SECTION 042000
UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Mortar and grout.
3. Steel reinforcing bars.
4. Masonry-joint reinforcement.
5. Miscellaneous masonry accessories.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for masonry setting.
2. Section 055000 "Metal fabrications" for loose lintels.
3. Section 078400 "Firestopping" for firestopping at masonry walls.
4. Section 079200 "Joint Sealants" for sealants associated with masonry.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS

A. Product Data: For each type of product.

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Masonry ties and reinforcing steel.
3. Mortar and grout materials including additives.
4. Mortar and grout mix compositions.
5. Masonry control joint accessories.

B. Submit laboratory test results for mortar and masonry units including design data for grout mixes when grout is to be pumped.

C. Certificates: Along with Product Data submit:

1. Letter of certification from each block manufacturer confirming that the block supplied to the site will be manufactured in the same manner as block tested and found to conform to the performance requirements specified herein below. Attach test reports to letter.
2. Letter of certification from manufacturer of horizontal joint reinforcing confirming the quality of coating(s) furnished on the products delivered to the site.

D. Material Certificates: For each type and size of the following:

1. Masonry units: Include data on material properties
2. Cementitious materials. Include name of manufacturer, brand name, and type.
3. Mortar admixtures.
4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
5. Grout mixes. Include description of type and proportions of ingredients.
6. Reinforcing bars.
7. Joint reinforcement.
8. Anchors, ties, and metal accessories.

E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

F. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

G. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 CODES AND STANDARDS

A. In addition to complying with all pertinent codes and regulations, comply with:

1. Standards of masonry installation described in the recommendations of:

a. National Concrete Masonry Association (NCMA).
b. Masonry Standards Joint Committee (MSJC) Spec. (ACI 530.1/ASCE 6/TMS 602).

B. Fire-Rated Masonry: Wherever a fire-resistance classification is shown or scheduled for unit masonry construction (2-hr., U.L. Design Nos., and similar designations), comply with the masonry materials and installation requirements established by the relevant governing authorities for the constructions shown.

1.6 QUALITY ASSURANCE

A. Sources of Supply: Obtain each kind of masonry units from one manufacturer, of uniform texture and color or uniform blend in the variation thereof, for each kind required, for each continuous area or visually related areas.

B. Coordination: Coordinate with concrete installers with respect to installation of bar reinforcement in concrete foundations to be extended up into reinforced masonry walls.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

A. Stain Prevention: Prevent grout, and mortar, from staining the face of masonry to be left exposed or painted. Immediately remove grout, and mortar that come in contact with such masonry.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 CONCRETE MASONRY UNITS

A. Concrete Masonry Units, except as otherwise indicated:

1. Type: Standard hollow and solid load bearing units made with ASTM C 33 aggregates to conform to ASTM C 90, including a total linear drying shrinkage less than .045%.
2. Sizes and Shapes: 8" x 16" nominal face size; thicknesses as indicated.

    a. Provide bullnose block on external corner and jamb units and other special conditions as shown. Furnish same square cornered units for sills and heads (installed on-end).
    b. Provide special shapes where shown and where required for lintels, bond beams and other special conditions.

3. Texture: Face textures of each type of block shall match each other.
4. Cores: 2-core or 3-core block may be used.

    a. Provide solid block, where required, with core area not exceeding 25% of gross cross sectional area.

5. Moisture Limits: Units shall be cured in a moisture-controlled atmosphere so that when delivered to job site the weight of water contained in the units shall not exceed 35% of the fully saturated capacity of the block.

    a. Moisture content of units stored at the site shall be maintained so as to not exceed 35% of block saturation capacity when tested by Owner's testing laboratory.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, non-staining, Type I or Type III (as required for cold weather conditions), natural gray.

B. Masonry Cement: Not permitted.

C. Hydrated Lime: Conforming to ASTM C 207, Type S.

D. Sand: Conforming to ASTM C 144, except that 100% shall pass the #8 sieve and 15% - 30% shall pass the #50 sieve.

E. Grout Aggregate: Gravel or crushed stone well graded from 3/8" to #16 and conforming to ASTM C 404. When fine aggregates are required, conform to ASTM C 404.

F. Additives: Not allowed, including calcium chloride or other chloride bearing formulations, as well as any air entraining agents except for Water Repellent Additive: W.R. Grace "Dry-Block Mortar Additive" or equal approved by Architect.

G. Water: Clean, potable, free from oil, soluble salts, acids, alkalis, organic impurities and other deleterious materials.

2.4 MORTAR AND GROUT MIXES

A. Mortar Mix Properties:

1. Mortar (lime-cement mortar) per ASTM C 270: Proportion portland cement, damp loose sand, and hydrated lime, by volume to achieve average, in-field, not lab compression strength of 2100 psi at 28 days. Refer to drawings for mortar type.
2. Submit specimens for testing when directed by Architect.

B. Grout Mix Proportions:

1. For Embedment of Reinforcing Bars: Coarse Grout per ASTM C 476.

C. Mixing:

1. Measurements: Measure ingredients precisely.

   a. Keep water-cement ratio precise from batch to batch.
   b. Accurately measure sand in damp, loose condition; measurement of sand by shovelful will NOT be allowed. Allow for contraction and expansion of sand's volume as it dries out and it gains moisture.

2. Mortar: Mix mortar in a motorized mechanical batch mixer. Ingredients shall be thoroughly mixed according to ASTM C 270 procedures for at least 3 minutes but not more than 5 minutes after all material is in the mixer. Mix only as much mortar as needed for immediate use.

   a. Cold Weather: When air temperature is 40°F or below, keep water warmed to above 70°F but do not allow it to exceed 160°F. When heating sand, heat slowly and evenly. Scorched sand shall be discarded.

3. Grout: Mix grout thoroughhly in a mechanical batch mixer according to ASTM C 476 procedures; hand mixing not allowed without approval. Grout may be premixed and delivered per ASTM C 94. Use only enough water to produce a workable consistency, except that for placement by pump more water may be added.

   a. Cold Weather: When air temperature is 40°F or below, mix grout according to cold weather restrictions for mortar, and deliver at 70°F-120°F.

4. Admixtures: Do not use admixtures except as specifically allowed by Architect and approved by Owner.

5. Pre-Mixed Mortars: Truck delivered batch mixing shall conform to ASTM C 1142. In addition to regular motorized mixers, Spec-Mix systems may be used. "SILO-MIX" WILL NOT BE ALLOWED.
6. Mortar Mixers, Boxes and Tools: Keep clean; thoroughly clean equipment and tools between batches and at end of each day's work.

D. Retempering:

1. Partially hardened mortar may be re-tempered to replace water lost through evaporation.
2. Do not retemper mortars out of mixer for more than 2-1/2 hours; but, rather, dispose of such mortar.
3. Repointing mortar shall be used within 30 minutes of final mixing; do not retemper or use partially hardened repointing mix.

2.5 REINFORCEMENT AND TIES

A. Acceptable Manufacturers: Subject to compliance with requirements of Specifications and Drawings, provide products by one of the following:

1. AA Wire Products.
2. Dur-O-Wal.
3. Heckman Building Products.
4. Hohmann & Barnard.
5. National Wire Products.
6. Masonry Reinforcing Corp. of America (Wire-Bond)

B. Corners and Intersections for Horizontal Joint Reinforcement: Factory fabricated matching **"**L**"** and **"**T**"** units only. Field fabricated corner units and lapped units at corners and intersections NOT allowed.

C. Bar Reinforcement:

1. Reinforcing Bars: Deformed new billet steel bars conforming to ASTM A 615, Grade 60.
2. Reinforcing Bar Positioners: Prefabricated units formed from #9 galvanized steel wire, specifically fabricated for holding steel reinforcing bars in proper relationship to block cores.

2.6 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 inches into masonry but with at least a 5/8-inch cover on outside face.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that reinforcing dowels are properly placed.
3. Verify that substrates are free of substances that would impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.

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

3.2 INSTALLATION, GENERAL

A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond to match existing; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

F. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows: Bed face shells in mortar and make head joints of depth equal to bed joints.:

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

C. Tool exposed joints to match existing when thumbprint hard.

3.6 MASONRY-JOINT REINFORCEMENT

A. Horizontal Joint Reinforcement: Reinforce concrete block walls as follows:

1. Typical Spacing: Install wire reinforcement in horizontal joints, spaced 16" o.c. vertically.
2. Tops and Bottoms of Walls: Place joint reinforcement continuous in first and second joint above bottom of walls and below top of walls.
3. Openings: Place masonry joint reinforcement in first and second horizontal joints above and below openings greater than 1'-0" wide, extending reinforcement at least 16" beyond each side of opening.
4. End Laps: Lap joint reinforcement ends a minimum of 6", placing a cross wire of each piece within the lap.
5. Intersections and Corners: Use only preformed welded units at corners and intersections, extending at least 18" each way; do not lap straight units at "T" intersections nor cut and bend joint reinforcement at "L" corners.
6. Mortar Coverage: Fully embed longitudinal side rods in mortar for their entire length: minimum cover of 5/8" on exterior side of walls after tooling and 1/2" at other locations.
7. Control and Expansion Joints: Break reinforcement at control joints. Do not bridge control or expansion joints with reinforcing except at wall openings.

3.7 BAR REINFORCED MASONRY

A. Concrete Block Placement:

1. Set block webs in full mortar beds to maintain leak-free cells. Fill end joints to the full depth of face shell thickness.
2. Maintain grout spaces free of excess mortar and debris.

B. Bond Beam Reinforcement:

1. Make bond beams continuous. Step bond beams as required in field.
2. Reinforce bond beam with two No. 4 bars placed 1" from bottom web when not indicated otherwise.
3. Place reinforcement in accordance with ACI 315. Return bars around corners a minimum of 8". Do not use defective bars or bars bent incorrectly.
4. Lap the splices to provide at least a Class A splice per ACI 318.

C. Grouting:

1. Remove loose rust and scale from reinforcing bars and remove rust, ice, water and dirt from cavity bottoms before pouring grout.
2. Grout walls using low-lift grouting technique in lifts not more than 5ft high, allowing at least 24 hours to pass between successive lifts.
3. Place grout continuously; do not interrupt pouring of grout for more than one hour. Do not disturb reinforcement while placing grout.
4. Consolidate grout 5 to 10 minutes after pouring. Puddle and rod the grout.

3.8 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

3.9 LINTELS

A. Install steel lintels furnished under Section 055000 "Metal Fabrications".

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.10 MORTAR JOINT FINISHING

A. Flush Joints: Strike interior wall joints flush where masonry is to be covered by other materials.

B. Tooled Joints: Tool all joints not concealed by other work.

1. At time of laying, strike masonry joints flush.
2. When mortar in joints becomes thumbprint hard, tool to a hard, concave finish, using sled-type jointer at least 16" long, with diameter 1/8" to 1/4" larger than joint.
3. Jointing tools shall be same diameter for each type of masonry.

C. Caulked Joints: Rake out joints 1/2" deep where caulking is required.

3.11 FITTING AND PATCHING

A. Do all cutting and patching of masonry for the Work required by other trades.

B. Replace damaged masonry. Spot patching of exposed units with mortar must be inconspicuous.

C. Cut and fit for chases, pipes, conduits, sleeves, etc. Cooperate with other trades to provide correct size, shape and location. Avoid cutting and patching to accommodate work under other Sections by coordinating masonry work with other trades.

3.12 REPAIR AND FINAL POINTING

A. At completion of the work, cut out and repoint all holes, cracks and defective joints, using mortar colored to match after it dries. Cut out hardened mortar to a depth of 1/2" and dampen the hardened mortar before patching.

B. Retool and reclean joint patches to match adjacent work. Leave exterior walls watertight.

3.13 CLEANING

A. Remove excess mortar and droppings as work progresses, avoiding stains and smears. Do not allow excess mortar lumps or smears to harden on finish surfaces.

B. Clean the interior masonry before application of floor finishes is started.

C. Concrete Block: When concrete masonry unit placement is complete, rub masonry with carborundum brick to remove all sharp edges and then clean work with stiff bristle brushes, or other approved method, removing loose granules, building dust, etc. Comply with recommendations of NCMA TEK Bulletin 28.

3.14 PROTECTION

A. At day’s end and when precipitation is anticipated, cover tops of unfinished walls with plastic sheeting to prevent moisture infiltration.

B. Protect exposed external corners that may be damaged by construction activities.

C. Brace and shore masonry constructions until they are able to withstand ambient wind loads.

3.15 MASONRY WASTE DISPOSAL

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

B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

DIVISION 05 – METALS

SECTION 055000
METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Items fabricated from iron and steel shapes, plates, bars, strips, tubes and pipes. The items of this Section include but are not necessarily limited to the following:

a. Steel lintels and miscellaneous framing members.
b. Rework existing metal hand rails.

2. Anchorages of type appropriate to the supporting structure and as required to provide a sturdy installation resistant to all reasonable loads.

3. Cutting, reinforcing, drilling and tapping as required to erect the work and to fit it with work provided under other Sections of the Specifications.

B. Related Requirements:

1. Section 042000 "Unit Masonry" for hand rail attachment to CMU walls.
2. Section 099113 "Painting" Finish painting.

1.3 COORDINATION

A. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorage that are to be embedded in existing masonry. Deliver such items to Project site in time for installation.

1.4 SUBMITTALS

A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for:

1. Loose steel lintels.
2. Miscellaneous steel framing members.

1.5 QUALITY ASSURANCE

A. Field Measurements: Take prior to preparation of Shop Drawings and fabrication, where possible. Take measurements in time, so as to avoid delaying job progress. Allow for trimming and fitting.

B. Qualifications of Welders: Welding operators for shop fabrication shall be qualified, in accordance with AWS "Standard Qualifications Procedure."

C. Codes and Standards: Comply with the following unless otherwise indicated:

1. AISI, Steel Products Manual, Stainless and Heat Resisting Steel.
2. ANSI A58.1, Minimum Design Loads in Buildings and Other Structures.
3. AWS D1.1 "Structural Welding Code."
4. OSHA: 1910.27 and 1926.1053.
5. All applicable building codes having jurisdiction.
6. Americans with Disabilities Architectural Guidelines.

1.6 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: For fabrication of miscellaneous metal work that will be exposed to view, use only materials that are smooth and free of surface blemishes, including pitting, seam marks, roller marks, rolled trade names and roughness.

1. Steel Plates, Shapes, and Bars: ASTM A 36.
2. Steel Tubing: Hot-formed, welded or seamless, ASTM A 501.
3. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

B. Anchor Bolts: Unfinished threaded fasteners per ASTM A 307, nonheaded type unless otherwise indicated

C. Metal Primer Paint: Comply with VOC limit requirements of Green Seal Standard GS-11.

2.2 SHOP FINISH

A. Shop Painting: One-coat shop paint in accordance with Society for Protective Coatings (SSPC) System Guide No. 7.00, except apply 2 coats of paint to surfaces that will be inaccessible after assembly or erection.

1. Extent: Shop paint all miscellaneous and ornamental metal work, except surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.
2. Surface Preparation: Remove scale, rust, grease, oils and other deleterious materials before applying shop coat of paint.

2.3 FABRICATION – GENERAL

A. Sizes and Thicknesses: As shown, or, if not shown, as required to produce adequate strength and durability in the finished products. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

B. Preassembly in Shop: Preassemble the items in the shop to greatest extent possible, to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

C. Dissimilar Metals: Wherever dissimilar metals come into contact, insert lead washers, spacers or gaskets between them to provide electrolytic insulation.

D. Workmanship: Form exposed work true to line and level, with accurate angles and surfaces and straight, sharp smooth edges.

E. Welds: Weld corners and seams continuously and in accordance with recommendations of American Welding Society. Grind exposed welds smooth and flush.

2.4 FABRICATION SPECIFICS

A. Miscellaneous Steel Beams and Framing: Provide structural framing members as noted on drawings.

B. Loose Steel Lintels:

1. General: Furnish loose structural steel lintels for installation over openings where shown or called for on drawings.
2. Finish: Steel and galvanized steel where noted on drawings.
3. Composite Constructions: Weld adjoining members together to form single unit unless indicated otherwise.
4. Bearing: Provide for at least 8" bearing at each side of openings unless opening is less than 6'–0" wide, in which case, provide at least 6" of bearing at each side.

C. Existing Stair Railings:

1. Wall Brackets: Secure handrails to wall with malleable iron brackets at not over 8 ft centers. Brackets shall be sized to provide 1-1/2" clearance between rail and face of wall.
2. Flange Coverings: Provide slip flange fittings to cover bolted-on rail end connections at walls.
3. Finish: Black steel with a rust inhibiting prime coat.

2.5 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls.

2.6 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Contractor shall verify all opening sizes in field prior to developing shop drawings.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

D. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
5. All contacts with steel angles shall be welded.

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

3.2 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

END OF SECTION 055000

SECTION 061000
CARPENTRY WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Wood blocking and nailers.

B. Installation of wood door and door hardware.

C. Related Requirements:

1. Section 081416 "Flush Wood Doors" for wood door to be installed.
2. Section 087110 "Door Hardware" for finish hardware to be installed in wood door installation.

1.3 SUBMITTALS

A. Product Data:

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Submit manufacturer’s product data for premanufactured items.

B. Evaluation Reports: For Wood-preservative-treated wood, from ICC-ES.

1.4 QUALITY ASSURANCE

A. Workmen: Use only tradesmen experienced in the fabrication and installation of millwork.

PART 2 - PRODUCTS

2.1 WOOD BASED MATERIALS

A. General: Wood shall be AWI Custom Grade, unless otherwise indicated, of an average moisture content within 5% to 10% ranges.

2.2 FASTENERS/SUPPORT FRAMING

A. Nails: Ring-shank or rough coated finish, size and type to suit application.

B. Screws: Plain steel; wood or sheet metal shank; flat, countersunk Phillips or square drive head.

C. Bolts, Nuts, Washers: Size and type to suit application; unfinished in concealed location.

2.3 WOOD PRODUCTS, GENERAL

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.4 WOOD BLOCKING AND NAILERS

A. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

B. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work

2.5 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is pressure-preservative treated provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.6 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction. Use Category UC3b for exterior construction.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry unless otherwise indicated**.**

PART 3 - EXECUTION

3.1 INSTALLATION

A. Wood Blocking/Nailer:

1. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
2. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
3. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

B. Flush Wood Door and Finish Hardware:

1. Install flush wood door on hollow metal door frame.
2. Install finish hardware on flush wood door and attach to hollow metal door frame.

C. General:

1. Setting: Secure work to grounds and blocking as required, holding to correct surfaces, lines and levels. Make finished work flat, plumb, and true. Install items tight to adjoining surfaces except as approved otherwise. Cope and scribe for tight fits.
2. Fastening: Conceal fastenings; where not possible, locate them in inconspicuous places. Where nailing is permitted through woodwork face, conceal nail heads. Do not nail adjacent woodwork to paneling.
3. Loose Joints: Locate loose joints to render them as inconspicuous as possible in finish work. Make joints in interior work with rail bolts that can be pulled up tight to form perfectly flush joints.
4. Expansion Joints: Install joints to permit sections to expand and contract without buckling, warping or causing other conditions that will detract from appearance and durability.
5. Coat cut surfaces of preservative treated wood after cutting, with a heavy brush coating of the same preservative

3.2 FINISH HARDWARE FOR DOORS

A. Receive, store, protect and install finish hardware for wood and hollow metal doors on entire project as furnished by finish hardware supplier under Section 087100 - Finish Hardware. Install according to requirements specified in Section 087100.

B. Adjust, and protect from injury all installed hardware. Cover door knobs and levers with heavy cloth until project acceptance.

C. Deliver keys to Owner at completion and acceptance of work.

3.3 ADJUST AND CLEAN

A. Repair damaged or defective work to the satisfaction of the Architect.

B. Adjust and lubricate hardware for proper operation.

C. Clean exposed interior surfaces.

3.4 PROTECTION

A. Protect installed finish carpentry from damage by other trades until Owner's acceptance of the work.

END OF SECTION 061000

SECTION 078400
FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Firestopping systems for the firestopping of top and ends of fire rated partitions and where elsewhere designated on drawings.

B. Sealing of **ALL** sleeved and un-sleeved pipe, conduit, cable, cable tray, duct and similar penetrations through **ALL** rated walls and partitions.

C. Related Requirements:

1. Section 079200 "Joint Sealants" for miscellaneous sealant work.

D. With respect to fire stopping of pipe, pipe sleeves and conduit penetrations, the requirements of this Section apply and are to cover fire stopping requirements specified in Mechanical and Electrical Divisions. Work of this Section shall be coordinated with Mechanical and Electrical contractors as required to assure compliance with the fire stopping requirements specified in Mechanical and Electrical Divisions.

1.3 SUBMITTALS

A. Schedule of Applications: Submit 6 copies of a usage schedule showing what products will be used for which situations.

1. Submit detailed drawings of all firestopping systems to be used, giving names of materials and means of installation. Indicate the appropriate UL or FM approval number with each drawing.
2. On a plan drawing of the project, reduced in scale as convenient, indicate where each kind of firestopping system submitted will be located.

B. Product Data: Provide data on characteristics, performance and limitation criteria of products.

1. Include manufacturer**'**s material safety data sheets (MSDS).
2. Manufacturer**'**s Installation Instructions: Include preparation and installation procedures required.

C. Certificates.

1. Manufacturer's Certification: Submit manufacturers' letters of certification verifying acceptability of proposed Fireproofing Installer.
2. Verification of Installation: Contractor shall submit letter certifying that fire stopping has been installed complete and in accordance with all specifications.

D. Sample Warranties: For manufacturer's warranties.

1.4 QUALITY ASSURANCE

A. Installer: Firestopping Installer shall complete the installations as specified and to the satisfaction of all authorized inspectors.

B. Manufacturer's Representative: Each manufacturer furnishing materials for the work shall have an on-site representative to perform the following:

1. Assist Installer with selection of correct products for the various conditions of installation.
2. Train Installer's personnel in proper installation procedures, including quantities of materials necessary to meet the fire resistance ratings required.
3. Verify throughout the course of the work that correct installation procedures are being used.

C. Firestopping Systems' Performance Requirements:

1. Fireproofing Resistance: As appropriate to the fire rating(s) noted on the Drawings, per ASTM E 814.

a. Flame and Temperature Ratings: As required by the pertinent building codes, according to test results produced in nationally accepted test agencies from tests conducted per ASTM E 814 or UL 1479. Flame (F) rating must be no less than the fire resistance rating of the assembly through which it is applied. Temperature (T) rating, when required by code authority, shall be measured under a positive pressure differential of at least .01" of water column.

2. Expansion Joint Materials: Tested for F, T and L ratings per UL 2079 at full extension after 500 expansion/contraction cycles.

D. Product Compatibility: In each type of firestopping system used, each component shall have been tested and approved for use with the other components installed.

E. Verification of Compliance: The Contractor shall provide to the Architect, prior to final payment, a letter of certification verifying that all perimeters of fire resistance rated constructions as well as penetrations through fire resistance rated constructions were completed as required by Code and the requirements of this Section

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original, unopened packaging with intact labels identifying product, UL labels, lot number and use-by date.

B. Store materials at site in one location, in original containers, under conditions recommended by manufacturer.

C. No material shall be used which has exceeded its shelf life.

1.6 PROJECT CONDITIONS

A. Install materials only under the conditions of temperature and humidity recommended by manufacturer of product to be installed.

B. Coordinate with other trades as required to assure proper installation of their work and the firestopping work. Install firestopping at drywall penetrations before finishing is started on drywall joints.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A. Acceptable Manufacturers: Products shall be produced by one or more of the following manufacturers:

a. Sonneborn Div. of ChemRex Inc.
b. Hilti.
c. 3M Brand Products.
d. RectorSeal Metacaulk.
e. Tremco.

2. Acceptable Products: Use one of the following or similar produced by a manufacturer listed above:

a. Hilti **"**FS-One**"** sealant with matching backer, and Hilti **"**FS-Fire Block.**"**
b. Sonneborn **"**NP2**"** sealant with BackerRod Mfg**'**s **"**Ultra Block**"** fire blocking mat.

2.2 MATERIALS

A. General: Use only UL listed materials complying with ASTM E 814 (UL 1479) or ASTM E 119 (UL 263) and appropriate to the kind of opening and kind of item penetrating the opening, as required to maintain the indicated fire rating of the construction assembly penetrated:

1. Materials shall be VOC compliant.
2. Materials shall be free of materials requiring hazardous waste disposal, including PCBs, lead and asbestos.
3. For each kind of firestopping situation, use materials from only one manufacturer.

B. Safing Insulation: Either unfaced mineral fiber OR ceramic fiber insulation, as required by system manufacturer

C. Accessories: Furnish sleeves, confinement collars, dam material, primers, sealants and other placement and attachment accessories as recommended by manufacturer and as necessary to establish the required fire ratings

D. Identification Labels: Plastic or plastic shielded paper, configured for permanent attachment and bearing the following information:

1. FIRESTOP SYSTEM - DO NOT DISTURB.
2. (Manufacturer's Name).
3. System Number _____.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that openings are ready to receive the work of this Section and that elements penetrating the floors, walls and partitions have been permanently affixed. All penetrations are to have sleeves, except as approved otherwise by Architect.

B. Verify that pipe sleeves have been properly installed.

1. Pipes and conduits shall be sleeved with un-split Schedule 40 pipe solidly joined to masonry with mortar, to drywall with joint compound and to concrete with mortar.
2. Pipe sleeves shall be sized to maintain a minimum gap of 1" all around the pipe or conduit (including any insulation on the pipe), irrespective of whether the pipe or conduit is aligned with the center of the sleeve or is off-center.
3. The pipe sleeve's length shall be 1" longer than the thickness of the wall assembly, so that it shall extend out from each face of the wall or partition by 1/2".
4. The pipe sleeve's length at floors shall be 2 1/2" longer than the thickness of the floor assembly, so that it shall extend 2" above the rough floor elevation and 1/2" below the bottom of the floor assembly.

C. Verify that pipes are not insulated with any materials inappropriate to the rated fire stopping system.

D. Should an area requiring firestopping be covered up with other construction or should other conditions unsatisfactory for a proper installation be found, such as lack of sleeves, report the conditions to Contractor for rectification, and send copy of report to Architect. Do not proceed with installation until unsatisfactory conditions have been corrected.

E. Clean substrate surfaces of dirt, dust, grease, oil, loose material and other matter that might affect bond of firestopping material.

F. Protect adjacent surfaces from damage due to material installation.

3.2 APPLICATION

A. General:

1. Apply materials in accordance with manufacturer's instructions, in the same manner as was used to achieve the UL design listing.
2. Apply firestopping materials to uniform densities and texture, in sufficient quantities to achieve required fire resistance rating. Keep exposed work neat.
3. Where additional layers of construction create voids in addition to the primary floor or partition, treat the extra voids the same as primary voids, assuring that fire, smoke and gases are restricted from flowing in any voids.
4. Install retention dams as required. After curing of firestop materials, incombustible dams may be left in place; combustible dams shall be removed.

B. Penetrations Through Fire Rated and Smoke Rated Interior Walls And Partitions:

1. Apply firestopping wherever a void has been made in a wall or partition for the penetration of pipes, conduit, wire, cables, ducts, sleeves, or other items which could allow passage of flame, smoke or gases in the event of a fire —whether that wall or partition is rated or not rated.
2. Ensure that any voids between the sleeve and the surrounding construction are filled and firestopped to the same degree as voids within the sleeve.

C. Tops Of Interior Walls And Partitions: At tops of masonry partitions and gypsum partitions, which are fire rated or smoke rated, create a fire and smoke barrier by installing firestopping between the top of the wall or partition and the deck above.

D. Permanently affix adjacent to each installation in a fire-rated wall the label specified above, properly identifying the firestopping system installed.

E. Correct any firestops that do not conform to the requirements specified, at no additional charge to the Owner

3.3 CLEANING, AND PROTECTION

A. Clean firestopping materials from adjacent surfaces.

B. General Contractor shall protect work of this Section from damage by other trades.

END OF SECTION 078400

SECTION 079200
JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes joint sealants for interior applications:

B. Related Requirements:

1. Section 033000 "Cast-In-Place Concrete" for sealing of floor joints.
2. Section 042000 "Unit Masonry" for sealing of masonry walls.
3. Section 076200 "Sheet Metal Work" for sealing joints in sheet metal work.
4. Section 081113 "Hollow Metal Doors and Frames" for perimeter sealing of door frames at walls.
5. Section 087100 "Finish Hardware" for perimeter sealing of door frames at walls

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish watertight and airtight continuous seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each type of joint sealant product.

B. Samples: For each kind and color of joint sealant required.

C. Joint Sealant Schedule: Include the following information:

1. Joint sealant application, joint location and designation.
2. Joint sealant manufacture and product line.
3. Joint sealant formulation.
4. Joint sealant color.

D. Product Test Reports.

E. Preconstruction compatibility and adhesive test reports.

F. Preconstruction field adhesion test reports.

G. Field adhesion test reports.

H. Warranties.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1.6 WARRANTY

A. Special Installer's Warranty: Manufacturer’s standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MAUFACTURERS

A. Products: Subject to compliance with requirements, provide one of, the products listed herein.

2.2 JOINT SEALANTS

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

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated in accordance with 40 CFR 59, Part 59, Subpart D (EPA Method 24):

1. Architectural sealants shall have a VOC content of 250 g/L or less.
2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
3. Sealants and sealant primers for porous substrates shall have a VOC content of 775 g/L or less.

C. Liquid Applied Sealants: Sealants and sealant primers shall comply with ASTM C 920 and other requirements for each liquid applied joint sealant specified including those referencing ASTM C 920 classifications for type, grade, class and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids: Where sealants are indicated of Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing in accordance with ASTM C 1247. Liquid used for testing is deionized water unless otherwise indicated.

D. Stain Test Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing in accordance with ASTM C 1248 and have not stained porous joint substrates indicated for the project.

E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with CFR 177.2600.

F. Colors of Exposed Joint Sealants: Color to be selected by Architect.

2.3 SEALANT TYPES

A. Sealant: Sealant for Interior Control Joints. Provide the following:

1. Sonneborn **"**Sonolastic Ultra**"** Basis-of-Design. Equal by:
2. Sika
3. Pecora
4. Tremco

B. Sealant: Sealant for Joints at Floor Perimeters. Provide the following:

1. Sonneborn **"**Sonolastic SL1**"** Basis-of-Design. Equal by:
2. Sika
3. Pecora
4. Tremco

C. Sealant: Sealant for Joints in Floors. Provide the following:

1. Sonneborn **"**Sonolastic SL1**"** or **"**Sonolastic SL2**"** Basis-of-Design. Equal by:
2. Sika
3. Pecora
4. Tremco

D. Sealant: Sealant for Other Interior Uses. Provide the following:

1. Sonneborn **"**Sonolastic Sonolac**"** Basis-of-Design. Equal by:
2. Sika
3. Pecora
4. Tremco

2.4 JOINT FILLER

A. Joint Filler: Backer rod for elastomeric sealants. Extruded closed cell polyethylene foam or polyethylene jacketed polyurethane foam, non-bleeding, non-staining, oversized 30 to 50 percent; provide one of the following:

1. Dow: Ethafoam.
2. Meadows: backer Rod.
3. Sonneborn: Sonofoam backer Rod.

2.5 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Non-staining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin**)**, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas and capable of remaining resilient at temperatures down to minum26 deg. F (minimum 32 deg. C). Provide product with low compression set of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

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

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

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

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

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

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

3.3 INSTALLATION OF JOINT SEALANTS

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

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

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 CLEANING

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

3.5 PROTECTION

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

END OF SECTION 079200

SECTION 081113
HOLLOW METAL DOOR FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Removal of existing hollow metal doors and frames.
2. Providing and installing new hollow metal door frame.

B. Related Requirements:

1. Section 081416 "Flush Wood Doors" for installation of new wood door in hollow metal frames.
2. Section 099000 "Painting" for finish painting of new hollow metal door frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 QUALITY ASSURANCE

A. General: Provide hollow metal work manufactured by a single firm**,** made in compliance with recommended specifications of the Steel Door Institute (SDI)**,** except as may be specified otherwise herein.

B. Fire-Rated Door Openings: Door and frame constructions shall conform to Code, UL10B and UL 10C. Installed frame and door assemblies shall conform to local Code and NFPA 80 for fire rating class scheduled on Door Schedule.

C. Field Measurements: Take when required to fit work accurately with existing work.

1.5 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and finishes.

B. Shop Drawings: Include the following:

1. Elevation of door frames
2. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
3. Locations of reinforcement and preparations for hardware.
4. Details of each different wall opening condition.
5. Details of anchorages, joints, field splices, and connections.

C. Hardware Data: Doorframe supplier shall furnish hardware location data sheets to wood door supplier. Submit copy of letter of transmittal to Architect.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For hollow metal door and borrowed lite frame assembly, for tests performed by a qualified testing agency.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturers:

1. Hollow metal doors and work shall be manufactured by one of the following:

a. Ceco.
b. Curries.
c. Precision Metals.
d. Philipp.
e. Steelcraft.
f. Security Metal Products Corp.

2.2 HOLLOW METAL DOOR FRAME

A. Construct door frame to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Commercial Door Frames: NAAMM-HMMA 861

1. Physical Performance: Level A according to SDI A250.4.

2. Frame:

a. Materials: 16 ga. Commercial quality**,** cold rolled carbon steel.
b. Construction: Full profile welded.
c. Size: 2" x 5 ¾" except as otherwise noted on drawings

C. Frame Anchors

1. Jamb Anchors (Postinstalled Expansion Type for In-Place Concrete or Masonry) Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
2. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows.

D. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), clip-type anchors, with two holes to receive fasteners.

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

E. Materials:

1. Standard Sheet Steel: Commercial quality**,** cold rolled carbon steel**,** complying with ASTM A 366 and ASTM A 568.
2. Frame Anchors: Steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
3. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/ A 153M.
4. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
5. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

F. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
4. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.

5. Head Anchors When recommended by Manufacturer): Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
6. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick

C. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce door frame to receive nontemplated, mortised, and surface-mounted hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

2.4 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap frames to receive nontemplated, mortised, and surface-mounted hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames for door, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    c. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    d. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
4. In-Place Concrete or Masonry Construction: Secure frames in place with post installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Section 099100 – Painting.

END OF SECTION 081113

SECTION 081416
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid-core fire rated and non-rated doors with wood-veneer faces.
2. Factory fitting flush wood doors to frames and factory machining for hardware.
3. Preparation of wood doors for glazed openings.

B. Related Requirements:

1. Section 061000 "Carpentry" for finish hardware installation.
2. Section 081113 "Hollow Metal Door Frames" for hollow metal door frames.
3. Section 087100 "Finish Hardware" for wood door finish hardware.
4. Section 088000 "Glazing" for wood door glazing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Undercuts.
4. Details of openings for glazing.
5. Fire-protection ratings for fire-rated doors.

C. Samples for Verification:

1. Provide Samples for species of veneer and solid lumber required.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 QUALITY ASSURANCE

A. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL 10C.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

1.7 WARRANTY

A. A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

2. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 TYPE AND MANUFACTURERS

A. Construction: Solid core**,** flush**,** wood veneer faced door of 5-ply hot press or 7-ply cold press construction**,** 1-3/4" thick, fire rated (where noted on door schedule). Factory finish, up to 2 standard stain finishes shall be selected.

B. Acceptable Manufacturers: One of the following:

1. Algoma Hardwoods**,** Inc.
2. Eggers Hardwood Products Corp.
3. Oshkosh Architectural Door.
4. V.T. Industries, Inc.
5. Graham Manufacturing Corp.

2.2 MATERIALS AND CONSTRUCTION

A. Face Panels:

1. Construction for Factory Finish: 2-ply face panels. Manufacturer's standard 3-ply face veneers will be accepted in lieu of 2-ply.
2. Face Veneer Species**,** Grade and Cut: Plain sliced Clear Maple, slip matched**,** Type I**,** Grade A**,** per AWI **"**Quality Standards**"** Section 01300 and C.S. 171-64. (No rotary or half round sliced veneers accepted.).

B. Crossbands (5/7-Ply Construction): Hardwood or natural/engineered fiberboard**,** minimum 1/16" thick**,** tapeless spliced**,** no voids.

C. Cores:

1. Provide mineral core as needed to provide fire-protection rating indicated.
2. Thickness: Matched to face veneer and crossband thicknesses so as to produce a door 1-3/4" thick.

D. Stiles & Rails: Solid**,** sound wood or structural composite lumber (SCL)**,** 1-3/8" minimum total width for stiles**,** 1-1/8" for rails**,** securely bonded to the core and then abrasively planed before application of face veneers to ensure minimal telegraphing of core parts through veneers.

1. Finish the vertical edges of door with hardwood of same species and grade as door veneers.
2. Stile Edge Split Resistance: Minimum of 750 lbs when tested per ASTM D 143-52/78 Modified.
3. Screw Withdrawal Resistance: Minimum of 740 lbs when tested per ASTM D 1037-78.
4. Cores:

E. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated.
3. Temperature-Rise Limit: At exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

F. Glazing:

1. Stops In Fire Rated Doors: Wood-faced steel glazing stops, bonderized and prime finished for finish painting under Section 091000 - Painting.

2.3 FABRICATION

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

1. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.4 DOOR FINISHING

A. Doors to receive factory finish from manufacturers full selection of stain finishes for Clear Maple.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

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

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

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Comply with NFPA 80 for fire-rated doors..
2. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 083113
ACCESS DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Provide access doors as required for electrical work.

B. Related Requirements:

1. Section 092900 "Gypsum Board System" for walls in which access doors are inserted.

2. Section 099000 "Painting" for finish painting of new access doors and frames.

1.3 REFERENCES

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "General Requirements."

B. Product Data: Manufacturer's product data.

1. Shop Drawings: Show metal gages, sizes, types and attachment to adjacent construction

1.5 COORDINATION

A. Coordinate with Electrical Contractor for access doors needed.

1. Coordinate with specific trade for sizes and locations of access doors.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturers: Basis of Design - Milcor,

1. Other acceptable access doors manufacturers include Karp, Nystrom Williams Bros. or other Architect approved equal

2.2 ACCESS DOORS

A. Type shall conform to Milcor model DW

1. Metal: Cold rolled steel; 16 gage for frames; 14 gage for panels.

2. Finish:

a. Prime Coat: Baked prime coat.
b. Finish Coats: Field applied to match finish coats specified under Section 099113 “Painting” for hollow metal doors and frames.

3. Hardware: Manufacturer's standard hinge assembly except hinges for doors in gypsum wallboard shall be fully concealed, screwdriver cam lock.

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.2 INSTALLATION

A. General: Install access doors work properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

3.3 ADJUSTING AND CLEANING

A. Final Adjustments: Remove and replace defective work.

B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Section 099100 – Painting.

END OF SECTION 083113

DIVISION 08 – OPENINGS

SECTION 087100
FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. SUMMARY

1. Door hardware for interior and exterior swinging doors

C. Related Sections:

1. Section 081113 "Hollow Metal Door Frames" for installation of hardware in doors frames including silencers.
2. Section 081416 "Flush Wood Doors" for installation of hardware in new wood doors.
3. Section 084113 "Aluminum Framed Entrance"

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. 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 the fabrication of other work that is critical in Project construction schedule.
b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
c. Content: Include the following information:

1) Identification number, location, hand, size, and material of each door and frame.
2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
4) Fastenings and other pertinent information.
5) Explanation of abbreviations, symbols, and codes contained in schedule.
6) Mounting locations for door hardware.
7) List of related door devices specified in other Sections for each door and frame.

2. Keying Schedule: Owner will complete all the keying to the cylinders. Provide (2) key blanks, of specified keyway, for each cylinder listed in the Door Hardware Schedule to the Owner.

1.3 INFORMATIONAL SUBMITTALS

A. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.

B. Source Limitations: Obtain each type of door hardware from a single manufacturer.

C. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

D. Accessibility Requirements: Comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
2. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
3. Closers: Adjust door and gate closer sweep periods so that, from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.6 COORDINATION

A. 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.

B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

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. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Two years from date of Substantial Completion, unless otherwise indicated.

a. Exit Devices: Three years from date of Substantial Completion.
b. Manual Closers: 10 years from date of Substantial Completion.
c. Bored Locksets: 7 years from date of Substantial Completion.
d. Hinges: Life of Building from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section as follows:

1. Locksets: Sargent or Owner approved equal.
2. Cylinders: As specified or Owner approved equal.
3. Closers: Norton or Owner approved equal.
4. All Other Hardware: As specified or Owner approved equal.

2.2 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Spacers or Sex Bolts: For through bolting of hollow-metal and wood doors.
3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.3 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule - Match existing - Verify with Owner prior to ordering.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. 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 PREPARATION

A. Steel Door Frames/Wood Doors & Aluminum Doors: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

3.3 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 Door Frames: ANSI/SDI A250.8.

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install type quantities indicated in door hardware schedule.

D. Thresholds: Set threshold in full bed of sealant.

E. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

F. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

G. Closers: All closers installed on wood doors shall be thru-bolted.

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. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

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 that door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DOOR HARDWARE SCHEDULE

HARDWARE SET # 01: FOR USE ON DOOR #20A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONTINUOUS HINGE	14HD	BZ	MCK
1	EA	CLASSROOM SECURITY LOCK	28-10G38 LL	612	SAR
1	EA	SURFACE CLOSER	7500	691	NOR
1	EA	KICK PLATE	K1050 10" X 2" LDW	612	ROC
1	EA	WALL STOP	409	612	RIX
1	SET	SEALS	S88C	DKB	PEM

HARDWARE SET # 02: FOR USE ON DOOR #20B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONTINUOUS HINGE	14HD	BZ	MCK
1	EA	STOREROOM LOCK	28-10G04 LL	612	SAR
1	EA	SURFACE CLOSER	7500	691	NOR
1	EA	KICK PLATE	K1050 10" X 2" LDW	612	ROC
1	EA	WALL STOP	409	612	RIX
1	SET	SEALS	S88C	DKB	PEM

HARDWARE SET # 03: FOR USE ON DOOR #21

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONTINUOUS HINGE	14HD	BZ	MCK
1	EA	CLASSROOM SECURITY LOCK	28-10G38 LL	612	SAR
1	EA	SURFACE CLOSER	7500	691	NOR
1	EA	KICK PLATE	K1050 10" X 2" LDW	612	ROC
1	EA	WALL STOP	409	612	RIX
1	SET	SEALS	S88C	DKB	PEM

*TEMPLATE CLOSER FOR 130° OPENING.

END OF SECTION 087100

SECTION 088000
GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Glazing of interior wood doors

B. Related Requirements:

1. Section 081416 "Flush Wood Doors" for glazing of wood doors.

1.3 QUALITY ASSURANCE

A. Comply with all pertinent codes and regulations, including the Consumer Product Safety Commission Safety Standard for Architectural Glazing Materials (16 CFR 1201) and the State of Illinois Safety Glazing Materials Act.

B. Comply with all pertinent recommendations in the Glazing Manual of the Flat Glass Marketing Association.

C. All glass shall bear glass manufacturer's label stating variety and grade.

1.4 SUBMITTALS

A. Product Data: Submit manufacturers' product data describing each type of glass and glazing item specified herein.

B. Samples: Submit for Architect's review 2 samples, 6" square, of each type of glass required.

C. Manufacturer's Instructions: Submit glazing gasket manufacturer's recommendations for each installation situation.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver glazing materials to job site in sealed containers with manufacturer's original labels attached to each piece of glass. Provide UL labels for fire rated glass. Provide cushions at edges to prevent impact damage.

B. Store glass on edge, under cover and protect from staining.

C. Avoid deformation of units. Protect faces from scratches and abrasion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE GLAZING PRODUCTS

A. Acceptable Glass Manufacturers:

1. Guardian.
2. Pilkington.
3. PPG.
4. TGP (Fire Rated Glass).

B. Acceptable Glass Fabricators:

1. Oldcastle Glass Co.
2. Trulite Glass.
3. Viracon.

C. Glass Type GL 1: 5/16” Fire rated 20 min) Clear Glass

2.2 Glazing Materials:

A. Approved Manufacturers: Use products of the following:

1. Tremco Manufacturing Co.
2. G.E.
3. Dap, Inc.
4. Pecora Corp.
5. Protective Treatments, Inc. (PTI).
6. Vetrotech (Saint-Gobain).

B. Setting Blocks: Neoprene, 70-90 durometer hardness, having proven compatibility with sealants used, width of rabbet less 1/16" by lengths sufficient for weight of glass supported.

C. Spacers: Neoprene, 40-50 durometer hardness, having proven compatibility with sealants used.

D. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used, flexible and resilient, with 5-10 psi compression strength for 25% deflection.

E. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.2 PREPARATION

A. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings that are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used. Verify that weep holes are free of obstructions.

B. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

C. Cut glass with smooth straight edges to full sizes required by openings. Do not attempt to cut, seam, nip or abrade glass that is tempered, heat strengthened, or coated.

3.3 INSTALLATION

A. Glass:

1. Set glass on setting blocks at quarter points, and fix without springing or inducing bowing. Install with proper bite and clearances all around.
2. Glass having waviness shall be set with waves placed horizontally unless Architect directs otherwise. Lites viewed in series or as a group shall have uniform draw, bow and similar characteristics.
3. Tempered glass having tong marks shall be installed so that tong marks are within rabbets at top of opening.

3.4 CLEANING

A. All glass shall be left whole, free from checks or other defects, and cleanly washed inside and out and the building left ready for occupancy when directed by the Architect.

B. Any defective glass that may appear after cleaning shall be removed and replaced with perfect glass.

END OF SECTION 088000

SECTION 092900
GYPSUM BOARD SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Provide and install gypsum board partition on metal studs with acoustical insulation.

B. Related Requirements: Section includes surface preparation and the application of paint systems

1. Section 081113 "Hollow Metal Frames" for door frames in wall.
2. Section 099113 "Painting" for finish painting of gypsum board surfaces.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 FRAMING MATERIALS

A. Metal Studs: Zinc coated steel channel studs**,** 20-gauge**,** 3-5/8" size except as required otherwise**,** conforming to ANSI/ASTM C 645 or GA 201 or GA 216.

B. Runner Tracks:

1. 20-gauge metal**,** matching stud width. Use tracks with minimum 1-1/4" leg when indicated or directed.
2. Deflection Track: Provide for deck deflection by using "VertiTrack" manufactured by The Steel Network, Inc., tel: 888-474-4876 or approved equal, complete with manufacturer's patented fasteners having step bushings sized to the gauge of the studs.

C. Reinforcing Strips: Electro-galvanized 20-gauge sheet steel meeting ASTM A 525, 8" wide.

D. Angle Connectors: Galvanized 20-gauge sheet steel meeting ASTM A 525, formed into angle with 1-1/2" legs.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board,: ASTM C 1396/C 1396M, Fire rated**,** tapered edge**,** conforming to ANSI/ASTM C 36 & C 1396**,** 5/8" thick from floor to minimum 8'-0" above floor except behind lockers:

1. "Tough Rock Fireguard X Abuse Resistant Gypsum Board" by Georgia Pacific.
2. "Gold Bond Hi-Abuse XP Gypsum Board" by National Gypsum Company.
3. **"**Fiberock Abuse Resistant Interior Panels" by USG.
4. Or approved equal

2.4 FINISH MATERIALS

A. Edge and Corner Reinforcement: Manufacturer**'**s standard trim beads made of hot-dip galvanized steel with either knurled and perforated or expanded flanges**,** and beaded for concealment of flanges in joint compound. Vinyl trimNOT allowed.

1. Corner Beads: Paper-faced heavy gauge metal or plastic with extra wide flanges, equal to USG "B1XW EL" or No-Coat "Ultracorner**"**.
2. Edge Beads: Paper-faced heavy gauge metal or plastic "L" type with extra wide flanges, equal to USG "B4 (1")" or No-Coat "L Trim.
3. Control Joint Beads: Flexible expansion channel**,** such as USG #093 or Gold Bond **"**.093 Zinc Control Joint.**"**

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Reinforcing Tape: Perforated joint reinforcing tape, paper or fiberglass, asbestos free.

C. Joint Compound: Ready mixed all-purpose drywall joint compound**,** type and mix as required for conditions of humidity and temperature. Use topping type compound for finishing coats.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Fasteners: Screws meeting ASTM **C 954** and the following:

1. For metal to metal framing: 1/2" long**,** Type S**,** shallow pan-head screws.
2. For gypsum board: 1-1/4" Type S bugle-head screws.
3. For tracks to concrete: Powder-actuated stud pins sized to penetrate concrete at least 1/2".
4. For moving (deflection) joints: "VertiClip Step Bushing Fasteners" sized to match gauge of studs.

C. Acoustical Sealant: One of the following:

1. USG "Acoustical Sealant"
2. W.W. Henry Co. "313 Sound Control Sealant"
3. Tremco "Acoustical Sealant"
4. Pecora "Acoustical Sealant BA-98"
5. Norton "Norseal V730 and V740FR Acoustical Foam Tape"

D. Acoustical Insulation: Sound attenuation blanket of thickness to produce an STC rating of not less than 48 in the constructions indicated, as manufactured by Johns Manville (Schuller), USG or Zonolite Grace.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

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

3.2 FRAMING INSTALLATION

A. Partitions:

1. Base Tracks: Install continuous tracks, straight and true, accurately aligned to the layout at base and at tops of studs. Set floor tracks in a continuous bead of acoustical sealant. Secure tracks at each end and a maximum of 24" o.c. in between. Use powder actuated pin anchors for anchoring to concrete.
2. Studs: Set studs plumb, not more than 16" o.c. and not more than 2" from abutting walls. In each line of studs, face flanges all in the same direction.
3. Partition Heights: All studs shall extend to heights as noted on Drawings.
4. Stud Securement: Studs shall engage both floor and top runners. Secure studs to tracks with 2 screws at top and 2 screws at bottom, one each at both inside and outside flanges.
5. Top Track: Provide multiple runner track installation, at top of wall to accommodate deck deflection.
6. Stud Flanges: Do not cut to accommodate pipes, conduit, etc. without Architect's specific approval for each case.

B. Control Joints:

1. Placement: As indicated, consistent with lines of building spaces. Provide additional control joints in locations approved by General Contractor so that no expanse of wall exceeds 30 feet.
2. Framing: Frame each control joint in walls with 2 nearly abutting studs set back to back. Seal each side of space between studs with bead of sealant.

3.3 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

D. Form control and expansion joints with space between edges of adjoining gypsum panels.

E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch wide joints to install sealant.

F. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.4 APPLYING INTERIOR GYPSUM BOARD

A. Single-Layer Application on Partition Walls: Apply Type “X” gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Acoustical Insulation: Install acoustical blanket insulation in all interior partition stud spaces. Insulation shall extend full height of wall and fill all voids. Place insulation behind and around electrical and mechanical items within partitions and tight to items passing through partitions.

C. Acoustical Sealant: Apply sealant continuously to joint between gypsum board and bottom track at partitions filled with acoustical insulation. Also, seal any untaped edges or corner joints butting into other wall materials at insulated partitions.

D. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

E. Interior Trim: Install cornerbeads at outside corners.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Level 4: At panel surfaces that will be covered by finish painting and according to ASTM C 840:

3.7 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095123
ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Acoustical tiles for ceilings.
2. Acoustical ceiling suspension systems.

B. Related Requirements:

1. Section 26 "Electrical Work" See Drawings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, submit product data from manufacturer's brochures describing each of the products to be used.

B. Samples:

1. Submit samples of acoustical materials and suspension system members for review before ordering any materials.
2. For each exposed product and for each color and texture specified, 6-inches- in size.

C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Tile: Set of full-size Samples of each type, color, pattern, and texture.
2. Exposed Moldings and Trim: Set of 6-inch long Samples of each type and color.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Maintenance Stock: Furnish not less than 1 unopened bundle of each type of acoustical ceiling units for future maintenance. Distribute quantities in approximate proportion to the different types of units installed. Deliver to location on site designated by Owner.

1.5 QUALITY ASSURANCE

A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the erection of the selected systems.

B. Installation Standards: Comply with recommendations of the current CISCA **"**Ceiling Systems Handbook**"** except as specified otherwise hereinafter**,** and maintain a copy of the handbook at the site for Architect**'**s inspection while work of this Section is being accomplished.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 WARRANTIES

A. Ceiling Panels: Where so specified herein below**,** products shall be warranted to be free from defects in materials and workmanship for a period of 10 years from date of purchase when subjected to the conditions of temperature and humidity specified.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 450 or less.

2.2 ACOUSTICAL TILES, GENERAL

A. Source Limitations:

1. Acoustical Ceiling Tile: Obtain each type from single source from single manufacturer.
2. Suspension System: Obtain each type from single source from single manufacturer.

B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.

C. Acoustical Tile Colors and Patterns: Match appearance characteristics indicated for each product type.

2.3 ACOUSTICAL TILES

A. Acoustical Ceiling Panel ACT-1: Angled tegular, fissured 24" x 24" x 5/8", lay-in panels; Accepted Product, USG "22121 Clima Plus High NRC CAS`" or approved equal

2.4 METAL SUSPENSION SYSTEMS

A. Exposed Grid Ceiling Suspension Systems: Rigid metal**,** complying with ASTM C 635**,** intermediate duty system**,** consisting of interlocking cross tees and main tee runners (not less than .020" thick) made from cold rolled**,** zinc-bonded or electro-galvanized steel and creating flush joints at intersections.

1. Components shall support items penetrating the ceilings**,** including light fixtures and HVAC outlets/inlets.
2. Tee sections shall be double web type with a 1" exposed flange cap finished in baked white enamel.
3. Hold-Down Clips (for use where specified): Manufacturer**'**s standard electro-galvanized steel hold-down clips.
4. Use USG **"**Donn DX**"** suspension systems for 24" x 24" grids or approved equal.

B. Wall Molding: Angle type**,** hemmed metal molding with finish to match grid system.

C. Hanger Wire: Pre-stretched**,** galvanized**,** soft-annealed mild steel wire conforming to ASTM A 641**,** 12-gauge.

D. Carrying Channels (for bridging between structural members overhead): Hot or cold rolled steel 1-1/2" channels painted with black asphaltic rust inhibitive paint and weighing not less than 475 lbs. per 1000 lineal feet.

E. Tie Wire for Attachment of Channels to Structure: Galvanized steel wire conforming to ASTM A 641**,** 16-gauge.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.

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

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

A. General: Install acoustical panel ceilings to comply with ASTM C 636, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
3. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
4. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

7. Do not attach hangers to steel deck tabs.
8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical tiles.

1. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.

1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tile and moldings, spaced 12 inches o.c.

3.4 CLEANING

A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123

SECTION 096519
RESILIENT FLOORING & BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Preparation of existing surfaces to receive new stair treads and risers, resilient floor covering at landings and new rubber bases.
2. Installation of new stair treads and risers, new resilient flooring at landings and new rubber bases.
3. Areas with moisture levels higher than recommended limits shall require moisture mitigation.
4. All areas to receive flooring shall receive a skim coat.

B. Related Requirements:

1. Section 042000 "Unit Masonry" for CMU walls.
2. Section 099100 "Gypsum Board Systems" for gypsum board walls.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Submit 3 sets of samples of each type**,** color and finish of stair treads and risers, resilient flooring**,** and rubber base and accessory required.

C. Submit a letter from the resilient flooring manufacturer that the adhesive proposed to be used is compatible with the resilient flooring.

1.4 QUALITY ASSURANCE

A. Manufacturers: Wherever possible**,** provide resilient flooring**,** adhesives and accessories produced by a single manufacturer.

B. Flammability: Provide only materials**,** including adhesives**,** which will produce an installation having:

1. Critical Radiant Flux of not less than 0.45 watts per cm^2 when tested per ASTM E 648.
2. Smoke Density no greater than 450 when tested per ASTM E 662.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet of each type, color, pattern, and size of rubber base installed.
2. Stair Treads and risers: Furnish to Owner in labeled boxes for future maintenance loose stair treads and risers not less than 5% of each color of stair tread installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store stair tread/riser, flooring, base and installation materials in dry spaces protected from the weather.

B. Install new materials after other finishing operations, including painting, have been completed.

1.7 WARRANTY

A. Provide a 2 year installation warranty. Provide product warrantees as listed in product specifications, in accordance with specific product installation guidelines, per product specified below.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acceptable Products & Manufacturers:

1. Floor Covering: Rubber Floor Tile at Stair Landings: 24” x 24” x 1/8” thickness. Rubber floor tile by Johnsonite, Hammered texture, Solid color to be selected from full range of options. Or approved equal.
2. Wall Base Products & Manufacturers: Rubber material complying with ASTM F 1861, Type TS, 6" high, 1/8" .080” thick, Style B coved profile, furnished in rolls.

a. Acceptable Manufacturers: Basis of Design –Johnsonite, Color: as selected by Architect. Rubber Base manufactured by Flexco or Roppe must meet or exceed Roppe specifications to be acceptable. Substitutions must be submitted 10 days prior to bid opening, for architect approval during bidding process.
b. Include pre-molded corner units for outside corners immediately adjacent to door frames.

B. Stair Treads/Risers & Stringers:

1. Rubber stair tread with integrated riser units complying with ASTM F-2169. Units shall have square nose with 2 wide contrasting color grit tape insert the full length of tread. Manufacturer shall be Johnsonite Model VIHTR (Visually Impaired) in

Hammered Surface, 2” hinged, square nose configuration, profile and size to match existing field condition, solid color to be selected from full range of options. Provide coordinating stringers. Or approved equal.

2. See drawings. At top of landings provide Johnsonite VIHMT (Visually Impaired) 12 1/4" Hammered Texture Stair tread. Provide separate solid colored Risers in sizes as required in field. Color to be selected. Or approved equal.

C. Transitions. Provide even heights between floor finishes, for a smooth level transition between flooring heights/types. Portland based cement product may be used to achieve level heights between existing flooring and new flooring. Basis of design, Johnsonite slimline and Schluter Systems, size and type as required on site. Architect review and approval required.

D. Adhesives: Water-resistant type recommended by resilient-product manufacturer as listed above, for resilient products and substrate conditions indicated. Or approved equal complying with manufacturer’s recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of rubber base.

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

C. Compliance: Comply with manufacturer’s product data, including product technical bulletins, product catalog, installation instructions.

D. Verify that wall surfaces to receive rubber base are free of bond breakers. Report to Contractor in writing any surfaces unsuitable to develop a permanent bond.

E. Verify that building air temperature and relative humidity are within manufacturers’ recommended limits and that concrete floor temperatures are within 20°F of surrounding air temperatures.

F. Verify that moisture contents of concrete slabs are within recommended limits of flooring and adhesive manufacturers, as determined by a 72-hour sodium-chloride kit test per ASTM F 1869.

1. Moisture meter readings and plastic mat test results will not be accepted as conclusive.
2. Perform tests in areas where drying is most restricted but not closer than 5ft to a perimeter, performing at least 2 tests for the first 2,000 SF and an additional test for each additional 1,000 SF.

3. Provide relative humidity tests based on at least 2 tests for the first 2,000 SF and an additional test for each additional 1,000 SF. Cost for testing is paid for by the flooring contractor.

If Moisture readings are higher than recommended limits in existing slabs, Notify Architect. Moisture mitigation (Bone Dry) is required. Subcontractor shall provide Bone Dry Pro System as a change order to the project. At areas requiring Moisture Mitigation, provide the following:

Bone Dry Pro. www.bonedryproducts.com (262) 694- 9748

4. Provide all physical materials for complete Bone Dry Pro system. Follow manufacturer's complete specification sections and product data sheets. Follow manufacturers full recommended preparation and installation methods. Provide documentation of any type of adhesive solvent/chemicals used, to determine manufacturers recommended prep methods.
   a. Clean floor of all foreign substances – drywall, paint, dust, debris.
   b. Scarify/Etch concrete.
   c. Fully protect all adjacent surfaces. Flooring contractor responsible to remove product from of any adjacent surfaces.
   d. Apply Bone Dry.
   e. Wait 24 hours, prior to flooring installation.

5. Register project with Bone Dry Manufacturer. Provide Manufacturers certificate of 20 year warrantee.

6. Provide written documentation from Bone Dry that their system is approved for use with Armstrong adhesives.

3.2 PREPARATION

A. Remove existing stair treads, risers and flooring at the landing and prepare surfaces for new materials.

B. Check the match of new products to ensure that there is no visible variation between dye lot runs.

C. Should excessive alkalinity be discovered, treat the affected areas with a water solution containing 10% muriatic or acetic acid and allow solution to dry. Verify and comply with flooring manufacturers PH level requirements.

D. Skim coat ALL areas to receive new flooring, regardless of possible moisture mitigation procedure, using Schonox SL Patch Portland Cement Based compound, at 1/8", or a Schonox Leveler, or equal following manufactures recommended installation, product data sheets, and specifications

E. Fill saw cut joints, construction joints, expansion joints, cracks and depressions with flexible vinyl filler or portland cement product as required to prevent show-through.

F. Clean and prepare floor to a satisfactory free of dust and debris condition, all surfaces scheduled to receive resilient flooring.

G. Prepare walls to receive new wall base as required. Remove bond breakers down to a solid**,** durable substrate. Fill voids with approved filler.

H. Before beginning work to install new flooring, treads, and base, examine all surfaces over which work is to be applied. Report to the Architect in writing any surface defects and conditions that are unsuitable to receive work.

I. Starting of work shall be construed as acceptance of the suitability of the surfaces to receive work. Remove and replace at no charge to Owner all work under this Section which may require removal in order to correct defects caused by insufficient examination and preparation of the substrates.

3.3 RESILIANT FLOORING AT LANDING INSTALLATION

A. Comply with manufacturer's written instructions for installing rubber tile.

B. Install flooring after building finishes**,** including painting.

C. Place flooring with adhesive cement in strict compliance with manufacturer**'**s recommendations**,** including open time. Tightly cement resilient flooring to floor**,** leaving an installation without open cracks**,** voids**,** raised or puckered joints**,** telegraphing of substrate imperfections or adhesive spreader marks**,** or other surface imperfections.

D. Butt the flooring tightly to vertical surfaces and edgings. Scribe as necessary around obstructions to produce neat joints**,** laid tight**,** even**,** and straight.

E. Install tile manufacturer**'**s recommended **PORTLAND CEMENT BASED** floor patch filler material to raise level of tile flush with other adjacent floor materials.

3.4 RUBBER BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing rubber base.

B. Apply rubber base to walls, in rooms and areas where base is required.

C. Install rubber base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere rubber base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch rubber base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of rubber base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

3.5 STAIR TREAD/RISER INSTALLATION

A. Install stair treads/risers in single pieces, from stair stringer to stringer, except as approved otherwise by Architect.

B. Use Johnsonite 930 Nose Epoxy and 965 adhesive for stair treads/risers with Nose Stick. Take special care to aggressively adhere nosings.

3.6 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas.

1. Repair or replace damaged installed products.
2. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

3.7 PROTECTION

A. Protect new products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION 096519

SECTION 096813
CARPET TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes modular carpet tile.

1. Preparation of existing concrete floors to receive new carpet tile.
2. Areas with moisture levels higher than recommended limits shall require moisture mitigation.
3. All areas to receive flooring shall receive a skim coat.
4. Installation of Walk off carpet tile
5. Carpet transition strips and rubber base.

B. Related Requirements:

1. Section 096513 "Resilient Flooring and Base" for resilient wall base.

1.3 QUALITY ASSURANCE

A. Installer's Qualifications: Carpet Installation Company: Shall be certified by carpet manufacturer and shall have at least 5 years' satisfactory experience in the installation of carpets of the types specified. Only qualified and experienced carpet mechanics working under proper supervision shall be employed on the project.

B. Flammability Test Requirements: Provide only materials, including adhesives, which will produce an installation having a Critical Radiant Flux of not less than 0.45 watts per square centimeter when tested by the Flooring Radiant Panel Test.

C. Adhesive Test Requirements: The suitability of the adhesive will require testing as further specified herein after under EXAMINATION.

1.4 SUBMITTALS

A. Certifications:

1. Manufacturer shall submit certification that materials manufactured are in accordance with materials herein specified. Include certified laboratory test report for flammability requirements.

2. Manufacturer shall submit certification that Installer is a factory approved installer.

B. Samples: Submit samples of carpets. Label samples, stating color or shade, location in which they are to be used and manufacturer's name. Carpet samples shall be at least one tile per pattern.

C. Maintenance Supply: Provide 5% maintenance stock of each type of carpet used. Package unused carpet tiles in boxes suitable for preservation of carpet in long term storage. Deliver packaged tiles to location in building designated by Owner

D. Maintenance Manuals: Obtain from manufacturer and submit for Owner's use, 3 copies of manufacturer's complete maintenance recommendations for carpet(s) installed.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and installation of carpeting shall be coordinated with completion schedule for the various areas.

B. Carpet shall be stored away from construction activities and shall be protected against moisture, dust and vermin.

C. Installation shall not begin in any area until painting and ceiling work for that area have been completed.

1.6 GUARANTEES

A. Guarantees shall start at an adjusted date if carpet is installed after the date of Substantial Completion.

B. Provide a 2 year installation warranty in addition to other warranties standard to the manufacturer for the carpets selected.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Acceptable Manufacturer. Basis of Design: Tandus Abrasive Action 02578 Modular. Carpet Tile manufacturers must meet or exceed Tandus Abrasive Action specifications including type, size, and general color options to be acceptable. Substitutions must be submitted 10 days prior to bid opening, for architect approval during bidding process.

1. Carpet Tile – CPT-1: Color: As selected by Architect from manufacturers standard colors.

   a. Carpet shall be installed unidirectional

2.2 ACCESSORIES

A. Carpet:

1. All seam tape, edge sealers and other accessories shall be as recommended by the carpet manufacturer.

2. Adhesives: Use Manufacturers recommended adhesive. C-EX - Water based, strippable, waterproof type, compatible with substrate and carpeting materials, as recommended by carpet manufacturer. Verify Internal Relative Humidity requirements. Or approved equal complying with manufacturer's recommendations, letter indicating approval from manufacturer required

B. Edge Transition Strips, and Rubber Base, including adhesive and accessories. Color/Finish to be selected. See Section 096513 "Resilient Flooring and Base"

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that building air temperature and relative humidity are within manufacturers' recommended limits and that concrete floor temperatures are within 20°F of surrounding air temperatures.

B. Provide required floor Moisture Vapor Emission Rate (MVER) testing, pH testing and Relative Humidity testing prior to flooring installations. MVER Testing (ASTM F-1869-10), RH Testing (ASTM F-2170 -10), pH Testing (ASTM F-710-10). A minimum of one test per 1,000 square feet of flooring space is required. Check manufacturer's full requirements and warranties prior to installation.

C. Verify that moisture contents of concrete slabs in existing areas are within recommended limits of flooring and adhesive manufacturers**,** as determined by a 72-hour sodium-chloride kit test per ASTM F 1869.

1. Moisture meter readings and plastic mat test results will not be accepted as conclusive.
2. Perform tests in areas where drying is most restricted but not closer than 5ft to a perimeter**,** performing at least 2 tests for the first 2**,**000 SF and an additional test for each additional 1**,**000 SF.
3. Provide relative humidity tests based on at least 2 tests for the first 2**,**000 SF and an additional test for each additional 1**,**000 SF. Cost for testing is paid for by the flooring contractor.

If Moisture readings are higher than recommended limits in existing slabs, Notify Architect. Moisture mitigation (Bone Dry) is required. Subcontractor shall provide Bone Dry Pro System as a change order to the project. At areas requiring Moisture Mitigation, provide the following:

Bone Dry Pro. www.bonedryproducts.com (262) 694- 9748

4. Provide all physical materials for complete Bone Dry Pro system. Follow manufacturer's complete specification sections and product data sheets. Follow manufacturers full recommended preparation and installation methods. Provide documentation of any type of adhesive solvent/chemicals used, to determine manufacturers recommended prep methods.

a. Clean floor of all foreign substances – drywall, paint, dust, debris.
b. Scarify/Etch concrete.
c. Fully protect all adjacent surfaces. Flooring contractor responsible to remove product from of any adjacent surfaces.
d. Apply Bone Dry.
e. Wait 24 hours, prior to flooring installation.

5. Register project with Bone Dry Manufacturer. Provide Manufacturers certificate of 20 year warrantee.

6. Provide written documentation from Bone Dry that their system is approved for use with Armstrong adhesives.

3.2 PREPARATION

A. Remove existing flooring and base as required and prepare surfaces for new materials.

B. Check the match of new carpet tiles to ensure that there is no visible variation between dye lot runs.

C. Should excessive alkalinity be discovered, treat the affected areas with a water solution containing 10% muriatic or acetic acid and allow solution to dry. Verify and comply with flooring manufacturers PH level requirements.

D. Skim coat ALL areas to receive new flooring, regardless of possible moisture mitigation procedure, using Schonox SL Patch Portland Cement Based compound, at 1/8", or a Schonox Leveler, or equal following manufactures recommended installation, product data sheets, and specifications

E. Fill saw cut joints, construction joints, expansion joints, cracks and depressions with flexible vinyl filler or portland cement product as required to prevent show-through.

F. Before beginning work to lay new carpet, examine all surfaces over which work is to be applied. Report to the Architect in writing any surface defects and conditions that are unsuitable to receive work.

G. Starting of work shall be construed as acceptance of the suitability of the surfaces to receive work. Remove and replace at no charge to Owner all work under this Section which may require removal in order to correct defects caused by insufficient examination and preparation of the substrates.

3.3 INSTALLATION

A. Carpet Tiles:

1. Glue vinyl backed carpet tile directly to floor. Use manufacturer's recommended application pattern for adhesive and cover floor evenly with adhesive.
2. Follow manufacturer's recommended installation for fillers.

3. Install transition strip at all exposed edges of carpet and where carpet abuts any other floor material, except at ceramic tile, in which case, the edging will be provided with the tile. Edging shall be one continuous piece at doors and wherever standard lengths permit. Securely fasten edging to floors.

    a. When carpet ends at doorway and door swings over carpet, place carpet under door (but not beyond door) and finish carpet with nose of edge strip aligned with the edge of the stop on the door frame.
    b. When carpet ends at doorway and door swings away from carpet, place carpet up to face of door and finish carpet with edge strip having its nose aligned with the edge of the stop on the door frame.

3.4 PROTECTION

A. No furniture or other heavy objects shall be placed on carpet until the adhesive has cured.

B. Protect carpet after installation against stains and accumulations of dust and debris.

3.5 CLEANING AND PROTECTION

A. The completed installation shall be free of scraps, carpet ripples and puckers. Clean up all dirt and debris. Clean all spots with proper remover. Remove loose threads; reweave any ravels at seams or edges.

B. Damage: Repair any damage to existing paintwork, millwork, walls, doors, floors, etc., caused by carpet installation.

C. Upon completion of the installation remove all waste, excess materials, protective coverings, tools and equipment.

D. Carefully and thoroughly vacuum clean all new installed carpet to Owner's satisfaction. Do not begin vacuuming until perimeter resilient base has cured at least 10 days. When schedules allow, do not begin vacuuming until 14 days after installation of resilient base.

END OF SECTION 096813

SECTION 099113
PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes finish painting of:

1. New and existing hollow metal door frames.
2. New vertical lift metal doors and frames.
3. New and existing CMU block.
4. New drywall partitions.
5. New steel lintels.
6. Existing handrails.
7. Existing wood base.
8. Existing exposed metal of stair.

B. Related Requirements: Section includes surface preparation and the application of paint systems

1. Section 017300 "Execution" for patched and existing adjacent existing masonry wall to be finish painted in field to be finish painted in field.
2. Section 055000 "Metal Fabrications" for pipe and guard rails to be finish painted in field.
3. Section 081113 "Hollow Metal Frames" for door frames to be finish painted in field.

1.3 SUBMITTALS

A. Product Data: Submit for Architect**'**s review on all products to be used. List each material and cross-reference it to the specified paint and finish system and application. Identify by manufacturer**'**s catalog number and general classification.

B. Color Samples: When so requested**,** submit samples of each finish and topcoat color for Architect**'**s review. Also**,** submit samples on portions of work at the site as directed by Architect**,** not less than 4ft x 4ft size.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Maintenance Supply: Deliver to Owner in unused containers 1 gallon of each type and color of paint used on the Project. Mark each container with color and room names/numbers where paint was used**,** without obscuring manufacturer**'**s label. Deliver these containers to place on site designated by Owner.

1.5 QUALITY ASSURANCE

A. Comply with State of Illinois Regulations (effective date July 1, 2009) regarding VOC (Volatile Organic Compounds).

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Approved Manufacturers: Basis of Design - Sherwin Williams paints as listed. Paint materials manufactured by Pittsburgh Paints PPG or Benjamin Moore products must meet or exceed SW specifications for each paint type listed to be acceptable.

B. Approved Products: Manufacturer**'**s products listed hereinafter in the Painting Schedule represent types and grades required. Or Owner approved equal during the bidding phase.

C. Grades: Materials not displaying manufacturer's identification as a best-grade product will not be acceptable.

D. Thinners: Paint manufacturer's preferred solvent.

E. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Conditions: Applicator must examine areas and conditions under which painting work is to be done and shall notify Contractor in writing of conditions detrimental to proper and timely completion of work.

B. Moisture Contents: Do not apply coatings to surfaces where electronic moisture meter indicates values above 12%, except that for wood, moisture content may be not exceed 15%.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 REPAINTING EXISTING PAINTED SURFACES

A. Surface Preparation:

1. Do not paint existing surfaces until any items attached to existing surfaces and not scheduled for painting (e.g. door hardware) have been removed. (The trade removing the attachments shall replace them to their original positions after painting is complete.).

2. Wash surfaces to be repainted.
3. Remove all loose**,** blistered**,** cracked or otherwise defective paint and varnish. Sand surfaces smooth**,** free of depressions. Cut out and fill cracks or other defects to match adjoining surfaces.

3.4 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint entire exposed surface of door frames.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.5 FIELD QUALITY CONTROL

A. Architect's Inspection: All work where a coat of material has been applied must be inspected and approved by Architect before application of succeeding specified coat**;** otherwise no credit for the coat applied will be given and the work in question shall be recoated.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.6 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 PAINTING SCHEDULE

A. New and Existing Interior Hollow Metal Door Frames, and Lintels

1 coat - S-W Pro-Industrial ProCryl Universal Acrylic Primer**,** B66-310**,**
2 coats - S-W Pro Industrial Precatalyzed Waterbased Epoxy eg-shel K45-150

B. New vertical lift metal doors and frames

1 coat - S-W Pro-Industrial ProCryl Universal Acrylic Primer**,** B66-310**,**
2 coats - S-W Pro Industrial Precatalyzed Waterbased Epoxy eg-shel K45-150

C. Existing and New Concrete Masonry Units (CMU).

Block filler - S-W Prep Rite Int/Ext Block Filler
2 coats - S-W Pro Industrial Precatalyzed Waterbased Epoxy eg-shel K45-150

Note: Block filler applied by airless spray and back rolled to fill all voids, at max. s.f./gal. rate recommended by manufacturer for 16 mil thickness.

D. New Gypsum Board Partitions.

1 coat S-W ProMar 200 Interior Latex Primer, B28W601
2 coats S-W Pro Industrial Precatalyzed Waterbased Epoxy eg-shel K45-150

E. New Steel Lintels and Steel Support Framing.

1 coat - S-W Pro Industrial ProCryl Universal Metal Primer B66-310
2 coats - S-W Pro Industrial Acrylic Semi-gloss B66-650

F. Existing Interior Hollow Metal Door Frames, Handrails, and Exposed Metal of Stair.

Sand, Clean and Surface prep existing surfaces for new paint.

2 coats - S-W Pro Industrial Precatalyzed Waterbased Epoxy eg-shel K45-150.

G. Existing Interior Wood Base.

2 coats - S-W ProClassic Waterborne Semi-Gloss**,** B31 Series.

END OF SECTION 099113

SECTION 144216
VERTICAL PLATFORM LIFTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes: All labor and incidental materials necessary for the delivery, set-up, installation, adjusting, inspecting, testing and delivery to the Owner of complete commercial wheelchair lift system at location in the building as designated on the drawings for the inclined stairway chairlift

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete platform.
2. Section 042000 "Unit masonry" for masonry walls.
3. Section 096519 "Resilient Flooring" for floor tile.
4. Division 26 - Electrical for electrical service and devices

1.3 REFERENCES

A. Lift shall be designed, manufactured and installed in accordance with the following standards:

1. American National Standards Institute (ANSI): ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. American Society of Mechanical Engineers (ASME): ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.
3. Underwriters Laboratories (UL).
4. International Building Code (IBC 2009).
5. National Fire Protection Agency (NFPA): NFPA 70 - National Electric Code.
6. American Society for Testing Materials (ASTM).
7. American Welding Society (AWS).

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Submit manufacturer's installation instructions, including preparation, storage and handling requirements.
2. Include complete description of performance and operating characteristics.
3. Show maximum and average power demands.

B. Shop Drawings:

1. Show typical details of assembly, erection and anchorage.
2. Show complete layout and location of equipment, including required clearances.
3. Samples for Initial Selection: For each finished product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
4. Samples for Verification: For each finished product specified, two samples, representing actual product, color, and patterns.

C. Closeout Submittals:

1. Operation and Maintenance Data: For type of lift to include in operation and maintenance manuals.
2. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

   a. Parts list with sources indicated.
   b. Recommended parts inventory list.

3. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted use of lifts.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm with minimum 10 years documented experience in manufacturing of inclined wheelchair platform lifts of installations of type specified.

B. Installer Qualifications: Firm licensed to install equipment of this scope, with evidence of experience with specified equipment. Installer shall maintain an adequate stock of replacement parts and have qualified people available to ensure timely maintenance and callback service at the project site.

1.6 REGULATORY REQUIREMENTS

A. Provide platform lifts in compliance with:

1. ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.
2. ASME A17.5 - Elevator and Escalator Electrical Equipment.
3. NFPA 70 - National Electric Code.

B. Sample Warranty: For special warranty.

1.7 PROJECT CONDITIONS

A. Do not use wheelchair lift for hoisting materials or personnel during construction period.

1.8 WARRANTY

A. Warranty: Provide a three year limited warranty covering replacement of defective parts and excluding labor.

B. Labor Warranty: One year.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Basis-Of-Design is by Savaria;

1. Contact: Max Savard
Regional Sales Manager Savard
430 Autoroute 13
Laval QC H7R 6E9
800.931.5655 x251; 450.624.1699 direct; 514.231.1922 mobile
msavard@savard.com
www.savard.com

B. Other Acceptable Manufacturers: Garaventa or Savaria equal.

2.2 COMMERCIAL WHEELCHAIR LIFT

A. Type: Basis-Of-Design: Hydraulic Vertical Platform Lifts: Savaria V1504-STD

B. Hydraulic Vertical Platform Lift: Manufactured by Savaria Lifts Inc, is a indoor commercial vertical platform lift consisting of a hydraulic tower with a lifting platform. The platform is made to accommodate a wheelchair user or a person with impaired mobility.

C. Work includes providing equipment, incidental material and labor required for complete, operable roped hydraulic wheelchair lift installation. Lifts shall be erected, installed, adjusted, tested and placed in operation by lift system manufacturer, or manufacturer's authorized installer.

1. Lifts shall be in accordance with ASME A18.1 and ADAAG compliant (USA).

D. The following preparatory work to receive the lifts specified in this section is part of the work of other sections:

1. Permanent 120 VAC, 20 amp single phase power to operate lift to be provided from a lockable fused/cartridge type disconnect switch with auxiliary contacts for battery operation. Refer to drawings for permanent power specifications and location of disconnects. Temporary power may be provided to expedite installation of lift.
2. Provide a plumb and square hoistway with smooth interior surfaces, including fascias or furring of the hoistway interior.
3. Provide rough openings per lift contractor's shop drawings.
4. Provide substantial, level pit floor slab as indicated on the lift contractor's shop drawings.

E. Characteristics:

1. Application: Indoor. Rated Load: 750 lb.
2. Rated Speed: 20 fpm.
3. Car Dimensions: 36 inches W by 54 inches D – Standard.

4. Levels Serviced: 2.
5. Car Configuration: Enter/Exit same side.
6. Travel: 9'-7"+/-.
7. Pit Depth: 3" – Standard.
8. Powder Coat Finish: Almond beige.
9. Operation: Constant pressure.
10. Power Supply: 120 volt, 20 amp, 1 phase, 60 Hz.
11. Drive System: 2:1 Roller chain hydraulic.
12. Emergency Power: 24VDC Battery raising and lowering.
13. Controller: Relay logic based controller.
14. Motor/Pump: 1 HP (112 kw), gear type.
15. Manual Lowering: Outside the hoistway at lower landing.

F. Cart Enclosure:

1. Cab Configuration: Side Guards of platform shall have a steel frame with a powder coat finish and steel panel inserts to a minimum of 80 inches. A steel ceiling with an egg crate insert and 4 x LED lights shall be provided.

G. Doors:

1. First landing door and Upper Landing Door:

   a. Door Type: 80" High 1-1/2 hour UL/ULC fire-rated Prodoor with concealed hinges and a concealed electro/mechanical interlock.
   b. Flush closing operation with hoistway side.
   c. Operation: Automatic - Concealed 24 volt door opener with battery back-up for fire-rated door.
   d. Door Width: 36"

H. Call Stations: Provide flush, surface or door frame mounted landing call/send stations.

1. Call stations will be Keyed (removable in off position).

I. Car Operation:

1. Car Operating Panel shall consist of constant pressure buttons, emergency stop/alarm button, on/off key switch (when applicable) and emergency LED light mounted on a removable stainless steel panel (Type 304 #4 Stainless Steel Finish).
2. Auxiliary lighting: The car shall be equipped with a battery operated LED light fixture. The battery shall be the rechargeable type with an automatic recharging system.
3. Telephone: The car shall be equipped with a ADA Hands free phone.

J. Pumping Unit and Control:

1. The pumping unit and control shall be enclosed in the tower. The controller and pump unit shall be pre-wired and tested prior to shipment. The controller is to be relay logic based operation for ease of maintenance and service.
2. Pump unit shall incorporate the following features:

   a. Adjustable pressure relief valve.

b. Manually operable down valve to lower lift in the event of an emergency. This valve shall be activated from outside of the hoistway through a keyed box.
c. Pressure gauge isolating valve, manually operable.
d. Gate valve to isolate cylinder from pump unit.
e. Electrical solenoid for down direction control.
f. Emergency Operation - A manual lowering device shall be located outside the hoistway in a lockable box positioned at a lower landing.

K. Cylinder And Plunger:

1. The cylinder shall be constructed of steel pipe of sufficient thickness and suitable safety margin. The top of the cylinder shall be equipped with a cylinder head with an internal guide ring and self-adjusting packing.
2. The plunger shall be constructed of a steel shaft of proper diameter machined true and smooth. The plunger shall be provided with a stop electrically welded to the bottom to prevent the plunger from leaving the cylinder.

L. Roller Chains: Two No.50 roller chains with 5/8 inch pitch. Minimum breaking strength 6100 lb each.

M. Leveling Device:

1. The lift shall be provided with an anti-creep device which will maintain the carriage level within 1/2 inch (12 mm) of each landing.
2. All limit switch and leveling device switches shall be located in a position to be inaccessible to unauthorized persons. They shall be located behind the mast wall and be accessible through removable panels.

N. Guide Yoke: The 2:1 guide yoke/sprocket assembly shall be supplied with idler sheaves, roller guide shoes, bearings and guards.

O. Terminal Stopping Devices: Normal terminal stopping devices shall be provided at top and bottom of runway to stop the car positively and automatically.

P. Guide Rails and Brackets: Steel 'C" guide rails and brackets shall be used to guide the platform and sling. Guide rails shall form part of the structural integrity of the unit and be integral to the mast enclosure, ensuring stability and minimum platform deflection when loaded.

Q. Car Sling: Car sling shall be fabricated from steel tubing 44 inches (1116 mm) high with adequate bracing to support the platform and car enclosure. Roller guide shoes shall be mounted on the top and bottom of the car sling to engage the guide rails. Guide shoes shall be roller type with 3 inches (76 mm) diameter wheels. Nylon guide shoes shall not be used for better ride quality and durability.

R. Wiring: All wiring and electrical connections shall comply with applicable codes. Insulated wiring shall have flame-retardant and moisture-proof outer covering and shall be run in conduit or electrical wire ways if located outside the unit enclosure. Quick disconnect harnesses shall be used when possible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify required supports are correct

C. Site dimensions shall be taken to verify that tolerances and clearances have been maintained and meet local regulations.

D. Verify electrical rough-in is at correct locations.

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

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

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

3.3 INSTALLATION

A. Install all the components of the lift system that are specified in this section to be provided, and that are required by jurisdictional authorities to license the lift.

B. Trained employees of the lift contractor shall perform all installation work of this section.

C. Adjust lift for proper operation and clean unit thoroughly.

D. Instruct users in operation procedures and Owner's maintenance person in trouble-shooting and maintenance procedures.

3.4 FIELD QUALITY CONTROL

A. Perform tests in compliance with regulatory requirements specified and as required by authorities having jurisdiction.

B. Schedule tests with agencies and Architect, Owner, and Contractor present.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lifts. Include a review of emergency systems and emergency procedures to be followed at time of operational failure and other building emergencies.

B. Check operation of lifts with Owner's personnel present and before date of Substantial Completion. Determine that operating systems and devices are functioning properly.

C. Check operation of lift with Owner's personnel present not more than one month before end of warranty period. Determine that operating systems and devices are functioning properly.

3.6 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION 144216