Cherokee Nation
West Siloam Springs Casino Hotel
Porte Cochere Addition

PROJECT MANUAL
Construction Documents
10.04.2018

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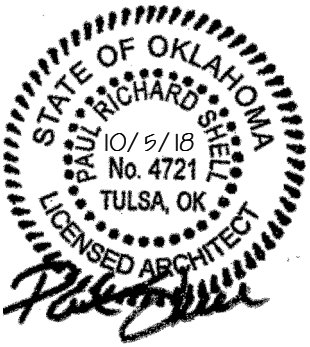

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West Siloam Springs Casino Hotel Porte Cochere

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SECTION 04 20 00 (04200)
UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Types of masonry work required include:

a. Standard Concrete Masonry Units

b. Mortar and Grout

c. Reinforcing Steel

B. Related Sections:

1. Section 04 72 00 - Cast Stone Masonry
2. Section 04 70 00 - Manufactured Masonry Veneer
3. Section 07 62 00 - Sheet Metal Flashing and Trim

1.02 REFERENCES

A. ASTM International Publications:

1. A82 “Standard Specification for Steel Wire, Plain, for Concrete Reinforcement”
2. A185 “Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete”
3. A307 "Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength"
4. A496 “Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement”
5. A497 “Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete”
6. A615 "Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"
7. A951 “Standard Specification for Masonry Joint Reinforcement”
8. C67 "Test Methods of Sampling and Testing Brick and Structural Clay Tile"
9. C90 “Standard Specification for Loadbearing Concrete Masonry Units”
10. C140 "Test Methods of Sampling and Testing Concrete Masonry Units and Related Units"
11. C144 “Standard Specification for Aggregate for Masonry Mortar”
12. C270 “Standard Specification for Mortar for Unit Masonry”
13. C404 “Standard Specification for Aggregates for Masonry Grout”
14. C476 “Standard Specification for Grout for Masonry”
15. C641 “Standard Test Methods for Mastics and Coatings Used With Thermal Insulation”
16. C1314 “Standard Test Method for Compressive Strength of Masonry Prisms”
17. E119 "Standard Test Methods for Fire Tests of Building Construction and Materials"

18. E514 "Test Method for Water Penetration and Leakage through Masonry"

B. Joint American Concrete Institute (ACI) / American Society of Civil Engineers (ASCE) / The Masonry Society (TMS) Publications:

1. ACI 530-1/ASCE 6/TMS 602 “Specification for Masonry Structures”

2. ACI 530/ASCE 5/TMS 402 “Building Code Requirements for Masonry Structures”

C. National Concrete Masonry Association (NCMA) Publications:

1. "Tek" Bulletins

1.03 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops the net-area compressive strengths at 28 days. Determine compressive strength of masonry from net-area compressive strengths of masonry units and mortar types according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

B. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C1314.

C. Fire Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies with fire-resistance ratings determined by testing in compliance with ASTM E119 by a recognized testing and inspecting organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

1.04 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01 Specification Sections.

B. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

C. Samples for Initial Selection: For the following:

1. Unit masonry samples in small-scale form showing the full range of colors and textures available for each different exposed masonry unit required.

1.05 QUALITY ASSURANCE

A. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602, "Specifications for Masonry Structures", except as otherwise indicated.

1. Revise ACI 530.1/ASCE 6 to exclude Sections 1.5; Parts 1.6-A.1.b and 1.6-A.1.c; an d Part 3.3-E.

B. Fire Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies with fire-resistance ratings determined by testing in compliance with ASTM E119 by a recognized testing and inspecting organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authority having jurisdiction.

C. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each different product required for each continuous surface or visually related surfaces.

D. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry materials to project in undamaged condition.

B. 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.

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

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

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

F. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

1.07 PROJECT/SITE CONDITIONS

A. Protection of Work: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform roof loading for at least 12 hours after building masonry walls or columns.

C. Do not apply uniform roof or floor loading until the masonry has cured to the extent that it will safely support the intended load, a minimum of 12 hours after building masonry walls or columns.

D. Do not apply concentrated loads until the masonry has cured to the extent that it will safely

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Approved Manufacturers:

1. Dolese

2. Oldcastle Architectural Inc. (800-899-8455)

3. Approved Substitution.

B. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

C. Concrete Masonry Units: Provide units complying with characteristics indicated below for grade, type, face size, exposed face and, under each form of block included, for weight classification:

1. Size:

a. Unless noted otherwise, provide manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thickness indicated.

2. Hollow Loadbearing Block: ASTM C90, and as follows:

a. Weight Classification: Medium weight, minimum compressive strength of 2000 psi (net area).

2.02 FIRE RATINGS: Where fire ratings on masonry walls are shown on the Drawings, the Contractor shall make certain that the fire-resistant units to be used qualify for the ratings.

2.03 MORTAR AND GROUT MATERIALS

A. Aggregate for Grout: ASTM C404.

B. Grout for Unit Masonry: Comply with ASTM C476 for grout for use in construction of reinforced and nonreinforced unit masonry. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Minimum compressive strength shall be 2,500 psi in 28 days.

1. Use fine grout in grout spaces less than 2" in horizontal direction, unless otherwise indicated.

2. Use coarse grout (maximum 3/8" aggregate) in grout spaces 2" or more in least horizontal dimension, unless otherwise indicated.

C. Mortar Color: Manufacturer’s standard

D. Water: Potable

2.04 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES

A. General: Comply with ASTM A 951.

B. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:

1. Mill Galvanized Steel Wire: ASTM A82 for uncoated wire and with ASTM C641 for zinc coating of class indicated below:

a. Class 1 (0.40 oz. per sq. ft. of wire surface).

2. Hot-Dip Galvanized, Carbon Steel Wire: ASTM A82 with ASTM A153 for zinc coating of class indicated below:

a. Class B-2.

C. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:

1. Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior.

2. Wire Size for Side and Cross Rods: #9 Gauge

3. For single-wythe masonry, provide type as follows with single pair of side rods:

a. Truss design with continuous diagonal cross rods spaced not more than 16" o.c.

D. Anchor Section: Sheet metal plate, with screw holes tope and bottom and with raised, rib-stiffened strap stamped into center to provide slot between strap and plate for connection of wire tie, of overall size and thickness indicated below:

1. Size: Plate and strap size: 1-1/4" wide for plate, 5/8" for strap x lengths indicated below. Slot clearance formed between face of plate and back of strap at maximum rib projection: 1/32" + diameter of wire tie.

2. Plate and Strap Lengths: 5" and 3-5/8", with both sides of plate stiffened by ribs.

3. Thickness: 0.0747" (14 Gauge)

2.05 REINFORCING STEEL

A. General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this article.

B. Steel Reinforcing Bars: Material and grade as follows:

1. Billet steel complying with ASTM A615, Grade 60.

C. Deformed Reinforcing Wire: ASTM A496.

D. Plain Welded Wire Fabric: ASTM A185.

E. Deformed Welded Wire Fabric: ASTM A497.

2.06 ACCESSORIES

A. Premolded Control Joint Strips: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall. Size and configuration as indicated.

1. Polyvinyl Chloride Complying with ASTM D2287, General Purpose Grade, Designation PVC-63506.

a. Avendra, LLC Preferred Manufacturers:

1) None

b. Approved Manufacturers:

1) "AA2000-2001 Blocktite"; Hohmann & Barnard, Inc. (800-645-0616)

2) "Rapid Poly-Joint"; Dur-O-Wal, A Dayton Superior Company (800-323-0090)

B. Weepholes: Provide the following for weepholes:

1. Round Plastic Weep/Vent Tubing: Medium Density Polyethylene with Rope Insert, Outside Diameter and Length as Indicated Below:

a. 3/8" o.d. x 4" long

C. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units shall be formed from 0.187-inch steel wire, hot-dip galvanized after fabrication.

1. Provide units with either two loops or four loops as needed for number of bars indicated.

2. Approved Manufacturers:

a. “D/A 811”; Dur-O-Wal, A Dayton Superior Company (800-323-0090)

b. “D/A 816”; Dur-O-Wal, A Dayton Superior Company (800-323-0090)

c. “#RB Rebar Positioner”; Hohmann & Barnard, Inc. (800-645-0616)

d. “#RB-Twin Rebar Positioner”; Hohmann & Barnard, Inc. (800-645-0616)

D. Flashings:

1. Refer to Section 07 62 00 (07620) – Sheet Metal Flashing & Trim for flashing materials.

E. Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A307, Grade A, hot-dip galvanized to comply with ASTM C153, Class C, in sizes and configuration indicated.

2.07 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

B. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification, for types of mortar required, unless otherwise indicated.

1. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type - N.

D. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.

2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.

PART 3 EXECUTION

3.01 EXAMINATION

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

1. Verify that foundations are within tolerances specified.

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

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

3.02 INSTALLATION - GENERAL

A. Do not wet concrete masonry units.

B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

C. Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.

D. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

E. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

1. Use dry cutting saws to cut concrete masonry units.

F. Select and arrange units for exposed unit masonry to provide a uniform blend of colors and textures.

3.03 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530-1/ASCE 6/TMS 602 and the following:

1. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20'. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints, do not exceed plus or minus 1/4" in 10'.

2. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls, do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

3. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

4. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.04 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.

B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

C. Bond Pattern: Lay exposed masonry in the bond pattern shown or, if not shown, lay in running bond with vertical joint in each course centered on units in courses above and below. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less that nominal 4" horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: In each course, rack back 1/2-unit length for 1/2-running bond or 1/3-unit length for 1/3 running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

E. Built-in Work: As construction progresses, build-in items specified under this and other Sections of these Specifications. Fill in solidly with masonry around built-in items.

1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

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

3. Fill cores in hollow concrete masonry units with grout 24” under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.

F. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.

2. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 07 Section "Firestopping."

3.05 MORTAR BEDDING AND JOINTING

A. Lay solid masonry units and brick units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

C. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

D. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

E. All exposed joints shall be well-tooled to a concave or rodded profile, unless otherwise indicated.

1. Provide raked joints at all vertical scores in scored brick units. Strike to match concave or rodded profile of horizontal joints.

2. Rake-out expansion joints and joints indicated on Drawings to receive sealant.

F. Mortar joints shall be struck at a consistent time interval when mortar is at the same medium stiff consistency in order to minimize color variations.

G. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

H. Collar Joints: After each course is laid, fill the vertical longitudinal joint between wythes solidly and with mortar for the following masonry work:

1. All exterior walls, except cavity walls, and interior walls and partitions.

I. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes. Install at not more than 16" o.c. vertically.

J. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

K. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:

1. Provide individual metal ties at not more than 24" o.c. vertically.

3.06 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls. Lap reinforcing a minimum of 6".

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Reinforce walls with continuous horizontal joint reinforcing, unless specifically noted to be omitted.

D. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

E. Space continuous horizontal reinforcement as follows:

1. For single-wythe walls, space reinforcement at 16" o.c. vertically, unless otherwise indicated.

F. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening, except at control joints.

1. In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

3.07 CONTROL AND EXPANSION JOINTS

A. General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

B. Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 30’-0” o.c. for concrete masonry wythes if reinforced, or 20’-0” o.c. if not reinforced. Locate control joints at points of natural weakness in the masonry work.

C. Build-in non-metallic joint fillers where indicated.

3.08 FLASHING OF MASONRY WORK

A. General: Provide concealed flashing in masonry work at, or above, shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.

B. Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2". At heads and sills, turn up ends not less than 2" to form a pan. Extend flashing on exterior to 1/4 inch past wall surface. Do **NOT** cut flush with wall.

C. Install flashing to comply with manufacturer's instructions.

D. Install weep holes in the exterior widths of the head joints of the first course of masonry immediately above embedded flashings. Space 24" o.c. unless otherwise indicated.

3.09 REPAIRING, POINTING AND CLEANING

A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Install new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.

2. Test cleaning methods on sample wall panel. Leave 1/2 panel uncleaned for comparison purposes. Obtain Owner's Representative approval of sample cleaning before proceeding with cleaning of masonry.

3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.

4. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

3.10 PROTECTION

A. Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION

SECTION 04 70 00
MANUFACTURED MASONRY VENEER

PART 1 -GENERAL

1.01 SUMMARY

A. Section Includes: Manufactured stone veneer, related materials, and sealer.

1.02 REFERENCES

A. Abbreviations and Acronyms:

1. ACI: American Concrete Institute.
2. ASTM: American Society for Testing and Materials.
3. MVMA Masonry Veneer Manufacturers Association.
4. NCMA National Concrete Masonry Association.

B. Reference Standards:

1. American Concrete Institute: Building Code Requirements for Masonry Structures.
2. American Society for Testing and Materials:
   a. ASTM C 39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   b. ASTM C 67: Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
   c. ASTM C 136: Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   d. ASTM C 138: Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
   e. ASTM C 140: Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
   f. ASTM C 143: Standard Test Method for Slump of Hydraulic-Cement Concrete.
   g. ASTM C 172: Standard Practice for Sampling Freshly Mixed Concrete.
   h. ASTM C 173: Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
   i. ASTM C 192: Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
   j. ASTM C 270: Standard Specification for Mortar for Unit Masonry.
   k. ASTM C 482: Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement.
   l. ASTM C 567: Standard Test Method for Determining Density of Structural Lightweight Concrete.
   m. ASTM C 847: Standard Specification for Metal Lath.
   n. ASTM C 932: Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
   o. ASTM C 933: Standard Specification for Welded Wire Lath.
   p. ASTM C 1032: Standard Specification for Woven Wire Plaster Base.
   q. ASTM C 1059: Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.
   r. ASTM C 1064: Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
   s. ASTM D 226: Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
   t. UBC Standard No. 17-1, Kraft Waterproof Building Paper.

1.03 SUBMITTALS

A. Submit following items:

1. Product Data:
   a. Manufactured masonry and application materials including mortar color charts, weather resistant barrier, and sealer.
2. Samples: Panel containing full-size samples of specified manufactured masonry showing representative range of colors and textures.
3. Quality Assurance/Control Submittals:
   a. Qualifications: 1) Proof of manufacturer qualifications. 2) Proof of installer qualifications.
   b. Certificates: Underwriters Laboratories Classification Listing.
   c. Manufacturer's Installation Instructions.

B. Closeout Submittals: Reference Section 01 78 00−Closeout Submittals; submit following items:

1 Maintenance and Cleaning Instructions.
2 Special Warranties.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications:
   a. Minimum five years experience in producing manufactured masonry.
   b. Member of following trade organizations: ASTM, MVMA, NCMA.
   c. Maintain documentable quality control program.
2. Installer Qualifications: Minimum three years documentable experience in installation of adhered concrete masonry veneer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Follow manufacturer's instructions.

B. Packaging:

1. Package manufactured masonry in waterproof bulk pallets.
2. Include following information on pallets:
   a. Style and color.
   b. Warranty information.
   c. Manufacturer's contact information.
3. Provide anti-scuffing inter-layer material between faces of masonry products.

C. Cure product minimum 3 days prior to shipment.

1.06 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1 If temperatures exceed 90 degrees F, comply with the hot weather construction requirements of local building codes, the recommendations of the manufacturer, and hot weather construction provisions of ACI 530.1/ASCE 6/TMS 602, Article 1.8D.
2 Applications shall be protected in temperatures below 40 degrees F. If temperatures are below 40 degrees F, comply with the cold weather construction provisions of ACI 530.1/ASCE 6/TMS 602, Article 1.8C. Manufactured units containing visible frozen moisture shall not be installed.

1.07 WARRANTY

A. Special Warranty: 75 year limited warranty from date of Final Acceptance covering defects in materials.

PART 2 -PRODUCTS

2.01 PRODUCTS

A. Match manufactured stone veneer on existing hotel.

B. Substitutions: No substitutions.

2.02 MANUFACTURED MASONRY MATERIAL

A. General Description: Cast masonry using a mixture of cement, lightweight aggregates, concrete additives, and color pigments.

B. Physical Properties:

1. Density: ASTM C 567: 15 psf. (73 kg/m^2) maximum.
2. Efflorescence: ASTM C67: None visible.
3. Compressive Strength: ASTM C 39: 2100 psi (17 MPa) (5 sample average).
4. Bond Strength: ASTM C 482: 50 psi (345 kPa).
5. Freeze/Thaw: ASTM C 67: Less than 3 percent weight loss.
6. Absorption: ASTM C 140: Less than 29 percent.
7. Surface Burning Characteristics: UBC Standard 7-1:

a. Flame Spread: 0
b. Smoke Developed: 0

C. Style and Color:

1 Style: As shown on Drawings.
2 Color: As shown on Drawings.

2.03 RELATED MATERIALS

A. Bonding Agent: ASTM C 932 or C 1059 Type II, Latex integral or surface applied bonding agent.

B. Weather Resistant Barrier: ASTM D 226 for type 1 felt or UBC Standard 17-1 for Kraft waterproof building paper.

C. Metal Lath: ASTM C 847 corrosion resistant minimum 2.5 lbs per square yard (1.36 kg/m^2), ASTM C 1032 corrosion resistant minimum 18 gauge woven wire, ASTM C 933 corrosion resistant welded wire lath, or corrosion resistant alternate lath material that carries an ICC Evaluation Report.

D. Fasteners: Comply with local building code.

E. Mortar: ASTM C 270 Type N or Type S capable of achieving shear bond strength of 50 psi (345 kPa) when tested in accordance with ASTM C 482. Use colored mortar for grouting joints – match grout on existing Casino.

F. Sealer: Penetrating, non-film forming breathable sealer (silane or siloxane).

2.04 SOURCE QUALITY CONTROL

A. Perform following minimum material quality control tests; comply with ASTM C 172 for sample collection:

1. Sieve analysis test: ASTM C 136–random sample.
2. Slump test: ASTM C 143–3 per shift.
3. Temperature test: ASTM C 1064–3 per shift.
4. Air content test: ASTM C 173–2 per shift.

5. Unit weight test: ASTM C 138–2 per shift.
6. Compressive strength specimens: ASTM C 192–2 sets of 3 samples per shift.
7. Compressive strength tests: ASTM C 39–break all collected samples .

B. Perform following minimum color control tests; comply with manufacturer's quality control procedures.
1. Smear for color.
2. Smear (paste test) for fresh concrete.
3. Surface color evaluation.

PART 3 -EXECUTION

3.01 EXAMINATION

A. Examine substrates upon which manufactured masonry will be installed.

B. Coordinate with responsible entity to correct unsatisfactory conditions.

C. Commencement of work by installer is acceptance of substrate conditions.

3.02 PREPARATION

A. Protection: Do not allow other trades to work on opposite side of walls to which manufactured masonry is applied during and for 48 hours following installation of the manufactured masonry.

B. Surface Preparation: Follow masonry manufacturer's instructions for preparing substrate.

3.03 INSTALLATION

A. Install manufactured masonry and related materials in accordance with masonry manufacturer's installation instructions, or product manufacturer's installation instructions if not covered by masonry manufacturer's installation instructions.
1. Wet back of masonry units prior to applying mortar during hot, dry weather.

B. Joint Type: Grouted.

C. Apply sealer in accordance with sealer manufacturer's installation instructions.

3.04 CLEANING

A. In accordance with masonry manufacturer’s installation instructions.

3.05 PROTECTION

A. Protect finished work from damage during remainder of construction period.

END OF SECTION

SECTION 04 72 00
CAST STONE

PART 1 - GENERAL

1.1. SECTION INCLUDES - Architectural Cast Stone.

A. Scope - All labor, materials and equipment to provide the Cast Stone shown on architectural drawings and as described in this specification.

1. Manufacturer shall furnish Cast Stone covered by this specification.

2. Installing contractor shall unload, store, furnish all anchors, set, patch, clean and seal (optional) the Cast Stone as required.

1.2. REFERENCES

A. ACI 318 – Building Code Requirements for Reinforced Concrete.

B. ASTM A 185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

C. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Reinforced Concrete.

D. ASTM C 33 – Standard Specification for Concrete Aggregates.

E. ASTM C 150 - Standard Specification for Portland Cement.

F. ASTM C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volume Method.

G. ASTM C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

H. ASTM C 260 - Standard Specification for Air-Entrained Admixtures for Concrete.

I. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.

J. ASTM C 426 – Standard Test Method for Linear Shrinkage of Concrete Masonry Units

K. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.

L. ASTM C 618 – Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

M. ASTM C 666 – Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

N. ASTM C 979 - Standard Specification for Coloring Pigments for Integrally Pigmented Concrete.

O. ASTM C 989 – Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete.

P. ASTM C 1194 - Standard Test Method for Compressive Strength of Architectural Cast Stone.

Q. ASTM C 1195 - Standard Test Method for Absorption of Architectural Cast Stone.

R. ASTM C 1364 - Standard Specification for Architectural Cast Stone.

S. ASTM D 2244 – Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

T. Cast Stone Institute[SM] Technical Manual (Current Edition)

1.3. DEFINITIONS

A. Cast Stone - a refined architectural concrete building unit manufactured to simulate natural cut stone, used in unit masonry applications.

1. Dry Cast Concrete Products – manufactured from zero slump concrete.

a. Vibrant Dry Tamp (VDT) casting method: Vibratory ramming of earth moist, zero- slump concrete against a rigid mold until it is densely compacted.

b. Machine casting method: manufactured from earth moist, zero-slump concrete compacted by machinery using vibration and pressure against a mold until it becomes densely consolidated.

2. Wet Cast Concrete Products – manufactured from measurable slump concrete.

a. Wet casting method: manufactured from measurable slump concrete and vibrated into a mold until it becomes densely consolidated.

1.4. SUBMITTAL PROCEDURES

B. Samples: Submit pieces of the Cast Stone that are representative of the general range of finish and color proposed to be furnished for the project.

C. Test results: Submit manufacturers test results of Cast Stone previously made by the manufacturer.

D. Shop Drawings: Submit manufacturers shop drawings including profiles, cross-sections, reinforcement, exposed faces, arrangement of joints (optional for standard or semi-custom installations), anchoring methods, anchors (if required), annotation of stone types and their location.

1.5. QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Supplier shall have sufficient plant facilities to produce the shapes, quantities and size of Cast Stone required in accordance with the project schedule.

2. Supplier, upon request, shall submit a written list of projects similar in scope and at least three (3) years of age, along with owner, architect and contractor references.

B. Standards: Comply with the requirements of the Cast Stone Institute[SM] Technical Manual and the project specifications. Where a conflict may occur, the contract documents shall prevail.

PART 2 - PRODUCTS

2.1. ARCHITECTURAL CAST STONE

A. Comply with ASTM C 1364

B. Physical properties: Provide the following:

1. Compressive Strength - ASTM C 1194: 6,500 psi (45 Mpa) minimum for products at 28 days.

2. Absorption - ASTM C 1195: 6% maximum by the cold water method, or 10% maximum by the boiling method for products at 28 days.

3. Air Content – ASTM C173 or C 231, for wet cast product shall be 4-8% for units exposed to freeze-thaw environments. Air entrainment is not required for VDT products.

4. Freeze-thaw – ASTM C 1364: The CPWL shall be less than 5% after 300 cycles of freezing and thawing.

5. Linear Shrinkage – ASTM C 426: Shrinkage shall not exceed 0.065%.

2.2. RAW MATERIALS

A. Portland cement – Type I or Type III, white and/or grey, ASTM C 150.

B. Coarse aggregates - Granite, quartz or limestone, ASTM C 33, except for gradation, and are optional for the VDT casting method.

C. Fine aggregates - Manufactured or natural sands, ASTM C 33, except for gradation.

D. Colors - Inorganic iron oxide pigments, ASTM C 979 except that carbon black pigments shall not be used.

E. Admixtures- Comply with the following:

1. ASTM C 260 for air-entraining admixtures.

2. ASTM C 494/C 495M Types A - G for water reducing, retarding, accelerating and high range admixtures.

3. Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.

4. ASTM C 618 mineral admixtures of dark and variable colors shall not be used in surfaces intended to be exposed to view.

5. ASTM C 989 granulated blast furnace slag may be used to improve physical properties. Tests are required to verify these features.

F. Water – Potable

G. Reinforcing bars:

1. ASTM A 615/A 615M. Grade 40 or 60 steel galvanized or epoxy coated when cover is less than 1.5 in. (37 mm).

2. Welded Wire Fabric: ASTM A 185 where applicable for wet cast units.

H. All anchors, dowels and other anchoring devices and shims shall be standard building stone anchors commercially available in a non-corrosive material such as zinc plated, galvanized steel, brass, or stainless steel Type 302 or 304.

2.3. COLOR AND FINISH

A. Match existing cast stone caps at existing hotel entry.

B. All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1/32 in. (0.8 mm) and the density of such voids shall be less than 3 occurrences per any 1 $in.^2$ (25 mm^2) and not obvious under direct daylight illumination at a 5 ft (1.5m) distance.

C. Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a 10 ft (3 m) distance.

1. ASTM D 2244 permissible variation in color between units of comparable age subjected to similar weathering exposure.

a. Total color difference – not greater than 6 units.

b. Total hue difference – not greater than 2 units.

D. Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under direct daylight illumination from a 20-ft (6 m) distance.

E. The occurrence of crazing or efflorescence shall not constitute a cause for rejection.

F. Remove cement film, if required, from exposed surfaces prior to packaging for shipment.

2.4. REINFORCING

A. Reinforce the units as required by the drawings and for safe handling and structural stress.

B. Minimum reinforcing shall be 0.25 percent of the cross section area.

C. Reinforcement shall be noncorrosive where faces exposed to weather are covered with less than 1.5 in. (38 mm) of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars.

D. Panels, soffits and similar stones greater than 24 in. (600 mm) in one direction shall be reinforced in that direction. Units less than 24 in. (600 mm) in both their length and width dimension shall be non-reinforced unless otherwise specified.

E. Welded wire fabric reinforcing shall not be used in dry cast products.

2.5. CURING

A. Cure units in a warm curing chamber approximately 100ºF (37.8ºC) at 95 percent relative humidity for approximately 12 hours, or cure in a 95 percent moist environment at a minimum 70ºF (21.1ºC) for 16 hours after casting. Additional yard curing at 95 percent relative humidity shall be 350 degree-days (i.e. 7 days @ 50°F (10°C) or 5 days @ 70°F (21°C)) prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.

2.6. MANUFACTURING TOLERANCES

A. Cross section dimensions shall not deviate by more than ±1/8 in. (3 mm) from approved dimensions.

B. Length of units shall not deviate by more than length/ 360 or ±1/8 in. (3 mm), whichever is greater, not to exceed ±1/4 in. (6 mm).

1. Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed by the manufacturer.

C. Warp, bow or twist of units shall not exceed length/ 360 or ±1/8 in. (3 mm), whichever is greater.

D. Location of dowel holes, anchor slots, flashing grooves, false joints and similar features – On formed sides of unit, 1/8 in. (3 mm), on unformed sides of unit, 3/8 in. (9 mm) maximum deviation.

2.7. PRODUCTION QUALITY CONTROL

A. Testing.

1. Test compressive strength and absorption from specimens selected at random from plant production.

2. Samples shall be taken and tested from every 500 (14 m^3) cubic feet of product produced.

3. Perform tests in accordance ASTM C 1194 and C 1195.

4. New and existing mix designs shall be tested for strength and absorption compliance prior to producing units.

2.8. DELIVERY, STORAGE AND HANDLING

A. Mark production units with the identification marks as shown on the shop drawings.

B. Package units and protect them from staining or damage during shipping and storage.

C. Provide an itemized list of product to support the bill of lading.

PART 3 EXECUTION

3.1. EXAMINATION

A. Installing contractor shall check Cast Stone materials for fit and finish prior to installation. Do not set unacceptable units.

3.2. SETTING TOLERANCES

A. Comply with Cast Stone Institute^{SM} Technical Manual.

B. Set stones 1/8 in. (3 mm) or less, within the plane of adjacent units.

C. Joints, plus - 1/16 in. (1.5 mm), minus - 1/8 in. (3 mm).

3.3. JOINTING

A. Joint size:

1. At stone/brick joints 3/8 in. (9.5 cm).
2. At stone/stone joints in vertical position 1/4 in. (6 mm) (3/8 in. (9.5 mm) optional).
3. Stone/stone joints exposed on top 3/8 in. (9.5 mm).

B. Joint materials:

1. Mortar, Type N, ASTM C 270.
2. Use a full bed of mortar at all bed joints.
3. Flush vertical joints full with mortar.
4. Leave all joints with exposed tops or under relieving angles open for sealant.
5. Leave head joints in copings and projecting components open for sealant.

C. Location of joints:

1. As shown on shop drawings.
2. At control and expansion joints unless otherwise shown.

3.4. SETTING

A. Drench units with clean water prior to setting.

B. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

C. Set units in full bed of mortar, unless otherwise detailed.

D. Rake mortar joints 3/4 in. (18 mm) in. for pointing.

E. Remove excess mortar from unit faces immediately after setting.

F. Tuck point unit joints to a slight concave profile.

3.5. JOINT PROTECTION

A. Comply with requirements of Section 07 90 00.

B. Prime ends of units, insert properly sized backing rod and install required sealant.

3.6. REPAIR AND CLEANING

A. Repair chips with touchup materials furnished by manufacturer.

B. Saturate units to be cleaned prior to applying an approved masonry cleaner.

C. Consult with manufacturer for appropriate cleaners.

3.7. INSPECTION AND ACCEPTANCE

A. Inspect finished installation according to Bulletin #36.

B. Do not field apply water repellant until repair, cleaning, inspection and acceptance is completed.

END OF SECTION

SECTION 07 24 23

DIRECT APPLIED EXTERIOR FINISH SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Direct-Applied Exterior Finish Systems (DEFS)

B. Related Sections:

1. Section 04 20 00 - Unit Masonry
2. Section 04 72 00 – Cast Stone Masonry
3. Section 07 62 00 - Sheet Metal Flashing and Trim
4. Section 07 92 00 – Joint Sealants

1.02 REFERENCES

A. ASTM International Publications:

1. B117 "Standard Practice for Operating Salt Spray (Fog) Apparatus"
2. C1063 “Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster”
3. C1177 “Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing”
4. C1382 Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints”
5. C1397 “Standard Practice for Application of Class PB Exterior Insulation and Finish Systems”
6. C1481 “Standard Guide for Use of Joint Sealants with Exterior Insulation and Finish Systems (EIFS)"
7. D578 “Standard Specification for Glass Fiber Strands”
8. D2247 “Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity”
9. D3273 "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber"
10. D3274 “Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation”
11. E84 "Standard Test Method for Surface Burning Characteristics of Building Materials"
12. E331 “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference”
13. E2098
14. E2273 “Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies”
15. E2485 “Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings “

B. International Code Council (ICC)

1.03 DEFINITIONS

A. Direct Applied Finish Systems:

1. Composite wall and ceiling finish system consisting of base coat, reinforcing mesh and finish coat applied to exterior gypsum sheathing.

1.04 SYSTEM DESCRIPTION

A. Design Requirements:

1. Polymer-based protective coating 100% pure acrylic resin based materials. No materials using non-acrylic resins in their formulas will be accepted.

B. Performance Requirements:

1. General: Provide systems that comply with the following performance requirements:

a. Bond Integrity: Free from bond failure within system components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.

b. Weathertightness: Resistant to water penetration from exterior into system and assemblies behind it or through them into interior of building that results in deterioration of thermal-insulating effectiveness or other degradation of system and assemblies behind it, including substrates, supporting wall construction, and interior finish.

c. Water Penetration: No water penetration when tested in accordance with ASTM E331.

d. Moisture Resistance: No deleterious effects after 14 days when tested in accordance with ASTM D2247.

e. Drainage: Greater than 90% drainage efficiency when tested in accordance with ASTM E2273.

f. Salt Spray Resistance: No deleterious effects after 300 hours when tested in accordance with ASTM B117.

g. Freeze/Thaw: No deleterious effects when tested in accordance with ASTM E2485.

h. Mildew Resistance: No growth supported during 28 day exposure period when tested in accordance with ASTM D3273 and evaluated according to ASTM D3274.

1.05 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections:

1. Product Data: Submit technical product data, test reports, installation instructions and recommendations from manufacturer, including data that materials comply with requirements.

2. Certifications:

a. Manufacturer's written certification of installer as qualified to install manufacturer's system using trained workers.

b. Certification that materials meet or exceed requirements.

c. Provide manufacturers applicable code compliance report stating that the EIFS as installed has been tested per local Code requirements and does not affect the fire rating of the exterior wall assembly.

B. Closeout Submittals:

1. Affidavits:

a. Where mandated by applicable building codes, provide affidavits from DEFS and sealant applicators confirming full compliance to all manufacturer's application requirements.

b. Field Observation Reports:

1) Copies of all “Field Observation Reports” from the DEFS manufacturer representative shall be submitted as an attachment to the DEFS warranty.

C. As part of Contract close-out, submit with warranty, copies of all "Field Inspection Reports" from DEFS manufacturer's representative and a letter from the approved DEFS manufacturer confirming the following:

1. The DEFS application and installation has been inspected by manufacturer's representative and are confirmed to be in full compliance to the manufacturer's minimum application requirements.

2. The specific brand and type of sealants used on this project are compatible with the correctly installed in conjunction with the approved DEFS. Document to also list the approved sealant manufacturer.

1.06 QUALITY ASSURANCE

A. Qualifications:

1. The Applicator shall be approved by the manufacturer in writing on company letterhead. Attach this letter to warranty.

2. The manufacturer shall have manufactured Exterior Insulation and Finish Systems in the United States for at least twenty years.

3. The installer shall have had a minimum of five years experience under the same company name or organization installing the specified product on projects similar in scope, and with a record of successful in-service performance.

B. Design and Detailing:

1. The Manufacturer's approved Applicator shall verify that the proposed Substrate is acceptable type prior to the application of the System.

2. The System shall be installed in accordance with manufacturer's published details and specific recommendations for this project.

C. Approvals, Listings, and Classifications:

1. Fire-Test-Response Characteristics: Provide system assemblies and components with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting agency.

a. Finish Coats: Flame Spread Index of 25 or less and a Smoke Developed Index of 450 or less when tested individually per ASTM E84.

2. Code Approvals:

a. The DEFS system shall maintain a research report with the applicable building codes and agencies within the jurisdiction of the Project. Code compliance must be based on full scale diversified fire testing in its end use configuration by independent

agencies whose classifications and requirements have general acceptance as regulator.

b. The System shall be evaluated, listed, and classified as described in the following documents:

1) ICC. Research Report

2) Local Approval

D. Pre-Installation meeting: The DEFS installer's foreman or superintendent for this project and a representative of the DEFS system manufacturer shall attend the Pre-installation meeting prior to the start of the DEFS application.

E. The engineered and tested performance of the DEFS and recommendation of the proper method of attachment of the system (adhered and/or mechanically fastened) shall be the sole responsibility of the DEFS manufacturer. The DEFS installer shall comply with the manufacturer's recommendations.

F. Field Observations and Inspections:

1. Provide independent third party inspection where required by applicable building codes and agencies within the jurisdiction of the Project.

2. Conduct inspections in accordance with code requirements and contract documents.

1.07 DELIVERY, STORAGE, AND HANDLING

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

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

1. Protect coatings delivered in pails from freezing and temperatures in excess of 90°F. Store away from direct sunlight.

2. Protect bagged Portland cement based materials from moisture and humidity. Store under cover and off the ground in a dry location.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not install system when ambient outdoor air and substrate temperatures are 40 deg F and falling unless temporary protection and heat are provided to maintain ambient temperatures above 40 deg F during installation of wet materials and until they have dried thoroughly and become weather resistant, but for at least 24 hours after installation.

B. Adjacent materials and the wall system shall be protected during installation, while curing and/or unattended, from weather and other damaging conditions.

1.09 COORDINATION

A. The work of this Section shall be coordinated with the work specified in related Sections.

B. Coordinate location of system terminations at adjoining materials and around penetrations to provide a minimum joint size as required by the system manufacturer for application of sealant but no less than ½ inches.

C. Install sealant immediately after installation of the DEFS and when DEFS coatings are dry.

D. Temporary protection shall be provided during the DEFS system application and prior to the installation of the sealant and flashing systems at all locations that could allow moisture penetration. Do not allow water to penetrate behind DEFS.

E. All joints to be sealed shall be done immediately after completion of field applied wall system.

1.10 WARRANTY

A. Manufacturer shall provide a 10-year limited warranty on the labor and materials associated with the DEFS system. This warranty is exclusive of flashings.

B. Work is warrantied against:

1. Material defects, including, but not limited to, peeling, cracking, delamination, flaking, or similar failures.

2. Seepage and leakage of water or excessive moisture into the building or wall cavities through the system. DEFS to DEFS and DEFS to dissimilar sealer joints.

C. Inspection:

1. The manufacturer shall provide final inspection at the completion of application of the system including all contiguous sealant joints.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. DEFS Approved Manufacturers:

1. “Textured Acrylic Finishes (TAFS) Option 2”; Dryvit Systems, Inc. (800-221-9255)

2. "StoQuik Gold System for Soffits"; Sto Finish Systems Div. (888-786-3437)

3. Approved Substitution by BASF Wall Systems, Inc. (800-221-9255).

4. Approved Substitution by Parex USA (866-516-0061)

2.02 GENERAL:

A. All components of the DEFS system shall be obtained from one manufacturer. No substitutions or addition of other materials will be allowed.

B. Compatibility: Provide substrates, adhesive, board insulation, reinforcing meshes, base- and finish-coat materials, sealants, and accessories that are compatible with one another and approved for use by system manufacturer for Project.

C. Primer/Adhesive: A factory blended, polymer modified, cement based adhesive/base coat as recommended by the system manufacturer.

D. Reinforcing Mesh: Balanced, alkali-resistant, interlaced open-weave glass-fiber mesh treated for compatibility with other system materials, made from continuous multi-end strands with retained mesh tensile strength of not less than 120 lbf/in per ASTM E2098, complying with ASTM D578 and the following requirements for minimum weight:

1. Standard weight, as recommended by manufacturer to meet “Standard Impact Resistance”, not less than 4.3 oz.

E. Base-Coat Materials: Factory blended, polymer based base coat as recommended by the system manufacturer to be compatible with the substrate and reinforcing mesh.

F. Finish Coat: Materials System manufacturer’s standard mixture, complying with the following requirements for material composition and method of combining materials:

1. Factory mixed acrylic polymer emulsion texture finish with color fast mineral pigments forming integral finish color.

2. Color: As approved by Architect.

3. Texture: As approved by Architect.

G. Water:

1. Water shall be clean and potable. Water shall be tested by the installer for excessive levels of iron and all other potentially damaging substances prior to its incorporation in accordance with the manufacturer's published instructions.

H. Sheathing (Vertical and Horizontal Applications):

1. Glass Mat Water-Resistant Gypsum Sheathing Board. Conform to ASTM C1177.

I. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with system manufacturer's written requirements, manufactured from vinyl plastic and complying with ASTM C1063.

J. Elastomeric Sealant Products: Provide system manufacturer's listed and recommended chemically curing, elastomeric sealant that is in accordance with ASTM C1382 and compatible with joint fillers, joint substrates, and other related materials, and complies with requirements for products and testing indicated in ASTM C1481 "Standard Guide for Use of Joint Sealants with Exterior Insulation and Finish Systems (EIFS)" and with requirements in Section 07 92 00 "Joint Sealants" for products.

1. Colors as selected by Owner's Representative.

2.03 MIXING

A. General: Comply with system manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as recommended by system manufacturer. Mix materials in clean containers. Use materials within time period specified by system manufacturer or discard.

PART 3 EXECUTION

3.01 EXAMINATION

A. Prior to application of the wall system, the substrate shall be examined by the installer for compliance with the Contract Documents and manufacturer's specifications. The Contractor and Owner's representative shall be advised of all discrepancies. All substrates shall be free of surface and excessive internal moisture. Work shall not proceed until unsatisfactory conditions are corrected.

B. Replace weather damaged sheathing and repair damaged or cracked surfaces.

3.02 PREPARATION

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

B. Protect system, substrates, and wall construction behind them from inclement weather during installation. Prevent infiltration of moisture behind system and deterioration of substrates.

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

1. Apply primer-sealer over substrates where required by system manufacturer for improving adhesion or for protecting substrates from degradation.

3.03 INSTALLATION

A. Comply with ASTM C1397 and system manufacturer's written instructions for installation of system as applicable to each type of substrate indicated.

1. Avoid all sources of open flame in immediate are of application.

2. Under no circumstances shall accelerators, retarders, or other admixtures be used.

3. Use clean non-metal container, free of all foreign substance, for mixing and preparing material. Do not use container which has been used for or cleaned with a petroleum product.

B. Accessory Installation

1. Install appropriate casing bead, soffit vent and joint accessories at system terminations in accordance with locations indicated on architectural contract documents. Maintain a gap of minimum 3/8" between the accessory and abutments with dissimilar construction to form a sealant joint.

2. Follow accessory manufacturer's instructions for accessory butt joints to maintain water tightness.

3. Provide expansion joints in sheathing at minimum intervals of 30 feet up to a maximum area of 900 square feet, wherever the system abuts dissimilar construction or an existing joint occurs in construction. Fit sheathing snugly into accessories prior to attachment.

C. Apply base coat to exposed surfaces of sheathing in thickness specified by system manufacturer.

1. Minimum thickness of base coat to be sufficient to embed reinforcing mesh, or as required by system manufacturer.

D. Fully embed reinforcing fabric of weight indicated below in wet base coat to produce wrinkle free installation so that no mesh color or pattern is visible: Follow system manufacturer's instructions for reinforcing mesh application.

1. Fabric Weight: Standard Impact Resistance, unless otherwise indicated..

2. Mesh to be continuous at corners and overlapped not less than 2-1/2". Do not lap reinforcing mesh within 8" of corners.

E. Apply finish coat over dry base coat in thickness required by system manufacturer to produce a uniform finish of texture and color matching approved sample.

F. Repair cracks, impact damage, spalls or delamination promptly.

3.04 INSTALLATION OF JOINT SEALANTS

A. Prepare joints for sealants, of type and at locations indicated, to comply with applicable requirements in Section 07 92 00 "Joint Sealants" and in ASTM C1481.

1. Clean surfaces to receive sealants to comply with indicated requirements and system manufacturer's written instructions.

2. Joint sealants to be applied after base coat has cured but before applying finish coat.

3.05 CLEANING AND PROTECTING

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

B. Provide final protection and maintain conditions, in a manner acceptable to Installer and system manufacturer that ensure system is without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 07 31 13
ASPHALT SHINGLES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Extent of shingles is indicated on Drawings and is hereby defined to include moisture shedding underlayment, eave, valley and ridge protection, and associated protective flashing.

B. Related Sections:

1. Section 07 62 00 (07620) - Sheet Metal Flashing and Trim

1.02 REFERENCES

A. ASTM International Publications:

1. B749 “Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products”
2. D226 “Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing”
3. D1970 “Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection”
4. D3018 “Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules”
5. D3161 “Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method)”
6. D3462 “Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules”
7. D4586 “Standard Specification for Asphalt Roof Cement, Asbestos-Free”
8. D4869 “Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing”
9. E108 “Standard Test Methods for Fire Tests of Roof Coverings”

B. Underwriter's Laboratories, Inc. (UL) Standards:

1. UL 790 “Standard Test Methods for Fire Tests of Roof Coverings”
2. UL 997 “Wind Resistance of Prepared Roof Covering Materials”

C. Asphalt Roofing Manufacturers Association (ARMA) Publications:

1. ARMA's Residential Asphalt Roofing Manual

D. National Roofing Contractors Association (NCRA) Publications:

1. The NRCA Steep Roofing Manual

E. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) Publications:

1. "Architectural Sheet Metal Manual", Current Edition

1.03 SUBMITTALS

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

1. Submit color samples, product information and samples clearly detailing material thickness, profiles, fastening and installation details.

2. Samples of colors for selection purposes.

1.04 QUALITY ASSURANCE

A. Fire-Test-Response Classification: Where products with a fire-test-response classification are specified, provide asphalt shingles identical to those tested according to ASTM E108 or UL 790 and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify each bundle of asphalt shingles with appropriate markings indicating fire-test-response classification of applicable testing and inspecting agency.

B. Wind-Resistance-Test Characteristics: Where wind-resistant asphalt shingles are indicated, provide products identical to those tested according to ASTM D3161 or UL 997 and passed. Identify each bundle of asphalt shingles with appropriate markings of applicable testing and inspecting agency.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturers unopened bundles or containers with labels intact.

B. Handle and store materials at Project site to prevent water damage, staining, or other physical damage. Store roll goods on end. Comply with manufacturer's recommendations for job-site storage, handling, and protection.

1.06 PROJECT CONDITIONS

A. Substrate: Proceed with shingle work only after substrate construction and penetrating work have been completed.

B. Weather Conditions: Proceed with shingle work only when existing and forecasted weather conditions are in compliance with manufacturer's recommendations and when substrate is completely dry.

1. Application of perimeter underlayment permitted only when air temperature is 40 degrees F. and above.

1.07 WARRANTY

A. Special Project Warranty: Submit a written warranty, executed by manufacturer, agreeing to repair or replace asphalt shingles that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, deformation or deterioration of shingles beyond normal weathering. This warranty shall be in addition to, and not a limitation of, other rights the Owner may have against the Contractor under the Contract Documents.

1. Minimum Warranty period is 25 years after date of Substantial Completion.

1.08 EXTRA MATERIALS

A. Furnish minimum of one full square of each type/color/texture shingle used in the work. Provide in unopened, clearly labeled bundles or containers.

PART 2 PRODUCTS

2.01 ASPHALT SHINGLE MATERIALS

A. Fiberglass Shingles: Minimum 240 lb/sq fiberglass-based, multi-tab, fungus resistant, strip asphalt shingles, complying with both ASTM D3018, Type I, and ASTM D3462. Provide shingles with a Class A fire-test-response per ASTM E108, and A Class “F” Wind Resistance per ASTM D3161

B. Hip and Ridge Shingles: Manufacturer's standard factory precut units to match shingles.

C. Products:

1. Match Existing type and color

2.02 ACCESSORIES

A. Felt Underlayment: Type I, 36” wide, asphalt-saturated organic felt, complying with ASTM D226 (No. 15) or ASTM D4869, 36" wide.

B. Asphalt Plastic Cement: Nonasbestos, fibrated asphalt cement complying with ASTM D4586, designed for trowel application.

C. Nails: Aluminum or hot-dip galvanized 12 barbed shank, sharp-pointed, conventional roofing nails, minimum 3/8" diameter head, and of sufficient length to penetrate 3/4" into solid decking or to penetrate at least 1/8” through plywood sheathing. Material of nails in contact with flashing shall match materials selected for flashing to prevent galvanic action. Staples are not permitted.

D. Metal Drip Edge: Minimum .024" aluminum sheet, brake-formed to provide 3" roof deck flange, and 1-1/2" fascia flange with 3/8" drip at lower edge. Furnish in 8' or 10' lengths. Color to be Brown.

2.03 FLASHING

A. Sheet Metal Materials: Furnish the sheet metal materials as specified in section 07 62 00 (07620).

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

PART 3 EXECUTION

3.01 GENERAL

A. Comply with manufacturer's instructions and recommendations, but not less than those recommended by ARMA's Residential Asphalt Roofing Manual" or "The NRCA Steep Roofing Manual".

3.02 EXAMINATION

A. Examine substrate and conditions under which shingling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with shingling work until unsatisfactory conditions have been corrected.

3.03 PREPARATION

A. Clean substrate of any projections and substances detrimental to shingling work. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with roofing nails.

B. Coordinate installation of shingles with flashing and other adjoining work to insure proper sequencing. Do not install shingle roofing until all vent stacks and other penetrations through roofing have been installed and are securely fastened against movement.

3.04 INSTALLATION

A. General: Comply with instructions and recommendations of shingle manufacturer, except to extent more stringent requirements are indicated, but in no case less than recommended by the "NRCA Steep Roofing Manual", and to meet the requirements of UL Class A.

1. Fasten asphalt shingles to roof sheathing with nails. No staples permitted.

B. Felt Underlayment: Apply one layer of felt horizontally over entire surface, lapping succeeding courses a minimum of 2-inches, end laps a minimum of 4-inches, and hips and valleys a minimum of 6-inches. Fasten with sufficient number of nails to hold in place until shingle application. Stagger seams for each layer.

C. Flashing Installation:

1. Flashing and sheet metal shall be installed in accordance with:

a. FM Global (FMG) Engineering and Research Requirements

b. SMACNA's "Architectural Sheet Metal Manual"

c. "Asphalt Roofing" Section of "The NRCA Steep Roofing Manual".

d. Conform to dimensions and profiles shown on the Drawings unless more stringent requirements are indicated.

2. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

3. Woven and Closed-Cut Valleys: Comply with ARMA and NRCA recommendations.

4. Open Valleys Flashing: Valley flashing to be applied before shingles.

a. Install centrally in valleys, lapping ends at least 8 inches in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.

b. Secure hemmed flange edges into metal cleats spaced 12 inches apart and fastened to roof deck.

5. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

6. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

D. Shingle Installation:

1. Comply with instructions and recommendations of shingle manufacturer, except to extent more stringent requirements are indicated, but in no case less than recommended by the "NRCA Steep Roofing Manual", and to meet the requirements of UL Class A.

2. Install asphalt shingles beginning at roof's lower edge, with a starter strip of roll roofing or inverted shingles with tabs removed. Fasten shingles in pattern, in desired weather exposure pattern; using a minimum of five, or number of fasteners per shingle as recommended by manufacturer. Use vertical and horizontal chalk lines or premarked underlayment to insure straight coursing.

a. Cut and fit asphalt shingles at valleys, ridges, and edges to provide maximum weather protection. Provide same weather exposure at ridges as specified for roof. Lap shingles at ridges to shed water away from direction of prevailing wind. Fasteners at ridges shall be of sufficient length to penetrate sheathing as specified.

3.05 ADJUSTING

A. Replace any damaged materials installed under this Section with new materials meeting specified requirements.

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GE NERAL

1.01 SUMMARY

A. Section Includes:

1. Roof Drainage Systems:

a. Gutters

b. Downspouts

2. Fasteners

B. Related Sections:

1. Section 07 31 13 (07311) - Asphalt Shingles

1.02 REFERENCES

A. ASTM International Publications:

1. D226 “Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing”

2. D1079 “Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials”

3. D2247 “Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity”

4. D2843 “Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics”

5. D6221 “Standard Specification for Reinforced Bituminous Flashing Sheets for Roofing and Waterproofing”

B. American Architectural Manufacturers Association (AAMA) Publications:

1. 1402 “Standard Specifications for Aluminum Siding, Soffit and Fascia”

2. 2603 “Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels”

3. 2604 “Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusion and Panels”

C. FM Global (FMG) Standards

D. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) Publications:

1. "Architectural Sheet Metal Manual", Current Edition

E. Single Ply Roofing Industry (SPRI) Publications:

1. ANSI/SPRI ES-1 “Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems”

F. The Society for Protective Coatings (SSPC) Publications:

1. “SSPC Painting Manual”

2. Paint 12, Cold-Applied Asphalt Mastic (Extra Thick Film)

G. National Association of Architectural Metal Manufacturers (NAAMM) Publications:

1. "Metal Finishes Manual"

1.03 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum range in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections and other detrimental effects. Provide clips that resist rotation and avoid sheer stress as a result of sheet metal and trim thermal movements.

1. Temperature Change (Range): 120 Degree F ambient; 180 Degree F material surfaces.

C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior

1.04 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01 Specification Sections.

1. Product Data: For each type of product specified.

2. Submit Shop Drawings, color samples, product information, and samples clearly detailing shaping, jointing, length of sections, fastening, and installation details.

3. Manufacturer's standard color charts for selection purposes.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

B. Do not proceed with the installation of flashing and sheet metal work until curb and substrate construction, cant strips, blocking, reglets, and other construction to receive the work is completed.

C. Flashing and sheet metal shall be installed in accordance with:

1. FM Global (FMG) Standards (Factory Mutual Engineering and Research Requirements)

2. SMACNA's Architectural Sheet Metal Manual"

3. Conform to dimensions and profiles shown unless more stringent requirements are indicated.

D. The installer must examine the substrate and the conditions under which flashing and sheet metal work is to be performed, and notify Owner's Representative in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

1.06 PROJECT CONDITIONS

A. Existing Conditions:

1. Exercise care when working on or about roof surfaces to avoid damaging or puncturing membrane or flexible flashings.

2. Place plywood panels on roof surfaces adjacent to work of this Section and on access routes. Keep in place until completion of work.

B. Roofing and flashing shall not be applied during precipitation and shall not be started in the event there is a probability of precipitation during application. Metal faced flashing shall not be applied when ambient temperature is below 35 degrees F.

C. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Storage and Protection: Protect materials from rain and physical damage. Provide cover on top and on all sides, allowing for adequate ventilation. Store flashing where temperatures will not exceed 90 degrees F for extended periods. Store all products in a dry area away from high heat, flames or sparks.

PART 2 PRODUCTS

2.01 GUTTERS & DOWNSPOUTS

A. Approved Manufacturers:

1. Alcoa Building Products (800-962-6973)
2. Alside, Inc. (800-257-4335)
3. Approved substitution

B. Materials:

1. Seamless, continuous, gutters to be minimum 032" thick, downspouts to be minimum .024" thick, sheet aluminum conforming to requirements of ASTM B209, Alloy 3003, Temper H14, finish to be thermo-setting acrylic enamel conforming to AAMA 603.8.
2. Color: To be selected by Architect from Manufacturer's full range of colors.
3. Size and Shape:
   a. Gutters: SMACNA Style A. Minimum nominal 6" top and 4-3/4" height
   b. Downspouts: Minimum 3-3/4" x 5" rectangular shape.
4. Accessories:
   a. Gutters:
      1) End caps
      2) Hangers: Concealed
      3) Non-corrosive leaf screens at gutters.
   b. Downspouts:
      1) Elbows
      2) Straps: Minimum two per downspout
      3) Strainers
   c. Provide splash-blocks where downspouts empty into landscaping beds. Units shall be concrete, minimum 3,000 psi at 28 days with 5% air entrainment. Size and profile to suit application.

2.02 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Bituminous Paint: Acid and alkali-resistant type; black color; FS TT-C-494 or SSPC-Paint 12 solvent type, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

B. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

C. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed.

D. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.

E. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

F. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

2.03 FABRICATION, GENERAL

A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

E. Expansion Provisions: Comply with SMACNA standards. Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

G. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application, but never less than thickness of metal being secured.

J. Form gutters and downspouts of profiles and sizes indicated and as required to properly collect and remove water. Fabricate complete with required connection pieces.

1. Form sections square, true, and accurate in size, in maximum possible lengths and free of distortions and defects detrimental to appearance or performance hem exposed edges. Allow for expansion at joints. Miter gutter corners.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Comply with manufacturer's instructions and recommendations for handling and installation of flashing and sheet metal work.

B. Performance: Coordinate the work with other work for the correct sequencing of items which make up the entire membrane or system of weatherproofing or waterproofing and rain drainage. It is required that the flashing and sheet metal work be permanently watertight, and not deteriorate in excess of manufacturer's published limitations.

C. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION – SHEET METAL

A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Install exposed sheet metal work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.

1. Use joint adhesive for nonmoving joints specified not to be soldered.

D. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder. Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

E. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

F. Roof-Drainage System: Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item manufacturer, to drain roof in the most efficient manner. Coordinate roof-drain flashing installation with roof-drainage system installation. Spike type anchors will not be permitted. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation.

3.03 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2006 (Reapproved 2011).

B. ASTM C834 - Standard Specification for Latex Sealants; 2010.

C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).

H. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.

2. List of backing materials approved for use with the specific product.

3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.

4. Substrates the product should not be used on.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Installation Plan: Submit at least four weeks prior to start of installation.

E. Installation Log: Submit filled out log for each length or instance of sealant installed.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installation Plan: Include schedule of sealed joints, including the following.

1. Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgement that some surfaces cannot be cleaned to like-new condition andtherefore prevention is imperative.

2. Installation Log Form: Include the following data fields, with known information filled out.

a. Substrates.

b. Sealant used.

c. Primer to be used, or indicate as "No primer" used.

d. Size and actual backing material used.

e. Date of installation.

f. Name of installer.

g. Actual joint width; provide space to indicate maximum and minimum width.

h. Actual joint depth to face of backing material at centerline of joint.

i. Air temperature.

1.05 WARRANTY

A. Correct defective work within a five year period after date of Substantial Completion.

B. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nonsag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.

1. Adhesives Technology Corporation: www.atcepoxy.com.

2. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.

3. Bostik Inc: www.bostik-us.com.

4. Dow Corning Corporation: www.dowcorning.com.

5. Hilti, Inc: www.us.hilti.com.

6. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.

7. Pecora Corporation: www.pecora.com.

8. The QUIKRETE Companies: www.quikrete.com.

9. Tremco Global Sealants: www.tremcosealants.com.

10. Sherwin-Williams Company: www.sherwin-williams.com.

11. W.R. Meadows, Inc: www.wrmeadows.com.

12. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.

a. Expansion and control joints.

b. Joints between different exposed materials.

c. Other joints indicated below.

2. Do not seal the following types of joints.

a. Intentional weepholes in masonry.

b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.

c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.

d. Joints where installation of sealant is specified in another section.

e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use nonsag non-staining silicone sealant, unless otherwise indicated.

2.03 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus 100 percent, minus 50 percent.

2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.

3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.

4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.

5. Color: Match adjacent finished surfaces.

6. Cure Type: Single-component, neutral moisture curing.

B. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface .

1. Movement Capability: Plus 100 percent, minus 50 percent.
2. Color: Match adjacent finished surfaces.

C. Nonsag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.

1. Movement Capability: Plus and minus 25 percent.
2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.
3. Color: Match adjacent finished surfaces.

2.04 SELF-LEVELING SEALANTS

A. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.

1. Composition: Multicomponent, 100 percent solids by weight.
2. Hardness: Minimum of 85 (Shore A) or 35 (Shore D), when tested in accordance with ASTM D2240 after 7 days.
3. Color: To be selected by Architect from manufacturer's standard colors.
4. Joint Width, Minimum: 1/8 inch.

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
2. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

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

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at the low temperature in the thermal cycle. Report failures immediately and repair.

END OF SECTION

SECTION 09 91 13

EXTERIOR 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 surface preparation and the application of paint systems on exterior substrates.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Indicate VOC content.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.

2. Label each coat of each Sample

3. Label each Sample for location and application area.

1.4 CLOSEOUT SUBMITTALS

A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

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. Paint: **1 gal. (3.8 L)** of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacture’s label with the following information:

1. Product name and type (description).

2. Batch date.

3. Color number.

4. VOC content.

5. Environmental handling requirements.

6. Surface preparation requirements.

7. Application instructions.

B. 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.

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

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company (The); products indicated or comparable product.

B. Comparable Products: Comparable products of approved manufacturers will be considered in accordance with the following:

1. Products are approved by manufacturer in writing for application specified.

2. Products meet performance and physical characteristics of basis of design product including published ratio of solids by volume, plus or minus two percent.

C. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: For field applications, provide paints and coatings that complies with VOC content limits of authorities having jurisdiction.

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

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

2. Testing agency will perform tests for compliance with product requirements.

3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.

1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

B. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

a. Concrete: 12 percent.

b. Fiber-Cement Board: 12 percent.

c. Masonry (Clay and CMU): 12 percent.

d. Wood: 15 percent.

e. Portland Cement Plaster: 12 percent.

f. Gypsum Board: 12 percent.

2. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

3. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI 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. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.

2. Sand surfaces that will be exposed to view, and dust off.

3. Prime edges, ends, faces, undersides, and backsides of wood.

4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI 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 both sides and edges of exterior doors and entire exposed surface of exterior door frames.

4. Paint entire exposed surface of window frames and sashes.

5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

6. 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.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

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.

3.5 CLEANING AND PROTECTION

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

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

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by 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.

3.6 EXTERIOR PAINTING SCHEDULE

A. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.

1. Latex System:

a. Prime Coat: Primer, latex for exterior wood.

1) S-W Exterior Latex Primer, B42, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

b. Intermediate Coat: Latex, exterior, matching topcoat.

c. Topcoat: Latex, exterior, satin:

1) S-W A-100 Exterior Latex Satin, A82 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

END OF SECTION