SECTION 04853

FULL VENEER STONE ASSEMBLIES

Click Here to download an amendable version.

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Solid masonry construction of base supported natural full stone veneer, set in cement mortar, with a structural back-up of masonry or metal lath on a structural backing.

B. Special decorative cut stone shapes for trim.

C. Installation of built-in accessories.

1.2 RELATED SECTIONS

A. Section 02950 - Landscape Stone.

B. Section 02780 - Exterior Stone Pavers.

C. Section 03300 - Cast-In-Place Concrete: Concrete Foundations.

D. Section 03300 - Cast-In-Place Concrete: Concrete supporting wall.

E. Section 04810 - Unit Masonry Assemblies: Masonry supporting wall.

F. Section 04852 - Thin Veneer Stone Assemblies: Thin cut veneer stone masonry.

G. Section 05120 - Structural Steel.

H. Section 05400 - Cold-Formed Metal Framing: Formed steel framed supporting wall.

I. Section 05500 - Metal Fabrications: Lintels, shelf angles, structural supports, anchors and other built-in components for building into stone veneer masonry by this section.

J. Section 06112 - Framing and Sheathing: Wood frame supporting wall.

K. Section 07620 - Sheet Metal Flashing and Trim.

L. Section 07650 - Flexible Flashing.

M. Section 07900 - Joint Sealers: Sealant for perimeter and control joints.

N. Section 09220 - Cement Plaster: Metal lath and scratch coat back-up over supporting walls.

1.3 REFERENCES

A. ASTM A 153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

B. ASTM A 580 - Standard Specification for Stainless Steel Wire.

C. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

D. ASTM C 91 - Standard Specification for Masonry Cement.

E. ASTM C 97 - Standard Specification for Absorption and Bulk Specific Gravity of Dimension Stone.

F. ASTM C 99 - Standard Specification for Modulus of Rupture of Dimension Stone.

G. ASTM C 144 - Aggregate for Masonry Mortar.

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

I. ASTM C 170 - Standard Specification for Compressive Strength of Dimension Stone.

J. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.

K. ASTM C 270 - Mortar for Unit Masonry.

L. ASTM C 568 - Standard Specification for Limestone Dimension Stone.

M. ASTM C 780 - Preconstruction Evaluation of Mortar for Plain & Reinforced Masonry.

N. ASTM C 880 - Standard Specification for Flexural Strength of Dimension Stone.

O. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures.

P. ACI 530.1/ASCE 6/TMS 602 - Specifications for Masonry Structures.

Q. National Concrete Masonry Association TEK 8-2A for masonry cleaning.

R. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures.

S. ACI 530.1/ASCE 6/TMS 602 - Specifications for Masonry Structures.

T. ACI 530.1/ASCE 6/TMS 602

U. AISC Specification for Structural Steel Buildings Allowable Stress Design, and Plastic Design.

V. AWS D1.1 - Structural Welding Code - Steel.

1.4 SYSTEM DESCRIPTION

A. Design Requirements: Perform Work in accordance with ACI 530/ASCE 5/TMS 402 Building Code Requirements for Masonry Structures, ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures and the applicable Building Code.

B. Design foundations, supporting walls, anchorage, spans, fastening, and joints under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

C. Design, fabricate, and install stonework to withstand normal loads from wind, gravity, movement of building structure, and thermally induced movement, as well as to resist deterioration under conditions of normal use including exposure to weather, without failure.

D. Design to carry the design loads with safety factors or allowable stresses as a minimum, in accordance with the following:
   1. Welds: Structural Welding Code (AWS D1.1 and AISC).
   2. Expansion Bolts: Per ICBO evaluation report for the specific bolt to be used.
   3. Design Loads: Design all panel and panel attachments to carry the following design loads

with appropriate safety factors:

a. Wind Loads: In accordance with the applicable code.
b. Seismic Loads: In accordance with the applicable code where applicable.
c. Vertical Loads:
    1) Dead Loads: Actual computed weight of panels and other stone work.
    2) Live Loads: In accordance with the applicable code.

E. Design, detail and fabricate connections to provide allowance for fabrication tolerances, erection tolerances, and structural deflections.

F. Design to include provisions to prevent galvanic and other forms of corrosion by insulating metals and other materials from direct contact with non-compatible materials, or by suitable coating.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.
4. Cleaning methods.

C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, with required environmental conditions, and admixture limitations.

D. Selection Samples: For each stone product specified, submit two samples, minimum size 48 inches (1216 mm) square, representing actual product, color, and texture.

E. Samples: Submit samples of mortar representing actual mortar color and color range.

F. Quarrier's Certificate: Certify stone properties and mortar mix will conform to specified requirements.

1.6 QUALIFICATIONS

A. Stone Quarrier: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Stone Masonry Company: Company specializing in performing Work of this section with minimum five years documented experience.

C. Qualify welding operators in accordance with AWS "Standard Qualification Procedure." Provide certification that each welder employed in the work is qualified for welding processes involved by having satisfactorily passed AWS qualification tests and, if applicable, by undergoing recertification.

1.7 QUALITY ASSURANCE

A. Stone Materials: Stone shall be standard grade, free of crack or seam which may impair its

structural integrity or function and shall comply with industry standards and practices specified.

B. Mock-Up: Provide a sample panel for evaluation of construction techniques, finishes and workmanship.
   1. Provide is location designated by Architect.
   2. Size: 8 feet by 8 feet (2.4 m by 2.4 m)
   3. Include stone types and sizes to be used and include a typical corner condition with special shapes and joint treatment.
   4. Clean the sample panel using the same materials and tools as planned for the final stone masonry construction.
   5. Do not proceed with remaining work until workmanship and color is approved by Architect.
   6. Sample panel will be used as a standard for the balance of the work.
   7. Remove sample panel at the completion of the work.
   8. Sample panel may be incorporated into the work.

C. Preconstruction Meetings: Conduct preconstruction meetings including the Architect, Contractor, stone masonry subcontractor, and the flashing subcontractor to verify project requirements, substrate conditions, manufacturer's installation instructions and other requirements. Comply with Division 1 requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store products on pallets, under cover and in manufacturer's unopened packaging until ready for installation.

B. All stone shall be received and unloaded at the site with necessary care in handling to avoid damaging or soiling.

C. Store stone materials on pallets on a dry level surface. Pallets shall not be stacked and shall be covered with tarps.

D. Store mortar under cover and in an area where temperature is maintained between 4 degrees C (40 degrees F) to 43 degrees C (110 degrees F).

1.9 PROJECT CONDITIONS

A. Hot and Cold Weather Requirements: In accordance with ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.

B. Ambient temperature shall be 40 degrees F (4.4 degrees C) or above during erection of stone masonry. When ambient temperature falls below 50 degrees F, mortar mixing water shall be heated.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Eden Stone Co. Inc., which is located at: W4520 Lime Rd. ; Eden, WI 53019-1108; Tel: 920-477-2521; Email: request info (schu@edenstone.net); Web: www.edenstone.net

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 VENEER STONE

A. Eden Dimensional Sawed Veneer – Splitface: Color: Light gray, slight buff, light buff increases slightly as it ages.
   1. Lengths: Random 8 to 36 inches (203 to 914 mm).
   2. Heights:
      a. 2-1/4 inches (57 mm).
      b. 5 inches (127 mm).
      c. 7-3/4 inches (197 mm).
      d. 10-1/2 inches (267 mm).
      e. 13-1/4 inches (337 mm).
   3. Thickness: 3-1/2 to 4-1/2 inches (89 to 114 mm) with some up to 5 inches (127 mm) maximum.
   4. Material shall conform to ASTM C 568 with the following properties:
      a. Maximum absorption rate of 0.40 percent when tested in accordance with ASTM C97.
      b. Minimum density of 170 lbs/cubic ft when tested in accordance with ASTM C97.
      c. Minimum compressive strength of 33,000 average psi when tested in accordance with ASTM C170.

B. Mountain Crest Dimensional Sawed Veneer - Splitface: Color: Various shades of gray.
   1. Lengths: Random 8 to 36 inches (203 to 914 mm).
   2. Heights:
      a. 2-1/4 inches (57 mm).
      b. 5 inches (127 mm).
      c. 7-3/4 inches (197 mm).
      d. 10-1/2 inches (267 mm).
      e. 13-1/4 inches (337 mm).
   3. Thickness: 3-1/2 to 4-1/2 inches (89 to 114 mm) with some up to 5 inches (127 mm) maximum.
   4. Material shall conform to ASTM C 568 with the following properties:
      a. Maximum absorption rate of 0.40 percent when tested in accordance with ASTM C97.
      b. Minimum density of 170 lbs/cubic ft when tested in accordance with ASTM C97.
      c. Minimum compressive strength of 33,000 average psi when tested in accordance with ASTM C170.

2.3 SPECIAL SHAPES

A. Provide special shapes as indicated on the Drawings and as follows:
   1. Quoins.
   2. Keystones.
   3. Edgestones.
   4. Cornerstones.
   5. Sills.
   6. Ledges.
   7. Medallions
   8. Other _____.

B. Stone shall be furnished in sizes indicated plus or minus 1/2 inch (12.5 mm). Materials shall conform to the properties specified for the materials specified.

C. Color shall be:
   1. Match the veneer stone.
   2. _____.

2.4 ACCESSORIES

A. Joint Reinforcement: As specified in Section _____.

B. Wall Ties: Formed steel wire, 22 gauge (0.73 mm) diameter, hot-dip galvanized to A 153, B2 finish:
   1. Eye and pintle type.
   2. Wall strap for bolted attachment to studs.
   3. Wire loop for embedment in back-up masonry.
   4. With provision for vertical adjustment after attachment.

C. Wall Ties: Formed steel wire, 22 gauge (0.73 mm) diameter, stainless steel conforming to ASTM A 580:
   1. Eye and pintle type.
   2. Wall strap for bolted attachment to studs.
   3. Wire loop for embedment in back-up masonry.
   4. With provision for vertical adjustment after attachment.

D. Other Anchors in Direct Contact with Stone: ASTM A 666, Type 304, stainless steel of sizes and configurations required for support of stone and applicable superimposed loads.

E. Plastic Tubing Weeps: Medium density polyethylene, outside diameter of 1/4 inch (6 mm) and of length required to extend between exterior face of stone and cavity behind.

F. Setting Shims: Lead, stainless steel, or plastic shims, non-staining to stone, sized to suit joint thicknesses and bed depths of stonework involved without intruding into required depths of joint sealants.

2.5 MORTAR

A. Masonry Cement: Complying with ASTM C 91:
   1. Type S.
   2. Type __.
   3. Color, gray.
   4. Color, white.
   5. Color _____.

B. Portland Cement: Complying with ASTM C 150:
   1. Type I.
   2. Type __.
   3. Color, gray.
   4. Color, white.
   5. Color _____.

C. Mortar Aggregate: Complying with ASTM C 144, standard masonry type.

D. Hydrated Lime: Complying with ASTM C 207:
   1. Type S.
   2. Type SA.
   3. Type N.
   4. Type NA.

E. Water: Clean and potable.

2.6 MIXES

A. Mortar Mixes:
   1. Mortar for Structural Masonry: Complying with ASTM C 270, using Proportion Specification.
      a. Type N.
      b. Type __.

B. Mortar Mixing:
   1. Mix mortar ingredients in accordance with ASTM C 270. Mix only in quantities needed for immediate use.
   2. Do not use anti-freeze compounds to lower freezing point of mortar.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until backing structure is plumb, bearing surfaces are level and substrates are clean and properly prepared.

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

C. Notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Stone must be water saturated, surface-dry when placed. Water down the stone 24 hours prior to placement until saturated. Reapply water to keep stone saturated as required by weather conditions.

B. Coordinate placement of reinforcement, anchors and accessories, flashings and other moisture control products supplied by other sections.

C. Clean all built-in items of loose rust, ice, mud, or other foreign matter before incorporating into the wall. All ferrous metal built into the wall shall be primed or galvanized.

D. If required, provide temporary bracing during installation of masonry work. Maintain bracing in place until building structure provides permanent support.

3.3 INSTALLATION

A. Install veneer stone and mortar in accordance with ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.

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

C. Pattern Bond:
   1. Lay stone with the bedface, splitface or weather edge exposed. Take care to avoid a concentration of any one color to any one wall surface.
   2. Maintain an approximate 1/2 inch (12.5 mm) joint, as stone allows.
   3. If a drystack installation is desired, stone is to be laid tight to one another, as the stone will naturally allow.
   4. Do not use stacked vertical joints.
   5. Lay out work in advance and distribute color range of stone uniformly over total work area.

D. Anchoring: Tie stone to backing as required by the applicable Building Code. As a minimum tie stone to backing with metal ties as follows:
   1. Provide minimum one tie per 2 square feet of wall surface area.
   2. Maximum spacing between adjacent ties shall be 16 inches vertically and 32 inches o.c. horizontally.
   3. Ties shall be imbedded in horizontal joints to a 2 inch minimum depth.
   4. Provide additional ties at openings within 12 inches of opening.

E. Joining Work: Where fresh masonry joints partially set masonry.
   1. Remove loose stone and mortar.
   2. Clean and lightly wet surface of set masonry.
   3. To avoid a horizontal run of masonry rack back 1/2 (12.5 mm) the length of stone in each course.
   4. Toothing is not permitted.

F. Joints:

1. Lay stone with an approximate 1/2 inch (12.5 mm) mortar joint, as stone allows.
2. Tool joints when "thumb-print" hard with a round jointer slightly larger than the width of the joint.
3. Trowel-point or concave tool exterior joints below grade.
4. Flush cut joints to be finished with a soft brush only.
5. Retempering or mortar is not permitted.
6. Use non-corrosive stone shims as required to maintain uniform joint thickness.

G. Flashing:
1. Clean surface of masonry smooth and remove any projections, which could damage flashings.
2. Place flashing on a bed of mortar.
3. Cover flashing with mortar.
4. Provide weep vents at head joints placed every 16 inches (406 mm) along the first course immediately above flashing or as recommended by weep vent manufacturer.
5. Use a non-corrosive, fluid conducting polymer mesh such as "Mortar Net", "Control Cavity", "CavClear" or equal to keep the air space behind the installed veneer stone, clear of mortar and mortar droppings.

H. Control and Expansion Joints: Keep joints open and free of debris. Coordinate control joint in accordance with Section 07900 for sealant performance.

I. Sealant Recesses: Provide open joint 3/4 inch (19 mm) deep and 1/4 inch (6 mm) wide, where masonry meets doors, windows and other exterior openings. Coordinate sealant joints in accordance with Section 07900 for sealant performance.

J. Cutting And Fitting: Cut and fit for chases, pipes, conduit, sleeves, grounds, and other penetrations and adjacent materials

3.4 FIELD QUALITY CONTROL

A. Test mortar and grout in accordance with Section 01110.

B. Testing of Mortar Mix: In accordance with ASTM C780, Annex A4, for mortar aggregate ratio and ASTM C 780, Annex A5, for mortar water content.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top of unfinished stone masonry work to protect it from the weather.

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

D. Prevent staining of stone from mortar, grout, sealants, and other sources. Immediately remove such materials from stone without damage to the stonework.

E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on

ground and over wall surface.

F. Protect sills, ledges and projections from droppings of mortar and sealants.

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

3.6 CLEANING

A. Clean exposed faces to remove dirt and stains which may be on units after erection and completion of joint treatments.

B. Wash and rinse in accordance with stone panel manufacturer's instruction.

C. Do not use cleaning materials or processes which could change the character of the exposed finishes.

3.7 SCHEDULES

END OF SECTION