STONE PRODUCTS INC./TEXAS LIMESTONE COMPANY

Tele: 972.695.6035
www.texaslimestonecompany.com
Email: stoneproducts@tlc-sp.com

ARCHITECTURAL SPECIFICATIONS FOR TEXAS LIMESTONE VENEER

SECTION 04853

MORTAR-PLACED STONE ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section includes solid masonry construction of base supported by natural full stone veneer, set in cement mortar, with a structural back-up of masonry or metal lath on a structural backing.
B. Section includes special decorative cut stone shapes for trim.
C. Section includes installation of built-in accessories.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete: Concrete Foundations.
B. Section 03300 - Cast-In-Place Concrete: Concrete supporting wall.
C. Section 04810 - Unit Masonry Assemblies: Masonry supporting wall.
D. Section 05500 - Metal Fabrications: Lintels, shelf angles, structural supports, anchors and other built-in components for building into stone masonry by this section.
E. Section 05400 - Cold-Formed Metal Framing: Formed steel framed supporting wall.
F. Section 06112 - Framing and Sheathing: Wood frame supporting wall.
G. Section 07620 - Sheet Metal Flashing and Trim.
H. Section 07900 - Joint Sealers: Sealant for perimeter and control joints.
I. Section 09220 - Cement Plaster: Metal lath and scratch coat back-up 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 144 - Aggregate for Masonry Mortar.
G. ASTM C 150 - Standard Specification for Portland Cement.
H. ASTM C 170 - Standard Specification for Compressive Strength of Dimension Stone.
I. ASTM C 270 - Mortar for Unit Masonry.
J. ASTM C 503 - Standard Specification for Marble Dimension Stone (Exterior).
K. ASTM C 568 - Standard Specification for Limestone Dimension Stone.
L. ASTM C 615 - Standard Specification for Granite 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.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

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.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
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 finished product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each finished product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Stone Products Inc./Texas Limestone Company specializes in manufacturing products specified in this section with a minimum of 25 years' documented experience.
B. Stone Products Inc./Texas Limestone Company qualifications: Company specializing in performing Work of this section with a minimum of 25 years' documented experience.
C. Mock-Up; Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Size: 48" x 48".
   2. Include all stone unit types and sizes to be used including a typical corner condition, special shapes and mortar joint treatment. Clean the sample panel using the same materials and tools as planned for the final stone masonry construction.
   3. Do not proceed with remaining work until workmanship and color is approved by Architect.
   4. Do not remove sample panel until construction activities of this section have been accepted by the Architect.
D. 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.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in the manufacturer's unopened packaging until ready for installation.
B. Store stone materials on pallets on a dry level surface. Pallets shall not be stacked and shall be covered with tarps.
C. Store mortar materials under cover and in an area where temperature is maintained between 40 degrees F to 110 degrees F.

1.8 PROJECT CONDITIONS

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

Ambient temperature should be 40 degrees F 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: Stone Products Inc./Texas Limestone Company.
B. www.texaslimestonecompany.com, Email: stoneproducts@tlc-sp.com, Tele.: 972.695.6035, Greg Kuiper, principal.
B. Substitutions: Not recommended.

2.2 FULL VENEER STONE

See **www.texaslimestonecompany.com** for colors, shapes, sizes and textures.

2.3 SPECIAL SHAPES

A. Provide special shapes as indicated on architectural drawings as follows:
   1. Quoins.
   2. Keystones.
   3. Window Surrounds
   4. Water Table
   5. Sills.
   6. Address Blocks
   7. Pier Caps
   8. Wall Caps
   9. Miscellaneous architectural pieces.
B. Material shall be furnished in sizes indicated plus or minus 1/2 inch. Material shall be as selected from the full veneer list above at **www.texaslimestonecompany.com**
C. Color shall be as selected from: **www.texaslimestonecompany.com**

2.4 ACCESSORIES

A. Wall Ties: Formed steel wire, 22 gage (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.
B. Wall Ties: Formed steel wire, 22 gage (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.
C. 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.

2.5 MORTAR

A. Masonry Cement: Complying with ASTM C 91:
   1. Type S.
   2. Color, gray is recommended
   3. Color, white is optional
B. Portland Cement: Complying with ASTM C 150:
   1. Type I.
   2. Color, gray is recommended
   3. Color, white is optional
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.
E. Water: Clean and potable.

2.6 MIXES

A. Mortar Mixes:
   1. Mortar for Structural Masonry: Complying with ASTM C 270, using Proportion Specification.
   2. Type S.
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 the freezing point of mortar.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify the Architect of unsatisfactory preparation before proceeding.
C. Do not begin installation until the backing structure is plumb, bearing surfaces are level and substrates are clean and properly prepared.
D. Verify that built-in items are in proper location, and ready for roughing into masonry.
E. Notify the Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. 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.
C. Coordinate placement of reinforcement, anchors and accessories, flashings and weep holes and other moisture control products supplied by other sections.
D. 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.
E. 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 masonry 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 the vertical and horizontal joints of uniform thickness.
C. Pattern Bond:
   1. Lay stone with the split-face, honed-face, or weather edge exposed. Take care to avoid a concentration of any one color to any one wall surface.
   2. Maintain an approximate 3/8 inch joint, as stone allows.
   3. Do not use stacked vertical joints.
   4. Lay out work in advance and distribute the 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 a minimum of 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 the length of stone in each course.

F. Joints:
   1. Lay stone with an approximate 3/8 inch mortar joint, as stone allows.

2. Tool joints when "thumbprint" 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 the surface of masonry smoothly and remove any projections, which could damage flashings.
2. Place flashing on a bed of mortar.
3. Cover flashing with mortar.
4. Provide weep hole vent devices at head joints placed every 16 inches 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 deep and 1/4 inch 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. Coordinate with other sections of work to provide correct size, shape, and location.

3.4 FIELD QUALITY CONTROL

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

B. Testing of Mortar Mix: In accordance with ASTM C 780, 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 the project.

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

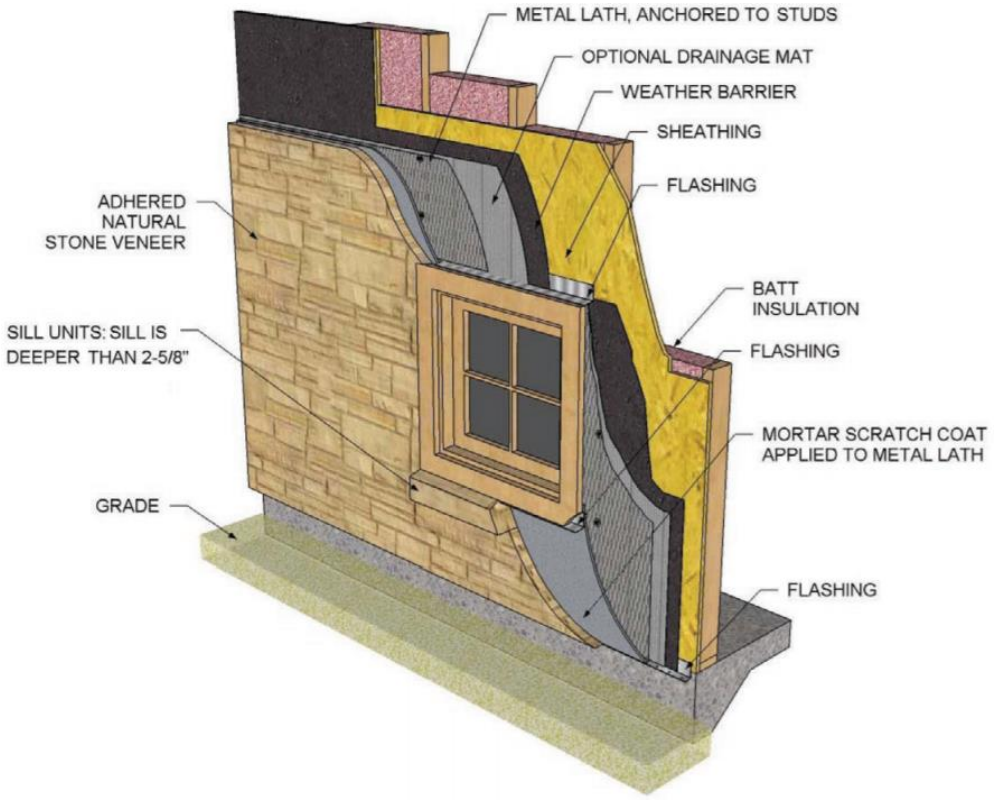
C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 CLEANING

A. Promptly remove excess wet mortar from the face of the stone as work progresses. Clean stone masonry with a stiff nylon (not metal) brush and clean water only.

END OF SECTION

Installation of Natural Thin Stone Veneer



Mortar Type

Type N or S mortar is used for installing natural thin stone veneer, depending upon the type of stone being installed. Check with the producer for a recommendation.

Bonding Admixtures

The use of a bonding admixture with the mortar is recommended to add bonding strength. Refer to the selected bonding agent instructions for suggested mixture quantities. Extra care should be taken when using bonding agents, since dropping can be difficult to remove once they cure. The use of an epoxy, thin set and/or construction adhesives should only be used in interior applications. Admixtures are necessary for all soffit or overhead conditions.

Once metal lath and the scratch coat have been applied, installation of the natural thin stone can proceed.

- When monolithic corner pieces are required for the application, start with the corners first.
- Most corner pieces will have a long end and a short end. These pieces should alternate in opposite directions, as they are stacked.
- The back of each stone should be covered 100% with a thickness of at least 3/8” of mortar.
- The stone should be pressed firmly against the scratch coat wall to ensure a sound bond.
- Grout joints can be filled with grout using a grout bag and/or a tuck pointing tool.
- Create control and movement joints in the thin veneer in the same places they exist in the structure.
- Tool the mortar joint with a round jointer when the mortar is thumbprint hard.

Thin veneer stone is lightweight and reduces production, shipping and construction costs, allowing greater affordability, installation versatility and real value when compared to artificial stone products.

Natural thin veneer stone can be installed quickly, without footings or ledges and adheres to concrete, plywood, paneling, drywall and metal. Monolithic, thin veneer stones are used in corner applications and conceal the true thickness of the stone. The overall result is an application that simulates traditional, full bed installations.

Thin veneer stone units should not weigh more than 15 psf.

Adhesion between the veneer units and the backup must have a shear strength of at least 50 psi, based on gross unit surface area when tested in accordance with ASTM C482.

Stone Products Inc./Texas Limestone Company
Mailing Address: 2810 Trinity Mills #209-339, Carrollton, Texas 75006
Office Phone: 972.695.6035
Email: stoneproducts@tlc-sp.com
Website: www.texaslimestonecompany.com

ASTM Values for Texas Limestone

Property	Test Requirements	Classifications	ASTM Test Method
Absorption by Weight, Max. %	**12%**	**I low-density**	**C 97**
	7.5%	**II medium density**	
	3%	**III high-density**	
Density, min. lbs/cf.	**110 lbs/cf.**	**I low-density**	**C 97**
	135 lbs/cf.	**II medium density**	
	160 lbs/cf.	**III high density**	
Compressive strength. min. psi	**1800 psi**	**I low-density**	**C 170**
	1400 psi	**II medium density**	
	8000 psi	**III high-density**	
Modulus of Rupture min. psi	**400 psi**	**I low-density**	**C 99**
	500 psi	**II medium density**	
	1000 psi	**III high-density**	
Abrasion Resistance, min. hardness	**10**	**I low-density**	**C 241**
	10	**II medium density**	
	10	**III high-density**	