials Processors: Use only facilities properly permitted in the State where the Project is located, and/or by local authorities where applicable.

PART 2 - PRODUCTS

2.1 WASTE CONTAINERS

A. Durable, covered, secured, reusable container for each category or waste.

B. All recycling containers shall be clearly marked and shall list the materials which can be recycled as well as appropriate materials which cannot.

PART 3 - EXECUTION

3.1 PROJECT / SITE CONDITIONS

A. Use construction methods that reduce construction waste. When possible:
   1. Order materials precut to required size.
   2. Order exact quantity required.
   3. Use temporary materials and facilities that will be reused at other projects.

B. Field Measurements: Contractor is to verify that field measurements are as indicated on construction and/or shop drawings before confirming product orders or proceeding with work, in order to minimize waste due to excessive materials.

C. Protect products from damage during storage, installation and in-place. Materials that become wet, damp or unusable for any reason due to improper storage shall be replaced at the Contractor’s expense.

D. Request or require products delivered to the Site with packing materials that can be returned to sender, reused by others, or easily recycled.

E. Use detailed take-offs to identify location and uses in structure to reduce risk of unplanned and potentially wasteful cuts.

3.2 PACKING AND SHIPPING

A. Shipping: Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Packing: Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.3 CUTTING AND PATCHING

A. Use on-site waste as primers, sealers, underlayments, supports, backing, blocking, furring, suspension systems, and accessories as required for any purpose in patching existing work.

B. Provide environmentally benign non-hazardous or recycled content materials for cutting and patching.

END OF SECTION

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Closeout procedures.
   2. Final cleaning.
   3. Project record documents.
   4. Operation and maintenance data.
   5. Operation instruction.
   6. Manufacturer's warranties.
   7. Guaranties.
   8. Spare parts and maintenance materials.

B. Related Sections:
   1. 011000 - Summary: Partial Owner occupancy.
   2. 015000 - Temporary Facilities and Controls: Cleaning during construction.
   3. 017421 - Construction Waste Management and Disposal: Construction waste management plan.
   4. Division 23 and 26 for special closeout requirements for mechanical and electrical systems.

C. This Section applies to all Technical Specification Sections, and supplements the General and Supplemental Conditions.

1.2 CLOSEOUT PROCEDURES

A. Comply with procedures stated in General Conditions of the Contract for Substantial and Final Completion.

B. Submit all certificates of approval issued by the governing authorities, including, without limitation, the following:
   1. Certificate of occupancy.

C. Prior to final payment, submit the following affidavits using the forms listed below:
   1. Contractor's Affidavit of Payment of Debts and Claims AIA Document G706.
   2. Consent of Surety to Final Payment AIA Document G707.
   3. Contractor's lien release, and lien releases from each subcontractor; Contractor's Affidavit of Release of Liens AIA Document G706A

D. Submit final Application for Payment identifying total adjusted contract sum, previous payments, and sum remaining due.

E. Submit building permit documents and building inspection signoff sheets to the Owner.

1.3 FINAL CLEANING

A. Execute prior to final inspection.

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

C. Clean equipment and fixtures to a sanitary condition.

D. Clean or replace filters of mechanical equipment.

E. Clean roofs, gutters, downspouts, and drainage systems.

F. Clean site; sweep paved areas, rake clean other surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site. Conform to Construction Waste Management and Disposal requirements specified in Section 017421.

1.4 PROJECT RECORD DOCUMENTS

A. Maintain a complete set of record documents which clearly and neatly indicate all changes from the Contract Documents, and all uncovered existing conditions which will be subsequently concealed.

B. Record documents shall include:
   1. Contract drawings.
   2. Specifications.
   3. Reviewed shop drawings, product data, and samples

C. Record documents shall be used for no other purpose and shall be stored separate from those used for construction.

D. Keep documents current; do not permanently conceal any work until required information has been recorded.

E. Mark specifications legibly and record at each Product section a description of actual products installed. Include the manufacturer's name and product model and number.

F. Drawings shall indicate exact installed locations and dimensions of all concealed work, including, without limitation, conduit, piping, ducts, mechanical and electrical equipment, and foundations. Indicate all changes to details which involve concealed construction.

G. Prior to approving each Payment Request, the Architect reserves the right to inspect the Record Documents. The Payment Request may not be approved until the record documents are current to the Date of the Payment Request.

H. At Contract Closeout, submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

1.5 OPERATION AND MAINTENANCE DATA

A. Furnish published operation and maintenance information covering all equipment and finish materials installed on the project. Whether specified or not, furnish published information whenever special maintenance procedures are required to assure the proper operation and durability of project material, equipment, and finishes.

B. Number of copies: Unless otherwise specified, submit four of each at time of project substantial completion.

C. Submit operation data and maintenance data bound in a three ring binder. Include divider tabs to separate data for each component. Include name of Project, Contractor, and Architect.

D. Information shall be submitted by the General Contractor through the Architect.

1.6 OPERATION INSTRUCTION

A. Prior to Final Completion, instruct Owner’s personnel in operation, adjustment, and maintenance of products, equipment and systems. Provide instruction at mutually agreed upon times.

B. Use experienced personnel trained and experienced in the operation and maintenance of the building equipment or system involved.

C. Use operation and maintenance manuals for each piece of equipment or system as the basis of instruction. Review contents in detail to explain all aspects of operation and maintenance.

D. Refer to the individual technical Sections for additional requirements for instruction of Owner’s personnel.

1.7 MANUFACTURER'S WARRANTIES

A. Furnish original and duplicate copies of each manufacturer warranty executed to the Owner.

B. Execute Contractor's submittals to the manufacturers, and assemble documents executed by the manufacturers.

C. Provide table of contents and assemble in binder with durable plastic cover.

D. Submit material prior to final application for payment in accordance with Section 013300. For equipment put into use with Owner's permission during construction, submit warranty within 10 days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, furnish warranty within ten days after acceptance, listing date of acceptance as start of warranty period.

1.8 GUARANTIES

A. Furnish written guaranty, executed to the Owner, on work covered by the additional guaranty requirements specified in the technical sections. The guaranty shall commence on the date of Owner acceptance of that portion of the work.

B. Transmit through the Architect in accordance with Section 013300.

1.9 SPARE PARTS AND MAINTENANCE MATERIALS

A. Furnish products, spare parts, and maintenance materials in quantities specified in each Section, in addition to that used for construction of Work. Coordinate with Owner, deliver to Project site and obtain receipt prior to final payment.

B. Unless specified otherwise, deliver materials in manufacturer’s original factory cartons or containers.

C. Materials shall be clearly labeled, and shall include designations used in the Contract Documents.

1.10 KEYS

A. Deliver properly identified and tagged keys and hardware maintenance tools to the Owner, including those specified in Sections083100 and 087100.

B. Obtain itemized receipt for all keys and tools.

C. Send all master keys by registered mail directly from manufacturer to Owner's representative as later directed.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cast-in-place concrete.
   2. Concrete accessories.
   3. Formwork, shoring, bracing, and anchorage.
   4. Concrete reinforcement.
   5. Underslab vapor retarder.
   6. Concrete Sealer.

B. Related Sections:
   1. 003152 - Testing and Inspection Services: Owner paid testing and inspections.
   2. 079200 - Joint Sealants: Expansion joint fillers.
   3. 312000 - Earth Moving: Fill under slabs on grade.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Concrete Institute (ACI):
   1. 117 - Standard Specification for Tolerances for Concrete Construction and Materials.
   2. 301-05 - Specifications for Structural Concrete.
   3. 315 - Details and Detailing of Concrete Reinforcement.

B. American Society for Testing and Materials (ASTM):
   1. A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
   2. C33 - Specifications for Concrete Aggregates.
   3. C94 - Specifications for Ready Mixed Concrete.
   4. C132 - Test for Slump of Portland Cement Concrete.
   5. C150 - Specification for Portland Cement.
   6. C156 - Test Method for Water Retention by Concrete Curing Materials.
   7. C171 - Specification for Sheet Materials for Curing Concrete.
   8. C260 - Specifications for Air-Entraining Admixtures for Concrete.
   9. C309 - Specification for Liquid Membrane Forming Compounds for Curing Compounds.
   10. C494 - Specifications for Chemical Admixtures for Concrete.
   11. C618 - Specification for Fly Ash and Raw or Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
   12. C939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete
   13. C1107 - Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
   14. C1315 - Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
   15. D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
   16. E1155 - Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Submit data for each accessory, admixture, and curing material proposed for the work.

C. Shop Drawings:
   1. Reinforcing:
      a. Detail reinforcing in accordance with ACI 315. Indicate reinforcement sizes, spacings, locations and quantities of reinforcing, bending and cutting schedules, splicing, and supporting and spacing devices.

b. Indicate embedded items.
2. Slab Layouts: Dimension locations of control, expansion, and construction joints. Relate to building grid lines.

D. Quality Control Submittals:
1. Mix Designs: Prior to concrete work, submit mix designs for approval.
2. Test Results: Submit test results per ASTM C311 performed less than 6 months prior to use for approval by Architect.
3. Certifications: Submit mill certificates for cement, aggregates, and reinforcing.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Concrete work is subject to special testing and inspection as specified in 014500. Notify Architect at least 48 hours before concrete is poured.

C. Pre-Installation Conference:
1. At least 35 days prior to start of concrete work the Contractor shall hold, in accordance with Section 013119, a meeting to review the detailed requirements of the concrete design mixes and to determine the procedures for producing proper concrete construction.
2. Required in attendance:
a. Contractor's superintendent.
b. Testing Laboratory representative.
c. Concrete subcontractor.
d. Ready-mix producer.
e. Admixtures manufacturer's representative.
f. Architect/Engineer
g. All subcontractors with work to be installed in, or affected by concrete work.
3. Notify Architect 10 days prior to the scheduled date of the meeting.
4. Agenda: Include the following.
a. Installation scheduling and coordination; scheduling of mock-up construction and review.
b. Classes of concrete required; mix designs; applicable references.
c. Formwork.
d. Reinforcement and placement.
e. Climatic conditions; hot and/or cold weather concreting procedures (as appropriate); unusual placing conditions.
f. Substrate preparation; placement methods; construction joints.
g. Flatwork; flatness and levelness requirements; finishing; criteria for acceptance; remedies.
h. Curing and protection procedures
i. Site quality control; inspection and testing requirements.
j. Sealers; locations and coverage rates

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Unless specified otherwise, conform to ACI 301.

B. Plywood:
1. APA rated High Density Overlay or Medium Density Overlay, Plyform Class 1. EXT.

C. Form Ties: Snap-off metal; metal washer ends.

2.2 REINFORCING

A. Reinforcing Steel: Types as indicated on the structural drawings.

B. Chairs, Bolsters, Bar Supports, and Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150, normal - Type 1 Portland, grey color.

B. Fly Ash: ASTM C618, Class C or F; loss on ignition (LOI) not to exceed 1 percent. Use fly ash from one single source for the whole Project.

C. Normal Weight Fine and Coarse Aggregates: ASTM C33; severe weather exposure.

D. Water: ASTM C94, para. 5.1.3

2.4 ADMIXTURES

A. Air-Entrainment: ASTM C 260; Master Builders Inc. "Micro-Air" or "MBVR", Euclid Chemical Co. "Air Mix," or approved.

B. Water Reducer Normal: ASTM C 494, Type A; Master Builders Inc. "Pozzolith/Polyheed," Euclid Chemical Co. "Eucon WR 75," or approved.

C. High Range Water Reducer (Superplasticizer): ASTM C 494, Type F or G and shall be of the second or third generation type. Shall be batch plant added, extend plasticity time, reduce water 20 to 30 percent. Master Builders Inc. "Rheobuild," Euclid Chemical "Eucon 37," or approved.

D. Accelerator: ASTM C 494, Type C or E, non-corrosive, non-chloride; Master Builders "Pozzutech 20," Euclid Chemical Co. "Accelgard 90," or approved.

E. Set Retarder: ASTM C494, Type B.

2.5 ACCESSORIES

A. Bonding Agent: Acrylic type; Sonneborn "Sonnocrete", W.R. Grace "Duraweld C", Euclid Chemical Co. "Flex-con", or approved.

B. Non-Shrink Grouts: ASTM C1107, Grade B; non-shrink non-catalyzed natural aggregate grout; minimum compressive strength of 7000 PSI at 28 days; 25 to 30 second flow when tested in accordance with ASTM C939 at 45 to 90 degrees F; cement gray in color; Master Builders Inc. "Masterflow 928," Euclid Chemical Co. "HiFlow Grout," or approved.

C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces when applied to forms or form liners.

D. Curing Materials:
   1. Waterproof Sheet Material: Waterproof paper in accordance with ASTM C171; reinforced waterproof kraft paper; white color at exterior applications; Burke Kraft Curing Paper Type I-SK-30, or approved.
   2. Mats and Burlap: Fabric covering composed of quilted polyethylene sheeting laminated to outer covering of burlap, cotton, or other approved fabric; outer covering shall weigh not less than 6 ounces per square yard.
   3. Curing Compound: ASTM C309; clear or translucent with fugitive dye; moisture loss not more than 0.055 gr./sq.cm. when tested in accordance with ASTM C156 and applied in a single coat at the manufacturers recommended rate. Euclid Chemical Co. "SuperFloor Coat" or "Floorcoat," or approved.
   4. Curing/Sealing Compound: ASTM C309; water based curing compound; Euclid Chemical Company "Aqua-Cure," Sonneborn "Kur-N-Seal WB," Burke by Edoco "Spartan-Cote WB II," or approved.

E. Underslab Vapor Retarder: ASTM E1745, Class A; one of the following:
   1. "Stego Wrap 15 Mil Vapor Barrier" by Stego Industries, LLC (877-464-7834).
   2. "Vapor Block 15" by Raven Industries (800-635-3456).
   3. "Griffolyn 15 Mil Green" by Reef Industries, Inc. (800-231-6074).
   4. “Perminator 15 Mil” by WR Meadows, Inc. (847-214-2100)
   5. “Florprufe 120” by WR Grace (866-333-3726).

F. Prefabricated Slab Construction Joints: Burke by Edoco "Keyed Kold Joint," with splice plates, stakes, and driving accessories, or approved; depth 1/2 inch less than slab thickness, galvanized sheet metal tongue and groove joint form, with knockouts for passing reinforcing bars through.

G. Preformed Joint Fillers:
   1. Non-extruding type; ASTM D1751; Sonneborn "Expansion Joint Filler," WR Meadows "Sealtight Fiber", " Burke by Edoco "Fiber expansion Joint," or approved.
   2. Joint Cap: Strippable plastic type; W.R. Meadows "SealTight Snap-Cap", Burke by Edoco "Joint Cap", or approved; width to match expansion joint filler material.

H. Finishing Aid: Evaporation retardant for preventing rapid drying during hot windy weather, Master Builders "Confilm."

2.6 CONCRETE MIX

A. Mix concrete in accordance with ASTM C94, and in accordance with the requirements indicated on the structural drawings.

B. Concrete at slabs on grade shall have a maximum water/cement ration of 0.45.

C. Admixtures:
   1. All concrete shall contain the specified water reducing or high range water reducing admixture, except concrete with a required water/cement ratio of 0.45 or lower shall contain a high range water reducing admixture.
   2. All concrete required to be air entrained shall contain air entraining admixture to produce 4% to 6% air.
   3. All concrete placed in ambient temperatures from 40 degrees F to 20 degrees F, and all slab concrete placed in ambient temperatures below 50 degrees F, shall contain an accelerator at the manufacturer's required dosage.
   4. All concrete placed in ambient temperatures of 90 degrees F or above, shall contain a set retarder at the manufacturer's required dosage.

D. Provide 28 day compressive strengths as indicated on the Structural Drawings. Where not indicated on the Structural Drawings, provide minimum 3000 psi compressive strength unless indicated otherwise.

E. Maximum amount of fly ash is indicated on the Structural Drawings.

2.7 REINFORCEMENT FABRICATION

A. Fabricate as indicated and in accordance with ACI 315.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 FORMWORK ERECTION

A. Verify lines, levels, and measurement before proceeding with formwork. Align form joints.

B. Use plywood forms, unless other systems are approved by the Architect.

C. Use form coating on forms in accordance with the manufacturer's recommendations. Verify that form coatings will not affect the bond of subsequent concrete surface treatments.

D. Coordinate with work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

E. Tolerances: Comply with ACI 117.

F. Where earth forms are used, hand trim sides and bottoms of earth forms. Remove loose dirt.

3.3 REINFORCEMENT

A. Place, support, and secure reinforcement against displacement.

B. Locate reinforcing splices not indicated on the drawings at points of minimum stress.

C. Provide laps and concrete cover as indicated in the Drawings.

3.4 UNDERSLAB VAPOR RETARDER

A. Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions under all interior slabs-on-grade.

B. Lap and seal all seams a minimum of 6 inches, seal around all penetrations, lap and seal against foundation walls and footings with manufacturer’s recommended sealing tape or mastic.

3.5 PLACING CONCRETE

A. In accordance with ACI 301.

B. Bonding Agent: Mix thoroughly and apply strictly in accord with the manufacturer's instructions; do not use when ambient temperature is below 45 degrees F. Place concrete in contact immediately while bonding agent is still tacky.

3.6 SUBSEQUENT TREATMENT FOR FORMED SURFACES

A. Provide smooth form finish for concrete to remain exposed in the finished work; rough form finish for concrete to remain concealed in the finished work.

3.7 SLABS

A. Expansion Joints for Slabs on Grade:
   1. Place expansion joints at locations indicated and where exterior slabs abut concrete walls, the building perimeter, and other fixed objects abutting or within the slab area. At exterior sidewalks, place expansion joints at maximum 20 foot intervals unless otherwise indicated.
   2. Form joints 1/2 inch wide x full depth of slab.
   3. Form expansion joints with preformed joint filler. Install strippable joint at joints to receive sealant specified in Section 079200.
   4. Tool expansion joints to 1/4 inch radius.
   5. Discontinue reinforcing at the expansion joint.
   6. Place perpendicular to longitudinal axis of wall and curbs. Where possible, make joints of curbs coincide with joints in walks.

B. Control Joints for Slabs on Grade:
   1. Make joints straight; perpendicular or parallel to building lines and slab edges, as appropriate.
   2. Control joints shall be saw cut or tooled, unless indicated otherwise.
   3. Radius tooled control joints to match expansion joints.
   4. Control joints shall penetrate the slab a minimum of 1/4 the thickness of the slab and shall be 3/16 inch in width minimum; 1/4 inch width in sidewalks.
   5. Space control joints at the locations indicated, except when not indicated locate in at 32 times the slab thickness. At exterior sidewalks, place control joints at maximum 5 foot intervals .
   6. Align joints with column lines when ever possible. Joints shall form rectangular panels with the long side less than 1-1/2 times the length of the short side. Provide circular or diamond shaped joint lines around columns. Locate control joints at reentrant corners. Coordinate with placement of joints in tile surfaces.

C. Construction Joints: Place at either expansion or control joint locations for slab on grade construction.

D. Curing:
   1. Moisture cure all concrete for a minimum of 7 days, unless approved or specified otherwise.
   2. Use curing/sealing compound on concrete slabs scheduled to receive sealer.
   3. A curing compound may be used on all exterior slabs, sidewalks, and curbs.

4. Use waterproof sheet material, mats or burlap at surfaces to receive subsequent bonded finish materials, including concrete stain and sealing compound. A curing compound may be used on surfaces to receive subsequent bonded finish materials, provided the curing compound is approved in writing by the manufacturer of the adhesive or the bonding finish material. Curing compound may also be used on surfaces to receive subsequent bonded finish materials, provided the curing compound is removed with shot blasting or other approved method prior to installation of bonded materials.
5. Apply curing compounds and curing/sealing compounds in accordance with the manufacturer's recommendations.
6. Maintain concrete temperatures above 50 degrees F.

E. Finishes:
1. Full Trowel finish interior floor slab surfaces, unless specified otherwise.
2. Light steel trowel finish interior floor slab surfaces scheduled to receive tile, carpet, or other similar bonded materials.
3. Broom finish exterior slabs, sidewalks, and curbs.

F. Curing/Sealing Compound: Apply a second coat of curing/sealing compound to concrete slabs scheduled to receive sealer. Clean floor and apply just prior to substantial completion. Apply in accordance with the manufacturer's recommendations.

G. Tolerance: Provide Random Traffic floor tolerances as follows, when measured in accordance with ASTM E1155, including those floors to receive subsequent finishes.
1. Slab on Grade at exposed slab conditions: F_F 45, F_L 35, over test area; F_F 30, F_L 24, minimum local value.
2. Slabs on Grade to receive thinset flooring and resilient floor covering : F_F 35, F_L 25, over test area; F_F 24, F_L 17, minimum local value.
3. Slabs on Grade to receive carpet: F_F 25, F_L 20, over test area; F_F 17, F_L 15, minimum local value.

END OF SECTION

SECTION 035416 – HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Underlayments as necessary for leveling of new cast-in-place concrete slabs to meet specified tolerances.
   2. Ramps and tapers as necessary to correct levels between dissimilar finishes.

B. Related Sections:
   1. 030013 - Concrete: Slab tolerances.
   2. 093000 - Tiling: Substrate tolerance requirements.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Proposals for alternate products and methods for applications indicated may be considered by the Architect, subject to requirements of Section 016000, system performance requirements, and applicable requirements of this Section.

1.2 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Manufacturer's product data and installation instructions.

1.3 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in their original unopened packages and protect from freezing, direct sun exposure, and exposure to moisture.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Maintain surface and ambient temperature of between 50 and 80 degrees F for 24 hours before, during, and 24 hours after underlayment installation.

B. Keep traffic out of area in which underlayment is being applied or cured.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Self Leveling Underlayment System: Self-leveling, pourable, cement based material, minimum 28 day compressive strength 2,000 psi; minimum bond strength 200 psi; one of the following.
   1. Mapei Corporation "Ultraplan 1".
   2. Ardex Inc. "K-15" Self-Leveling Underlayment Concrete
   3. Laticrete International, Inc. "Laticrete 86 LatiLevel Thin Pour Underlayment."
   4. Laticrete International, Inc. "Laticrete 88 LatiLevel Thick Pour Underlayment."

B. Trowelable Underlayment System:
   1. Ardex Inc. "SD-P" Fast-Setting Underlayment.
   2. Laticrete International, Inc. "Laticrete 220 Medium Bed Mortar mixed with "Laticrete 3701 Latex Mortar Admix."
   3. Mapei Corporation "Mapacem 100" or "Planitop 10".
   4. Tamms Industries Co. "Thin Patch."

C. Accessories: Furnish primers, patching compounds, and sand fillers as recommended by the underlayment manufacturer for the conditions of the project.

2.2 MIXING

A. Thoroughly mix underlayment materials for each type of product in proper proportions to achieve smooth homogeneous mix, free of lumps.

PART 3 - EXECUTION

3.1 GENERAL

A. With the exception of areas where leveling can be accomplished by use of latex underlayment, as specified in other sections, install cementitious underlayment to concrete slabs as indicated on the Drawings, and as necessary to level slabs or bring substrates to proper elevation.

3.2 PREPARATION

A. Inspect floor to verify that demolition is complete to the point where work may progress.

B. Survey floor as necessary to set screeds and reference points. Identify construction, control, and expansion joints. Prepare for underlayment at all locations where floor does not meet specified tolerance requirements.

C. Ensure that subfloor is clean, dry, hard, sound, and free of oils, or other substance which would affect proper bonding and curing. Abrade or shotblast as necessary to achieve clean surface.Verify that all areas to be leveled are at or below final design elevation.

E. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions and responsibility for defective installation caused by prior observable conditions.

3.3 APPLICATION

A. Install trowelable underlayment at locations where slopes are indicated and at other locations as appropriate to installation conditions; install self leveling underlayment at other locations as necessary to correct slab flatness and levelness.

B. Set screeds, markers, and reference blocks. Set screeds at all construction and control joints to establish weakened plane joints in underlayment.

C. Install patching compounds in accordance with the manufacturer's recommendations. Where subsequent finishing of the material is required, float to level surface. Do not trowel.

D. Apply primer to all areas to receive underlayment; repeat application if necessary to achieve proper build.

E. Mix materials and pour or pump and squeegee into place to achieve appropriate thickness. Finish to a smooth level surface within tolerances specified for concrete floors.

G. Cure in accordance with the manufacturer's instructions.

H. Tolerances: As specified in Section 033013.

3.4 CLEANING

A. As work proceeds, clean up excess materials, rubbish, and splash.

END OF SECTION

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Elements indicated on the Structural Drawings, including the following:
      a. Structural steel.
      b. Shear connector studs and stud anchors.
      c. Structural welding.
      d. Baseplate grouting.
   2. Priming of structural steel.

B. Related Sections:
   1. 014500 - Quality Control: Requirements for testing and inspection.
   2. 030013 - Concrete: Placement of structural steel to be embedded in concrete.
   3. 054000 - Cold-Formed Metal Framing; Lightgage structural elements.
   4. 055000 - Metal Fabrications: Steel fabrications not indicated on the Structural Drawings.
   5. 099000 - Painting: Field painting of structural steel elements.

C. Drawings, the provisions of the Agreement Conditions of the Contract, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Institute of Steel Construction (AISC):
   1. Specification for Structural Steel Buildings, 2010.
   2. Code of Standard Practice for Steel Buildings and Bridges, 2010.
   3. Manual of Steel Construction, 14th Edition 2010.
   4. Specifications for Structural Joints Using ASTM A325 or A490 Bolts, 2014.

B. American Society for Testing and Materials (ASTM):
   1. A36 - Structural Steel.
   2. A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. A569 - Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality.
   4. A572 - High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
   5. A992 - Standard Specification for Steel for Structural Shapes For Use in Building Framing
   6. C1107 - Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

C. American Welding Society (AWS): D1.1 - Structural Welding Code - Steel.

D. Steel Structures Painting Council (SSPC): "Steel Structures Painting Manual, Volume 2, Systems and Specifications."

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data:
   1. Shop applied primers.
   2. Non-shrink grout.

C. Shop Drawings:
   1. Indicate profiles, sizes, spacing, and locations of structural members, connections, attachments, fasteners, cambers, loads.
   2. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
   3. Indicate types and locations of field welds.
   4. Indicate members to be shop primed.

D. Quality Control Submittals:
   1. Certifications: Submit certification of materials with copies of mill reports for each heat of steel used.

1.4 QUALITY ASSURANCE

A. The work of this Section is subject to testing and inspection as specified in Section 014500.

B. Use only certified welders approved by the jurisdictional code authorities.

C. Unless specified or indicated otherwise, work shall comply with AWS and AISC Standards.

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL

A. Types as indicated on the Structural Drawings.

2.2 ACCESSORIES

A. Non-Shrink Grout: BASF "Masterflow 713 Plus," Sonneborn "Sonogrout," or approved; non-shrink, non-metallic grout in compliance with ASTM C1107.

B. Welding Electrodes: E-70 series, low hydrogen, appropriate for use.

C. Interior Primer: Modified alkyd type (VOC compliant); lead and chromate free; gray or white color; one of the following unless approved otherwise.
   1. "Azeron Primer Series 88HS" by Tnemec Company Inc. (Kansas City, MO; 816-483-3400).
   2. "Amercoat 5105" by Ameron Protective Coatings (Brea, CA; 714-529-1951).
   3. "Carbocoat 150HG" by Carboline Company (St. Louis, MO; 314-644-1000; 800-848-4645).

D. Exterior Primer:
   1. Special Zinc Primer: One of the following; provide product from same manufacturer selected for finish systems specified in Section 099000.
      a. “Series 394 PerimePrime" by Tnemec Company Inc. (Kansas City, MO; 816-483-3400).
      b. "Carbozinc 859" by Carboline Company (St. Louis, MO; 314-644-1000; 800-848-4645); organic zinc-rich epoxy primer.
      c. "68HS" by Ameron Protective Coatings (Brea, CA; 714-529-1951); organic zinc-rich epoxy primer.
      d. "Catha-Coat 302H" by ICI Devoe; "reinforced" inorganic zinc-rich epoxy primer.
   2. EpoxyTie Coat: Tnemec Series N69 Epoxoline, or approved.

2.3 FABRICATION

A. Fabricate structural steel items in accordance with AISC and AWS Standards and in accordance with approved shop drawings. Properly mark and match-mark all materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling.

B. Shop Assembly: Fabricate units in as large a part or section as practicable.

C. Structural Steel to be Exposed in the Finished Work:
   1. Comply with provisions of AISC "Code of Standard Practice for Steel Buildings and Bridges" Section 10 "ARCHITECTURAL EXPOSED STRUCTURAL STEEL."
   2. Grind welds smooth with adjacent surfaces. Grind butt welds flat and perpendicular to the weld direction.
   3. All welds for structural steel elements to receive organic zinc primer shall be continuous.
   4. The cross section of abutting members shall match.
   5. Raised manufacturer identification markers shall be ground smooth to match adjacent surfaces.
   6. Stamped manufacturer identification markers shall be filled to match adjacent surfaces.

D. Standard Shop Primer Application:
   1. Preparation: Remove rust and scale by wire brushing, scraping, and sanding down to bare metal in accordance with SSPC-SP2 and SP3. Where SP2 and SP3 measures are insufficient, provide commercial blast cleaning in accordance with SSPC-SP6.

2. Application: Spray apply primer in accordance with manufacturer's recommendations, mil minimum dry film thickness.
3. Shop Primer: Shop prime all steel except:
   a. Steel encased in concrete.
   b. Surfaces to be field welded.
   c. Contact surfaces at high-strength bolts.
   d. Members which will be concealed by interior finishes.
   e. Surfaces to receive sprayed fireproofing.
   f. Surfaces to receive other special shop primers.

E. Special Shop Primer Application:
1. Prepare surfaces in accordance with the manufacturer's recommendations, and as specified below.
2. Solvent clean in accordance with SSPC SP-1; near white blast ungalvanized ferrous metal surfaces in accordance with SSPC SP-10.
3. Spray apply one coat organic zinc primer and one intermediate coat epoxy primer in accordance with the manufacturer's recommendations. Apply primers to receive field application of finish coats as specified in Section 099000.
4. Maintain at least one coat of primer at all times during installation. Immediately patch damaged coatings.
5. Apply organic zinc/epoxy primer to steel elements exposed to the weather.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 ERECTION

A. Embedded Items: Provide anchor bolts and templates, and other items as indicated, to other Sections for installation prior to placement of cast-in concrete.

B. Temporary Shoring and Bracing: Provide as required with connections of sufficient strength to bear imposed loads. Remove temporary members when permanent members are in place and final connections are made.

C. Erect structural steel in accordance with approved shop drawings and AISC "Code of Standard Practice," Section 7.

D. Welds shall be in accordance with AWS D1.1.

E. Cut holes by drilling only.

F. Tolerances: Maximum deviation from plumb, level, and alignment shall not exceed 1 to 500.

G. Base Plate Grouting: Set on leveling nuts to accurate elevations and grout solid with non-shrink grout.

H. Cleaning and Touch-Up:
1. Clean steel of oil or other contaminants as specified under Fabrication.
2. Columns, beams, girders, and other members which are to receive sprayed-on fireproofing shall be cleaned free of loose rust, heavy mill scale, oil, dirt or other foreign substances prior to application of fireproofing materials.

3. Immediately after erection, clean field welds, bolted connections, and abraded areas and touch-up factory primed surfaces with same primer as used in shop; touch-up galvanized surfaces with zinc-rich primer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior lightgage (axial and transverse) load bearing metal framing, with anchorage and bracing.

B. Related Sections:
   1. 051200 - Structural Steel Framing: Related steel supports.
   2. 061643 - Gypsum Sheathing: Exterior cladding.
   3. 072100 - Thermal Insulation: Batt and board insulation.
   4. 092200 – Lightgage Metal Support Framing: Non-structural lightgage metal framing.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Iron and Steel Institute (AISI).

B. American Society for Testing and Materials (ASTM)
   1. A653 - Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   2. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
   3. C954 - Standard Specifications for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 In, (0.84mm) to 0.112 In. (2.84mm) in Thickness
   4. C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

C. American Welding Society (AWS): D1.3 - Structural Welding Code - Sheet Steel.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Indicate each type of framing member proposed; include structural characteristics ad span tables.

C. Shop Drawings: Indicate all typical and special details, including framing details, anchorage systems, fastening systems, loads, and accessories or items required of other work for complete installation.

D. Closeout Submittal:
   1. In accordance with Section 017700.
   2. Submit designing engineer's certification that products and installation comply with design requirements.

1.4 QUALITY ASSURANCE

A. The work of this section is subject to testing and inspection as specified in 014500.

B. Use only AWS certified welders.

C. Welding shall comply with AWS D1.3.

D. Calculate structural properties of framing members in accordance with the AISI "Specification for the Design of Cold Formed Steel Members".

E. Regulatory Requirements:
   1. Framing system shall meet the requirements of the jurisdictional code authorities.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Cold Formed Light-gage Steel Framing: ASTM A653; types as indicated on the structural drawings; G60 galvanized coating.

B. Accessories:
   1. Screws: ASTM C954; self drilling, self tapping; pan head; galvanized or fluoropolymer coated steel.
   2. Sill Gasket: Closed cell polyethylene foam, glass fiber strips, or approved; continuous rolls; width of sill plate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 ERECTION

A. Install lightgage structural framing in accordance with ASTM C1007, unless indicated or specified otherwise.

B. Erect metal framing as indicated.

C. Screw or weld each joint. Welds shall be in accordance with AWS D1.3.

D. Metal framing members shall be saw or shear cut. No torch cutting is permitted.

E. Construct corners with a minimum of 3 studs per corner.

F. Frame both sides of expansion and seismic joints. Do not bridge joints with system components or accessories.

G. Provide framing as required to form solid backing for all edges of gypsum sheathing, and trim accessories.

H. Tolerances:
   1. Plumb: 1/8 inch in 10 feet.
   2. Location: Within 1/4 inch of the required location.
   3. Alignment: Stud and runner faces to receive finish materials shall not vary more than 1/8 inch from the required plane.
   4. Level: 1/8 inch in 10 feet.

I. Erect studs in one piece full length. Splicing and wire tying of framing components shall not be used.

J. Make provision for erection stresses. Provide temporary alignment and bracing. Touch-up field welds and scratched or damaged galvanizing in accordance with requirements of ASTM A780.

K. Attach cross studs or furring channels to studs for attachment of wall mounted items.

L. Install framing between studs for attachment of electrical boxes and other mechanical and electrical items.

M. Ensure framing provides true and flat surfaces, ready to receive designated finish.

N. Place sill gasket directly on concrete foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.

END OF SECTION

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fabricated metal items indicated on the Architectural Drawings and scheduled at the end of this Section.

B. Related Sections:
   1. 030013 - Concrete: Embedment of metal fabrications; fill at pipe bollards.
   2. 051200 - Structural Steel Framing: Steel elements indicated on the Structural Drawings.
   3. 099000 - Painting: Field painting of metal fabrications shop primed in this section.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. A36 - Specification for Structural Steel.
   2. A53 - Specification for Welded and Seamless Steel Pipe.
   3. A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   4. A143 - Safeguarding Against Embrittlement of Hot Dipped Galvanized Structural Steel Products and Procedures for Detecting Embrittlement.
   5. A153 - Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
   6. A307 - Specification for Carbon Steel Externally Threaded Standard Fasteners.
   7. A366 - Specification for Carbon Steel Cold Rolled Sheet.
   8. A384 - Safeguarding Against Warpage and Distortion During Hot Dip Galvanizing of Steel Assemblies.
   9. A385 - Providing High Quality Zinc Coatings (Hot Dip).
   10. A500 - Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
   11. A501 - Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
   12. A569 - Specification for Commercial Quality Hot Rolled Sheet and Strip Carbon (0.15 Maximum Percent) Steel.
   13. A570 - Specification for Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.

B. National Association of Architectural Metal Manufacturers (NAAMM):
   1. "Metal Bar Grating Manual," current edition.
   2. "Pipe Railing Manual," current edition.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Literature: Submit product literature for all prefabricated products.

C. Shop Drawings:
   1. Show details of fabrication and installation; indicate materials, thicknesses, dimensions, methods of reinforcement and embedment, attachments, shop finishes, provisions for work of other trades, and other pertinent information as requested by Architect.

D. Closeout Submittal:
   1. In accordance with Section 017700.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Experienced and regularly engaged in producing metal fabrications of the type specified; must employ only skilled personnel using proper equipment to produce work.

B. Testing and Inspection: All metal fabrications are subject to special inspection as specified in Section 014500.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Carbon Steel:
1. Structural Shapes, Plates, and Bars: ASTM A36.
2. Sheet: ASTM A366.
3. Pipe: ASTM A53, seamless, Type S, plain end; schedule 40 unless indicated otherwise.
4. Tubing: ASTM A500 or A501, seamless.

B. Fasteners: Types as indicated, specified, or required for the assembly and installation of fabricated items.
1. Bolts: ASTM A307, unless indicated otherwise; include nuts and plain hardened washers.
2. Drilled-In Concrete Anchors: Ramset "Trubolt Stud Anchor," Hilti Fastening Systems "Kwikbolt," or approved.

C. Interior Primer: Modified alkyd type (VOC compliant); lead and chromate free; gray or white color; one of the following unless approved otherwise.
1. "Azeron Primer Series 88HS" by Tnemec Company Inc. (Kansas City, MO; 816-483-3400).
2. "Amercoat 5105" by Ameron Protective Coatings (Brea, CA; 714-529-1951).
3. "Carbocoat 150HG" by Carboline Company (St. Louis, MO; 314-644-1000; 800-848-4645).

D. Exterior Primer:
1. Manufacturer: Tnemec Company Inc. (Kansas City, MO; 816-483-3400).
2. Zinc Primer: "Series 394 PerimePrime"; single component moisture cured primer.
3. Epoxy Tie Coat: Tnemec Series 69 Epoxoline."

E. Cold Galvanizing Compound: "Galv-Weld," "Galvican," "ZRC Cold Galvanizing Compound," or equivalent zinc-rich primer.

F. Miscellaneous Materials: Furnish incidental accessory materials, tools, and equipment as necessary for fabrication and installation of miscellaneous metal items as indicated on the Drawings.
1. Non-Shrink Grout: Master Builder's "Master Flow 713," Sonneborn "Sonogrout," or approved.

2.2 PREFABRICATED COMPONENTS

A. Unistrut: Unistrut Corporation (Wayne, MI), or approved. Furnish manufacturer's standard components corresponding to "P" numbers indicated on the drawing. Include 1/4 inch thick steel connecting hardware, and 1/2" diameter bolts, nuts, and lock washers.

2.3 FABRICATION

A. General Fabrication Requirements: Fabricate as follows, unless specified or indicated otherwise.
1. Verify all dimensions and fabricate to detail with accurate sizes and shapes, straight lines, smooth curves, and sharp angles.
2. Welds shall have sufficient strength to withstand the loads applied.
3. For items exposed to view or subject to contact, grind welds smooth and level with adjacent surfaces; remove all burrs from cut edges. Fill imperfections with body putty as necessary for a smooth even finish.
4. Bend curved sections to a smooth radius free from buckles and twists.
5. Fabrications in exterior locations shall be fabricated to shed water.
6. All welds on fabrications to receive organic zinc primer shall be continuous, full length of joint.

B. Fabrication of Elements to Receive Galvanized Coatings:
1. Fabricate in accordance with the applicable requirements of ASTM A143, A384, and A385.
2. Remove welding slag and burrs prior to galvanizing.
3. Avoid fabrication techniques which could cause distortion or embrittlement of the steel.

2.4 SHOP FINISHES

A. Hot Dip Galvanizing:
   1. Steel fabrications shall be galvanized in accordance with ASTM A123. Bolts, nuts, washers, and other hardware shall be galvanized in accordance with A153.
   2. Surface Finish: The galvanized coatings shall be continuous, firmly adhered, smooth, and free from defects.
   3. Locations: Provide hot dip galvanizing for all metal fabrications in exterior or moist conditions, unless otherwise indicated. Unless otherwise approved by the Architect, plug and cold galvanize ventilation and lifting holes which will be exposed to moisture penetration in the finished work.

B. Interior Primed Finish:
   1. Preparation: Solvent clean in accordance with SSPC-SP1. Remove rust and scale by wire brushing, scraping, and sanding down to bare metal in accordance with SSPC-SP2 and SP3. Where SP2 and SP3 measures are insufficient, provide commercial blast cleaning in accordance with SSPC-SP6. Immediately apply specified prime coat.
   2. Apply interior primer in accordance with manufacturer's recommendations.
   3. Locations: Provide at all interior metal fabrication exposed to view, unless otherwise indicated. Do not prime surfaces to be embedded in concrete, and surfaces to be field welded.

C. Exterior Primed Finish:
   1. Prepare surfaces in accordance with the finish coat manufacturer's recommendations, and as specified below.
   2. Solvent clean in accordance with SSPC SP-1; commercial blast ungalvanized ferrous metal surfaces in accordance with SSPC SP10. Abrade galvanized surfaces with a metal preparation pad.
   3. Spray apply organic zinc and epoxy primer intermediate coat in accordance with the manufacturer's recommendations. Apply primers to receive field application of finish coats as specified in Section 099000.
   4. Except for surfaces indicated to be field welded, coat all surfaces of fabrication, whether or not exposed to view in installed position.
   5. Maintain at least one coat of primer at all times during installation. Immediately patch damaged coatings.
   6. Finish coat shall be free of dirt, flow lines, sags, blisters, pinholes, and other surface imperfections.
   7. Locations: Provide at all exterior metal fabrication exposed to view, and other fabrications as scheduled. Do not prime surfaces to be field welded.

2.5 PROTECTION

A. For metal in contact with concrete, masonry, and other dissimilar materials, coat contact surfaces with zinc-rich primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 INSTALLATION

A. Install metal fabrications in accurate locations shown. Unless indicated otherwise, fabrications shall be installed plumb and level.

B. Provide all anchorage devices as indicated and required for a secure installation.

C. Touch-up all surfaces damaged during installation. Patch all welds and damage marks with matching primer.

D. Coordinate with Section 030000 for foundations, installation, and concrete fill at pipe bollards.

3.3 SCHEDULE

A. The following list includes, without limitation, the principal metal fabrications and finishes in the Work.
   1. Steel bollards; galvanized finish with special exterior primer.

END OF SECTION

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sheathing.
   2. Dimensional wood framing.
   3. Glued-laminated beams.
   4. Blocking, nailers, and curbing.
   5. Plywood terminal back boards.

B. Related Sections:
   1. 054000 - Cold-Formed Metal Framing: Structural lightgage metal framing.
   2. 062000 – Finish Carpentry
   3. 076200 - Sheet Metal Flashing and Trim.
   4. 092200 – Lightgage Metal Support Framing: Support framing; metal backing.
   5. 092900 - Gypsum Board:

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitutions will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Institute of Timber Construction (AITC)

B. American National Standards Institute (ANSI): 190.1 - Structural Glued Laminated Timber.

C. American Plywood Association (APA)

D. American Society for Testing and Materials (ASTM):
   1. D2898 - Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing.
   2. E84 - Test Method for Surface Burning Characteristics of Building Materials.

E. American Wood Preservers' Association: Book of Standards (AWPA).

F. National Lumber Grading Authority of Canada (NLGA).

G. Product Standard (PS): PS-20 - American Softwood Lumber Standard.

H. Southern Pine Inspection Bureau (SPIB).

I. West Coast Lumber Inspection Bureau (WCLB): Standard Grading Rules for West Coast Lumber.

J. Western Wood Products Association (WWPA).

1.3 SYSTEM DESCRIPTION

A. Structural Requirements for Fabricated Wood Structural Members: Design for dead loads and live loads as indicated on the structural drawings, with deflection limited to 1/360 the span for floor loads and 1/240 the span for roof loads.

1.4 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Submit complete technical and product data on the following:
   1. Preservative and fire retardant wood treatments.
   2. Framing and sheathing accessories.
   3. Fabricated structural wood members.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Work shall conform to the requirements of the currently enforced International Building Code as adopted by the jurisdiction.

B. Fabricated Wood Structural Member Manufacturers Qualifications:
   1. For each type of fabricated structural wood member, use company specializing in the manufacture of the type of structural wood member with a minimum of three years experience.
   2. Glued Laminated Wood Structural Member Manufacturer: Certified by the AITC or APA-EWS (American Wood Systems), in accordance with ANSI A190.1.

C. Glued laminated structural units shall conform to Voluntary Product Standards PS 56 "Structural Glue Laminated Timber" and AITC 117 "Standard Specifications for Structural Glue-Laminated Timber of Softwood Species".

D. Design fabricated wood structural members under direct supervision of Professional Engineer experienced in structural framing design registered in State of Wisconsin.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store and protect products under provisions of Section 016000.

B. Glued Laminated Wood Members:
   1. Protective Wrapping: Industrial grade members may be shipped unwrapped. Individually wrap architectural grade members. Maintain protection until immediately prior to installation.
   2. Use padded, non-marring slings when handling architectural grade members.
   3. Prevent glued laminated members from becoming wet.

PART 2 - PRODUCTS

2.1 DIMENSION LUMBER

A. Lumber shall be manufactured in accordance with PS 20, and shall be stamped and graded in accordance with WWPA, WCLB, NLGA, or SPIB grading rules.

B. Moisture Content: Kiln dried to 19% maximum moisture content, except for material whose least dimension is 4 inches thick or greater.

C. Species: Hem-Fir, Spruce-Pine-Fir (SPF), or Douglas Fir Larch, unless indicated or specified otherwise.

D. Structural Lumber Grades: As indicated on the Structural Drawings.

E. Architectural Lumber Grades: Unexposed non-structural wood framing and blocking indicated on the Architectural Drawings shall be graded as follows:
   1. Non-Structural Framing (2" to 4" thick, 2" to 6" wide): "Construction - Light Framing," "Stud," or better.
   2. Blocking and Nailers: "Utility - Light Framing," or better.

2.2 PANEL MATERIALS

A. Miscellaneous Concealed Sheathing: APA Rated Sheathing; Structural I; CD grade; Exterior; plywood, unless approved otherwise; thicknesses as indicated.

B. Exposed Sheathing: APA Rated Sheathing; Structural I; BC grade; Exterior; plywood, unless approved otherwise; thicknesses as indicated.

C. Terminal Backboards: APA AC grade exterior; fire retardant treated.

2.3 FABRICATED WOOD STRUCTURAL MEMBERS

A. Glued Laminated Wood Members: As indicated on the Architectural Drawings.
   1. Appearance Grades: Architectural grade.
   2. Fabricate glue laminated structural members in accordance with AITC Architectural grade.
   3. Fabricate members to the dimensions, combinations, and cambers indicated.
   4. Strength: 24F-E10 or 24F-V11.

B. General Fabrication Requirements for Fabricated Wood Structural Members:
   1. Verify dimensions and site conditions prior to fabrication.
   2. Fabricate to meet the structural requirements specified.

2.4 ACCESSORIES

A. Fasteners:
   1. Hot-dipped galvanized steel for exterior, high humidity, and fire treated wood locations.
   2. For Use With Preservative Treated Wood: 300 Series stainless steel.
   3. Use ring shank nails at floor sheathing.
   4. Screws: Self tapping; countersunk or low profile head.

B. Metal Connectors: Simpson Company, Silver Metal Products, Inc, USP Structural Connectors, or approved; types as indicated on the Drawings; minimum G-185 galvanized coating.

C. Construction Adhesive: One of the following:
   1. BASF Construction Chemicals LLC (Shakopee, MN 952-496-6091); “CX-400”.
   2. Henkel Consumer Adhesives/OSI Sealants, Inc. (Mentor, OH 440-255-8900); “PL 400 Heavy Duty Construction Adhesive”.
   3. GE/Momentive Performance Materials, Inc., (Euless, TX 817-359-1450); “GE 400 Plus.”
   4. Other product meeting the requirements of AFG-01.

D. Sill Gasket: Closed cell polyethylene foam, glass fiber strips, or approved; continuous rolls; width of sill plate.

2.5 WOOD TREATMENT

A. Wood Preservative (Pressure Treatment):
   1. Preservative treat all exterior lumber, including roofing nailers, curbs and other wood in contact with concrete, masonry, and moist conditions.
   2. For above ground use, use AWPA certified Ammonium Copper Quaternium (ACQ) or Copper Hydroxide Sodium Dimethyldithiocarbamate (CDDC) waterborne preservative with 0.25 pounds per cubic foot of wood retention.
   3. For ground contract use, use AWPA Treatment C-22 using CCA waterborne preservative with 0.40 pounds per cubic foot of wood retention.
   4. Treated lumber shall be kiln dried to a maximum moisture content of 19%; treated plywood shall be kiln dried to a maximum moisture content of 15%.
   5. Treated lumber shall bear the quality stamp of an inspection agency approved by the jurisdictional code authorities.

B. Fire Retardant Treatments:
   1. Fire retardant treat all interior concealed lumber and plywood, and other wood as indicated or specified.
   2. All fire retardant treated wood materials shall bear a UL "FR-S" label, or a label from an approved inspection agency certifying that the material meets the requirements of AWPA C-20 Type A for lumber and AWPA C-27 Type A for plywood.
   3. Treated lumber shall be kiln dried to a maximum moisture content of 19%; treated plywood shall be kiln dried to a maximum moisture content of 15%.
   4. Approved Products:
      a. Interior Fireproofing: Hickson Corporation "Dricon", Hoover Treated Wood Products "Pyro-guard," or Osmose Wood Preserving Co. of America, Inc. "Flame Proof LHC."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 FRAMING

A. Erect as indicated.

B. Erect wood framing members level and plumb unless indicated otherwise.

C. Place horizontal members crown side up.

D. Nailing shall be in accordance with IBC table 2304.9.1, unless indicated otherwise. Use screws when fastening into metal framing and supports.

E. Use framing members full length without splices.

F. Tolerances:
   1. Maximum 1/4 inch from true position.
   2. Maximum 1/4 inch in 10 feet from true plumb or level.

G. Site treat cut ends of field cut pressure preservative treated lumber with compatible material as recommended by the treatment materials manufacturer.

H. After end trimming glued laminated beams, seal with penetrating sealer in accordance with AITC requirements. Do not apply sealer to surfaces to receive stains or other finish treatments.

I. Place sill gasket directly on concrete foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.

3.3 SHEATHING

A. Install sheathing as indicated. When not indicated, install as follows:
   1. Secure sheathing with edges on firm bearing. Provide solid edge blocking between sheets.
   2. Secure roof sheathing perpendicular to framing members with ends staggered.

B. Fastening shall be in accordance with code requirements. Use screws in lieu of nails when fastening into metal lightgage metal framing.

C. Allow 1/8 inch spacing at ends and edges between panels, unless otherwise recommended by panel manufacturer.

3.4 BLOCKING, NAILERS, AND CURBS

A. Provide blocking, nailers, and curbs for sheathing, roof construction, metal flashing, and other construction as indicated, and as necessary for firm support. Unless otherwise indicated, solid wood backing shall be minimum 2 inch nominal thickness; plywood shall be minimum 3/4 inch thick, except that sloped parapet caps may be 1/2 inch thick.

B. Blocking: Install wood blocking to receive mechanical fasteners for support of plumbing and electrical fixtures and equipment, cabinets, door stop plates, wood base, wainscots, coat hooks, toilet and bath accessories, kitchen equipment, and all other wall and ceiling mounted components.

C. Screw fasten wood components to metal framing and support elements.

D. For attachment of plywood backing, kerf plywood 1/4" (3/8", maximum if required for heavy gage studs) to receive flange return (or crimp the return closed); provide supplementary sheet metal angle attached to back of stud where necessary to support backing. Screws into edge of plywood are unacceptable.

3.5 PLYWOOD TERMINAL BACKBOARDS

A. Provide a fire retardant treated plywood terminal backboard for telephone systems where indicated on the drawings.

B. Mechanically apply directly over gypsum backing board.

END OF SECTION

SECTION 062000 - FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wood standing and running trim.
   2. Paneling.
   3. Shop and field applied finishing.

B. Related Sections:
   1. 061000 - Rough Carpentry: Blocking for finish carpentry
   2. 081400 - Wood Doors.
   3. 087100 - Door Hardware.
   4. 099000 - Painting: Stains and finish coatings.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 Specification Sections apply to all the Work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American National Standards Institute (ANSI)
   1. A208.1 - Particleboard, Mat Formed Wood
   2. A208.2 - Medium Density Fiberboard for Interior Use

B. Architectural Woodwork Institute (AWI): Architectural Woodwork Quality Standards, Current Edition.

C. West Coast Lumber Inspection Bureau (WCLB): Standard Grading Rules No. 17.

D. U.S. Product Standard (PS): PS 1 Product Standard for Construction and Industrial Plywood

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Shop Drawings. Indicate materials, components, profiles, fastening methods, jointing details, finishes and accessories. Details shall be minimum scale of 1-1/2 inch per foot.

C. Samples:
   1. Solid Wood with Transparent Finish: Minimum of three 12 inch long samples representative of the maximum range of color and graining to be expected for each species, cut, and finish combination indicated. Include samples of transparent finish with putty filled holes and specified field applied top coat.
   2. Opaque Finish Wood: Minimum of three 12 inch long samples representative of the maximum range of graining and surface imperfections to be expected.

1.4 QUALITY ASSURANCE

A. Qualifications of Installers: Use only journeyman finish carpenters who are thoroughly trained and skilled in the work, and who are completely familiar with the materials and quality standards specified.

1.5 DELIVERY, STORAGE AND HANDLING

A. In accordance with Section 016000, and as follows:
   1. Do not deliver wood materials to the building until "wet" work such as gypsum board work has been completed.
   2. Store materials indoors in ventilated area with minimum temperature of 60 degrees F., and relative humidity between 25 and 55 percent.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lumber:

1. Maximum moisture content of 10 percent.
2. Transparent Finish Lumber: AWI Grade I; Select white hard maple (Acer saccharum); all sapwood; flat sawn..
3. Opaque Finish Lumber: AWI Grade II Poplar.
4. Concealed Framing Lumber: AWI Grade II pine, fir, hemlock, or other species as approved.

B. Plywood:
1. Plywood Paneling: APA rated in accordance with PS 1; 3/4 inch thick AC exterior grade unless indicated or specified otherwise; rotary cut birch veneer at exposed face.

C. Accessories:
1. Exposed Screws: Stainless steel pan-head with stainless steel beauty washers.
2. Flame Retardant Finishes: One of the following:
   a. “Flame Stop II” by Flame Stop, Inc. (877-397-7867).
   b. “Flamort WC” by Flamort Co, Inc (510-357-9494).
   c. “No-Burn Wood Gard Mih” by No-Burn Inc. (800-989-8577).

2.2 STANDING AND RUNNING TRIM FABRICATION

A. Shop fabricate all trim to the shapes indicated.

B. Assemble built-up sections. All glue lines shall be free of squeeze-out where transparent finishes are to be applied.

C. Tolerances for Overall Assembly Dimensions: ±1/32 inch.

D. Shop fit and assemble to the greatest extent possible.

E. Back or kerf cut all trim greater than 2 inch in width, except terminate before exposed ends.

F. Fabricate trim from solid lumber.

2.3 WOOD DOOR FRAME FABRICATION

A. Fabricate door frames to the shapes indicated.

B. Fabricate to provide the following door installation clearances:
1. 1/8 inch at top, and edges.
2. 1/2 inch from door bottom to the floor finish.

C. Machine frames to receive hardware specified in Section 087100. Request templates from the hardware supplier.

D. Fabricate to receive glazing with proper clearances for expansion and contraction.

E. Fabricate frames from single length pieces, without joints, for each straight length.

F. Fabricate each section from solid stock.

2.4 PLYWOOD PANEL FABRICATION

A. Fabricate veneer paneling to AWI "Custom" grade standards.

B. Fabricate panels with hardwood veneer plywood. Fire retardant treat all interior exposed plywood.

C. Provide solid wood edging at veneer panels with exposed edges.

D. Fabricate panels with joints accurately matched, tightly fitted.

2.5 FINISHING

A. Shop finish all architectural woodwork wood surfaces. Shop finishing may be implemented in an enclosed on-site location which has a controlled environment for proper ventilation, heating, and cleanliness.

B. Sand all exposed and semi-exposed wood surfaces smooth, always sanding in the direction of the wood grain.

C. Sand all exposed transparent finish wood surfaces to AWI "Premium " grade standards. Sand all semi-exposed transparent or opaque finish wood surfaces to AWI "Custom" grade standards.

D. Fill all depressions and imperfections with color matched putty.

E. Transparent Finish Coating: Spray apply in accordance with manufacturer's instructions.

F. Items which have been shop finished shall be retouched as necessary to conceal all damage. Items which cannot be successfully repaired shall be replaced with new complying items.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

A. Coordinate the installation of blocking and other supports required for the installation of architectural woodwork elements.

3.3 STANDING AND RUNNING TRIM

A. Jointing: Make all joints to conceal shrinkage; miter all exterior corners; cope all interior corners, miter or scarf all end-to-end joints; install all trim pieces as long as possible, jointing only where solid support is obtained. Make no joints closer than 4 feet to corners.

B. Lengths of Material: Use random lengths and show typical joint locations on shop drawings. The minimum length shall be 8 feet, except where short lengths are required by installation conditions.

C. Fastening:
   1. Install all items straight, true, level, plumb, and firmly anchored in place; where blocking or backing is required, coordinate as necessary with other trades to ensure placement of all required backing and blocking in a timely manner.
   2. Fasten trim with finish nails or screws of proper dimension to hold the member firmly in place without splitting the wood.
   3. On exposed finish work, set all nails and screws and putty.
   4. Align exposed fasteners for uniform pattern; random or "shotgun" patterns will not be accepted.

D. Select and arrange standing and running trim so that abutting members have a similar grain and color match to the greatest extent possible.

3.4 DOOR AND SIDELIGHT FRAMES

A. Install wood door frames to receive operable doors in accordance with Section 087300.

B. Install in accordance with the applicable requirements specified for standing and running trim.

C. Glaze window frames and fix in position with wood stops as indicated.

D. Provide wood support framing and nailers.

3.5 PLYWOOD PANELING

A. Install paneling as indicated in accordance with AWI Section 500C Premium grade standards.

B. Install wood paneling over wall surfaces by exposed fasteners in pattern approved by Architect, unless approved otherwise.

C. Cut and fit each panel to its particular position including cutting around items which cannot be remounted to panel face, and predrilling for holes for wire access for electrical devices to be mounted on the panel face.

D. Secure sheathing with edges on firm bearing except use galvanized steel sheathing clips at unsupported long (horizontal) edges.

E. Allow 1/8 inch spacing at ends and edges between panels, unless indicated otherwise.

3.6 SITE FINISHING

A. Set all exposed fasteners.

B. Apply matching wood filler to exposed fastener indentations and other minor imperfections.

C. Spray apply top coat to match the shop applied finishes.

3.7 CLEANING UP

A. Keep the premises in a neat, safe, and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.

B. At the end of each working day, or more often if necessary, remove refuse and thoroughly sweep and/or vacuum surfaces.

END OF SECTION

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Thermal batt insulation with separate vapor barrier.
   2. Rigid board wall insulation.
   3. Rigid board perimeter insulation.
   4. Rigid board insulation for equipment pad (fill).
   5. Cavity wall insulation and associated fire safing systems.

B. Related Sections:
   1. 072700 - Weather Resistive Barriers.
   2. 098100 - Acoustic Insulation.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C518 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by means of the Heat Flow Meter Apparatus.
   2. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
   3. C612 - Specification for Mineral Fiber Block and Board Thermal Insulation.
   4. C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   5. D1621 - Test Method for Compressive Properties of Rigid Cellular Plastics.
   6. E84 - Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

A. Make submittals under provisions of Section 013300.

B. Product Data: Submit manufacturer's product data and installation instructions for each type of insulation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Unfaced Batt and Blanket Insulation: ASTM C665, Type I; preformed unfaced glass fiber roll; flame spread of 25 or less and smoke developed of 50 or less when tested in accordance with ASTM E84; formaldehyde free, Johns Manville Corp. "Unfaced Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation;" or approved; oversize widths for friction-fit between metal framing.

B. Rigid Extruded Polystyrene Board:
   1. Standard: ASTM C578, Type IV; extruded cellular polystyrene.
   2. Thermal Resistance: Minimum "R" per inch of 5 when tested in accordance with ASTM C518 at 75 degrees F. mean temperature.
   3. Compressive Strength: Minimum 25 psi when tested in accordance with ASTM D1621.
   4. Water Absorption: 0.10 to 0.15 percent when tested in accordance with ASTM C272.
   5. Thickness/R-value: 1 inch, R-5.
   6. Size: 24 inch width, 96 inch length, with square edges.
   7. Approved Products:
      a. Styrofoam by The Dow Chemical Company (Midland, MI; 800-441-4369)
      b. Foamular 250 by Owens Corning, (Toledo, OH; 800-438-7465).

C. Cavity Wall Insulation:
   1. Non-combustible, lightweight, water repellent, semi-rigid mineral wool insulation board.
   2. Density: Minimum 4.2 pounds per cubic foot.
   3. Acceptable Products:
      a. Roxul Inc., “Cavityrock MD”.
      b. Thermafiber “Rain Barrier”
   4. Thickness: 1-1/2 inches, unless indicated otherwise.

2.2 ACCESSORIES

A. Separate Vapor Barrier for Batt Insulation: Foil scrim kraft FSK 25; flame spread of 25 or less and a smoke developed of 50 or less when tested in accordance with ASTM E84.

B. Tape: To match foil scrim kraft face of vapor barrier; 2 inch minimum width.

C. Protective Membrane: White metallized polypropylene (WMP); "WMP-VRP" by Lamtec Corporation (800-852-6832); flame spread of 25 or less when tested in accordance with ASTM E84; perforations at 1/8 inch centers.

D. Impaling Pins: 12 gage pins; length as required with mounting plates for welding or adhesive mounting; include retainer shields.

E. Related Accessories: Provide other accessories, not specifically described, as required for a complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify adjacent materials are secure, properly spaced, dry, and ready to receive installation.

B. Verify mechanical and electrical services within spaces to insulated have been installed and tested.

C. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

D. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 INSTALLATION - BATT INSULATION

A. Install batt insulation in accordance with manufacturer's instructions.Install insulation without gaps or voids.

C. Trim insulation neatly to fit spaces. Use batts free of damage.

D. At metal stud framing, insert the insulation edges tightly into the stud channels for a friction fit. Provide additional supports as necessary to prevent sliding of batts in the stud cavity.

E. Mechanical Fastening:
   1. At locations where no support framing is present, provide metal impaling pins and retainers.
   2. Mechanically or adhesively bond the retaining pins to the substrate in accordance with the manufacturer's recommendations.
   3. Space pins at maximum 24 inches on center along the edges and within the field of the batt. Place edge pins within 6 inches from the edge of the batt.

F. Pack batt insulation in shim spaces at perimeter of window assembly to maintain continuity of thermal barrier.

G. Separate Vapor Barrier Installation:
   1. Install separate vapor barrier over unfaced insulation.
   2. Install vapor barrier toward warm side of building spaces.
   3. Vapor barrier shall be continuous.

4. At locations where insulation is mechanically fastened by impaling pins, place vapor retarder over impaling pins and hold in position with additional retainers. The installation shall present a tight, continuous, and wrinkle free appearance.
5. At lightgage support framing, secure to studs with double stick tape or spray adhesive.
6. Lap joints in vapor barrier 2 inches, except provide tape sealed joints at locations where vapor barrier will remain exposed in the finished work.
7. Tape seal vapor barrier to adjacent construction at perimeter edges.
8. Tape and seal tears or cuts in vapor barrier.

H. Separate Protective Membrane Installation
1. Install with protective membrane over mechanically fastened batt insulation.
2. Place protective membrane over impaling pins and hold in position with additional retainers over previously installed retainers. The membrane shall present a tight, continuous, and wrinkle free appearance.
3. Fold membrane over at perimeter and cover all exposed insulation edges. Tightly secure in position. Tuck into space between insulation and deck.
4. Neatly tape the joints with matching tape. Tape seal tears or cuts in vapor retarder.

I. R value Schedule:
1. Provide batt insulation in sufficient thickness to provide minimum R-values as listed on the Drawings.

3.3 INSTALLATION - RIGID BOARD PERIMETER INSULATION

A. Use rigid extruded polystyrene insulation. Coordinate with Section 312000 for installation of rigid perimeter insulation.

B. Install perimeter insulation vertically and horizontally with tight butt joints at locations detailed.

C. Minimum vertical height: As detailed.

D. Minimum horizontal width: As detailed.

3.4 CAVITY WALL INSULATION AT WALLS AND SOFFITS

A. Install semi-rigid mineral wool insulation where cavity wall insulation is indicated at walls and soffits.

B. Except as otherwise indicated or specified, install all insulation in accordance with the manufacturer's current installation instructions.

C. Trim insulation to tightly fit between the furring and framing and to fit around penetrations.

D. Mechanically fasten with manufacturer’s recommended fasteners.

E. Seal joints in vapor retarder.

END OF SECTION

SECTION 072700 - WEATHER RESISTIVE BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sheet air, moisture and weather barrier systems at framed walls.
   2. Filler and membrane systems required to seal joints and penetrations to form a continuous weather-resistive barrier assembly.
   3. Related weather-resistive barrier accessories and components.

B. Related Sections:
   1. 061000 – Rough Carpentry: Plywood sheathing.
   2. 076200 - Sheet Metal Flashing and Trim: Flexible flashing provided with separate sheet metal flashing systems.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 012500.

1.2 DEFINITIONS

A. Weather-Resistive Barrier: A weather-resistive barrier is an assembly of interconnected components within the exterior envelope of a building which prevents air flow across the assembly, and which is intended to prevent excess moisture transfer across the assembly driven by air pressure differentials.

1.3 SYSTEM DESCRIPTION

A. All voids within weather-resistive barrier systems shall be closed to prevent air flow across the assembly.

B. The following elements provided under the work of other Sections shall be considered integral parts of the weather-resistive barrier assembly:
   1. Concrete foundation.
   2. Roof membrane. Plumbing vents and roof drains shall not be considered penetrations.
   3. Exterior windows and doors.

C. For the work of this Section, weather-resistive barrier systems shall consist of the following:
   1. Weather-resistive sheet membrane over solid substrates on the exterior building enclosure.
   2. Connective seal from foundation wall to the weather-resistive sheet membrane layer.
   3. Connective seal of weather-resistive sheet membrane to roof membrane.
   4. Sealing of penetrations in the building envelope, including windows, doors, plumbing elements, electrical elements, and mechanical components, including duct penetrations at rooftop mechanical unit.

1.4 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Catalog cuts and installation instructions for specified manufactured products.

1.5 QUALITY ASSURANCE

A. Applicator: Work of this section shall be performed by a single applicator, unless specifically approved otherwise by the Architect.

B. Pre-Installation Conference:
   1. Administer pre-installation conference in accordance with Section 013119.
   2. Schedule meeting prior to installation of weather-resistive barrier components.
   3. Discuss weather-resistive barrier components and sequence of installation.
   4. Discuss all joints and penetrations and proposed methods for sealing.
   5. Identify and discuss all special conditions.

1.6 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 015000.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Weather-Resistive Barrier System: Vaproshield, LLC (Gig Harbor, WA; 866-731-7663);
   1. Weather Resistive Barrier: “Wrapshield SA”.
   2. Flexible Transitional Flashing: VaproShield “Vaproflashing SA” .
   3. Liquid Flashing: Vaproshield “Liquiflash”.
   4. Manufacturer and product are specified for construction, quality, performance and/or appearance. Provide specified product or approved equal. Alternate products shall meet or exceed the following requirements:

Construction	Triple layer spunbond polypropylene
Water Vapor Transmission	308.9 grams/m2/24hrs (50 perms)
Air Permeability	0.0095 L/s/m2 or 0.0019 cmf/ft2

B. Flexible Seal: Ethylene Propylene Diene Terpolymer (EPDM) black membrane, reinforced or non-reinforced, nominal 0.045 inch thick; complete with manufacturer's recommended splicing materials.

C. Weather-Resistive Barrier Sealant: Single component urethane gun grade sealant.

D. SPF (Sprayed Polyurethane Foam) Sealant: Furnish one- or two-component, foamed-in-place, polyurethane foam sealant with the following characteristics:
   1. Density: 1.5 to 2.0 pcf.
   2. Flame Spread (ASTM E162): 25 or less.
   3. Acceptable Materials: Flexible Products.

E. Sheet Metal Closures:
   1. Minimum 24 gage prefinished galvanized steel.
   2. Custom fabricated to fit the conditions.

F. Accessories: Provide surface conditioners, primers, mastic, tape, and other accessories as specified by or acceptable to the manufacturer of each product.

G. Fasteners: Copolymer coated galvanized steel, or stainless steel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 INSTALLATION

A. Coordinate work with other trades as necessary to form a continuous weather-resistive barrier envelope for the building.

B. Weather-resistive Barrier Installation:
   1. Apply single layer of weather-resistive barrier over solid exterior substrates in accordance with the manufacturer’s recommendations.
   2. Tape seal all joints and penetrations with manufacturer’s recommended tape.

3. Coordinate installation of windows, metal head and subsilll flashings lapped into liquid and flexible flashings, and other wall penetrations with the installation of liquid and flexible flashing and weather-resistive barrier.
4. Secure with staples as recommended by manufacturer.
5. Sequence with installation of flexible flashing and metal flashing elements as shown and as necessary to form a continuous air and moisture barrier.

C. Liquid and Flexible Flashings:
1. Install liquid and flexible flashing as indicated and as specified below.
2. Trim flexible flashing so that it will not be exposed in the finished work.
3. Coordinate installation of flashings with installation of building paper and sheet metal flashing elements.
4. Install in accordance with the manufacturer's recommendations for each condition.
5. Provide transitional flexible flashing as indicated and in the following locations to seal joints and penetrations between building paper base layer and the following:
   a. Concrete foundation walls.
   b. Roof membrane.
   c. Pipe, conduit, and electrical box penetrations.
   d. Window and door frames.
6. Provide flexible flashing at parapet tops as necessary to link to the weather-resistive sheet membrane layers on both sides of the parapet walls.
7. Provide flexible flashing to seal the joint between sheet metal closure angles and building paper base layer.
8. Provide materials separation where required and do not lap or place flexible flashing in direct contact with roofing membrane.

D. Foam Sealant:
1. Seal holes in electrical boxes, including around wire openings.
2. Seal penetrations which cannot be sealed with flexible flashing.
3. Provide lightgage sheet metal angle edge trim at gypsum board edges to receive sealant.

E. Special Construction:
1. Provide custom fabricated sheet metal enclosures around recessed light fixtures and similar elements which penetrate building paper weather-resistive barrier assemblies.
2. Mechanical Curbs:
   a. Rigid insulation boards at equipment curbs are installed as a part of the roofing subcontract.
   b. Foam seal joints between rigid insulation boards. Cut boards as necessary to allow foam penetration between the boards.
   c. Foam seal joints between rigid insulation board and adjacent curb construction.
   d. After installation of rooftop mechanical unit and ducts, foam seal the joint between the rigid insulation boards and the ducts.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior resin panels.
   2. Related flashings, accessories, and fastenings.

B. Related Sections:
   1. 061000 – Rough Carpentry: Sheathing.
   2. 072100 – Thermal Insulation: Adjacent construction.
   3. 072700 – Weather Resistive Barrier: Adjacent construction
   4. 076200 - Sheet Metal Flashing and Trim: Metal and membrane flashing.
   5. 079200 - Joint Sealants: Joint fillers.

C. Drawings, the provisions of the Agreement, including bonds and certificates, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 SUBMITTALS

A. Make submittals in accordance with Section 013030.

B. Submit product data for composite panels.

C. Submit samples:
   1. Each type of proposed fastener.

D. Shop Drawings:
   1. Indicate material profile, dimensions, jointing details, furring, fastening methods, flashings, penetrations, and installation details.
   2. Include manufacturer's installation instructions for manufactured items incorporated in work.
   3. Indicate all flashing related to the system, including adjacent receivers and cap flashing to be provided under Section 076200.

1.3 QUALITY ASSURANCE

A. Manufacturer Representation:
   1. The manufacturer of the panel system shall provide a representative thoroughly knowledgeable in the product and installation requirements of this project who will visit the site as a minimum at the following occasions:
      a. Pre-Installation Conference
      b. Approval of mock-up.
      c. Completion of work of this Section.
      d. Project completion.

B. Pre-Installation Conference:
   1. In accordance with Section 013119, schedule and administer a meeting to review and discuss the panel system fabrication and installation a minimum of 7 calendar days prior to commencement of work of this Section.
   2. Require in attendance the Architect, the Contractor, the panel fabricator, the panel installer, the panel material manufacturer’s representative, and all other parties affected by work of this Section.
   3. Agenda: Address installation scheduling and procedures, scheduling of mock-up construction and review, coordination, substrate condition and preparation, protection requirements, furring and blocking requirements, material and installation tolerances, acceptance criteria, remedies, overage required for waste, and overage for maintenance stock.

C. Mock Up:
   1. Provide mock ups in accordance with Section 014500.
   2. Install a minimum of 100 square feet of materials in locations on the Work as directed by the Architect.
   3. Approved mock-up may be used in the Work.

1.4 DELIVERY AND STORAGE

A. Deliver products to site under provisions of Section 016000.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Exterior Resin Panels:
   1. Stonewood Division of Fiberesin Industries Inc. (Oconomowoc WI; 262-567-4427).
   2. Stonewood Exterior Panels; exterior grade panels; 10mm (0.4”) thickness; color as indicated or selected by Architect.
   3. Provide shop cut panels with eased edges for field installation; field cutting will not be permitted except by permission of Architect.

2.2 ACCESSORIES

A. Panel Screws:
   1. Stainless steel, powder coated in color selected by Architect; fast-fixing; sufficient length to penetrate furring a minimum of 3/4 inch.
   2. Provide rubber washers in color as selected by Architect.
   3. Provide plastic caps in color as selected by Architect.

B. Support Framing: As indicated on the Drawings and specified in Section 054000.

C. Weather Barrier: As indicated on the Drawings and specified in Section 072700.

D. Venting Screed (Air Grill):
   1. 304 stainless steel sheet, minimum thickness .036”;
   2. Perforated with maximum 3/32” diameter holes, minimum 50 holes per square inch, between 45% and 50% open area.
   3. Brake shape into “C” profile, with base to match width of opening bridged, and 1” legs.

E. Bug Screen: Aluminum bug screen; natural aluminum color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

A. Coordinate installation of furring to accommodate panel installation.

3.3 INSTALLATION

A. General Installation Requirements for Panel System:
   1. Securely fasten in place as instructed by manufacturer, aligned, level, and plumb. Strictly comply with manufacturer’s requirements.
   2. Arrange components to encourage watershed.

3. Exercise care when site drilling. Provide oversized holes where recommended by panel manufacturer.
4. Align coursing to within 1/8”.
5. Screw attach panel at spacing indicated but in no case greater than 24 inches on center along edges and at intermediate supports.
6. Fastener clearance from edge shall be uniform and as indicated, but in no case less than 1” nor greater than 3”.
7. Components shall be plumb and level unless indicated otherwise.

B. Installation of Venting Matrix:
   1. Install in strict compliance with manufacturer’s instructions for conditions.

C. Installation of Venting Screed (Air Grill):
   1. Expand “C” shape slightly so legs are slightly splayed before installation.
   2. Fasten one leg of screed to sheathing with stainless steel fasteners, legs downward.
   3. Install bug screen over entire horizontal surface of air grill.
   4. Compress outside leg with panel product during panel installation without deforming or repositioning screed.

END OF SECTION

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cleaning and preparation of joint surfaces.
   2. Sealant and backing materials.

B. Related Sections:
   1. 071900 - Water Repellents: Scheduling requirements.
   2. 133419 - Metal Building Systems: Sealants, furnished and installed as part of sheet metal roofing and flashing work.
   3. 088000 - Glazing: Glazing sealants.
   4. 093000 - Tiling: Grout color samples; mock-up.
   5. 098100 - Acoustic Insulation: Acoustical sealant.
   6. 321313 - Concrete Paving: Expansion joint fillers.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C1193 - Guide for Use of Joint Sealants.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Submit for each sealant material used. Include manufacturer's surface preparation, priming, and installation instructions for each proposed sealant.

C. Samples:
   1. Submit cured samples of each sealant type and color proposed for the work.
   2. For each sealant type indicated for "color as selected," or for which no color is indicated, submit color card indicating available stock colors from manufacturer's complete line of pre-formulated colors for each type of sealant.
   3. For custom colors, request color selection from the Architect prior to sample submittal.

D. Quality Control Submittals:
   1. Schedule of sealant types, colors and respective locations.

1.4 QUALITY ASSURANCE

A. Installers:
   1. Use only skilled workmen specially trained in the techniques of sealing, and familiar with the published recommendations of the manufacturers of the sealants being used.
   2. Installers shall be capable of demonstrating successful completion of a minimum of three projects similar in type and scope to that of this project, within the southern Wisconsin area within the past 2 years.

1.5 ENVIRONMENTAL CONDITIONS

A. Unless recommended otherwise by the manufacturer, install sealant systems as follows:
   1. Do not apply sealant when ambient temperatures are below 40 degrees F, or expected to fall below 40 degrees F before sealant cure is complete.
   2. Do not apply sealant to substrates or accessories that are moist.

1.6 GUARANTEE

A. Furnish guarantees in accordance with Section 017700.

B. Furnish a 2 year installer's guarantee covering defects in installation.

C. Furnish Type S sealant manufacturer's 20 year material guarantee.

PART 2 - PRODUCTS

2.1 SEALANTS

A. Type S - Neutral Cure Silicone Sealants:
   1. Dow Corning, 790 Silicone Building Sealant, or "795 Silicone Structural Glazing and Weatherproofing Sealant."
   2. Pecora "890 Architectural Silicone Sealant."
   3. Spectrem 3 by Tremco Incorporated.

B. Type PT: ASTM C920, Type M, Grade P, class 25; Tremco "THC 900", Sonneborn/ChemRex "Sonolastic SL 2", Pecora "Urexpan NR-200", or approved; standard colors as selected.

C. Type PTNS: ASTM C920, Type M, grade NS, Class 25, Use T; Pecora "Dynatred," Tremco "THC901," Sika "Sikaflex-2c NS TG," or approved; custom colors to match the Architect's samples.

D. Type A: ASTM C834; Tremco "Acrylic Latex Caulk," Pecora "AC-20," Sonneborn/ChemRex "Sonolac," or approved; standard colors to match adjacent construction.

E. Type SM: Mildew Resistant Silicone Sealant: USDA approved; Dow Corning 786 by Dow Chemical, 898 Silicone" by Pecora (800-523-6688), Sonolastic Omniplus by Sonneborn/ChemRex, Sanitary 1702 Silicone Sealant by GE Silicones / General Electric Company, or approved; white color.

2.2 COMPRESSIBLE FOAM TAPE

A. Precompressed self-adhesive open cell polyurethane foam tape; grey or black color; "Greyflex" by Emseal Joint Systems, Ltd., "Will-Seal" by Illbruck., or approved.

B. Furnish tape in thickness recommended by the manufacturer for widths of joints to be filled.

2.3 ACCESSORY MATERIALS

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Backer Rod: Closed or open cell foam as recommended by the sealant manufacturer for the application; round profile; thickness approximately 130 percent of joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

C. Verify joint dimensions and conditions are acceptable to receive the work of this Section.

3.2 PREPARATION

A. Clean and prepare joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.

B. Apply masking tightly around joints to protect adjacent surfaces from excess sealant.

C. Prime as required for proper bond to substrate materials.

D. Backing Materials:
   1. Place backer rod to achieve proper sealant width/depth ratios and to prevent sealant sag.
   2. Use bond breaker where there is insufficient depth to use joint filler.
   3. Do not use backer rod and bond breaker at joints to receive Type PTNS sealant.

3.3 INSTALLATION

A. Perform work in accordance with ASTM C1193, unless specified otherwise or recommended otherwise by the sealant manufacturer.

B. Apply sealant within recommended temperature ranges.

C. Joint Profile:
   1. Sealant beads shall have a sectional width to depth ratio of 2 to 1, unless specified otherwise or recommended otherwise by the sealant manufacturer.
   2. Install Type PTNS sealant full depth in tile expansion joints with no backer rod.

D. Tooling:
   1. Tool joints concave, unless indicated or specified otherwise. Finish to uniform profile and depth, free of air pockets, embedded matter, ridges, and sags.
   2. Tool type PTNS sealant to match grout joint profile.

3.4 CLEANUP

A. Clean adjacent surfaces free of excess sealant as the work progresses. Use cleaning agents recommended by the sealant manufacturer.

B. Upon completion, remove and dispose of masking.

3.5 PROTECTION

A. Protect sealant in joints subject to dirt, moisture, and traffic during the sealant curing process. Protection shall be able to resist traffic while remaining securely in position.

3.6 SCHEDULE

A. Type S: Provide at all exterior joints, unless specified otherwise; colors as selected from manufacturer's complete line for each type of sealant.

B. Type PT: Provide at all exterior and interior horizontal joints subject to traffic and abrasion, unless specified otherwise; standard colors as selected from manufacturer's complete line of pre-formulated colors.

C. Type PTNS: Provide at all expansion joints in tile; standard colors as selected from manufacturer's complete line of pre-formulated colors.

D. Type A: Provide at all interior joints, unless specified otherwise.

E. Type SM: Provide at joints around countertops in restrooms or moist areas.

END OF SECTION

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Rolled steel doors and frames.
   2. Interior sidelite and window frames.
   3. Accessories.

B. Related Sections:
   1. 081400 - Wood Doors: Doors for metal frames.
   2. 087100 - Door Hardware.
   3. 087300 - Door and Hardware Installation: Installation of doors and related hardware.
   4. 088000 - Glazing: Glazing in doors and frames.
   5. 092200 - Lightgage Metal Support Framing: Bracing for frame installation.
   6. 099000 - Painting: Field painting of doors and frames.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American National Standards Institute (ANSI): A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames.

B. American Society for Testing and Materials (ASTM)
   1. A366 - Specification for Steel, Carbon, Cold Rolled Sheet, Commercial Quality.
   2. A569 - Specification for Steel, Carbon (0.15 Maximum Percent), Hot Rolled Sheet and Strip, Commercial Quality.
   3. A653 - Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.

C. International Building Code (IBC)

D. National Fire Protection Association (NFPA): NFPA 80 - Fire Doors and Windows.

E. Steel Door Institute (SDI): SDI-105 - Recommended Erection Instructions for Steel Frames.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Literature: Submit manufacturer's published literature for doors and frames.

C. Shop Drawings:
   1. Frames: Indicate configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.
   2. Doors: Indicate elevations, internal reinforcement, closure method, and cutouts for hardware, glazing and louvers.

1.4 QUALITY ASSURANCE

A. Conform to requirements of ANSI A250.8.

B. Regulatory Requirements:
   1. Installed frame and door assembly shall conform to NFPA 80 for fire rated class indicated.
   2. Where doors are noted with an hourly fire resistance rating, provide door and frame assemblies labeled by Underwriter's Laboratory, or any other testing laboratory approved by the local code authorities, to meet the hourly fire rating noted.
   3. Where a hollow metal frame is used as a glazed opening in an interior fire rated wall assembly, the frame shall be labeled to match the fire rating required for a door assembly in the fire rated

wall, except in a 1 hour rated exit corridor wall assembly, the glazed frame shall be labeled to a 45 minute rating. In a 1 hour fire rated corridor wall assembly, where the door frame is integral with the glazed frame, the frame shall have a 45 minute rating.

4. Include "S" label on fire rated door assemblies which are located at 1 hour rated exit corridors.

1.5 DELIVERY, STORAGE AND HANDLING

A. In accordance with Section 016000.

B. Protect doors and frames with factory installed protective packaging. Maintain protective packaging until installation commences.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Members of the Steel Door Institute and of the National Association of Architectural Metal Manufacturers, subject to compliance with the specified requirements.

2.2 MATERIALS

A. Steel Sheet: Cold rolled ASTM A366, or hot rolled pickled and oiled sheet conforming to ASTM A569.

2.3 DOORS

A. ANSI A250.8; Seamless.

B. Minimum 18 gage face sheets for interior doors; minimum 16 gage face sheets for exterior doors.

C. Core:
   1. Interior Doors: Vertical steel stiffeners with sound deadening fill between stiffeners, or resin impregnated kraft paper honey comb core.
   2. Exterior Doors: Polystyrene or polyurethane foam core.

D. Provide continuously welded seamless edges.

E. Close top edges of exterior doors flush with steel filler cap; seal joints watertight.

F. Cut mortises for butts using appropriate templates; universal non-handed preparation of doors is not acceptable.

2.4 FRAMES

A. Design: Double equal rabbet, unless indicated otherwise; fully welded. Fabricate frames with throat dimensions as indicated.

B. Gages:
   1. Exterior Frames: Minimum 14 gage.
   2. Interior Frames: Minimum 16 gage for frames of door openings up to and including 4 feet in width; 14 gage for frames greater than 4 feet in width.

2.5 ACCESSORIES

A. Glazing Stops: Rolled steel channel shape, butted corners; prepared for countersink style tamperproof screws.

B. Non-Rated Louvers: Roll formed steel; 1.25 oz/sq ft. galvanized finish; factory primed for field painting as specified elsewhere; Inverted 'V' blade design; 50 percent free area; tamperproof fasteners.

2.6 FINISH

A. Exterior Units:
   1. A60 hot dip galvannealed coating conforming to ASTM A653.
   2. Include reinforcing and other internal components.
   3. Use zinc rich primer to touch-up galvanized coatings damaged during fabrication.

4. Apply modified epoxy ester baked-on primer to receive epoxy/urethane coating system specified in Section 099000.

B. Interior Units: Manufacturer's standard rust inhibitive primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 INSTALLATION OF FRAMES

A. Install frames in accordance with SDI-105 and in accordance with labeling requirements.

B. Coordinate with wall construction for anchor placement.

C. Coordinate installation of glass and glazing.

D. Install accessories.

E. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

F. Installation Tolerances; Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

G. Door and hardware installation is specified in Section 087300.

END OF SECTION

SECTION 081400 - WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wood doors.

B. Related Sections:
   1. 081113 - Hollow Metal Doors and Frames: Steel frames.
   2. 087100 - Door Hardware.
   3. 087300 - Door and Hardware Installation.
   4. 088000 - Glazing: Vision lites.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. Architectural Woodwork Institute (AWI): Architectural Woodwork Quality Standards, Guide Specifications, and Quality Certification Program; current edition.

B. International Building Code (IBC)

C. NFPA 80 - Fire Doors and windows.

D. Window and Door Manufacturing Association (WDMA): Industry Standard I.S.1-A current edition.

1.3 SUBMITTALS

A. In accordance with Section 013300.

B. Product Data: Submit manufacturer's product literature for each type of door.

C. Shop Drawings: Indicate door sizes and thickness, materials, stile and rail reinforcement, internal blocking for hardware attachment, cutouts for glazing and louvers, louver details and glazing stops.

D. Samples: Submit two 8 x 10 inch samples of each transparent finish species and finish combination proposed.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Installed frame and door assembly shall conform to NFPA 80 for fire rated class indicated.
   2. Where doors are noted with an hourly fire resistance rating, provide door and frame assemblies labeled by Underwriter's Laboratory, or any other testing laboratory approved by the local code authorities, to meet the hourly fire rating noted. Assemblies shall meet IBC requirements for positive pressure.
   3. Include "S" label on fire rated door assemblies which are located at 1 hour rated exit corridors.

B. Urea-Formaldehyde Free: All materials used to manufacture the door shall be urea-formaldehyde free.

1.5 DELIVERY, STORAGE, AND PROTECTION

A. In accordance with Section 016000.

B. Package, deliver, and store doors in accordance with AWI requirements.

1.6 WARRANTY

A. Furnish manufacturer's standard warranty under provisions of Section 017700.

PART 2 - PRODUCTS

2.1 DOORS

A. Solid Core Flush Doors:
   1. Approved Manufacturers: One of the following.
      a. Algoma Hardwoods, Inc. (Algoma WI; 920-487-5221; 800-678-8910).
      b. Marshfield Door Systems (Marshfield, WI 800-869-3667).
      c. Eggers Industries (Two Rivers WI; 920-793-1351).
   2. AWI Section 1300, PC-5 or PC-7 (5 or 7 ply construction; bonded core); Premium grade.
   3. Core: Solid particleboard, unless required otherwise for fire labeling requirements; formaldehyde free.
   4. Furnish labeled doors as required to meet the hourly fire rating indicated.
   5. Face Veneer:
      a. For Transparent Finish: Hard Maple (Acer saccharum), AWI Select White "Grade AA", all sapwood; free of mineral stains; limited figure; plain sawn or half round, veneer panels slip matched.
      b. Paint Grade Veneer: Medium density overlay or paint grade birch.
   6. Where intumescent seals are required to meet positive pressure labeling requirements, provide concealed edge sealing system built into the door edge.
   7. At transparent finish doors, edges shall be wood to match face veneer; no finger joints will be permitted except at paint grade doors.

2.2 ACCESSORIES

A. Glass Stops: Wood type, except as required to conform to labeling requirements; finished to match door finish.

B. Non-Rated Louvers: Roll formed steel or extruded aluminum material, factory primed for field painting as specified elsewhere; Inverted 'V' blade design; 30 percent free area; tamperproof fasteners.

2.3 FABRICATION

A. Fabricate doors to the configurations indicated, in accordance with the AWI standards specified, and to fire rated labeling requirements. Attach fire and smoke rating labels.

B. Bevel lock and hinge edges 1/8 inch in 2 inches on single acting doors.

C. Bond edge banding to solid core with hot melt or RF cured adhesive.

D. Prefit and premachine doors in accordance with AWI 1300-S-6. Premachine for hardware specified in Section 087100, and locate as specified in Section 087300.

E. Doors shall be factory prefinished as scheduled to match Architect's sample; AWI Premium Grade U-V Cured Polyurethane.

F. Provide metal astragals to meet fire rating requirements for double fire doors. Finish to match door.

G. Factory install door louvers.

H. Factory pre-glaze doors.

I. Flush Door Blocking: For flush doors, provide solid lock blocks and special blocking as required for the hardware components specified elsewhere. Blocking for fire rated doors shall meet the door manufacturer's labeling requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install doors as specified in Section 087300.

END OF SECTION

SECTION 083100 - ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fire resistive rated and non-rated access doors and frames and accessories.

B. Related Sections:
   1. 087100 – Door Hardware: Lockset and keying for access door.
   2. 092200 – Lightgage Metal Support Framing: Framing of openings for access doors.
   3. 092900 - Gypsum Board: Finishes for concealed access doors.
   4. 099000 - Painting: Field paint finish.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data. Include sizes, types, finishes, scheduled locations, and details of adjoining work.

1.3 QUALITY ASSURANCE

A. Where an access door is required in fire rated construction, the access door assembly shall be labeled by Underwriter's Laboratory, Warnock Hersey, or any other testing laboratory approved by the local code authorities, to meet the hourly fire resistance rating of the construction in which the access door is installed.

PART 2 - PRODUCTS

2.1 WALL AND CEILING ACCESS DOORS

A. Acceptable Manufacturers:
   1. Milcor LP. (Lima OH; 800-441-6899).
   2. The Williams Brothers Corporation of America (Front Royal, VA; 800-255-5515).
   3. Nystrom Products Co. (Minneapolis MN; 612-781-7850).
   4. Karp Associates, Inc. (Maspeth NY;718-784-2105).
   5. JL Industries (Bloomington, MN; 612-835-6850)

B. Door Types:
   1. Fire Rated Metal Access Door:
      a. Flush type design.
      b. 16 gage frame; minimum 20 gage welded pan door panel insulated with non-combustible filler
      c. Self closing and self latching, with interior latch release
      d. Fully concealed pin type hinges or continuous piano hinge, 175 degree opening.
      e. Ring turn latch; furnish 2 at latch edges greater than 30 inches in length.
      f. Key operated cylinder lock.
   2. Non Rated Concealed Drywall Access Door:
      a. Flush type design, with integral attachment flange and drywall bead for flush installation.
      b. Minimum 16 gage frame; minimum 14 gage door panel.
      c. Fully concealed pin type hinges or continuous piano hinge, 175 degree opening.
      d. Latches: Screw driver operated cam type.
      e. Key operated cylinder lock.

C. Sizes: Approximately 12" x 12" size for hand access, 22" x 22" size for man entry, unless indicated otherwise; furnish custom sizes as necessary.

D. Finish: Galvanized steel with wiped coat finish; prime units with manufacturer's standard primer to receive paint coatings as specified in Section 099000. Provide stainless steel access doors at restrooms, and other moist locations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

C. Verify rough openings for door and frame are correctly sized and located.

3.2 INSTALLATION

A. Install access doors of sizes and in locations as indicated. Provide access doors for access to balancing and fire dampers, trap primers, valves, fans, terminal units, and other equipment requiring periodic inspection through finished walls and ceilings, whether indicated or not. Coordinate access requirements with other trades.

B. Provide concealed access doors at gypsum board locations, except where fire rated doors are required.

C. Install frames plumb and level in wall and ceiling openings, with plane of door surface in accurate alignment with plane of wall or ceiling surface.

D. Secure rigidly in place in accordance with manufacturer's instructions.

END OF SECTION

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Overhead coiling doors.
   2. Support framing.

B. Related Sections:
   1. 099000 - Painting: Field painting of overhead coiling doors.
   2. Division 26 - Electrical: Installation of key operated push button station, conduit, and wiring; connection of alarm and detection system to fire rated door assemblies.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 SYSTEM DESCRIPTION

A. Overhead coiling door assembly includes curtain, curtain guides, brackets, counterbalance, hood, motor or manual operators as specified, push button stations, steel structural supports and other accessories required for a complete installation.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Submit manufacturer's complete product literature indicating specified items and method of installation.

C. Shop Drawings: Indicate details and dimensions of installation, including tracks, supports, connection points and details, and locations of operating components.

1.4 QUALITY ASSURANCE

A. Installers: Trained and authorized by the door manufacturer.

1.5 MANUFACTURERS

A. The Cookson Company is specified as the standard of approval, similar and equal products from Overhead Door Corporation, Wayne-Dalton Corporation, Cornell Iron Works, Inc., and McKeon Rolling Door Company may be used.

B. Acceptable Substitutions (Subject to Architect's approval for compliance with design concept:
   1. Overhead Door Corporation
   2. Wayne-Dalton Corporation.
   3. Cornell Iron Works, Inc.
   4. McKeon Rolling Door Company

1.6 PREMANUFACTURED DOOR ASSEMBLIES

A. Motorized Insulated Non-Rated Doors:
   1. Cookson Type FMWI; motorized operation.
   2. Motor Operator: Heavy duty gear head motor operator; 3 phase power; verify voltage.
   3. Curtain: Galvanized steel curtain with polyurethane insulated slats; factory primed finish.
   4. Reversing footpiece. Bottom-bar switch at doors shall be detailed and mounted so as not to overhang the bottom-bar angle.
   5. Weatherstripping at exterior doors.
   6. Keyed push button station with "open", "close", and "stop;" ADA compliant visual and horn.

B. Manually Operated Non-Rated Doors:
   1. Cookson Type FP; push-up operation.
   2. Curtain: Galvanized steel curtain; No. 5 slat design; factory primed finish; weatherstripping.

1.7 SUPPORT FRAMING

A. Provide tube steel framing as indicated to support the overhead coiling doors.

B. The support framing shall be Contractor designed.

C. Provide bracing, attachments, and anchors to adjacent structure to maintain the installation firmly in position.

D. Framing shall be designed to accommodate deflection from the structure above without transmission of the load to the structure below.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

C. Verify that openings are prepared with headers level, jambs plumb, floor level, without projections, and are correctly dimensioned to receive door.

2.2 INSTALLATION

A. Install door assemblies as indicated in accordance with manufacturer's installation instructions.]

2.3 FIELD QUALITY CONTROL

A. Verify that moving parts operate smoothly, coiling doors are free from warp, twists, or distortion, doors remain in required position, and safety features function properly.

B. Repair damage to overhead coiling doors to match manufacturer's original finish. Replace components which cannot be properly repaired.

2.4 ADJUST

A. Adjust mechanism so moving parts operate smoothly.

END OF SECTION

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Stick framed aluminum storefront system.
   2. Aluminum and glass entrances.

B. Related Sections:
   1. 079200 - Joint Sealants: Perimeter sealants.
   2. 088000 - Glazing: Glass and glazing.
   3. 084413 - Glazed Aluminum Curtain Walls.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   2. B209 - Aluminum and Aluminum Alloy Sheet and Plate.
   3. B221 - Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
   4. E283 - Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
   5. E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
   6. E331 - Test Method for Water Penetration of Exterior Windows, Curtainwalls, and Doors by Uniform Static Air Pressure Difference.

B. American Architectural Manufacturers Association (AAMA)
   1. 2605-02 -Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

1.3 SYSTEM DESCRIPTION

A. Performance:
   1. System shall provide for expansion and contraction caused by a cycling temperature range of -20°F to +160°F without causing detrimental effects to components, sealing systems, and surrounding construction.
   2. Design system with provisions to drain moisture to the exterior of the system.
   3. Air Infiltration:
      a. Fixed Glazing: Limit air infiltration through assembly to 0.06 cfm/sf of assembly surface area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ANSI/ASTM E283
      b. Swing Door: Limit to 1 cfm/ft of perimeter crack around pair of doors, measured at a reference differential pressure across assembly of 1.57 psf, as measured in accordance with ANSI/ASTM E283.
   4. Water Infiltration; Storefront System: No water penetration at a test pressure of 6.24 lb/sf when measured in accordance with ASTM E331.

B. Thermal Transmittance (Exterior Storefront): Maximum U=0.37 when tested in accordance with NFRC requirements. Provide storefront systems with certification stating that they have been tested in accordance with NFRC to meet the specified requirements using glass which matches the glass to be used in the Project.

C. System Structural Design:
   1. Design and size members and anchorages to withstand positive and negative wind loads as required by the jurisdictional code authorities, and to resist pivot and closer reaction forces.

2. Limit mullion deflection to 1/175, or flexure limit of glass with full recovery of glazing materials, whichever is less.

D. Dynamic Movement: System shall accommodate the following without damage to system components or performance.
1. Movement within the system.
2. Application and release of design live loads.
3. ±5/8" maximum deflection of structural support framing between head and sill.

E. Profiles: Framing member profiles, as indicated in the Drawings, indicate proportions and intent. Minor variations in profiles, assemblies, and connections which are indicated on the shop drawings will be accepted, provided that, in the opinion of the Architect, they do not substantially alter the intended appearance.

1.4 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Shop Drawings:
1. Include wall opening dimensions, component dimensions, tolerances required, anchorages and fasteners, operator and electrical coordination requirements, relationship to adjacent construction, threshold configurations,installation details, flashings, and sealant locations.

C. Quality Control Submittals:
1. Certification: Submit certification that aluminum storefront systems have been designed to meet the specified requirements.

D. Closeout Submittal
1. In accordance with Section 017700.
2. Submit designing engineer's certification that products and installation comply with design requirements.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company authorized by system manufacturer, one installer for total system.

1.6 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 01600.

1.7 GUARANTEE AND WARRANTY

A. Furnish in accordance with Section 017700.

B. Manufacturer's Warranty: Furnish three year written warranties executed to the Owner, from the manufacturers of the storefront and aluminum window systems, against defects in materials and workmanship.

C. Installer's Guarantee: Furnish three year written guarantee against defects in installation.

PART 2 - PRODUCTS

2.1 STOREFRONT SYSTEMS

A. Acceptable Manufacturers: Tubelite Inc, Kawneer Co. Inc, Arcadia, Vistawall, US Aluminum Corporation, or approved.

B. Storefront Framing System: Tubelite TU2400, Kawneer VG 451T, Arcadia AG451T, Vistwall Series FG-3000T, US Aluminum Corporation IT 451, or approved; 2 x 4-1/2 inch nominal extruded aluminum section; center set; flush design; thermally broken.

C. Furnish spacers and adapters as necessary for a complete installation.

2.2 DOORS

A. Doors: Heavy duty extruded aluminum frame; wide stile. Provide with special 10 inch high bottom rail.

B. Swinging Entry Doors: Tubelite; Heavy duty aluminum/glass type; outswinging.
   1. Acceptable Substitutions: Kawneer Company, Inc. "350 Heavy Wall Door"; United States Aluminum Corporation "Durafront Series 800" door; aluminum door system.
   2. Configure with 10 inch high bottom rail.

2.3 MATERIALS

A. Extruded Aluminum: ANSI/ASTM B221; 6063-T5 Alloy and Temper.

B. Sheet Aluminum: ASTM B209, minimum .019 inch thickness for flashings, minimum .062 inch thick for brake formed trim applications.

C. Fasteners: Stainless steel, or zinc-plated in accordance with ASTM A164.

D. Glazing: Furnished under Section 088000. Provide shop glazed units at Contractor's option.

E. Miscellaneous Accessories: Furnish reinforcing, attachment hardware, aluminum flashings, and other items as necessary.

2.4 DOOR HARDWARE

A. Door Hardware:
   1. Weatherstripping: Hard-backed poly pile in door and/or frame. Meeting stile of each leaf shall have a double line of hard-backed poly-pile astragal.
   2. Sill Sweeps: Brush strip, concealed.
   3. All other door hardware is specified in Section 087100.

B. Low Energy Operator:
   1. The following manufacturer's are approved, subject to the specified requirements:
      a. Horton Automatics Division of Overhead Door Corporation.
      b. Stanley.
      c. Dor-O-matic.
   2. Operator: Low energy electro-mechanical swing operator; overhead concealed transom mount: door configurations as indicated on the Drawings; aluminum housing with clear anodized aluminum finish.
   3. Pushbutton Switches:
      a. Jamb Mounted Pushbutton Switches: Recessed configuration for mounting in cutout in adjacent jamb; narrow profile black cover plate with handicap logo, red push button, and text to read PRESS TO OPEN; white enamel paint filled engraving.
      b. Wall Mounted Pushbutton Switches: Recessed configuration in 4x4 junction box; 6" diameter stainless steel push plate with engraved handicap logo and message "PRESS TO OPEN." Provide blue enamel filled engraving.
      c. Provide 2 switches per opening.
      d. Provide weatherproof design for exterior installations.
   4. Remote Power Switches:
      a. Model 1200MC (maintained contact) with key operated switch, labeled ON and OFF by Folger Adam Security, Lemont, IL (630/739-3900).
      b. Bronze cover plate with oil rubbed finish similar to US10B.
      c. Keyed cylinders are furnished under Section 087100 for installation by this Section.
   5. Low energy doors shall conform to the currently enforced edition of ANSI A156.19.

C. Sliding Door Systems:
   1. Stanley "Dura-glide 2000, Designer System" or Horton Automatics, Division of Overhead Door Corporation, "Series 2110," bi-parting slide with fixed sidelights, full height lights without intermediate rail; size as indicated.
   2. Operators:
      a. Drive: All electro-mechanical operator with 1/8 HP DC permanent magnet motor and linear actuator drive.
      b. Provide keyed power ON and OFF switch on interior side of jamb.
      c. Motion Detector: Include two detectors and sonar scan device across door opening.

d. Presence Detector: As scheduled.
   1) Detector: Photo-electric beam and sensor device, two sets per opening; as required for coverage of full door opening width.
   2) Mat Type: Recessed mat, both sides of door.
e. Include supplementary spring to reclose door if pushed open.

3. Threshold/Track: Manufacturer's standard; clear anodized.

D. Locks, Pulls, and Indicators: Furnished under Section 087100.

2.5 FABRICATION

A. Field verify openings prior to fabrication.

B. Fabricate frames allowing for shim spacing around perimeter of assembly, yet enabling installation.

C. Rigidly fit joints and corners. Accurately fit and secure corners tight. Make corner joints flush, hairline, and weatherproof. Seal joints with sealant.

D. Provide drainage holes to allow water to flow to exterior.

E. Prepare components to receive anchorage devices. Fabricate anchorage items.

F. Form bent components accurately to line, without deformation of component profiles. Fabricate in lengths consistent with finisher's capacity to handle bent shapes. Prefit all clips and mating components to ensure secure fit at time of assembly.

G. Provide internal reinforcement in mullions with members to maintain rigidity. Provide reinforcing at all door strike jambs.

H. Fabricate storefront system to accommodate hardware using templates furnished from Section 087100.

I. Sub-Sills:
   1. Provide extruded aluminum sub-sills in accordance with manufacturer’s installation instructions and as specified below.
   2. Provide manufacturer’s standard end dams and splice plates sealed into position. End dams and splice plates shall match the height of the sub-sill back.
   3. Seal joint between end dam and jamb.
   4. Fasten the sub-sill securely to the sill construction. Cap seal tops of fasteners.
   5. Fasten the storefront framing into the sub-sill. Use manufacturer’s standard interlocking anchors which engage the sub-sill and allow fastening of the storefront without penetrating the horizontal pan of the sub-sill.

J. Install water diverters.

K. Compensation Heads:
   1. Provide compensation channels at head conditions in accordance with manufacturer’s installation instructions and as specified below.
   2. Provide manufacturer’s standard end caps sealed into position. End caps shall match the height of the compensation channel and shall be pre-finished to match the framing at exposed locations.
   3. Provide interlocking mullion anchors at vertical tubes.

L. Provide plastic backing plates at jambs to receive sealant and backing rod.

M. Fabricate custom extrusions, closures, and sheet materials to the shapes indicated; fabricate for attachment with concealed fasteners to the greatest possible extent.

2.6 FINISHES

A. Exposed Surfaces: Manufacturer's standard PVDF finish system; minimum 70% resin; custom color to match Architect's sample; conform to AAMA 2605.

B. Concealed Steel Items: Galvanized in accordance with ANSI/ASTM A123 to minimum 1.7 oz/sf.

C. Apply two coats of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify wall openings are ready to receive work of this Section.

B. Notify Architect of unacceptable conditions, prior to installation. Do not install window units until such conditions have been corrected.

3.2 INSTALLATION

A. Install frames and hardware in accordance with manufacturer's instructions.

B. Align frames plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

C. Install under sill aluminum flashings and water diverters. Seal all frame joints, and penetrations in flashings.

D. Doors:
   1. Install closers and doors for uniform clearances and smooth operation.
   2. Coordinate with Division 16, and other trades as necessary for installation of barrier free entrance operators.

E. Low Energy Operators:
   1. Install operators and controls in accordance with manufacturers instructions and ANSI requirements.
   2. Coordinate electrical service, wiring and connections with work of Division 26 - Electrical.

F. Perimeter sealant is provided under Section 079200.

3.3 ADJUSTING

A. Set clearances and adjust operating hardware for smooth operation.

B. Closers:
   1. Set manual closers at exterior entrances to pounds spring tension at the pull handles.
   2. Set initial opening force to 5 pounds and time delay at barrier free entrances to 15 seconds, unless otherwise directed.

3.4 FIELD QUALITY CONTROL

A. After completion of all glazing and sealing work, hose test all exterior glazed storefront and window systems. Notify Architect a minimum of 72 hours prior to hose testing.

B. All areas which exhibit water penetration to the inside of the building shall be repaired, resealed, and retested until watertightness can be demonstrated.

3.5 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Retouch damage to PVDF finish with matching air-dry material as recommended by the finish coating manufacturer.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Mechanical and electrified door hardware for:
      a. Swinging doors.
   2. Electronic access control system components.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:
   1. Windows
   2. Cabinets (casework), including locks in cabinets
   3. Signage
   4. Toilet accessories
   5. Overhead doors

C. Related Sections:
   1. Division 01 Section “Alternates” for alternates affecting this section.
   2. Division 07 Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.
   3. Division 08 Section “Openings” for preparing doors and frames for the products specified in this section.
   4. Division 09 sections for touchup finishing or refinishing of existing openings modified by this section.
   5. Division 26 sections for connections to electrical power system and for low-voltage wiring.
   6. Division 28 sections for coordination with other components of electronic access control system.

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

1.2 REFERENCES

A. Fire/Life Safety
   1. NFPA - National Fire Protection Association
      a. NFPA 70 – National Electric Code
      b. NFPA 80 - Standard for Fire Doors and Fire Windows
      c. NFPA 101 - Life Safety Code
      d. NFPA 105 - Smoke and Draft Control Door Assemblies
   2. State Fire Safety Code.

B. UL - Underwriters Laboratories
   1. UL 10B - Fire Test of Door Assemblies
   2. UL 10C - Positive Pressure Test of Fire Door Assemblies
   3. UL 1784 - Air Leakage Tests of Door Assemblies
   4. UL 305 - Panic Hardware

C. Accessibility
   1. ADA - Americans with Disabilities Act .
   2. ANSI A117.1 - Accessible and Usable Buildings and Facilities.

D. DHI - Door and Hardware Institute
   1. Sequence and Format for the Hardware Schedule
   2. Recommended Locations for Builders Hardware
   3. Key Systems and Nomenclature

E. ANSI - American National Standards Institute
   1. ANSI/BHMA A156.1 - A156.29, and ANSI A156.31 - Standards for Hardware and Specialties

1.3 SUBMITTALS

A. General:
   1. Submit in accordance with Conditions of Contract and Division 01 requirements.

2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.

B. Action Submittals:
1. Product Data: Product data including manufacturers’ technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
    a. Wiring Diagrams: For power, signal, and control wiring and including:
        1) Details of interface of electrified door hardware and building safety and security systems.
        2) Schematic diagram of systems that interface with electrified door hardware.
        3) Point-to-point wiring.
        4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
    a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
    a. Door Index; include door number, heading number, and Architects hardware set number.
    b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
    c. Type, style, function, size, and finish of each hardware item.
    d. Name and manufacturer of each item.
    e. Fastenings and other pertinent information.
    f. Location of each hardware set cross-referenced to indications on Drawings.
    g. Explanation of all abbreviations, symbols, and codes contained in schedule.
    h. Mounting locations for hardware.
    i. Door and frame sizes and materials.
    j. Name and phone number for local manufacturer's representative for each product.
    k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
        1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.
5. Key Schedule:
    a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
    b. Use ANSI A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
    c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
    d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.

e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
   1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:
1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Product Certificates for electrified door hardware, signed by manufacturer:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
3. Certificates of Compliance:
   a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
   b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.
   c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.
4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
5. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:
1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Name, address, and phone number of local representative for each manufacturer.
   d. Parts list for each product.
   e. Final approved hardware schedule, edited to reflect conditions as-installed.
   f. Final keying schedule
   g. Copies of floor plans with keying nomenclature
   h. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
   i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.4 QUALITY ASSURANCE

A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.
1. Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)
   a. Where no additional products or manufacturers are listed in product category, requirements for "No Substitute" govern product selection.
2. Where products indicate "acceptable substitute" or "acceptable manufacturer", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.

B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
   1. Warehousing Facilities: In Project's vicinity.
   2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
   3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
   4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
      a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.

D. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
   2. Can provide installation and technical data to Architect and other related subcontractors.
   3. Can inspect and verify components are in working order upon completion of installation.
   4. Capable of producing wiring diagrams.
   5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
   1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
   2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

G. 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.
   1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

H. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

I. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.

J. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.
   1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf (22.2 N).
   2. Maximum opening-force requirements:
      a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
      b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.

c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.

K. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.
1. Attendees: Owner, Contractor, Architect, Installer, Owner's security consultant, and Supplier's Architectural Hardware Consultant.
2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
b. Preliminary key system schematic diagram.
c. Requirements for key control system.
d. Requirements for access control.
e. Address for delivery of keys.

L. Pre-installation Conference: Conduct conference at Project site.
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

M. Coordination Conferences:
1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
a. Attendees: Door hardware supplier, door hardware installer, Contractor.
b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Owner, Owner's security consultant, Architect and Contractor.
b. After meeting, provide letter of compliance to Architect, indicating when coordination conference was held and who was in attendance.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
1. Deliver each article of hardware in manufacturer's original packaging.

C. Project Conditions:
1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:
1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.

3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

F. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.6 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

F. Direct shipments not permitted, unless approved by Contractor.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
      a. Closers:
         1) Mechanical: 30 years.
      b. Exit Devices:
         1) Mechanical: 3 years.
         2) Electrified: 1 year.
      c. Locksets:
         1) Mechanical: 3 years.
      d. Continuous Hinges: Lifetime warranty.
      e. Key Blanks: Lifetime
   2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.8 MAINTENANCE

A. Maintenance Tools:
   1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Approval of manufacturers other than those listed shall be in accordance with QUALITY ASSURANCE article, herein.

B. Approval of products from manufacturers indicated as “Acceptable Manufacturer” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

Item	Scheduled Manufacturer	Acceptable Manufacturer
Hinges	Ives (IVE)	McKinney, Stanley
Continuous Hinges	Ives (IVE)	Markar, Stanley
Electric Power Transfer	Von Duprin (VON)	ABH, Falcon
Flush Bolt	Ives (IVE)	Hiawatha, Trimco
Locksets & Deadlocks	Schlage (SCH)	Best, Sargent
Aluminum Door Locks – Narrow Style	Adams Rite (ADA)	As pre-approved
Exit Devices & Mullions	Von Duprin (VON)	Precision, Sargent
Electric Strikes	Von Duprin (VON)	HES, Folger Adam
Power Supplies	Schlage Electronics (SCE) or Von Duprin (VON)	Precision, Sargent
Cylinders & Keying	Schlage (SCH)	Best, Sargent
Door Closers	LCN (LCN)	Norton, Sargent
Door Trim	Ives (IVE)	Hiawatha, Trimco
Protection Plates	Ives (IVE)	Hiawatha, Trimco
Overhead Stops	Glynn-Johnson (GLY)	Rixson, Sargent
Stops & Holders	Ives (IVE)	Hiawatha, Trimco
Thresholds & Weatherstrip	Zero International (ZER)	Pemko, National Guard
Silencers	Ives (IVE)	Hiawatha, Trimco
Key Cabinets	Telkee (TEL)	HPC, Lund

C. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

A. Fasteners
   1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
   2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
   3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
   4. Install hardware with fasteners provided by hardware manufacturer.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
   1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.3 HINGES

A. Provide five-knuckle, ball bearing hinges.
   1. Manufacturers and Products:
      a. Scheduled Manufacturer and Product: Ives 5BB series.
      b. Acceptable Manufacturers and Products: McKinney TB/T4B series, Stanley FBB Series.

B. Requirements:
   1. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
      a. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

2. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Interior: Heavy weight, steel, 5 inches (127 mm) high
3. 2 inches or thicker doors:
   a. Interior: Heavy weight, steel, 5 inches (127 mm) high
4. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
5. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins
7. Width of hinges: Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

2.4 CONTINUOUS HINGES

A. Aluminum Geared
   1. Manufacturers:
      a. Scheduled Manufacturer: Ives.
      b. Acceptable Manufacturers: Markar, Stanley.
   2. Requirements:
      a. Provide aluminum geared continuous hinges conforming to ANSI A156.25, Grade 2.
      b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum, with 0.25-inch (6 mm) diameter Teflon coated stainless steel hinge pin.
      c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
      d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
      e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
      f. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
      g. Install hinges with fasteners supplied by manufacturer.
      h. Provide hinges with symmetrical hole pattern.

2.5 ELECTRIC POWER TRANSFER

A. Manufacturers:
   1. Scheduled Manufacturer: Von Duprin
   2. Acceptable Manufacturers: Falcon, ABH

B. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires sufficient to accommodate electric function of specified hardware.

C. Locate electric power transfer per manufacturer’s template and UL requirements, unless interference with operation of door or other hardware items.

2.6 FLUSH BOLTS

A. Manufacturers:
   1. Scheduled Manufacturer: Ives
   2. Acceptable Manufacturers: Hiawatha, Trimco

B. Requirements:
   1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90

inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.
2. CYLINDRICAL LOCKS – GRADE 1

C. Manufacturers and Products:
1. Scheduled Manufacturer and Product: Schlage ND Series
2. Acceptable Manufacturers and Products: Sargent 10-Line, Best 9K3 Series.

D. Requirements:
1. Provide cylindrical locks conforming to ANSI A156.2 Series 4000, Grade 1. Cylinders: Refer to "KEYING" article, herein.
2. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
3. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
4. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
6. Provide electrified options as scheduled in the hardware sets.
7. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.
   a. Lever Design: Schlage Athens.
   b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

2.7 AUXILIARY LOCKS

A. Aluminum Door Deadbolt - Narrow Style:
1. Manufacturer and Product: Adams Rite MS1850 Series
2. Requirements:
   a. Provide narrow style aluminum door deadbolts as specified. Cylinders: Refer to "KEYING" article, herein.
   b. Provide deadbolts with backset with full 1-13/32 inches (36 mm) throw deadbolt.
   c. Provide manufacturer's standard strikes unless extended lip strikes are necessary to protect trim.

2.8 EXIT DEVICES

A. Manufacturers and Products:
1. Scheduled Manufacturer and Product: Von Duprin 99/33A series
2. Acceptable Manufacturers and Products: Sargent 80 series, Precision Apex series

B. Requirements:
1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to "KEYING" article, herein.
2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Touchpad: Extend minimum of one half of door width. Match exit device finish, stainless steel for US26, US26D, US28, US32, and US32D finishes; and for all other finishes, provide compatible finish to exit device. Provide compression springs in devices, latches, and outside trims or controls; tension springs also acceptable.
4. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
5. Provide exit devices with manufacturer's approved strikes.
6. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
7. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
8. Provide hex-key dogging at non-fire-rated exit devices, unless specified less dogging.
9. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion that is removed by use of a keyed cylinder, which is self-locking when re-installed.

10. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
    a. Lever Style: Match lever style of locksets.
    b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.
11. Provide UL labeled fire exit hardware for fire rated openings.
12. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
13. Provide electrified options as scheduled.

2.9 ELECTRIC STRIKES

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product: Von Duprin 6000 series
   2. Acceptable Manufacturers and Products: Folger Adam 300 series, HES 1006 series

B. Requirements:
   1. Provide electric strikes designed for use with type of locks shown at each opening.
   2. Provide electric strikes UL Listed as burglary-resistant.
   3. Where required, provide electric strikes UL Listed for fire doors and frames.
   4. Provide fail-secure type electric strikes, unless specified otherwise.
   5. Coordinate voltage and provide transformers and rectifiers for each strike as required.

2.10 POWER SUPPLIES

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product: Schlage Electronics or Von Duprin PS900 series
   2. Acceptable Manufacturers and Products: Precision ELR series, Sargent 3500 series

B. Requirements:
   1. Provide power supplies, recommended and approved by manufacturer of electrified locking component, for operation of electrified locks, electrified exit devices, magnetic locks, electric strikes, and other components requiring power supply.
   2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
   3. Provide regulated and filtered 24 VDC power supply , and UL class 2 listed.
   4. Options:
      a. Provide power supply, where specified, with internal capability of charging sealed backup batteries 24 VDC, in addition to operating DC load.
      b. Provide sealed batteries for battery back-up at each power supply where specified.
      c. Provide keyed power supply cabinet.
   5. Provide power supply in an enclosure, complete, and requiring 120VAC to fused input.
   6. Provide power supply with emergency release terminals, where specified, that allow release of all devices upon activation of fire alarm system complete with fire alarm input for initiating “no delay” exiting mode.

2.11 CYLINDERS

A. Manufacturer and Product:
   1. Scheduled Manufacturer and Product: Schlage Everest 29.
   2. Acceptable Manufacturers and Products: Best or Sargent Patented.

B. Requirements: Provide cylinders/cores complying with the following requirements.
   1. Cylinders/cores compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer’s series as indicated.

C. Full-sized cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
   1. Conventional Patented cylinder with open keyway with FSIC cores at exit device locations only.

D. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent-protected until the year, 2029.

E. Nickel silver bottom pins.

F. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Blind code marks shall not include actual key cuts.

G. Identification stamping provisions must be approved by the Architect and Owner.

H. Failure to comply with stamping requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
   1. Forward cylinders/cores to Owner, separately from keys, by means as directed by Owner.

I. Replaceable Construction Cores.
   1. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.

J. 12 construction change (day) keys.
   1. Owner or Owner’s Representative will replace temporary construction cores with permanent cores.

2.12 KEYING

A. Keying System: Factory registered, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Keying Requirements – General
   1. Permanent cylinders/cores keyed by the manufacturer according to the following key system.

C. Keying system as directed by the Owner.

D. Key Features: Provide keys with the following features.
   1. Patent Protection: Keys and blanks protected by one or more utility patent(s) until the year, 2029.

E. Keys
   1. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)

F. Coordinate with cylinder/core and key identification requirements above.

G. Stamp keys with Owner’s unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with “DO NOT DUPLICATE” along with the “PATENTED” or patent number to enforce the patent protection.

H. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
   1. Quantity: Furnish in the following quantities.
      a. Change (Day) Keys: 3 per cylinder/core.
      b. Permanent Control Keys: 3.
      c. Master Keys: 6.
      d. Unused balance of key blanks shall be furnished to Owner with the cut keys.

2.13 KEY CONTROL SYSTEM

A. Key Control System Manufacturers:
   1. Scheduled Manufacturer: Telkee
   2. Acceptable Manufacturers: HPC, Lund

B. Requirements:
   1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
      a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.

b. Provide hinged-panel type cabinet for wall mounting.

2.14 DOOR CLOSERS

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product: LCN 4010/4110 series
   2. Acceptable Manufacturers and Products: Sargent 281/281P10/281TJ or Norton 9500 series factory assembled (without PRV).

B. Requirements:
   1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Stamp units with date of manufacture code.
   2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
   3. Cylinder Body: 1-1/2 inch (38 mm) diameter, with 5/8 inch (16 mm) diameter double heat-treated pinion journal.
   4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
   5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
   6. Hydraulic Regulation: By tamper-proof, non-critical valves with separate adjustment for latch speed, general speed, and backcheck.
   7. Provide closers with a solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
   8. Pressure Relief Valve (PRV) Technology: Not permitted.
   9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
   10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.15 DOOR TRIM

A. Manufacturers:
   1. Scheduled Manufacturer: Ives.
   2. Acceptable Manufacturers: Hiawatha, Trimco.

B. Requirements:
   1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
   2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
   3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
   4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
   5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
   6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
   7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
   8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.16 PROTECTION PLATES

A. Manufacturers:
   1. Scheduled Manufacturer: Ives.
   2. Acceptable Manufacturers: Hiawatha, Trimco.

B. Requirements:
   1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
   2. Sizes of plates:
      a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
      b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
      c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.17 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturers: Glynn-Johnson
   2. Acceptable Manufacturers: Rixson, Sargent

B. Requirements:
   1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
   2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
   3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
   4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.18 DOOR STOPS AND HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturer: Ives.
   2. Acceptable Manufacturers: Hiawatha, Trimco.

B. Provide door stops at each door leaf:
   1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
   2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
   3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.19 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:
   1. Scheduled Manufacturer: Zero International.
   2. Acceptable Manufacturers: National Guard, Pemko.

B. Requirements:
   1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
   2. Size of thresholds:
      a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
      b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width
   3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.20 SILENCERS

A. Manufacturers:
   1. Scheduled Manufacturer: Ives.
   2. Acceptable Manufacturers: Hiawatha, Trimco.

B. Requirements:
   1. Provide "push-in" type silencers for hollow metal or wood frames.
   2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
   3. Omit where gasketing is specified.

2.21 FINSHES

A. Finish: BHMA 626/652 (US26D); except:
   1. Continuous Hinges: BHMA 628 (US28)
   2. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
   3. Protection Plates: BHMA 630 (US32D)
   4. Overhead Stops and Holders: BHMA 630 (US32D)
   5. Door Closers: Powder Coat to Match
   6. Exit devices on the exterior or in highly corrosive environments: RAL Tiger-Coating Powder Coat to match 628 finish
   7. Wall Stops: BHMA 630 (US32D)
   8. Latch Protectors: BHMA 630 (US32D)
   9. Weatherstripping: Clear Anodized Aluminum
   10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

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

3.2 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
   1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
   2. Custom Steel Doors and Frames: HMMA 831.
   3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each hardware item in compliance with manufacturer’s instructions and recommendations, using only fasteners provided by manufacturer.

C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.
   1. Replace construction cores with permanent cores as indicated in keying section.

I. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
   1. Conduit, junction boxes and wire pulls.
   2. Connections to and from power supplies to electrified hardware.
   3. Connections to fire/smoke alarm system and smoke evacuation system.
   4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
   5. Testing and labeling wires with Architect's opening number.

J. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

L. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
   1. Configuration: Provide one power supply for each door opening with electrified door hardware.

M. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

N. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

O. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

P. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

Q. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.3 FIELD QUALITY CONTROL

A. Architectural Hardware Consultant: Engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
   1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
   1. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
   2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DEMONSTRATION

A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.7 DOOR HARDWARE SCHEDULE

A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Hardware Groups:

Hardware Group No. 01

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONT. HINGE	112HD EPT	628	IVE
2	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	QEL+-9949-EO	626	VON
1	EA	ELEC PANIC HARDWARE	QEL+-9949-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
2	EA	90 DEG OFFSET PULL	8190HD 10" O	630	IVE
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	MOUNTING PLATE	4110-18	689	LCN
2	EA	BLADE STOP SPACER	4110-61	689	LCN
2	EA	MEETING STILE SEAL	8193AA	AL	ZER
2	EA	DOOR SWEEP	39A	AL	ZER
1	EA	THRESHOLD	625A MSLA-10	AL	ZER
1	EA	POWER SUPPLY	PS902 900-2RS	LGR	VON

Perimeter weatherstripping by aluminum door manufacturer.

Credential reader device and interfacing with the "QEL" electric latch retraction feature inside the exit device is by the security system supplier.

Power for the "QEL" electric latch retraction feature is by the PS902 power supply.

Hardware Group No. 02

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	99-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE	630	VON
1	EA	90 DEG OFFSET PULL	8190HD 10" O	630	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	DOOR SWEEP	39A	AL	ZER
1	EA	THRESHOLD	625A MSLA-10	AL	ZER

Perimeter weatherstripping by aluminum door manufacturer.

Credential reader device and interfacing with the electric strike is by the security system supplier.

Hardware Group No. 03

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	RAIN DRIP	142A	AL	ZER
1	EA	DOOR SWEEP	39A	AL	ZER
1	EA	THRESHOLD	625A MSLA-10	AL	ZER

Perimeter weatherstripping by aluminum door manufacturer.

Hardware Group No. 04

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONT. HINGE	112HD	628	IVE
2	EA	DUMMY PUSH BAR	330	626	VON
2	EA	90 DEG OFFSET PULL	8190HD 10" O	630	IVE
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	MOUNTING PLATE	4110-18	689	LCN
2	EA	BLADE STOP SPACER	4110-61	689	LCN

Hardware Group No. 05

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	DUMMY PUSH BAR	330	626	VON
1	EA	90 DEG OFFSET PULL	8190HD 10" O	630	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN

Hardware Group No. 06

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONT. HINGE	224HD	628	IVE
1	EA	PANIC HARDWARE	LD-9949-EO	626	VON
1	EA	PANIC HARDWARE	LD-9949-L-NL-07	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B4E	630	IVE
1	EA	RAIN DRIP	142A	AL	ZER
1	SET	SEALS	328AA	AL	ZER
2	EA	MEETING STILE SEAL	8193AA	AL	ZER
2	EA	DOOR SWEEP	39A	AL	ZER
1	EA	THRESHOLD	566A MSLA-10	AL	ZER

Mount head seal prior to mounting closer.

Hardware Group No. 07

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	224HD	628	IVE
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	RAIN DRIP	142A	AL	ZER
1	SET	SEALS	328AA	AL	ZER
1	EA	DOOR SWEEP	39A	AL	ZER
1	EA	THRESHOLD	566A MSLA-10	AL	ZER

Mount head seal prior to mounting closer.

Hardware Group No. 08

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONT. HINGE	112HD	628	IVE
2	SET	PUSH/PULL BAR	9103EZHD-10"-NO	630	IVE
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
2	EA	MOUNTING PLATE	4020-18	689	LCN

Hardware Group No. 09

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONT. HINGE	112HD	628	IVE
2	EA	MANUAL FLUSH BOLT	FB458 24"	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	DEADLOCK	MS1850S	628	ADA
1	EA	ADA THUMBTURN CYL	ADA7181TK1	626	KAB
1	EA	MORTISE CYLINDER	20-013 118	626	SCH
2	SET	PUSH/PULL BAR	9190HD-10"-NO	630	IVE
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
2	EA	MOUNTING PLATE	4020-18	689	LCN

Key to be on the push side and thumbturn to be on the pull side.

Hardware Group No. 10

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	STOREROOM LOCK	ND80PD ATH	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	MOUNTING PLATE	4110-18	689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN

Hardware Group No. 11

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50PD ATH	626	SCH
1	EA	OH STOP & HOLDER	100F ADJ	630	GLY

Hardware Group No. 12

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CLASSROOM LOCK	ND70PD ATH	626	SCH
1	EA	OH STOP & HOLDER	100F ADJ	630	GLY

Hardware Group No. 13

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80PD ATH	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	188S	BLK	ZER

Hardware Group No. 14

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80PD ATH	626	SCH
1	EA	OH STOP & HOLDER	90F	630	GLY
1	SET	SEALS	188S	BLK	ZER

Hardware Group No. 15

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50PD ATH	626	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY

Hardware Group No. 16

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50PD ATH	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE

Hardware Group No. 17

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70PD ATH	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE

Hardware Group No. 18

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	ND40S ATH	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE

Hardware Group No. 19

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S ATH	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE

Hardware Group No. 20

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	MORTISE CYLINDER	20-062	626	SCH

All other hardware by door manufacturer.

Hardware Group No. 21

Provide each SGL door(s) with the following:

All hardware by door manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Glass and glazing for aluminum entrances and storefronts.
   2. Glass for wood and hollow steel doors.
   3. Polycarbonate panel glazing.
   4. Glazing schedule at the end of the Section.

B. Related Sections:
   1. 074246 - Exterior Resin Panels: Translucent panels at building envelope.
   2. 081113 - Hollow Metal Doors and Frames: Doors and frames to receive glazing.
   3. 081400 - Wood Doors: Doors to receive glazing.
   4. 084113 - Aluminum-Framed Entrances and Storefronts: Metal framing and glazing materials.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American National Standard (ANSI): Z97.1 - Performance Specifications and Test Methods for Safety Glazing Materials in Buildings.

B. American Society for Testing and Materials (ASTM):
   1. C1036 - Standard Specification for Flat Glass.
   2. C1048 - Standard Specification for Heat Treated Flat Glass, Kind HS, Kind FT (Coated and Uncoated).
   3. E773 - Test Method for Seal Durability of Sealed Insulating Glass Units.
   4. E774 - Specifications for Sealed Insulating Glass Units.

C. Glass Association of North America (GANA): Glazing Manual.

D. National Fire Protection Association (NFPA): NFPA 80 - "Standard for Fire Doors and Windows, 1999 Edition."

E. National Fenestration Rating Council Inc. (NFRC).

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Submittals specified in this Section shall be incorporated into submittal specified in other Sections, where glass is to be provided in those Sections.

C. Product Data: Submit product data on glass, glazing materials, and insulating glass system.

D. Shop Drawings: Show size and thicknesses of glass, proposed "bites" in frames, sizes and locations of blocking, spacers, beads, stops, and edge treatments. Note quality, type, and strength of each light.

E. Warranty: Submit draft of manufacturer's and fabricator's warranty for Architect's review.

1.4 QUALITY ASSURANCE

A. Comply with pertinent recommendations in the GANA "Manual of Glazing."

B. Safety Glass Standard: Comply with applicable IBC requirements.

C. Qualifications of Glass Manufacturer: Provide glass produced by a nationally recognized manufacturer of high efficiency glass.

D. Qualifications of Glazers: Provide personnel thoroughly trained and experienced in the skills required, and at least one person completely familiar with the referenced standards and the requirements of this Work, who shall personally direct installation of glazing materials.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with applicable provisions of Section 016000.

B. Provide cushions at edges of glass to prevent impact damage during shipment and storage.

C. Keep vacuum cups free from foreign material that could scratch glass.

D. Comply with insulating unit fabricators requirements for limits on exposure to reduced barometric pressure during shipment.

1.6 WARRANTY

A. Submit warranties under provisions of Section 017700.

B. Replacement Guarantee:
   1. Provide new conforming glass units to replace glass units which break for a period of one year.
   2. Units broken by impact, fire, earthquake, or similar events which exceed the design loads and conditions are not subject to this requirement.
   3. Do not include probability for glass breakage based on specified statistical glass breakage analysis factor.
   4. Include all labor and materials for replacement of failed unit(s). Replacement shall include coordination with the Owner, immediate provision for maintaining openings secure and weathertight, timely ordering and fabrication of replacement items as required, installation, and cleaning.
   5. Include a separate price in the Bid for the replacement guarantee.

C. Reflective Coating Warranty: Furnish ten year warranty from the glass manufacturer agreeing to replace glass units which have defective reflective coating. Defective coating is defined as peeling, discoloration, or other forms of deterioration to the reflective coating.

D. Insulating Glass Unit Warranty:
   1. Furnish ten year manufacturer's warranty, including coverage of units for seal failure, interpane dusting or misting, and replacement of same, under provisions of Section 017700.
   2. Furnish manufacturer's warranty, including coverage of units against seal failure, or interpane dusting or misting; term of warranty as follows.
      a. Vertical Applications: Ten years.

PART 2 - PRODUCTS

2.1 GLASS

A. Furnish the following glass in combinations as scheduled at the end of this Section:
   1. Clear Glass: ASTM C1036, Type I, class 1 (clear), quality Q3 glazing select.

2.2 PLASTIC GLAZING

A. Cellular Sheets: Gallina USA (Janesville, WI; 888-463-3342) "Arcoplus 547" multi-wall polycarbonate panels with interlocking tongued and grooved side edges; tinted; 40 mm thickness; color “Opal”.

2.3 ACCESSORIES

A. Setting Blocks: Neoprene; 70-90 Shore A durometer hardness; 4 inches long x 1/4 high x width as required for application indicated.

B. Weather Glazing Sealant: Compatible with insulating glass seal.

C. Glazing Tape (Interior): Norton "V-980," PTI "303," or approved. Size: 1/8 inch by 1/2 inch.

2.4 FABRICATION

A. Insulating Glass Units:
   1. Dual lite units fabricated from glass as scheduled; 1/2 inch nominal airspace; dual seal system.
   2. Twin seals; polyisobutylene primary seal and silicone secondary seal. Outer seal shall be compatible with glazing system.
   3. Spacer Bar: Mill finish aluminum; fill with desiccant; corners shall be partially miter cut and bent (not cut through), or formed with corner keys ultrasonically soldered in place.
   4. Certified through the Insulating Glass Certification Council (IGCC) in accordance with ASTM E773 and E774; certified to level CBA.
   5. Each piece shall bear certification number, date, and manufacturer's identification mark.

B. Laminated Glass (PVB):
   1. Two layers of glass as scheduled with a minimum .030 inch thick vinyl interlayer.
   2. Film:
      a. Manufacturer: Solutia Inc. (St. Louis, MO; 877-674-1233; 314-674-1000).
      b. Type: Polyvinyl butyral sheets, uniform in color, specifically manufactured for use in fabrication of laminated glass sheets, ultraviolet stabilized, uniform thickness as specified.
      c. Translucent Laminating Film: 000A "Cool White"; minimum 0.030 inch thickness.

C. Tempered and Heat Strengthened Glass:
   1. Tempered Glass: ASTM C1048, FT; glass which has been heat treated to strengthen glass in bending to not less than 4 times the annealed strength; certified safety glass in accordance with ANSI Z97.1.
   2. Heat Strengthened Glass: ASTM C1048, HS ; glass which has been heat treated to strengthen glass in bending to not less than 2 times annealed strength.
   3. Fabricate tempered and heat strengthened glass units so that principle distortion will be in the horizontal direction in the finished installation.
   4. Unless otherwise approved by the building official, provide manufacturer's label on each light, indicating type and thickness of glass.
   5. Comply with IBC requirements for identification and labeling of safety-glazing materials in hazardous locations subject to human impact loads.
   6. Fabrication Process: Horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

D. Low E Coating: High performance type; applied by using sputtered deposition technology.
   1. Basis of Design: PPG (Pittsburgh PA; 412-434-2858) "Solarban 60."
   2. Acceptable Substitution: Viracon (Otawana MN; 800-533-2080) "Solarscreen 2000."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

C. Verify surfaces of glazing channels or recesses are clean, free of obstructions, and ready for work of this Section.

3.2 PREPARATION

A. Clean contact surfaces and wipe dry.

B. Seal frame corner joints, and other leakage points with sealant. At insulating glass units the sealant shall be compatible with the seal of the unit. Do not plug weep holes.

C. Prime surfaces scheduled to receive sealant, unless otherwise recommended by the sealant manufacturer.

3.3 INSTALLATION

A. Setting Blocks: Place setting blocks in frames for support of glass. Place at quarter points unless approved otherwise.

B. Set glass tightly in position with proper clearances in accordance with the referenced standards.

C. Perimeter glass clearances within setting frame shall be in accordance with GANA recommendations, and as required by the glass manufacturer to provide for wind, earthquake drift, and thermal expansion.

D. Unless specified otherwise, glaze units with gaskets furnished with the framing systems specified in other sections.

E. Glazing for Interior Non-Rated Doors and Windows, Where Gaskets Are Not Furnished:
   1. Glaze with glazing tape.
   2. Pre-measure and cut tapes to required lengths; adhere to fixed stops, setting horizontal tape at heads and sills before vertical tape.
   3. Install tape with tight butt joints; no overlaps will be accepted. Set tape with straight lines level with frame sight line.
   4. Position glass, uniformly sealing against tape. Install inside removable stops and place tape in stops forming a uniform seal against glass, level with sight lines.

F. Adjust glazing materials to form a uniform sight line.

3.4 CLEANING

A. Clean excess glazing materials from adjacent finished surfaces.

B. Remove labels after work is completed.

3.5 GLASS TYPE SCHEDULE

A. The following are the glass types as indicated on the Drawings:
   1. GL-1:
      a. Insulating glass unit with 1/2 inch air space between two panes of glass as follows:
         1) Exterior Pane: 1/4 inch clear glass with low e coating on #2 surface.
         2) Interior Pane: Nominal 1/2 inch thick laminated obscured glass.
   2. GL-2:
      a. Insulating glass unit with 1/2 inch air space between two panes of glass as follows:
         1) Exterior Pane: 1/4 inch clear glass with low e coating on #2 surface.
         2) Interior Pane: 1/4 inch clear glass.
      b. Performance as follows:
         1) Visible Light Transmittance: 70%
         2) Winter U value: .29
         3) Shading Coefficient: .44.
         4) SHGC: .38
   3. GL-3: Minimum 1/4 inch thick clear glass.

B. Provide tempered glass in hazardous locations to meet the requirements of the jurisdictional code authorities.

3.6 GLASS LOCATION SCHEDULE

A. GL-1: Exterior glazing where obscured glass is indicated.

B. GL-2: All exterior glazing unless scheduled otherwise.

C. GL-3: All interior glazing, unless scheduled otherwise.

END OF SECTION

SECTION 088323 - UNFRAMED GLASS MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Custom wall-mounted mirrors.

B. Related Sections:
   1. 088000 - Glazing: Vision glazing.
   2. 092200 – Lightgage Metal Support Framing: Metal backing and supports.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitutions will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM): C1036 - Flat Glass.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Submit manufacturers' product data and installation instructions for adhesives and accessories.

D. Samples:
   1. Submit a minimum of two 12 x 12 inch samples of each type of mirror. Show each combination of edge finish, corner finish, and backing proposed for each type of mirror.
   2. Submit samples of each type of channel, angle, and screw for securing mirrors.

1.4 PRODUCT HANDLING

A. In accordance with provisions of Section 016000.

1.5 WARRANTY

A. Furnish five year manufacturer's warranty, executed to Owner, under provisions of Section 017700.

B. Warranty: Include coverage of glass and coating against discoloration, silver spoilage, and manufacturing defects.

PART 2 - PRODUCTS

2.1 MIRRORS

A. Mirrors: ASTM C1036; 1/4 inch thick, Quality q^2 clear float glass; full silver coating, copper coating, and manufacturer's standard organic coating applied to minimum average dry film thickness of 1.4 mils.

2.2 ACCESSORIES

A. Anodized Aluminum Mounting Retainers:
   1. Approved Manufacturers:
      a. C.R. Laurence Co., Inc., Union City, CA (510-475-1000).
      b. Stylmark (800-328-2495)
   2. Bottom Channel: One of the following.
      a. C.R. Lawrence No. D516BA 5/16 inch Standard "J" Channel.
      b. Stylmark No. 420068 J-Molding;
   3. Top Channel: One of the following.
      a. C.R. Laurence Co.No. D58BA 5/16 inch Deep Nose "J" Channel.
      b. Stylmark No. 420107 J-Molding
   4. Finish: Clear anodized aluminum.

B. Screws: Stainless steel; flat head design; self tapping; sufficient length to penetrate backing a minimum of 3/8 inch or wood backing a minimum of 3/4 inch.

C. Mounting Adhesive: Palmer Products Corporation (800-431-6151) "Mirro Mastic"or C. Gunther (800-227-6181) "ultra/bond." Furnish manufacturer's recommended primer.

D. Shims: Clear softwood, milled to thickness as required for installation of mirrors according to detail.

2.3 FABRICATION

A. Cut to size indicated; verify field dimensions for restroom mirrors and at other critical locations, prior to fabrication.

B. Finish edges as follows.
   1. Top and Bottom Edges to be Concealed by Retaining Channels: Swipe.
   2. Vertical Edges: Pencil edge.

C. Glass Fabrication Tolerances:
   1. Out of Square: Maximum 1/16", diagonal measure.
   2. Width: As required to meet detailing and installation tolerance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are sound, smooth, plane, dry, and ready for mirror installation, and are within the tolerances specified for metal framing and gypsum board construction.

B. Verify that continuous metal backing is present for fastening of mounting clips.

C. Beginning of installation constitutes Contractor acceptance of conditions.

3.2 INSTALLATION OF MIRRORS

A. Installation of Mounting Channels:
   1. Install mounting channels at bottom edge. Fasten with specified screws at 6 inches on center along the clip, with minimum 4 screws per panel. Install clips continuous in longest practical lengths. Where splices are required, install for tight fit. Locate joints at approximate midpoints of mirror edges.
   2. Locate top clip to furnish a minimum 3/8 inch bite; prefit to final location.

B. Use adhesive to install shims, sized to locate glass against front edge of clips.

C. Fasten top channel with screws at 12 inches on center.

D. Adhesive Installation:
   1. Apply specified drywall primer to substrate in accordance with the adhesive manufacturer's printed instructions. Allow primer to dry.
   2. Apply adhesive in pats to thickness that will ensure contact of mirror back with each pat.

E. Set mirror into top channel, tip inward into adhesive and slide down into bottom channel.

F. Mirrors shall be installed with uniform narrow (1/8 inch maximum) gaps between adjacent mirrors, and in accurate plane so that reflected images are in alignment from one mirror to the next.

G. Installation Tolerances:
   1. Outside Corners: Install accurately to detail with intersection between mirrors accurately aligned for the full height of the mirror, and with exposed mirror edge not more than 1/16 inch behind and not projecting more than 1/16 inch beyond plane of face of adjacent mirror.
   2. Gaps Between Adjacent Mirrors: Plus or minus 25 percent of indicated dimension, except provide tolerance of plus 0, where maximum dimension is indicated on the Drawings.

3.3 CLEANING

A. Remove excess adhesive.

B. Patch adjacent surfaces damaged by work of this Section.

C. Remove labels and clean exposed surfaces of mirrors

3.4 PROTECTION

A. Protect installation from subsequent damage.

END OF SECTION

SECTION 092200 – LIGHTGAGE METAL SUPPORT FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Partition framing.
   2. Steel backing.
   3. Ceiling and soffit framing.
   4. Furring.
   5. Structural design of overhead lightgage metal support framing systems.

B. Related Sections:
   1. 054000 - Cold-Formed Metal Framing: Lightgage metal framing indicated on the structural drawings.
   2. 061000 - Rough Carpentry: Wood blocking; framing and sheathing.
   3. 072100 - Thermal Insulation: Insulation between framing.
   4. 098100 - Acoustic Insulation: Insulation between framing members.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. A641 - Zinc-Coated Galvanized) Carbon Steel Wire.
   2. C635 - Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
   3. C645 - Non-Loadbearing Steel Studs, Runners, and Rigid Furring Channels.
   4. C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.

B. Underwriters Laboratories (UL): Standard 2079 - Tests for Fire Resistance of Building Joint Systems.

1.3 SYSTEM DESCRIPTION

A. Structural Design:
   1. Structural design of overhead lightgage metal framing systems shall be furnished by the Contractor.
   2. Select framing systems, gages, supports, bracing, and connections as necessary to meet the structural requirements specified.
   3. Partition framing shall conform to the widths indicated, unless approved otherwise. Provide thicker gages and decreased stud spacing as necessary to meet the design requirements.
   4. Select framing members based on the manufacturer's published span tables.

B. Design Loads:
   1. Interior Ceiling Assemblies: 5 pounds per square foot uniform live load, plus dead loads.
   2. Exterior Soffit Assemblies: 30 psf positive and negative uniform live load, plus dead loads.
   3. Interior Partitions without Wall Mounted Casework: 5 pounds per square foot uniform live lateral load.
   4. Interior Partitions with Wall Mounted Casework: 5 pounds per square foot uniform live lateral load, casework dead load, and casework live load of 25 PSF of shelf area.
   5. Seismic Loads: Conform to the requirements of currently enforced edition of the jurisdictional code authorities.

C. Deflection Requirements:
   1. Maximum deflection of 1/240 for flexible finish materials such as gypsum board and veneer plaster.
   2. Maximum deflection of 1/360 for rigid finish materials including gypsum plaster, cement plaster, ceramic tile, maximum 3/8" thick stone tile, or mirrors.

1.4 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Submit complete published literature for framing systems and components. Include span tables for proposed framing systems.

C. Shop Drawings: Submit shop drawings for special overhead stud framed conditions. Indicate typical fastening systems, adjacent construction, gages, framing spacing, bracing configurations, and locations. Shop drawings shall bear designing structural engineer's stamp.

D. Quality Control Submittals:
   1. Certification: Submit certification that the overhead framing systems have been designed in accordance with the specified requirements.

E. Closeout Submittal:
   1. In accordance with Section 017700.
   2. Submit designing engineer's certification that products and installation comply with design requirements.

1.5 QUALITY ASSURANCE

A. Unless indicated or specified otherwise, perform work in accordance with ASTM C754.

B. Code Requirements:
   1. Provide assemblies meeting the hourly fire ratings indicated and specified. Assemblies shall been tested in accordance with ASTM E119, and shall be approved by the local jurisdictional code authorities. Coordinate installation of other materials which are a part each assembly.
   2. Fire rating requirements take precedence over the construction requirements indicated. In the event of conflict, notify the Architect, and do not begin construction in the area of conflict until the conflict has been resolved.
   3. Provide calculations, drawings, product data, and other verification as required by the jurisdictional code authority to obtain approval of the lightgage metal framing installation.

C. Structural Design: Non-prescriptive and non-proprietary overhead framing systems shall be designed by a structural engineer licensed to practice in the state where the Project is located.

PART 2 - PRODUCTS

2.1 MATERIALS

2.2 NON-LOAD BEARING LIGHT GAGE METAL FRAMING:

A. Base Steel (all stud types):
   1. ASTM C645; G40 galvanized; non-compliant materials will not be accepted.

B. General:
   1. Furnish "C" shaped studs, depth as scheduled, with return lip and not less than 1-1/4 inch flanges; prepunched openings for the installation of stiffening channels and mechanical and electrical items.
   2. Furnish U shaped tracks (runners), hat and "Z" shaped furring channels, and other sizes and shapes as indicated on the Drawings, and required by the referenced standards.
   3. Minimum 25 gage unless indicated or specified otherwise; and as follows:
      a. Furnish gages as necessary to meet deflection requirements, unless indicated or specified otherwise.
      b. Top runner for partitions extending only to the acoustical ceiling grid shall be 20 gage.
      c. Provide minimum 20 gage for full height partition framing extending from structure to structure.
      d. Provide minimum 20 gage studs at jambs of doors and interior relites.
   4. Gages:
      a. Furnish gages as necessary to meet deflection requirements, unless indicated or specified otherwise.
      b. Top runner for partitions extending only to the acoustical ceiling grid shall be 20 gage.

C. Standard Gage Metal Framing:
   1. Formed from minimum 36 KSI steel.
   2. Material Thickness: Minimum nominal base steel thickness (design thickness) shall comply with the following:
      a. 26 gage – 0.0179 inch (0.455mm)
      b. 25 gage – 0.0209 inch (0.531mm)
      c. 22 gage – 0.0299 inch (0.759mm)
      d. 20 gage – 0.0359 inch (0.912mm)
      e. 18 gage – 0.0478 inch (1.214mm)
      f. 16 gage – 0.0598 inch (1.519mm)
      g. 14 gage – 0.0747 inch (1.897mm)
      h. 12 gage – 0.1046 inch (2.657mm)
      i. 10 gage – 0.1345 inch (3.419mm)

2.3 OTHER FRAMING SYSTEMS

A. Channels: Hot or cold rolled channels; rust inhibitive paint coating; sizes in accordance with ASTM C754.

B. Proprietary Ceiling Suspension System:
   1. Manufacturer:
      a. As specified: Chicago Metallic (Los Angeles CA; 800-323-7164).
      b. Acceptable Substitutions:
         1) USG Interiors, Inc. (Chicago, IL; 800-874-4968).
         2) Armstrong (800-207-2321).
   2. Suspension System: Similar to System 650, or 670; ASTM C635 heavy duty classification.
      a. Furring Runners: Manufactured from 0.020 inch thick steel 1-3/8 inch wide with knurled face by 1-1/2 inches high; factory punched cross tee slots, hanger holes, and non-directional bayonet end tab couplings.
      b. Furring Tees: Manufactured from 0.020 inch thick l-3/8 inch wide with knurled face by 1-1/2 inches high; factory punched cross tee slots and hanger holes.
      c. Furring Cross Channel: 0.020 inch thick steel; 1-3/8 Inch wide with knurled face by 7/8 inches high by 48 inches long with straight locking end tabs.
      d. Cross Tees: 0.020 inch thick steel 15/16 inch wide by 1-1/2 inches high; with staked-on dip end tab couplings, factory punched cross tee slots.
      e. Moldings: Manufacturer's standard.
      f. Channel beam splice clip: Manufacturer’s standard.

C. Accessories:
   1. Screws: Self tapping; low profile head; galvanized.
   2. Hanger wire: ASTM A641; Class 1 zinc coating; soft temper; prestretched; 12 gage.

D. Other Framing Materials: Provide other framing materials in accordance with ASTM C754.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin work until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Steel Decking:
   1. Where fastening into bottom of steel decking is required, fasten only into lower flutes.
   2. Do not use fasteners in steel deck which penetrate more than 1 inch.

B. Verify location of conduit in poured concrete construction before making attachments.

3.3 INTERIOR PARTITION FRAMING

A. Runners:
   1. Secure runners with fasteners at maximum 24 inches oc.
   2. At concrete floors, use powder driven fasteners or drilled in concrete anchors.
   3. Top Runner: Secure head track to structure with allowance for structural deflection.
      a. Non Rated Partitions: Use proprietary compensating channel or deep leg track at Contractor's option, as necessary to accommodate building deflection.
   4. Align to tolerances specified.

B. Unless indicated otherwise, install studs vertically at 16 inches oc, and not more than 2 inches from abutting construction, at each side of openings, and at corners.

C. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.

D. Brace partition framing system and make rigid. Provide diagonal stud bracing at maximum 8 ft on center at framing which does not extend to structure. At partitions attached to acoustical ceiling grid with partition clip, screw attach bracing to clip. Brace shall allow placement of acoustical tile without cutting.

E. Install double studs continuous from floor to ceiling track at the jamb of each door frame and cased opening. Studs shall be no less than 20 gage. Provide diagonal steel stud bracing to structure at each jamb at partitions which do not extent to structure.

F. Install minimum 20 gage studs at partitions indicated for support of modular wall-mounted casework or equipment.

G. Coordinate erection of studs with installation of service utilities. Align stud web openings.

H. Coordinate installation of bucks, anchors, blocking, electrical, and mechanical work to be placed in or behind stud framing.

I. Coordinate erection of stud system with requirements of door and window frames, fire extinguisher cabinets, recessed toilet accessories, access doors, acoustical insulation, and other construction within partition.

J. Coordinate the installation of framing with the gypsum board installer to ensure support at board edges. Provide framing immediately either side of expansion joints.

K. Stud splicing not permissible.

L. At non-load bearing full height partitions subject to compression caused by overhead structural deflection, and where proprietary compensating channel system is not used, cut studs 1/2 inch short from full height. Do not rigidly connect stud to top runner.

M. Stud Bridging:
   1. At interior partitions greater than 4 feet in length, and with rigid facing material on one stud flange only, provide 3/4" bridging channels in horizontal rows at a maximum of 5'-0" on center for the full height of the partition.
   2. Interior full height partitions (studs extending from the floor to the structure above) with rigid facing material stopping 3'-0" or more below top of studs - Provide one row 3/4" bridging channel horizontally at termination of gypsum board material, and one additional row for each 5'-0" of exposed studs.
   3. Install stud bridging channels in long lengths, wire tying and lapping the joints a minimum of 12 inches. Attach bridging channel to each stud as shown in manufacturer's printed instructions.

3.4 BACKING

A. Provide steel or fire treated wood backing, unless indicated otherwise, for the support of wall mounted items.

B. Unless indicated otherwise, steel backing shall consist of minimum 4 inch wide 16 gage steel plate screwed rigidly to the studs. Provide 12 gage backing plates at handrails, guardrails, and grab bars.

3.5 CEILING , SOFFIT, AND FASCIA FRAMING

A. Coordinate locations of hangers and supports with the work of other Sections.

B. Ceiling framing shall consist of stud and runner framing or suspended framing, unless indicated or specified otherwise.

C. Stud and Runner Framing:
   1. Secure runners to structure above with fasteners at a maximum of 24 inches on center. Size fasteners and use reinforcements as necessary to support the dead loads applied.
   2. Screw fasten framing at each flange joint.
   3. Space studs at 16 inches on center at horizontal locations.
   4. Select members to meet the structural requirements specified.

D. Lightgage Suspended Framing:
   1. Install in accordance with ASTM C754, unless indicated or specified otherwise.
   2. Suspend ceiling from overhead structural elements only. Do not support from any electrical, HVAC, plumbing, or sprinkler system components.
   3. Space carrying channels 4 feet on center with splices lapped 12 inches and tied.
   4. Support cold rolled carrying channels with hanger wires spaced at 3 feet on center for lath and plaster ceilings and 4 feet on center for gypsum board ceilings. Loop hanger wire around support element and tightly wrap around vertical wire 3 times; cut off neatly.
   5. Space furring channels 16" o.c. with splices lapped 12", minimum and tied; clip or saddle tie to runner channels with 16-gage tie wire.
   6. Where overhead obstructions prevent the regular spacing of hangers, provide secondary carrying members for indirect support of the suspension system, or reinforce the nearest adjacent hangers and related framing components as required to span the required distance.

E. Proprietary Suspended Framing: Install in accordance with manufacturer’s recommendations.

F. Stabilize suspended ceiling, soffit, and fascia framing against lateral movement by means of diagonal bracing. At locations where partitions extend to ceiling, only, install supplementary bracing at maximum 8'-0" o.c. along length of partition, and above each door hinge and strike jamb.

G. Form openings in ceilings and frame openings for recessed light fixtures, air diffusers, access doors, hatches, etc.

H. Install supplementary hanger wires for support of ceiling mounted equipment.

3.6 TOLERANCES

A. Install members to provide surface plane with maximum variation of 1/8 inch in 10 feet in any direction.

B. Locate assemblies within 1/4 inch of required locations.

C. Locate framing on the center of the joint between gypsum board panels, within a tolerance of 1/4 inch.

3.7 FIELD QUALITY CONTROL

A. The structural design engineer for the overhead framing systems or an authorized representative shall visit the site to inspect the work. Verity and certify that the installation has been installed in accordance with the structural requirements.

END OF SECTION

SECTION 092843 - GYPSUM SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Gypsum sheathing.

B. Related Sections:
   1. 054000 - Cold-Formed Metal Framing: Support framing.
   2. 092900 - Gypsum Board: Interior gypsum products.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C1177 - Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
   2. C1278 - Standard Specification for Fiber Reinforced Gypsum Panel

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Product literature on gypsum sheathing and screw fasteners.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Gypsum Sheathing: One of the following:
   1. G-P Gypsum Corporation "Dens-Glass Gold"; glass mat faced; ASTM C1177; thickness as indicated.
   2. Certainteed. "GlasRoc"; glass mat faced; ASTM C1177; thickness as indicated.
   3. USG "FIBEROCK® Brand Sheathing with Aqua-Tough™"; ASTM C1278; thickness as indicated

B. Exterior Sheathing Screws: Complying with ASTM C1002, C954, and the following:
   1. Self-drilling, self-tapping, Type S-12, bugle head, minimum length of 1-1/4 inch for 1/2 inch and 5/8 inch boards.
   2. Organic-polymer, ceramic, or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
   3. Approved Product: Hilti (www.us.hilti.com) 6 x 1-1/4 inch “PSH SD HCR Sheathing Screws”, item No. 00413489.

C. Joint and Penetration Sealant: Dow Corning 795 Building Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

C. Verify that framing is ready for installation of sheathing.

3.2 GYPSUM SHEATHING INSTALLATION

A. Install square edge boards parallel or perpendicular to framing. Install boards parallel to framing at fire rated walls. Apply sheathing with joints staggered. All edges shall be firmly supported.
   1. Maximum span: 16 inches.
   2. Maximum cantilever: 2 inches..

B. Install sheathing with coating towards exterior.

C. Screw to framing. Space fasteners 8 inches o.c. in field and 4 inches o.c. at ends along each framing member.

D. Do not bridge expansion joints.

E. Coordinate with Division 16 work for cutouts for electrical penetrations.

END OF SECTION

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior gypsum board.

B. Related Sections:
   1. 054000 - Cold-Formed Metal Framing: Exterior support framing.
   2. 072100 - Thermal Insulation.
   3. 092200 – Lightgage Metal Support Framing: Support framing for gypsum board; tolerance requirements.
   4. 092843 - Gypsum Sheathing.
   5. 093000 - Tiling: Finish materials; tile backer board.
   6. 098100 - Acoustic Insulation.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.

D. Substitutions: Substitutions will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
   2. C557 - Adhesives for Fastening Gypsum Wallboard to Wood Framing.
   3. C931 - Standard Specification for Exterior Gypsum Soffit Board
   4. C1002 - Steel Drill Screws for the Application of Gypsum Board.
   5. C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
   6. C1278 - Specification for Fiber Reinforced Gypsum Panels.
   7. C1395 - Specification for Gypsum Ceiling Board
   8. C1396 - Specification for Gypsum Board
   9. D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

B. Gypsum Association (GA):
   1. GA-214 - Recommended Levels of Gypsum Board Finish.
   2. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Submit complete manufacturer's product literature and installation instructions for each of the materials used.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with GA 216, unless specified otherwise, or required otherwise to meet fire rating requirements.

B. Regulatory Requirements:
   1. Provide assemblies meeting the hourly fire ratings indicated and specified. Assemblies shall be approved by the local jurisdictional authorities.
   2. Fire rating requirements take precedence over the construction requirements indicated. In the event of conflict, notify the Architect, and do not begin construction in the area of conflict until the conflict has been resolved.

C. Assembly Instructions: Contractor shall keep at the site and make available to installers a copy of the following:
   1. Installation requirements for each fire rated assembly.
   2. GA 216.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD MATERIALS

A. Furnish boards of maximum permissible length for type of installation indicated, tapered edge for boards to be exposed, taped and finished; square edge for boards in concealed applications; 5/8 inch thick unless noted or specified otherwise; furnish type X for fire rated partitions.

B. Types:
   1. Standard Board, Backing Board, Exterior Water Resistant Soffit Board: ASTM C1396; 5/8 inch thickness unless otherwise indicated.
   2. Water Resistant Board: ASTM C1396.
   3. Ceiling Board: ASTM C1395; sag resistant.
   4. Abuse Resistant Board: ASTM C1278; USG Corporation "Fiberock Aqua-Tough Interior Panels"; 5/8 inch thickness; Type X; surfaces shall be resistant to mold and mildew growth; score of 10 when tested in accordance with ASTM D3273.

2.2 ACCESSORIES

A. Interior Gypsum Trim:
   1. Conform to GA 216, unless indicated or specified otherwise.
   2. Concealed flange crimp-on or tape-on type; metal or PVC at Contractor's option.
   3. Control Joint Trim: USG 093 or approved.
   4. Reveal Moldings: Fry Reglet Co. , Pittcon Industries, Inc., Gordon Inc, or approved; aluminum extrusions with taping flanges; shapes as indicated.

B. Joint Compound, Tape, and Finishing Compound: ASTM C475; furnish setting type joint compound for use at water resistant board.

C. Screws: ASTM C1002; galvanized or polymer coated at exterior or moist locations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin work until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 GYPSUM BOARD INSTALLATION

A. Install gypsum board in accordance with GA 216, and fire rated assembly requirements.

B. Erect wallboard so that edges and corners are firmly supported.

C. Use screws to fasten gypsum board to metal furring or framing. Adhesive application of gypsum board may be used if it is in accordance with the manufacturer's recommendations and meets fire rating requirements.

D. Double Layer Applications:
   1. Use backing board or standard board for first layer.
   2. Offset joints of second layer from joints of first layer.

E. Trim:
   1. Use longest practical lengths, with no piece less than 2 feet long for continuous runs greater than 8 feet. Securely fasten and align trim ends at joints.
   2. Place concealed flange corner beads at external corners. At angles other than 90 degrees, bend the flange to conform to the angle.
   3. Place concealed flange type L trim where gypsum board abuts dissimilar materials.
   4. Use J trim at exposed gypsum board edges and at joints where sealant is indicated.

F. Allow a 1/2 inch gap where gypsum board extends to overhead structure and deflection provisions are incorporated into lightgage metal framing. Do not fasten gypsum board to top runner. Where the ceiling is exposed in the finished work, finish top edge with a casing bead, and caulk with acrylic sealant as specified in Section 079200.

G. Sealant Joints:
   1. Coordinate installation of firestopping and sealants at concealed joints between partitions and structure at fire rated and acoustically insulated partitions.
   2. Where sealant joints are indicated at ends or edges of wallboard, install for uniform 1/8 inch joint, unless otherwise indicated. Installation of sealant in exposed locations is specified in Section 079200.

H. Cement board backing for tile surfaces is specified in Section 093000.

I. Provide water resistant gypsum board at walls in restrooms, toilets, shower rooms, janitor closets and other areas subject to similar damp conditions. Install exterior gypsum soffit board at ceilings.

3.3 CONTROL JOINTS

A. Discontinue gypsum board and use control joint trim at control joints.

B. Coordinate with the framing installer to ensure that framing is installed immediately on either side of each control joint.

C. Space control joints as indicated. When not indicated, locate as follows:
   1. At maximum 30 foot intervals along continuous wall planes.
   2. At maximum 50 foot intervals at continuous ceilings with perimeter relief.
   3. At maximum 30 foot intervals at continuous ceilings without perimeter relief.
   4. At locations where expansion or control joints occur in the building structure.
   5. Locate control joints to form rectangular or square sections, in "L," "U," "T," or other irregularly shaped areas.
   6. Position control joints to intersect light fixtures, air diffusers, door openings, and other areas of stress concentration.
   7. Coordinate with Section 092200 for special requirements at fire rated assemblies.

D. Verify location with the Architect prior to installation. Give the Architect a minimum of 48 hours notice.

3.4 FINISHING

A. Provide finishing in accordance with GA 214.

B. Where necessary to sand, do so without damaging the face of the gypsum board.

C. Levels of Finish:
   1. Level 5: Not used.
   2. Level 4: Typical, unless indicated or specified otherwise.
   3. Level 3: Not used
   4. Level 2: Provide at the following locations:
      a. Storage rooms.
      b. Mechanical rooms.
      c. Janitors closets.
   5. Level 1: Not used
   6. Level 0: Not used

D. Level 4 finishes: Return to the site after primer is applied, and touch-up surface defects.

3.5 TOLERANCES

A. Install gypsum board with 1/8 inch in 10 feet maximum variation from plane in any direction.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Interior wall tile.
2. Interior floor tile.
3. Crack isolation membranes.
4. Tile backing board.
5. Screeds.
6. Sealer.

B. Related Sections:
1. 030013 - Concrete: Substrate.
2. 079200 - Joint Sealants: Expansion joint fillers.
3. 092900 - Gypsum Board: Substrate.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American National Standards Institute (ANSI):
1. A108.1 - Ceramic Tile Installed with Portland Cement Mortar.
2. A108.5 - Installation of Ceramic Tile With Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
3. A108.10 - Installation of Grout in Tilework.
4. A118.4 - Latex-Portland Cement Mortar.
5. A137.1 - Ceramic Tile

B. American Society for Testing and Materials (ASTM):
1. C144 - Aggregate for Masonry Mortar.
2. C150 - Portland Cement.
3. C206 - Finishing Hydrated Lime.
4. C207 - Hydrated Lime for Masonry Purposes.]

C. Tile Council of North America (TCNA):
1. Handbook of for Ceramic Tile Installation, current edition.
2. 137.1- Recommended Standard Specifications for Ceramic Tile.

1.3 DEFINITIONS

A. Expansion Joints: Unless otherwise detailed, expansion joints in tile fields are sealant-filled joints to accommodate expansion and contraction of tile and possible substrate movement at slab control and construction joints.

1.4 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Submit for each type of tile, grout, adhesive, additive, accessory, and membrane specified.

C. Shop Drawings: Indicate general layout, surrounding construction, location of expansion joints in substrates and tile fields, edge details, and special conditions.

D. Samples:
1. Tile: Submit samples of each type and color of tile. Include representative range of colors and finishes to be expected.
2. Grout: Submit cured samples of each grout color.

3. Screeds: Submit samples of each type and finish of screed; minimum 3 inch length.

E. Schedule: Submit a schedule of each tile type, grout, and joint width combination proposed.

F. Certifications: For each type of tile specified, submit master grade certificates prior to the arrival of the shipment to the job site.

1.5 QUALITY ASSURANCE

A. Conform to ANSI Standard Specifications for the Installation of Ceramic Tile.

1.6 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 016000.

1.7 GUARANTY

A. In accordance with Section 017700, furnish from the tile installer, a two year written guaranty, executed to the Owner, against defects in workmanship and materials.

PART 2 - PRODUCTS

2.1 TILE

A. Tile Types: Types as indicated on the drawings.

B. Special Shapes: Unless otherwise indicated or specified, furnish special shapes as standard with the tile manufacturer for uniform transitions and concealed edges in the finished installation. Special shapes include bullnoses, double bullnoses, corner bullnoses, and cove assemblies.

2.2 ACCESSORY MATERIALS

A. Setting Materials:
1. Thinset Mortar: Latex modified; "Kerabond" with "Universal Keralastic" by Mapei Corp., "211 Crete Filler Powder" with "4237 Latex Thin-set Mortar Additive," by Laticrete International, Inc., "317 Floor and Wall Thin Set Mortar" with "3701 Latex Mortar Admix," by Laticrete International, Inc., Hydroment"Tile-Mate Premium" with "447 Flex-a-lastic" by Bostik, or approved.
2. Rapid-Set Thin Bed Mortar: Latex modified; "Grani/Rapid" with "KER 318" Flexible Admixture" by Mapei Corp., Hydroment "Single Flex FS," by Bostik, or "211 Crete Filler Powder" with "4237 Latex Thin-set Mortar Additive" and "101 Rapid Set Latex"(proportions as recommended by the manufacturer for the setting time required)," by Laticrete International, Inc..

B. Cementitious Sanded Grout:
1. Fast Setting: "Ultra/Color" by Mapei Corp., "Floor Joint and Grout Filler" with "3701 Latex Mortar Admixture" and "101 Rapid Set Latex", by Laticrete International, Inc. (proportions as recommended by the manufacturer for the setting time required); sanded, except unsanded at joints scheduled at 1/16 inch wide.
2. Standard Grout: "Keracolor S" by Mapei Corp., or "1500 Series Sanded Grout" with "1776 Grout Admix Plus" or "101 Rapid Set Latex", by Laticrete International, Inc., Hydroment"Ceramic Tile Grout /Joint Filler" with "425 Flexible Grout Admixture" by Bostik; sanded, except unsanded at joints scheduled at 1/16 inch wide.
3. Colors: As selected by the Architect from the manufacturer's standard line.

C. Crack Isolation Membrane: One of the following.
1. "NobleSeal CIS," by The Noble Company; reinforced CPE sheet membrane; 36" width; NobleBond 21 adhesive.
2. "ECB Membrane," by N.A.C. Products Inc.; self bonding reinforced modified asphalt sheet membrane; 36" width.
3. "Mapelastic SM" by the Mapei Corp.

D. Tile Backing Board and Accessories:
1. Cementitious Backing Board: 1/2 inch nominal thickness aggregated portland cement panel, reinforced with glass fiber mesh; "Durock Brand Cement Board" by USG (800-874-8968, "Wonderboard" by Custom Building Products (800-272-8786), or approved.

2. Gypsum Backing Board: Georgia Pacific (800-225-6119) "DensShield,"or approved; 5/8 inch thickness.
3. Joint Tape: Open weave glass mesh joint tape, self-adhesive; 2-1/2 inches wide.
4. Fasteners: As recommended by the backing board manufacturer; thread forming self-drilling wafer head screws; polymer coated or zinc plated; USG "Durock Screws," "Rock-On," or approved.

E. Metal Screed: As manufactured by Schlüter Systems, Inc. (800/225-8902), Ceramic Tool Company, (800/236-5230), or Blanke Corporation (800/787-5055); clear anodized aluminum tile edging trim; sizes as required for installation of top of screed flush with top of tile, as detailed.

F. Curing Paper: Fortifiber "All Purpose Building Paper," or approved; do not use polyethylene or products containing bituminous materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

C. Verify that locations of expansion joints, control joints, and construction joints in substrate correspond to tile expansion joint locations.

D. Where cementitious backing board is indicated as substrate for wainscot, shim as necessary to align with gypsum board above.

3.2 PREPARATION

A. Clean substrate surfaces free of grease, dirt, dust, organic impurities, and other materials which would impair bond. Where curing agents have been used mechanically abrade or shotblast substrate surface.

3.3 TILE BACKING BOARD INSTALLATION

A. Use cementitious backing board, except where gypsum backing board is indicated.

B. Install in accordance with the manufacturer's installation instructions.

C. Install units with edges firmly supported.

D. Screw attach units with 1 inch long drywall screws spaced 6 inches on center along framing.

E. Install fiberglass reinforcing tape at joints between panels. Completely embed in a thin set mortar bed. Trowel mortar smooth with adjacent surfaces.

3.4 CRACK ISOLATION MEMBRANE

A. Install crack isolation membrane in accordance with the manufacturer's instructions, unless indicated or specified otherwise.

B. Provide crack isolation membrane at following locations:
1. At control and construction joints in concrete floors.
2. At changes in substrate materials.
3. Shrinkage cracks 1/16 inch or larger in slabs as directed by the Architect.

C. Extend a minimum of 12 inches each side of crack or joint.

D. Do not apply crack isolation membrane at joints which will be reflected as expansion joints in the tile.

E. Substrate Examination:
   1. Substrates are subject to examination by the Owner and the Architect prior to installation of tile or slab leveling materials. Furnish a minimum of 7 days notice.
   2. The examination will determine the need for additional crack isolation membrane at shrinkage cracks and other special conditions.

3.5 SLAB LEVELING

A. Prior to installation of thinset floor tile, where local irregularities in the substrate surface would prevent level installation of the tile, the substrate shall be brought to plane surface with variations not to exceed 1/8 inch in 4 feet (cumulative) and 1/4 inch in 10 feet (non-cumulative). Smooth abrupt changes in plane.

B. Use thinset mortar or other filler for slab leveling. Other fillers are subject to endorsement by the setting mortar manufacturer. Submit manufacturer's letter of approval to the Architect, and the Owner's Representative.

C. Screed or float to appropriate thickness and specified surface tolerance. Allow to set prior to proceeding with installation. Do not exceed the maximum thicknesses for thin bed mortar as recommended by the manufacturer.

3.6 INSTALLATION OF TILE

A. Interior Floor Application - Thinset over Concrete Substrate and Concrete Substrates with Crack Isolation Membrane.
   1. TCNA System: F113 or F122 at Waterproof Membranes.
   2. Installation Standard: ANSI A108.5.
   3. Setting Materials: Thinset mortar; 3/32 inch minimum thickness.

B. Wall Application - Tile Backing Board:
   1. TCNA System: Similar to W244.
   2. Installation Standard: ANSI A108.5.
   3. Setting Materials: Thinset mortar.
   4. Use vapor barrier behind tile backing board; overlap at joints a minimum of 2 inches; overlap waterproof membrane at base 3/4 inch.

C. Joint Pattern:
   1. Lay out tile pattern prior to commencing tile installation.
   2. Accurately locate grout joints on lines indicated; where not indicated, adjust grout joints within specified tolerances to minimize use of cut tiles at field edges.
   3. Where cut tiles are necessary, position tile such that cut tile at each edge of each rectilinear field is not less than half of a full size unit, unless indicated otherwise.

D. Tiles shall be blended as required to avoid pattern repeats and "patches" of adjoining tiles of distinctive color or character within each field area. Coordinate distribution of tiles with the Architect.

E. Tiles which exhibit directional patterns shall be set with grain direction as indicated on the shop drawings, or, if not indicated, as directed by the Architect.

F. Install tiles aligned with adjacent finishes, where indicated. Provide mortar fill as necessary for proper alignment.

G. Except as otherwise indicated, install bullnose tiles at exposed tile edges, including edges adjacent to carpet, edges of planters, external corners, and tops of bases.

H. Clean joints of mortar to minimum depth of 1/4 inch to allow subsequent grout installation.

I. Provide temporary setting buttons and shims as necessary to maintain wall tiles in position until setting mortar has set.

J. Tolerances:
   1. Joint Width Variation: Plus or minus 25% of the proposed joint width.
   2. Taper: Plus or minus 25 percent from one end to the other.
   3. No portion of a tile surface shall vary more than 1/16 inch above or below an adjacent tile surface.
   4. Install tile fields level to within tolerance specified for finished substrate.

K. Special Requirements for Large Format Tiles (8 x 8 inch size or larger):
   1. Wash backs of each tile to remove dust and soil that would compromise adhesion.
   2. Dampen substrate as necessary to prevent excessive suction.
   3. Key the mortar into the substrate with the flat side of the trowel.
   4. Comb mortar over the previously keyed substrate in one direction using the notch side of the trowel.
   5. Firmly press each tile into the mortar. Press down and move the tile back and forth perpendicularly across the ridges approximately 1/8 to 1/4 inch to flatten the ridges and fill in the valleys of the combed mortar.
   6. Set tiles in accurate alignment.

L. Screed Installation:
   1. Install screeds at tile field edges at the locations indicated.
   2. Accurately cut to length for flush tightly butted joints. Provide miter cut angle joints. Remove burrs at field cuts.
   3. Install in longest possible lengths, except that no screed section shall be longer than 12 feet or shorter than 4 feet in length for continuous runs greater than 16 feet.
   4. Install screeds free from waves and variations in height, flush with top of adjacent tile surfaces.
   5. Set screeds directly in setting bed as the tile installation proceeds. Comply with screed manufacturer's instructions to achieve mortar tightly compacted between screed and tile edge.
   6. Grind screed joints as necessary to correct minor misalignment and to ease sharp outside corners.

3.7 EXPANSION JOINTS

A. Place expansion joints at maximum 30 foot intervals for interior installations.

B. Place expansion joints at control and expansion joints in concrete slabs, and at intersections with walls and columns.

C. Joint Sizes: Set to match width of typical grouted joint; but in no case less than 1/4".

D. Leave expansion joints free of mortar.

E. Sealant materials and installation are specified in Section 079200.

3.8 GROUTING

A. Comply with provisions of ANSI A108.10.

B. Mix grouts in accordance with manufacturer's instructions.

C. Grout joints, except expansion joints, in accordance with the manufacturer's recommendations. Float joints to a slightly concave profile.

D. Remove excess grout from tile surfaces in accordance with the grout and tile manufacturer's recommendations. Do not use excess amounts of water.

E. Protect adjacent surfaces from damage caused by cleaning agents. Do not use cleaners which would damage tile or grout surfaces.

F. Do not grout joints indicated to receive sealants, including inside right angle corner joints between floors and walls of column bases. Grout joints perpendicular to expansion joints shall be finished flush with tile edges.

G. Cured grout joints shall be made free of efflorescence, prior to sealing.

3.9 CURING

A. Cure installation in accordance with the grout manufacturer's recommendations. Protect tile and grout during curing operations.

B. Protect tile surfaces during curing. Keep traffic off tile surfaces for a minimum of 4 days, unless recommended otherwise by the grout or mortar manufacturer.

3.10 PROTECTION

A. Protect tile installations from damage, in accordance with Section 015000.

B. Replace damaged tiles.

3.11 CLEANING

A. In accordance with Section 015000 and Section 017700.

B. Coordinate final cleaning with work of Section 079200. Do not begin cleaning operations until tile expansion joints sealants are fully cured.

C. Wash and thoroughly rinse tile. Leave tile surfaces clean.

END OF SECTION

SECTION 096500 - RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Resilient sheet flooring.
   2. Resilient tile flooring.
   3. Resilient base.

B. Related Sections:
   1. 030013 - Concrete: Substrate.
   2. 096813 – Tile Carpeting.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. F710 - Preparing Concrete Floors to Receive Resilient Flooring.
   2. F1066 – Standard Specification for Vinyl Composition Floor Tile.
   3. F1861 - Standard Specification for Resilient Wall Base.
   4. F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.3 SUBMITTALS

A. Make submittals in accordance Section 013300.

B. Product Data:
   1. Resilient flooring.
   2. Resilient base.
   3. Accessories.

C. Samples:
   1. Each type and color of resilient flooring material; not less than 8"x10" in size.
   2. Each type and color of resilient base scheduled; not less than 12 inches in length.
   3. Submit samples, not less than 12 inches in length, of each type of transition strip required for the work.

1.4 QUALITY ASSURANCE

A. Qualifications of Installers:
   1. Use only skilled and experienced resilient flooring installers for preparation of substrate and installation of resilient flooring.
   2. Helpers and apprentices used for such work shall be under full and constant supervision at all times by thoroughly skilled resilient flooring installers.

1.5 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 016000.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Maintain minimum 70 degrees F air temperature at flooring installation area for three days prior to, during, and for 24 hours after installation.

B. Store flooring materials in area of application. Allow three days for material to reach equal temperature as area.

PART 2 - PRODUCTS

2.1 RESILIENT FLOORING

A. Resilient Sheet Flooring: As scheduled on the drawings.

B. Resilient Tile Flooring: As scheduled on the drawings.

2.2 RESILIENT BASE

A. Manufacturer: One of the following, subject to Architect's approval of color:
   1. Roppe Rubber Corp.
   2. Burke Flooring Products / Burke Industries.
   3. Allstate Rubber Corp.

B. Resilient Base: ASTM F1861, Type TS, 100 percent vulcanized rubber; 1/8 inch thick; roll stock; coved and straight base as specified; 4 inch height, unless otherwise indicated on the Drawings.

2.3 ACCESSORIES

A. Subfloor Filler: Portland cement based latex filler, mixed with water to produce a self leveling underlayment, or cementitious paste, as appropriate to project requirements.

B. Adhesives:
   1. Types recommended by resilient flooring and base manufacturers for specific application.

C. Transition Strips: Vinyl; color as selected by the Architect from manufacturer's standard.

D. All other materials not specifically described, but required for a complete and proper installation of resilient flooring, shall be only as recommended by the manufacturer of the material to which it is applied and shall be subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine site conditions and verify that the work of this Section may properly commence. Notify the Architect in writing of unsatisfactory conditions.

B. Moisture Testing of Concrete Slabs:
   1. Test at all concrete slabs indicated to receive resilient flooring, to determine the vapor emission rate.
   2. Perform tests in accordance with ASTM F1869.
   3. Notify the Architect if tests results show a vapor emission rate which exceeds 3 lbs per 1000 sf in a 24 hour period.
   4. Test kits are available from VAPRECISION 800-449-6194.

C. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

A. Prepare floors in accordance with ASTM F710. Install subfloor filler to fill low spots, cracks, construction joints, holes and other defects, and as required to adjust level to meet adjacent finishes. Feather to maximum slope of 1/8 inch in 1 foot; float to smooth, flat, hard surface. Prohibit traffic over filler.

3.3 FLOORING INSTALLATION

A. Install all resilient flooring where scheduled in accordance with the manufacturer's recommendations.

B. Unless indicated otherwise, install resilient flooring with joints and seams parallel to building lines.

C. Terminate resilient flooring at centerline of door at door openings where adjacent floor finish is dissimilar, and where no threshold is indicated.

D. Install edge strips at unprotected or exposed edges where flooring terminates.

E. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.

F. Clean substrate. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.

G. Set flooring in place, press with heavy roller to ensure full adhesion.

H. Special Requirements for Sheet Flooring:
   1. Install sheet flooring to a minimum 1/3 full material width, with length of sheet parallel to length of room. Where cutting is required, double cut and weld as specified. Trim in accordance with manufacturer's instructions.
   2. Seal seams in accordance with the manufacturer's printed instructions.
   3. Unless indicated otherwise, lay flooring with seams parallel to building lines to produce minimum number of seams.

I. Special Requirements for Resilient Tile:
   1. Open floor tile cartons, enough to cover each area, and mix tile to ensure shade variations do not occur within any one area.
   2. Unless indicated otherwise, lay tiles parallel to building lines to produce symmetrical tile pattern.
   3. Install with minimum tile width 1/2 full size at room or area perimeter.
   4. Arrange to square grid pattern with all joints aligned, with pattern grain alternating with adjacent unit to produce basket weave pattern.

J. Seal joint between flooring and adjacent materials at restrooms, bathrooms, kitchens, and other moist areas with clear silicone sealant.

3.4 BASE INSTALLATION

A. Adhesive install base materials in accordance with the manufacturer's recommendations.

B. Install base in maximum practical lengths, with minimum number of joints in each run. Fit joints tight, vertical, and in accurate alignment.

C. Install straight style base at all walls where resilient base is scheduled in areas with carpeted floors; install cove style base at walls scheduled for resilient base abutting hard surface and resilient floors.

D. Install base to walls, columns, and to casework toe kicks in all areas where resilient base is scheduled, and where no other base finish is specifically noted or detailed.

E. Coordinate installation of base with work of Section 096800.

F. Fit joints tight and vertical, in accurate alignment. For straight runs greater than 48 inches, maintain minimum 18 inches between joints.

G. Score back of base material with grooving tool, at all outside corners; maintain minimum leg length 18 inches where wall length permits. Mount base so that scored groove is accurately aligned with corner, and with base tightly adhered to wall at both sides of corner, with no visible gaps at top of base. Where cove base is formed around outside corners, stretch toe of cove for smooth transition around corner, with toe in uniform contact with the finish flooring.

H. Miter or cope inside corners for accurate fit.

I. Scribe and fit to door frames, stairs, and other obstructions.

J. Install straight and level to maximum variation of plus or minus 1/8 inch over 10 feet.

3.5 PROTECTION

A. Unless recommended otherwise by the adhesive manufacturer, prohibit traffic from resilient flooring for 48 hours after installation.

3.6 CLEANING

A. Upon completion of the installation, immediately remove all surplus adhesive from adjacent surfaces.

B. As soon as possible after installation, and in accordance with the timing recommended by the manufacturers, clean the entire resilient flooring surface using the materials recommended for that purpose by the manufacturers of the materials being cleaned.

END OF SECTION

SECTION 096566 - ATHLETIC FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Resilient athletic sheet flooring.

B. Related Sections:
   1. 030013 - Concrete: Substrate
   2. 096500 – Resilient Flooring.
   3. 096813 – Tile Carpeting.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. F710 - Preparing Concrete Floors to Receive Resilient Flooring.
   2. F1066 – Standard Specification for Vinyl Composition Floor Tile.
   3. F1861 - Standard Specification for Resilient Wall Base.
   4. F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.3 SUBMITTALS

A. Make submittals in accordance Section 013300.

B. Product Data:
   1. Resilient athletic flooring.

C. Samples:
   1. Each type and color of resilient flooring material; not less than 8"x10" in size.
   2. Each type and color of resilient base scheduled; not less than 12 inches in length.
   3. Submit samples, not less than 12 inches in length, of each type of transition strip required for the work.

1.4 QUALITY ASSURANCE

A. Qualifications of Installers:
   1. Use only skilled and experienced resilient flooring installers for preparation of substrate and installation of resilient flooring.
   2. Helpers and apprentices used for such work shall be under full and constant supervision at all times by thoroughly skilled resilient flooring installers.

1.5 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 016000.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Maintain minimum 70 degrees F air temperature at flooring installation area for three days prior to, during, and for 24 hours after installation.

B. Store flooring materials in area of application. Allow three days for material to reach equal temperature as area.

PART 2 - PRODUCTS

2.1 RESILIENT FLOORING

A. Resilient Athletic Sheet Flooring: As scheduled on the drawings.

2.2 RESILIENT BASE

A. Manufacturer: One of the following, subject to Architect's approval of color:
   1. Roppe Rubber Corp.
   2. Burke Flooring Products / Burke Industries.
   3. Allstate Rubber Corp.

2.3 ACCESSORIES

A. Subfloor Filler: Portland cement based latex filler, mixed with water to produce a self leveling underlayment, or cementitious paste, as appropriate to project requirements.

B. Adhesives:
   1. Types recommended by resilient flooring [and base] manufacturers for specific application.

C. Transition Strips: Vinyl; color as selected by the Architect from manufacturer's standard.

D. All other materials not specifically described, but required for a complete and proper installation of resilient flooring, shall be only as recommended by the manufacturer of the material to which it is applied and shall be subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine site conditions and verify that the work of this Section may properly commence. Notify the Architect in writing of unsatisfactory conditions.

B. Moisture Testing of Concrete Slabs:
   1. Test at all concrete slabs indicated to receive resilient flooring, to determine the vapor emission rate.
   2. Perform tests in accordance with ASTM F1869.
   3. Notify the Architect if tests results show a vapor emission rate which exceeds 3 lbs per 1000 sf in a 24 hour period.
   4. Test kits are available from VAPRECISION 800-449-6194.

C. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

A. Prepare floors in accordance with ASTM F710. Install subfloor filler to fill low spots, cracks, construction joints, holes and other defects, and as required to adjust level to meet adjacent finishes. Feather to maximum slope of 1/8 inch in 1 foot; float to smooth, flat, hard surface. Prohibit traffic over filler.

3.3 FLOORING INSTALLATION

A. Install all resilient flooring where scheduled in accordance with the manufacturer's recommendations.

B. Unless indicated otherwise, install resilient flooring with joints and seams parallel to building lines.

C. Terminate resilient flooring at centerline of door at door openings where adjacent floor finish is dissimilar, and where no threshold is indicated.

D. Install edge strips at unprotected or exposed edges where flooring terminates.

E. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.

F. Clean substrate. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.

G. Set flooring in place, press with heavy roller to ensure full adhesion.

H. Special Requirements for Athletic Sheet Flooring:
   1. Install sheet flooring to a minimum 1/3 full material width, with length of sheet parallel to length of room. Where cutting is required, double cut and weld as specified. Trim in accordance with manufacturer's instructions.
   2. Heat weld seams in accordance with the manufacturer's printed instructions. Use welding rod in color as selected by the Architect.
   3. Unless indicated otherwise, lay flooring with seams parallel to building lines to produce minimum number of seams.

I. Seal joint between flooring and adjacent materials at restrooms, bathrooms, kitchens, and other moist areas with clear silicone sealant.

3.4 PROTECTION

A. Unless recommended otherwise by the adhesive manufacturer, prohibit traffic from resilient flooring for 48 hours after installation.

3.5 CLEANING

A. Upon completion of the installation, immediately remove all surplus adhesive from adjacent surfaces.

B. As soon as possible after installation, and in accordance with the timing recommended by the manufacturers, clean the entire resilient flooring surface using the materials recommended for that purpose by the manufacturers of the materials being cleaned.

C. [Seal, and wax floor [and base] surfaces in accordance with manufacturer's instructions.]

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Carpet tiles, glued down to concrete substrate.

B. Related Section: 033013 - Concrete: Substrate; slab level tolerances.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing & Materials (ASTM):
   1. D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
   2. E648-78 - Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

B. American Association of Textile Chemists & Colorists (AATCC): 134-1975 - Electrostatic Propensity of Carpet.

1.3 SUBMITTALS

A. Make submittals in accordance with provisions of 013300 and 017700, as applicable.

B. Product Data: Submit carpet manufacturer's material specification and installation instructions.

C. Samples: For each color and type of carpet tile proposed for the work, submit two full size carpet tiles.

D. Maintenance Manuals: Furnish Owner with 2 printed copies of the manufacturer's recommendation for the care, cleaning, and maintenance of the carpet, including detailed instructions pertaining to the cleaning and removal of stains.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Specialist in carpet installation employing only skilled craftsmen.

B. Measurement Verification: Measurements shown on the Drawings are approximate. The Contractor's shall verify all dimensions and job site conditions; order sufficient carpet tiles to fully carpet areas as indicated and to fill overage requirements as specified.

C. All carpet of the same type shall be from the same dye lot.

1.5 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 016000.

B. Delivery: Deliver carpet tiles to site in manufacturer's original packages clearly labeled with the manufacturer's name, brand, and related information. Upon receipt of materials, inspect for in transit damage and replace if necessary.

C. Storage: Store in dry, clean, well ventilated space; protect from damage, soiling, fading and moisture.

1.6 JOB CONDITIONS

A. Precondition: Leave carpet tiles in area to be tiled for 48 hours prior to installation.

B. Environmental Conditions: Maintain temperature in space in accordance with carpet or adhesive manufacturer's recommendations, but in no case less than 60 degrees F for 24 hours prior to, during, and after installation. Permit no traffic over newly laid adhesive applied carpet for a minimum of 24 hours after installation.

1.7 WARRANTY

A. Installed carpeting shall be warranted by the manufacturer for a period of ten years from the date of purchase, against wear in excess of ten percent of face weight, backing delamination, edge ravel, and change in dimension, and cup, dome, or dish.

1.8 MAINTENANCE

A. Extra Stock: Furnish extra uncut carpet tile in the amount of 5 percent of the installed quantity of each type and color of carpet tile. Deliver to the Owner in clearly market cartons; store where directed.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. CPT-1: As scheduled on the Drawings.

2.2 RELATED MATERIALS

A. Adhesive: W.W. Henry Company "Peach Glue", 3M Company "Blue Glue", or approved waterproof, non-flammable carpet adhesive as recommended by the carpet tile manufacturer for compatibility with carpet backing. Carpet adhesive shall be release type, allowing carpet tiles to be removed and replaced at a later date without damaging or removing the adjacent tile pieces.

B. Floor Transition Strips: Unless otherwise indicated, floor transition strips at all transitions where carpet abuts concrete shall be stainless steel. Furnish Phillips head stainless steel countersunk screws and lead expansion anchors as necessary for anchorage.

C. Latex Underlayment: White premix latex filler, mixed with water to produce cementitious paste. Dependable Chemical Co., Inc. "Dependable White Skimcoat Underlayment" with "Latex Liquid Additive" or W.W. Henry Company "#335 Underlayment Powder" with #336 Latex Liquid Additive."

D. Miscellaneous: Furnish incidental and accessory materials, tools, and equipment required for installation of carpet.

E. Protection Paper: Fortifiber Corporation "Seekure 892," or approved heavy, reinforced, non-staining kraft laminated paper.

PART 3 - EXECUTION

3.1 INSPECTION

A. General: Do not start work under this Section until work of other trades, including painting, is substantially completed. Inspect surfaces to receive carpet; do not proceed with the work until unsatisfactory conditions have been corrected. Commencement of work constitutes acceptance of surfaces.

B. Preparation: Surfaces shall be dry, firm, sound and free from oil, dirt, paint, joint compound, bond-breaking or curing compounds, or other foreign matter. Surfaces shall be free from unusual roughness and sharp edges such that the installed carpet will present an even, smooth appearance. Damp mop floors with warm water and vacuum after mopping.

C. Cracks: Fill cracks, indents and other imperfections which could interfere with satisfactory installation with latex underlayment, mixed and applied in accordance with the manufacturer's printed instructions. Trowel to smooth surface. Allow underlayment to fully dry before applying carpet adhesive.

D. Moisture Test: Prior to commencement of carpet tile installation, and unless otherwise recommended by the carpet adhesive manufacturer, conduct standard 16-hour moisture test on concrete floors in accordance with ASTM D4263, at each area to receive carpet tile.

3.2 INSTALLATION

A. Floor adhesive shall be applied in accordance with adhesive manufacturer's recommendations using a roller to ensure 100 percent contact.

B. Installation: Place all carpet tiles in accordance with manufacturer's recommended procedures. Carpet tiles shall be adhesively applied to concrete slab. All carpet tile shall be oriented in the same direction and shall lay completely flat.

C. Lay out area such that cut perimeter tiles will be not less than 8 inches wide. Commence laying tile in center of room or space and work toward perimeters; cut border tile after field tiles have been installed. Cut carpet evenly and accurately to fit neatly at walls, columns, and projections. Lay tile square with area of installation. Joints shall be tight and unnoticeable upon completion.

D. All cutting of carpet for telephone and electrical outlets shall be the responsibility of the carpet installer.

E. Carpet tile installation shall be rolled and rerolled on the day following installation to assure complete transfer of adhesive.

F. Install floor transition strips at terminations where required. Secure strips to substrate with specified anchors, spaced 6" o.c., maximum.

3.3 CLEANING AND PROTECTION

A. Cleaning: Remove all spillage and adhesive from the face of the installed carpet immediately. Use recommended cleaning materials. On completion of installation, the entire carpet area shall be cleaned with an upright beater-type vacuum cleaner.

B. All defective and damaged carpet tiles, improperly cut tiles, and carpet tiles on which there are stains which cannot be completely removed to the satisfaction of the Architect or Owner, shall be replaced with new. The entire installation shall be left clean and free from imperfections.

C. Protection: Following cleaning and vacuuming, protect the carpeting from soiling and damage until final acceptance. In areas where painting or other wet work is to be performed subsequent to carpeting installation, protection shall be accomplished using specified protection paper. Lap edges of paper 6 inches and secure with non-staining tape. The covering shall be kept in repair and damaged portions replaced during the construction period.

END OF SECTION

SECTION 098100 - ACOUSTIC INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Acoustical insulation in walls.
   2. Acoustical sealant.

B. Related Sections:
   1. 072100 - Thermal Insulation: Thermal batt and blanket insulation.
   2. 092200 – Lightgage Metal Support Framing: Support framing.
   3. 095123 – Acoustical Tile Ceilings.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   2. E84 - Test Method for Surface Burning Characteristics of Building Materials.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Batt Acoustical Insulation: ASTM C665, Type I; unfaced glass fiber batts, blankets, or rolls; minimum fire hazard classification rating of 25/50 per ASTM E84; 2-3/4 inches thick for installation in 2-1/2 inch stud cavities; 3-5/8 to 4 inches thick for installation in 3-5/8 inch stud cavities;6-1/2 inches thick for installation in 6 inch stud cavities; widths to friction-fit between studs, where indicated for installation in stud walls; formaldehyde free.

B. Acoustical Sealant: Non-hardening, low-shrinkage; for use in conjunction with gypsum board; similar to USG "Sheetrock Brand Acoustical Sealant," Tremco "Acoustical Sealant 30CTG," Quiet Solution (Sunnyvale CA; ; 408-541-8000) "QuietSeal QS-350," or approved.

C. Accessories: Furnish other accessories such as fasteners and retainers, not specifically described, but required for a complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence.

B. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

C. Do not begin work until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

A. Verify that adjacent materials are secure, properly spaced, dry, and ready to receive installation.

B. Verify that mechanical and electrical services within spaces to insulated have been installed and tested.

C. Furnish acoustical insulation to hollow metal installer for installation in hollow metal frames in acoustical partitions.

3.3 INSTALLATION

A. Install insulation in stud cavities in accordance with manufacturer's instructions, and as indicated. Coordinate with other trades as necessary to complete acoustical barriers at wall penetrations.

B. Install insulation without gaps or voids.

C. Trim insulation neatly to fit spaces. Use insulation materials free of damage.

D. Sealant:
   1. Install acoustical sealant continuously around perimeter of all acoustically insulated partitions; one continuous bead at each side of framing member interface with substrate.
   2. Except for penetrations in fire rated construction to receive firestopping or fire rated construction joint assemblies, seal all penetrations through acoustical assemblies, including cutouts for lighting fixtures, cabinets, pipes and plumbing, HVAC ducts, and electrical boxes.

END OF SECTION

GENERAL

1.1 SUMMARY

A. Section Includes: Site applied paint coatings.

B. Related Sections:
1. 051200 - Structural Steel: Preprimed metal surfaces.
2. 055000 - Metal Fabrications: Pre-primed metal surfaces.
3. 062000 - Finish Carpentry: Shop finished materials.
4. 081113 - Hollow Metal Doors and Frames: Preprimed metal surfaces.
5. 081400 - Wood Doors: Prefinished doors.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. Master Painters Institute (MPI): Architectural Painting Specification Manual

B. Steel Structures Painting Council (SSPC).

1.3 DEFINITIONS:

A. Sheen: Degree of luster of the dried paint film. Where terms such as "gloss," "semi-gloss," "low-gloss," "matte," "satin," "eggshell," or "flat," are used, it shall be subject to the Architect's interpretation, regardless of manufacturer's nomenclature for any particular sheen level. The Architect reserves the right to select from any of manufacturer's published sheen levels for each paint system, if sheen of initial paint finish sample is not approved.

1.4 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Materials List: Organize to indicate painting systems to be used with each substrate. Include proposed dft for each coat and manufacturer's product data as required to verify compliance with the specified requirements. Do not include MSDS sheets.

C. Samples:
1. Paint Samples:
   a. Submit three samples of each paint finish on an 8"x10" card. Reference manufacturer, type of paint, color, sheen, substrate, and application.
   b. Furnish additional samples until all paint finishes are approved.
2. Transparent Finish Samples:
   a. Submit samples of each wood species and transparent finish combination.
   b. If, in the judgment of the Contractor, the wood species or finish method selected indicate that color variations may be inevitable, submit samples in sets of 3 or more illustrating the possible range of these variations.
   c. When approved, the finished sample or sets shall become the standard for approval.

D. Contract Closeout Submittals: Record Paint Samples: In accordance with Section 017700, submit three 8"x10" samples of each paint and color used, indicating paint manufacturer and formula number; bind in identical sets. Deliver to on site location as directed.

1.5 QUALITY ASSURANCE

A. Applicator: Company specializing in commercial painting and finishing with a minimum of three years documented experience.

B. Environmental Requirements for Solvent Based Paints: Comply with the Environmental Protection Agency (EPA) requirements for volatile solvents content limitations, as applicable to each classification of coating.

C. Visual Standards: Each distinct area of the finished work shall be free of variations in color and sheen, orange peel, runs, sags, blistering, checking, cracking, scratches, dust, dirt, bugs, and other contaminants.

1.6 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 016000.

B. Delivery: Deliver paint materials to the jobsite in sealed, original, labeled containers, each bearing manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and/or reducing.

C. Storage: Store paint materials at a minimum ambient temperature of 45 degrees F. in a well ventilated area. Adequate storage facilities will be made available at the jobsite.

D. Toxic, acidic, and combustible materials: Take all necessary precautionary safety measures as recommended by the material manufacturers and governing regulations.

E. Place cotton waste, cloths, and material which may constitute a fire hazard in closed metal containers and daily remove from the site.

1.7 SITE CONDITIONS

A. Weather Conditions:
   1. Do no exterior work on unprotected surfaces when raining, or other moisture is present or expected, or before applied paints can dry or attain proper cure.
   2. Allow wetted surfaces to dry and attain temperatures and condition specified hereinafter before proceeding with previously started work.

B. Temperature:
   1. Do no painting work when surface and air temperatures are below 40 degrees F or below those temperatures recommended by the manufacturer for the material type used.
   2. Minimum temperatures for latex finishes: 45 degrees F for interior work and 50 degrees F. for exterior work, unless approved otherwise.

C. Lighting: Maintain a lighting level of minimum 50 foot-candles on the surfaces to be painted or finished.

D. Ventilation: Provide adequate continuous ventilation.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Unless specified otherwise, furnish manufacturer's highest grade coating systems by one of the following manufacturers:
   1. Benjamin Moore Paint Company.
   2. Pittsburgh Paints.
   3. Pratt & Lambert.
   4. The Sherwin-Williams Company.
   5. ICI Paints North America.

B. Exterior Paint Systems: One of the following; color matches as scheduled at the end of this Section.
   1. Manufacturer: Benjamin Moore Paint Company
      a. Wood Substrate:
         1) Primer: Super Spec Latex Exterior Primer (169)
         2) Finish: Ultra Spec Exterior Flat Finish (N447)
      b. Wood (structural lumber and glue-lams)
         1) Primer: Super Spec Latex Exterior Primer (169)
         2) Finish: Ultra Spec Exterior Flat Finish (N447)

3) Finish: Arborcoat Semi-Transparent Deck & Siding Stain (0638))
2. Manufacturer: ICI Dulux
   a. Wood Substrate:
      1) Primer: "#2000 Dulux Professional Exterior 100% Acrylic Wood Primer."
      2) Finish: "#2200 Dulux Professional Exterior 100% Acrylic Flat Finish
3. Manufacturer: Sherwin-Williams
   a. Wood Substrate:
      1) Primer: "A-100 Exterior Latex Wood Primer."
      2) Finish: "A-100 Exterior Latex Flat."
   b. Cement Plaster Substrate:
   c. Wood (structural lumber and glue-lams)
      1) Primer: A-100 Exterior Latex Wood Primer, B42W41
      2) Finish: A-100 Exterior Latex Flat, A6 Series
      1) Finish: WoodScapes Polyurethane Stain, A15T5

C. Interior Latex Paint System – Gypsum Board Substrate: One of the following.
   1. Manufacturer: ICI Devoe
      a. Primer: DR3160 "Wonderpure Primer."
      b. Finish: DR3249 "Wonderpure Eggshell."
   2. Manufacturer: ICI Dulux
      a. Primer: LM9116 "Lifemaster 2000" primer."
      b. Finish: LM9300 "Lifemaster 2000" Eggshell."
   3. Manufacturer: Sherwin-Williams
      a. Primer: Harmony Primer 0 VOC B11W900
      b. Finish: Harmony 0 VOC B9 Series; Eggshell sheen
   4. Manufacturer: Benjamin Moore Paint Company
      a. Primer: Ultra Spec 500 Zero VOC Interior Latex Primer (N534)
      b. Finish: Ultra Spec 500 Zero VOC Interior Eggshell Finish (N538)
   5. Manufacturer: Parker Paint Mfg. Co., Inc.
      a. Primer: #1849 "Premium Great Northwest, Klean-Air Coating", Interior Latex Primer/Sealer.
      b. Finish: #4350 "Premium Great Northwest, Klean-Air Coating", Eggshell Latex Enamel.

D. Interior Trim Systems – Metal Substrate: One of the following.
   1. Manufacturer: ICI Devoe
      a. Metal Primer: "Mirrolac" DP 8502 WB; DTM waterborne primer.
      b. Finish: DR3349 "Wonderpure SG."
   2. Manufacturer: ICI Dulux
      a. Metal Primer: "Devflex" 4020 DTM waterborne primer.
      b. Finish: LM9200 "Lifemaster 2000" S.G.
   3. Manufacturer: Sherwin-Williams
      a. Metal Primer: “Pro Industrial Pro-Cryl B66” Universal Acrylic Primer
      b. ; 2.5 – 5.0 mils dft 138 g/l VOC
      c. Finish: Pro Classic Waterborne Semi-gloss dft 157 g/l VOC
      d. Metal Primer: (DTM waterborne). Super Spec HP D.T.M. Acrylic Semi-Gloss Enamel (P29)
      e. Finish: (Semi-Gloss) Super Spec HP D.T.M. Acrylic Semi-Gloss Enamel (P29)
   4. Manufacturer: Ameron International.
      a. Metal Primer: "Amercoat 148," Waterborne Acrylic Primer.
      b. Finish: "Amercoat 220," Waterborne Acrylic Topcoat; semigloss.

E. Interior Trim Systems – Opaque Finish Wood Substrate: One of the following.
   1. Manufacturer: ICI Devoe
      a. Primer: DR3160 "Wonderpure Primer."
      b. Finish: DR3349 "Wonderpure SG."
   2. Manufacturer: ICI Dulux
      a. Primer: LM9116 "Lifemaster 2000" primer."
      b. Finish: LM9200 "Lifemaster 2000" S.G.
   3. Manufacturer: Sherwin-Williams
      a. Primer: Harmony Primer 0 VOC B11W900
      b. Finish: Pro Classic Waterborne Semi-gloss dft 157 g/l VOC

4. Manufacturer: Benjamin Moore Paint Company
   a. Primer: Ultra Spec 500 Zero VOC Interior Latex Primer (N534)
   b. Finish: Ultra Spec 500 Zero VOC Interior Semi-Gloss Finish (N539)
5. Manufacturer: Parker Paint Mfg. Co., Inc.
   a. Primer: #1880 "Latex Millwork Primer" Interior Acrylic Latex Primer."
   b. Finish: #5350 "Great Northwest Interior Latex" Semi Gloss.

F. Ferrous Metal - Zinc Rich/Epoxy/Polyurethane System: One of the following
1. Manufacturer: Tnemec Company Inc. (Kansas City, MO; 816-483-3400).
   a. Zinc Primer: Tnemec Series "394 PerimePrime;" single component moisture cured primer; minimum 62 percent solids by volume.
   b. Epoxy Primer: "Hi-Build Epoxoline II" Series N69.
   c. Polyurethane Finish Coats: Series 1075 "Endura-Shield II"; Acrylic Polyurethane Enamel; semi-gloss or satin sheen.
2. Manufacturer: Carboline Company (St. Louis, MO; 314-644-1000; 800-848-4645).
   a. Zinc-Rich Primer: "Carbozinc 859"; organic zinc-rich epoxy primer; minimum 80 percent by weight metallic zinc in the cured film.
   b. Epoxy Primer: "Carboline 888 "
   c. Polyurethane Finish Coats: Carboline 133 HB; semi-gloss or satin sheen.
3. Manufacturer: Ameron Protective Coatings (Brea, CA; 714-529-1951).
   a. Zinc-Rich Primer: "68HS"; organic zinc-rich epoxy primer; minimum 80 percent by weight metallic zinc in the cured film.
   b. Epoxy Primer: "Amercoat 385."
   c. Polyurethane Finish Coats: Amercoat 450SA"; semi-gloss or satin sheen.
4. Manufacturer: Benjamin Moore & Company
   a. Zinc- Rich Primer: Corotech Organic Zinc Rich Primer (V170)
   b. Primer: Corotech Acrylic Metal Primer (V110)
   c. Urethane Finish Coats: Corotech Waterborne Urethane Gloss (V540)
5. Manufacturer: ICI Devoe.
   a. Zinc-Rich Primer: "Catha-Coat 302H"; "reinforced" inorganic zinc-rich epoxy primer; minimum 56 percent by weight metallic zinc in the cured film.
   b. Epoxy Primer: "Devran 224HS," "Bar-Rust 231," or "Bar-Rust 233H."
   c. Polyurethane Finish Coats: "Devthane 378"; semi-gloss or satin sheen.

G. Epoxy Paint System:
1. Primer: As recommended by the finish coat manufacturer for the application.
2. Epoxy Finish Coats: Tnemec "Hi-Build Epoxoline II" Series N69, Sherwin Williams Sher-Tile High Solids Epoxy B67, Carboline "Sanitile 250 WB," Benjamin Moore & Company Polyamide Epoxy Coating (V400) or approved.

H. Exterior Wood Stain: Cabots semi-transparent stain; Olympic semi-transparent water based acrylic stain

I. Spar Varnish: McCloskey's Man O War; Benjamin Moore & Company Lenmar Spar Varnish (1V.109)

J. Materials not specifically noted and otherwise required for the work, such as linseed oil, shellac, thinners and the like shall be of a quality not less than that required by manufacturers of the finish materials used in the work.

K. Products for each general purpose shall be compatible. Each system shall be products of one manufacturer where ever possible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Perform adhesion tests on factory primed items. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 MOISTURE CHECK

A. Check for excess moisture using an electronic moisture meter. Do not paint materials with moisture levels which would impair the bonding of finish coatings.

3.3 PROTECTION

A. Adequately protect surfaces not to be painted, from spills, drips, over painting, and other damage caused by this work. Include surfaces within the paint storage and preparation areas.

B. Hardware and Miscellaneous Items:
   1. Remove electrical outlet and switch plates, mechanical diffusers, escutcheons, surface hardware, and fittings prior to starting work.
   2. Store, clean and reinstall these items upon completion of work in each area. Use materials and techniques as necessary to prevent damage to finishes on such items.

3.4 SURFACE PREPARATION

A. Prepare surfaces by removing dirt, dust, grease, oil, moisture, and other contaminants which would impair finish adhesion.

B. Ferrous Metal Shop Primed under other Sections: Solvent clean to remove oil and grease. Remove loose rust, and blistered and peeling paint to bare metal by scraping, sanding, and wire brushing in accordance with SSPC-SP2 and SP3. Immediately retouch damaged or abraded surfaces with compatible primer. Lightly sand all shop prime painted surfaces to receive paint finish.

C. Galvanized Ferrous Metal:
   1. Undamaged Surfaces: Solvent clean in accordance with SSPC-SP1; abrade surfaces with metal preparation pad.
   2. Damaged Surfaces: Remove loose rust to bare metal by scraping, sanding, and wire brushing in accordance with SSPC-SP2 and SP3. Touch up damaged surfaces with zinc rich primer.

D. Unprimed Ferrous Metal:
   1. Solvent clean in accordance with SSPC SP-1.
   2. Commercial blast per SSPC SP6.

E. Wood - Opaque paint finish:
   1. Spot coat knots, pitch streaks, and sappy sections with sealer.
   2. Fill all nail holes and cracks. Sand filler smooth and level with wood surface.

F. Wood - Transparent Finish: Fill all exposed finish nail holes and cracks with matching color filler after prime coat is applied. Sand filler smooth and level with adjacent surfaces.

3.5 GENERAL APPLICATION REQUIREMENTS

A. Unless specified or indicated otherwise, follow paint manufacturer's label directions for general application procedures and coverage rates.

B. Do not apply finishes on surfaces that are not sufficiently dry. Make sure each coat of finish is dry and hard before a following coat is applied unless the manufacturer's directions state otherwise.

C. Tint filler to match stain when clear finishes are specified; work filler well into grain and, before it has set, working perpendicularly to the grain, wipe the excess from the surface.

D. Opaque Finishes:
   1. Apply number of coats scheduled for each application, except that additional finish coats shall be applied as necessary for complete hiding of substrate colors.
   2. Apply primer coats untinted. Where more than one coat of paint is required, tint each succeeding coat up to the final coat similar in tint, but slightly lighter in value (shade).
   3. Sand lightly between coats if necessary to achieve required finish; sand between all coats applied to wood substrates.

E. Rollers for application and backrolling of latex paints shall have a nap of 3/8 inch or less.

F. Where roller texture is scheduled for application to gypsum board surfaces, finish coats may be roller-applied, or spray applied and backrolled at Contractor's option.

G. Factory Primed Surfaces: Apply scheduled finish system, less primer coat, except as necessary for patching damage to factory prime coating.

H. Epoxy/Urethane Systems: Brush or roller apply.

3.6 EXTERIOR PAINTING SYSTEMS

A. Galvanized Ferrous Metal - Epoxy/Urethane System:
   1. System: Apply one coat epoxy primer, and two urethane finish coats in accordance with the manufacturer's recommendations. Verify compatibility with shop applied primer. Apply epoxy primer over all shop applied primers, unless the specified primer was shop applied.
   2. Sheen: Semi-gloss or satin, unless indicated otherwise.
   3. Application: Use on all exterior ferrous metal surfaces.

B. Non-Galvanized Ferrous Metal - Zinc/Epoxy/Urethane System:
   1. System: Shop apply one coat of zinc primer; field apply one coat of epoxy primer to 3 mil minimum thickness and one coat urethane finish in accordance with the manufacturer's recommendations.
   2. Sheen: Semi-gloss or satin, unless indicated otherwise.
   3. Application: Use on all exterior ferrous metal surfaces.

C. Wood - Exterior Stain Finish:
   1. System: Two coats of exterior wood stain in accordance with the manufacturer's recommendations. Each coat shall be spray applied and back brushed
   2. Application: Exterior wood siding and trim.
   3. The first coat shall be machine applied to all wood surfaces prior to installation. The second coat shall be brush applied or spray applied and back brushed in.

D. Wood - Latex System:
   1. System: Three coats; first coat exterior alkyd primer, second and third coats exterior latex.
   2. Sheen: Semi-gloss, unless indicated otherwise.
   3. Application: Exterior wood trim, and window frames.

E. Wood - Urethane System:
   1. System: Two coats of urethane finish.
   2. Sheen: Semi-gloss, unless indicated otherwise.
   3. Application: Exterior doors, and door frames, subject to abrasion. Paint interior surfaces as well as exterior surfaces.

3.7 INTERIOR PAINTING AND FINISHING SYSTEMS

A. Gypsum Board - Latex System:
   1. System: Three coats - first coat latex primer sealer (untinted), second and third coat latex paint.
   2. Sheen: Roller texture, satin sheen, except provide flat sheen at light coves, ceilings, skylight areas, clerestory areas, interior fascias, and other light sensitive surfaces. Verify locations of each sheen with Architect before proceeding with work.
   3. Application:
      a. Use on all exposed gypsum board surfaces.
      b. Provide prime coat only behind permanently mounted mechanically anchored mirrors, fabric panels, and similar elements.
      c. Do not apply primer or paint coatings to surfaces to receive adhesively mounted mirrors or tile.

B. Gypsum Wall Board - Epoxy System:
   1. System: Three coats - first coat manufacturer's recommended primer sealer, and second and third coats epoxy coating.
   2. Sheen: Gloss, unless indicated otherwise.
   3. Application: Gypsum board wall surfaces indicated on the Drawings.

C. Wood - Opaque Finish Latex System:
   1. System: Three coats; first coat latex wood primer, and second and third coat latex enamel.
   2. Sheen: Semi-gloss, unless indicated otherwise.
   3. Application: Use on all wood surfaces, including wood doors, and standing and running trim.

D. Wood - Stain & Varnish Transparent Finish System:
   1. System: Four coats; first coat stain, second coat alkyd sanding sealer, and third and fourth coats alkyd varnish. Sand with 220 grit sandpaper between coats. Filler need not be used for open grain woods.
   2. Sheen: Semi-gloss, unless indicated otherwise.
   3. Application: Woods scheduled for transparent finish as specified in 062000.

E. Ferrous Metal and Galvanized - Acrylic System:
   1. System: Three coats; first coat acrylic DTM primer; second and third coats latex finish. The primer may be omitted at factory primed surfaces, except as necessary to recoat damaged or abraded preprimed surfaces.
   2. Sheen: Semi-gloss, unless indicated otherwise.
   3. Application: Interior ferrous metal surfaces including hollow steel metal doors and frames, pipe steel hand and guard rails, overhead doors and frames, access doors and panels, and fire extinguisher cabinets.

3.8 CLEANUP

A. As the work proceeds and on completion of the work, promptly remove all sealers, primers, paints and finishes where spilled, splashed or splattered in a manner not to damage the surface from which it is removed.

B. Remove masking.

C. Clean, or replace with new, all lamps and electrical fixtures damaged by overspray; replace with new identical components all lighting fixture louvers and reflectors damaged by overspray.

3.9 COLOR SCHEDULE

A. Provide paint colors to match those indicated on the drawings. Where a paint color is listed from a specific manufacturer, paint products from other approved manufacturers may be used, provided the color exactly matches the specified color, and the paint system meets the specified requirements. Where no paint color is indicated, provide color and sheen as selected by the Architect.

END OF SECTION

SECTION 101473 - CODE SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Code required signage.

B. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

C. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 SYSTEM DESCRIPTION

A. Room Occupancy Signs: In the following rooms, in a conspicuous location near the main exit, provide signs with minimum 3/4 inch high letters posting each room's occupant capacity in accordance with 1004.3 of the IBC.

Room Name	Maximum Occupancy

B. Accessibility Signage:
   1. Provide acrylic plastic reverse silk screened signs with international symbol of accessibility, raised letters, and Braille, at the following locations:
      a. Accessible areas of refuge.
      b. Accessible toilet and bathing facilities.
   2. Provide painted metal international symbol of accessibility at the following locations:
      a. Accessible parking locations.
      b. Accessible passenger loading zones.
   3. Provide directional signage at the following in accessible areas to indicate the direction to the nearest similar accessible area:
      a. Inaccessible building entrances.
      b. In accessible public toilet and bathing facilities.
      c. Inaccessible elevators and exit stairs.
   4. Each door to an exit stairway shall have a tactile sign stating EXIT, which includes raised letters and Braille, and which complies with ANSI A117.1.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Samples: Submit samples of each general sign type proposed for the Work.

C. Schedule: Submit schedule of signage. List text, location, size, and type for each sign to be provided.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Fabricator Qualifications: Signage manufacturer with five years documented experience in work of similar type and scope.
   2. Installer Qualifications: Use only installers skilled and experienced in the installation of graphics of the type scheduled.

B. Regulatory Requirements: Signage shall conform to the requirements of the jurisdictional code authorities.

C. Preinstallation Conference:
   1. Administer preinstallation conference as specified in Section 013119.
   2. Attendees: Contractor, Architect, Owner's Representative, sign installer.
   3. Review installation procedures and proposed locations. Perform mock-up installations in locations as approved.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Plastic Sheet: 1/8 inch thick acrylic sheet; low gloss finish.

B. Double Stick Tape: 3M Scotch brand #665 double-stick, double-coated tape, 1/4" wide.

2.2 FABRICATION

A. Signs shall be free of rough edges, irregular surfaces, non uniform finishes, and similar imperfections.

B. Unless specified otherwise, signage shall be silk screened to the backside of clear plastic sheet, unless approved otherwise. Provide solid color background over silk screened text. Apply images with uniform colors, sharp definition of line, and accurate configuration. Unless specified otherwise, text shall be 1 inch high Helvetica medium.

C. Exterior Traffic and Parking Signs:
   1. Fabricate from minimum .063 aluminum, with baked enamel finish and silk screened graphic.
      a. Traffic Control - beaded embossed.
      b. Parking Control - flat screened.
   2. Support: U-Channel hot-rolled steel; deep green baked enamel finish; punched for bolt mounting of sign.

2.3 PHOTOLUMINESCENT SIGNS

A. Manufacturer: Active Safety Corporation (Murray UT; 800-657-6324).

B. Exit Signs: 2001DCMR; "Doubleface Canopy (Ceiling Mount); red letters; high level.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 INSTALLATION

A. All graphics shall be mounted level and plumb and in accurate alignment, unless indicated otherwise.

B. Mounting:
   1. Clean surfaces as necessary to accept mounting tape.

2. Use double stick tape for mounting unless approved otherwise.

C. Exit Stair Signs: Locate the sign approximately 5 feet above the floor landing in a position which is readily visible when the door is in the open or closed position.

END OF SECTION

SECTION 102115 - SOLID PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Floor supported solid plastic toilet partitions, doors and hardware.
   2. Attachment and operating hardware.

B. Related Sections:
   1. 061000 - Rough Carpentry: Blocking.
   2. 092200 – Lightgage Metal Support Framing: Metal backing.
   3. 102813 - Toilet Accessories.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016310

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D256 - Test Method for Impact Resistance of Plastics.
   2. D2240 - Test Method for Rubber Property - Durometer Hardness.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Indicate the exact items proposed for use including fittings, hardware, and attachment items.

C. Shop Drawings: Indicate partition layouts and dimensions, swing of doors, elevations, anchorage and mounting details, components, hardware, finishes, blocking requirements, and critical field dimensions.

D. Product Data: Indicate the exact items proposed for use including fittings, hardware, and attachment items.

E. Samples:
   1. Plastic: For each color required, two (2) 8x10 inch samples of plastic material.
   2. Hardware: One (1) sample of each type of hardware, excluding floor attachment hardware, proposed for the work.

1.4 QUALITY ASSURANCE

A. Codes:
   1. All work shall meet the requirements of governing codes, ordinances, laws, regulations, safety orders and directives relating to the work.
   2. Handicapped Requirements: Comply with applicable regulations regarding access by handicapped persons.

1.5 MAINTENANCE

A. Furnish twelve additional latch and strike assemblies, with fasteners, for maintenance stock.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. One of the following:
   1. Scranton Products Inc. (Scranton, Pa; 800.445.5148)
   2. Accurate Partitions Corp. (Lyons, IL; 708-442.6800)
   3. Approved equal.

2.2 MATERIALS

A. Panels, doors, pilasters, shoes and wall brackets shall be fabricated from polymer resins (HDPE) under high pressure to form a single component section which is waterproof and nonabsorbant.
   1. Color: to be selected from manufacturer's standards.

B. Pilaster Shoes: ASTM A 167, Type 302/304 stainless steel, not less than 3 inches high, 20 gage, finished to match hardware.

C. Stirrup Brackets: Polished chromium plated over solid brass, or polished stainless steel, unless indicated otherwise. Aluminum or low temperature alloy castings not acceptable.

D. Hardware: Polished chromium plated over solid brass, or polished stainless steel, unless specified otherwise. Aluminum or low temperature alloy castings not acceptable.
   1. Hinges: Cutout inset type, adjustable to hold door open at any angle up to 90 degrees. Provide gravity type, spring-action cam type, or concealed torsion-rod type, to suit manufacturer's standards.
   2. Latch units for non-handicapped compartments: Manufacturer's standard concealed or surface-mounted strike and keeper units designed for emergency access.
   3. Latch units for handicapped compartments: Manufacturer's standard concealed or surface-mounted sliding or flip-over latch units, designed for emergency access and for use by handicapped persons.
   4. Coat hook: Manufacturer's standard unit, combination hook and rubber-tipped bumper.
   5. Door pull: Manufacturer's standard U-shaped handle unit.

E. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, or chromium-plated steel or brass finished to match hardware, with tamper-resistant heads and nuts. For concealed anchors, use hot-dip galvanized, cadmium-plated, or other rust-resistant protective-coated steel.

2.3 FABRICATION

A. Take field measurements prior to fabrication where possible. Coordinate installation of adjacent materials as necessary to accommodate installation within specified requirements.

B. Door Configurations:
   1. Ordinary Toilet Stalls: 24 inch wide, in-swinging doors.
   2. Handicapped Toilet Stalls: 32 inch wide (clear opening) out-swinging doors.

C. Urinal Screen Size: 18 x 42 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

C. Verify correct location of built-in framing, blocking, and bracing, where required.

3.2 INSTALLATION

A. Install partitions secure, plumb, square.

B. Provide 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using appropriate anchorage devices.

D. Anchor urinal screen panels to walls with manufacturer's standard mounting brackets, secured through substrate to concealed blocking.

E. Adjust pilasters for floor variations; conceal floor fastenings with pilaster shoes.

F. Make provisions for setting and securing continuous aluminum overhead-bracing tube at top of each pilaster. Hang doors and adjust so that tops of doors are parallel with overhead brace when doors are in closed position.

G. Equip each door with hinges, one door latch, and one coat hook.

H. Install door strike on each pilaster in alignment with door latch.

I. Adjust and align hardware to uniform clearance at vertical edges of doors not exceeding 3/16 inch.

J. Adjust hinges to locate doors in partial open position when unlatched, except that out-swing doors shall return to closed position.

3.3 CLEANING

A. Remove protective maskings.

B. Clean surfaces, leave in condition ready for public use.

3.4 ADJUSTING

A. Approximately 60 days after substantial completion, return to site and adjust pilaster floor attachments as necessary for accurate alignment. Coordinate with Owner's Representative.

END OF SECTION

SECTION 104400 - FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fire extinguishers.
   2. Cabinets.

B. Related Sections:
   1. 092200 – Lightgage Metal Support Framing: Rough framing.
   2. 092900 - Gypsum Board: Adjacent finishes.
   3. 099000 - Painting and Coating: Field paint finish.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. National Fire Protection Association (NFPA): NFPA 10 - Portable Fire Extinguishers.

B. Underwriter's Laboratory (UL).

1.3 QUALITY ASSURANCE

A. Conform to NFPA 10 requirements for extinguishers.

B. Extinguishers shall be Factory Mutual approved and UL listed.

C. Provide fire extinguishers, cabinets, and accessories from a single manufacturer.

1.4 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data: Submit product literature for fire extinguisher brackets, fire extinguisher cabinets, and each type of extinguisher proposed for the work. Indicate valve and standpipe sizes and configurations as appropriate for valve cabinets.

C. Contract Closeout Submittal: Submit manufacturer's operation and maintenance data under provisions of Section 017700. Include test, refill or recharge schedules, procedures, and re-certification requirements.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Larsen's Manufacturing Company (Minneapolis MN; 612-571-1181).

B. J.L. Industries Inc. (Commerce CA; 323-726-9070).

C. Potter Roemer (Santa Ana CA; 714-430-5300, 800-366-3473).

D. Williams Brothers Corporation (Scarborough Ontario; 540-636-4444; 800-255-5515).

2.2 EXTINGUISHERS

A. Multi-Purpose Dry Chemical Type (FE): Heavy Duty DOT Steel tank; UL rating 2A-10B: C, 5 lb capacity, with pressure gage; red enamel finish; metal valves and siphon tubes.

B. Wet Chemical Type:
   1. UL Class K: J.L. Industries “Saturn 25”, Amerex 262, or Larsen WC Series; 2-1/2 gallon capacity, approximately 7 inch diameter x 25 inch high, stainless steel shell or approved.
   2. Agent: Potassium acetate base.

2.3 TYPICAL INTERIOR CABINETS

A. Semi-recessed models in locations as indicated on the Drawings. All cabinets shall be semi-recessed unless otherwise indicated.

B. Furnish sizes as necessary to accommodate extinguishers, at locations indicated on the Drawings.

C. Trim: Formed Sheet Steel, minimum 20 gage; 1-1/4 to 1-3/4 inches wide face; square edge configuration.

D. Door: Formed Sheet Steel, minimum 20 gage; reinforced for flatness and rigidity; satin zinc or aluminum pull, roller catch, and continuous hinge; clear glass vision panel.

E. Cabinet Finishes:
   1. Cabinet Trim and Door: Manufacturer's standard primed finish to receive paint coatings as specified in Section 099000.
   2. Cabinet Interior: Manufacturer's standard white epoxy or white baked enamel.

F. Signage: Pressure sensitive letters "FIRE EXTINGUISHER"; red; font as directed by the Architect; vertical ascending.

G. Fire Extinguisher Brackets: Wall mount type, appropriate to the size of the extinguisher, equipped with strap and quick release clip.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence. Notify the Architect, in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 INSTALLATION

A. Install cabinets plumb and level in wall openings and secured to framing in locations as indicated. Unless otherwise indicated, install 30 inches from finished floor to inside bottom of cabinet.

B. Coordinate with Section 099000 for installation of signage on cabinets.

C. Install fire extinguisher in each fire extinguisher cabinet by brackets mounted at back of cabinet.

D. Where fire extinguishers are indicated for wall mounting, secure bracket to wall through finish to framing or blocking.

E. Fire extinguishers shall be installed, charged, tagged, and dated, not more than 30 days prior to Substantial Completion.

END OF SECTION

SECTION 105113 - METAL LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal lockers.
   2. Locker room benches.

B. Related Sections:
   1. 092200 – Lightgage Metal Support Framing: Metal backing.
   2. 092900 - Gypsum Board: Substrate.

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitutions will be considered only under the terms and conditions of Section 016000.

1.2 SUBMITTALS

A. Make submittals in accordance with Section 013300.

B. Product Data:
   1. Manufacturer's standard published literature with complete description of components, and features of products proposed for the work.
   2. Color card with samples or reproductions of manufacturer's standard finish colors.

C. Shop Drawings: Indicate locker room layout; locker types and configurations, field dimensions (as appropriate), and attachment details. Identify filler panel locations and accessories.

PART 2 - PRODUCTS

2.1 LOCKERS

A. Manufacturer: One of the following.
   1. Penco Products Inc.
   2. Lyon Metal Products Inc.
   3. Republic Storage Systems Co. Inc.
   4. Medart Inc

B. Type and Size: Standard two tier box locker design; size 12”Wx36”Hx15”D per box; louvered door panel.

C. Finish: Manufacturer's standard baked enamel; color as selected by Architect.

D. Provide all lockers with 6" legs and metal filler panels, 20 gauge.

E. Exposed locker ends shall have minimum 16-gage cover panels; furnish top and vertical filler panels to close gaps between locker row ends and walls.

F. Provide the following accessories at each locker:
   1. Padlock hasp.
   2. Number plate, with sequential number.

G. Provide continuous sloping hood at top row of lockers.

H. Provide top filler at inside corners.

2.2 BENCHES

A. Locker Room Benches: Locker manufacturer's standard hardwood bench; approximately 10" wide x lengths indicated; two minimum 1-1/4" o.d. pedestals; all components prefinished (metal components to match locker finish).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence. Notify the Architect, in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 INSTALLATION

A. Install lockers and benches plumb and in strict accordance with the manufacturer's recommendations, unless indicated otherwise.

B. Wall-mounted lockers shall be securely anchored to wall.

END OF SECTION

SECTION 133419 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Thermal insulation.
5. Doors and frames.
6. Windows.
7. Accessories.

B. Related Sections:
1. 051200 – Structural Steel Framing: Material requirements
2. 054000 - Cold Formed Metal Framing: Exterior lightgage (axial and transverse) load bearing metal framing
3. 061000 – Rough Carpentry: Canopy and other wood framing.
4. 072100 – Thermal Insulation.
5. 072700 – Weather Resistive Barrier: Air barrier in exterior wall assemblies.
6. 074246 – Exterior Resin Panels.
7. 079200 – Joint Sealants.
8. 084113 - Aluminum-Framed Entrances And Windows.
9. 088000 – Glazing: Canopy glass.
10. 092843 – Gypsum Sheathing

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. A525 - Steel Sheet, Zinc Coated, (Galvanized) by the Hot Dip Process.
2. D659 - Method for Evaluating Degree of Chalking of Exterior Paints.
3. D2244 - Method for Instrumental Evaluation of Color Differences of Opaque Materials.

B. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Metal building systems shall be designed according to procedures in MBMA's "Metal Building Systems Manual."
1. Design Loads:
a. As indicated on Drawings.
b. As required by the IBC
c. As required by ASCE/SEI 7.
d. As required by MBMA's "Metal Building Systems Manual."

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 1/240 of the span.
   b. Girts: Horizontal deflection of 1/240 of the span.
   c. Metal Roof Panels: Vertical deflection of 1/240 of the span.
   d. Metal Wall Panels: Horizontal deflection of 1/240 of the span.
   e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
3. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:
   a. Lateral Drift: Maximum of 1/400 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.

C. 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.

D. Metal Roof and Wall Panels:
   1. Sheet metal roofing system includes self supporting standing seam panels; single span application, and includes attachment system, sheet metal flashing and trim, gutters, receivers and downspouts.
   2. Wall panel system shall be designed and installed to preclude entrance of water into the building interior or into concealed mansard and parapet spaces, and shall drain condensation occurring within the panel system to the building exterior.
   3. The roofing system shall be capable of accommodating movement of supporting components and thermal movement of the panels, themselves, without buckling, failure of joint seals, undue stress on fasteners, and other detrimental effects.
   4. System shall accommodate tolerances of the structure.
   5. Installed system shall be capable of resisting wind uplift equivalent to that required for Underwriters Laboratories, Inc. Class 90.
   6. Wall panel system shall be capable of withstanding code imposed design loads, with maximum deflection of L/180, for each loading and support condition indicated.
   7. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft.
   8. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft.
   9. Air Infiltration for Metal Roof 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.
   10. Air Infiltration for Metal Wall Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at static-air-pressure difference of 1.57 lbf/sq. ft.

E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90.

F. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.

G. Energy Performance: Provide roof panels that are listed on the DOE's ENERGY STAR Roof Products Qualified Product List for slope indicated.

1.4 SUBMITTALS

A. Product Data: For each type of metal building system component.

B. Shop Drawings: For metal building system components. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

D. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.

E. Welding certificates.

F. 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, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
      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.

G. Material test reports.

H. Source quality-control reports.

I. Field quality-control reports.

J. Warranties: Sample of special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 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. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3, "Structural Welding Code - Sheet Steel."

D. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

E. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

F. Preinstallation Conference: Conduct conference at Project site.

1.7 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. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Standing-Seam 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Foremost Buildings, Inc. (Jefferson, WI; 920-674-6746).

2.2 STRUCTURAL-STEEL FRAMING

A. Steel: In compliance with Section 051200 and the following:
   1. Steel for built-up sections shall generally conform to the physical requirements of ASTM A570, ASTM A572 or ASTM A36 as applicable, with minimum yield of 50,000 or 55,000 psi as indicated by the design requirements.
   2. Steel used to form purlins, girts, eave struts, and “C” sections shall be ASTM 572 or equivalent, comparable to the requirements of ASTM A607 Grade 57. Minimum yield shall be 57 ksi, per requirements of the Light Gage Structural Institute.

B. 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.
   2. Frame Configuration: As indicated on the Drawings
   3. Exterior Column Type: Uniform depth.
   4. Rafter Type: Uniform depth or Tapered.

C. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly.

D. Secondary Framing:
   1. Steel used to form purlins, girts, eave struts, and “C” sections shall be ASTM A572 or equivalent, comparable to the requirements of ASTM A607 Grade 57. Minimum yield shall be 57 ksi, per requirements of the Light Gage Structural Institute.
   2. Cold formed metal framing shall comply with Section 054000.

E. 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.

F. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

2.3 METAL ROOF PANELS

A. Vertical-Rib, Standing-Seam Metal Roof Panels: Formed with ribs at panel edges with or without 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; formed into insulated sandwich panels standard with the manufacturer..
   1. Material: Zinc-aluminum coated (galvalume) steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: Two-coat fluoropolymer
      b. Color: As selected by Architect 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: Mechanically seamed, folded according to manufacturer's standard.
   4. Panel Coverage: 16 inches nominal
   5. Panel Height: 2 inches nominal..
   6. Uplift Rating: UL 90.
   7. R-Value: As indicated on the Drawings.

2.4 METAL WALL PANELS

A. Exposed-Fastener Metal Wall Panels: Foremost “7.2” profile; trapezoidal corrugated; 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-aluminum coated (galvalume) steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: Two-coat fluoropolymer
      b. Color: As selected by Architect from manufacturer's full range

2.5 RESIN WALL PANELS

A. As specified in Section 074246.

2.6 THERMAL INSULATION

A. As specified in Section 072100.

2.7 SHEATHING

A. As specified in Section 092823.

2.8 DOORS AND FRAMES

A. As specified in Section 081113 and 081400.

2.9 ALUMINUM ENTRANCES AND WINDOWS

A. Aluminum Entrances and Windows: As specified in Section 084113

B. Glazing: As specified in Section 088000.

2.10 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.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

D. Flashing and Trim: Formed from 0.028-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.

E. Gutters: Formed from 0.028-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted 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.

F. Downspouts: Formed from 0.028-inch nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted 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.

G. Roof Ventilators: Gravity type, complete with hardware, flashing, closures, and fittings.
1. Continuous or Sectional-Ridge Type: Factory-engineered and -fabricated, continuous unit; fabricated from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal roof panels. Fabricated in minimum 10-foot- (3-m-) 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 or aluminum.

H. Roof Curbs: Fabricated from minimum 0.052-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal roof panels; capable of withstanding loads of size and height indicated.

I. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

2.11 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to evaluate product.

B. Special Inspector: Owner will engage a qualified special inspector to perform the following tests and inspections and to submit reports. Special inspector will verify that manufacturer maintains detailed fabrication and quality-control procedures and will review the completeness and adequacy of those procedures to perform the Work.

C. Testing: Test and inspect shop connections for metal buildings according to the following:
1. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

2. Welded Connections: In addition to visual inspection, shop-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
   c. Ultrasonic Inspection: ASTM E 164.
   d. Radiographic Inspection: ASTM E 94.

D. Product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

2.12 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 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.

D. Secondary Framing: Shop fabricate framing components to 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.

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.

PART 3 - EXECUTION

3.1 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 and End Walls: 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, ventilators, and other penetrations of roof and walls.

H. Steel Joists: Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.
1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Bolt joists to supporting steel framework using carbon-steel bolts unless high-strength structural bolts are required by the manufacturer.
5. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
6. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

I. 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.

J. 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.

K. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.2 METAL PANEL INSTALLATION, GENERAL

A. 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.

B. 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.

C. 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.

D. 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 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 Division 07 Section "Joint Sealants."

3.3 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 and hip 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.

3.4 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 (102 mm) 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.

3.5 WINDOW INSTALLATION

A. General: Install windows plumb, rigid, properly aligned, without warp or rack of frames or sash, and securely fasten in place according to manufacturer's written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each window frame with elastomeric sealant used for metal wall panels.
1. Separate dissimilar materials from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440.

B. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Mount screens directly to frames with tapped screw clips.

3.6 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 eave 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.

E. Continuous Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports. Join sections with splice plates and end-cap skirt assemblies where required to achieve indicated length. Install preformed filler strips at base to seal ventilator to metal roof panels.

F. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.

G. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.7 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform special inspections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

C. Tests and Inspections:
1. High-Strength, Field-Bolted Connections: Connections shall be tested and inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
a. Liquid Penetrant Inspection: ASTM E 165.

b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

D. Product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

END OF SECTION

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8-3-15

FIELDHOUSE USE (400 max):

Batting Cages-1 person in each of the 5 cages at a time, with up to 2 more people waiting for each cage=**15** people.

Turf field-There might be some baseball players practicing fielding or playing catch on the turf field not taken up by the batting cages, which would be a maximum of **15** more people being active in that space.

Basketball Courts-10 people per team, 2 teams playing on each court, 2 courts= 40 people (players). If we were having a tournament, there might be another team waiting to play at each court, which would add 10 more people waiting around each court, so the new total number of players would be **60** players.

Spectators-there is room around the basketball courts for some people to bring their own chairs, so that might add **100** more people to the area surrounding the courts.

Track-Walkers/Runners-typical usage for walkers/runners indicates that we would never have more than **50** people walking/running at one time.

Other track usage-We might have part of a high school track team using some of the track to practice some things, so that might add another **20** people to the track space.

TOTAL MAXIMUM NUMBER OF PEOPLE: **260** We could add another 20% to that maximum number, just to cover any unforeseen circumstances that might bring more people in to that area, which would add another **52** people, bringing the new total to **312** people.

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