

SECTION 092423 – PORTLAND CEMENT STUCCO**PART 1 - GENERAL****1.1 SECTION INCLUDES**

- A. Materials and installation of exterior stucco wall covering with air and water-resistive barrier (AWRB) for use on concrete, concrete masonry, and frame wall construction.

1.2 RELATED SECTIONS

- A. Section 072726 “Fluid-Applied Membrane Air Barriers”.
- B. Section 076200 “Sheet Metal Flashing and Trim”.
- C. Section 079200 “Joint Sealants”.

1.3 PROJECT REQUIREMENTS

- A. Work required in this section includes all components from the weather barrier (applied to sheathing - see Section 072110 “Continuous Insulated Wall Sheathing”) to the finish coat including the weather barrier, lath, scratch, brown and finish coats and associated primers, felts, fasteners, PVC accessories and crack suppression materials.
 - 1. The basis-of-design manufacturer of materials listed in this section is Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120. Atlanta, GA 30331. As such, their proprietary products are listed throughout the section. Products of equal physical characteristics, quality, appearance and function manufactured by one of the additional companies listed in “Part 2 – Products” under “Manufacturers” will be acceptable, subject to compliance with the specifications.
 - 2. All products will be from a single source, or as approved by the stucco manufacturer.

1.4 REFERENCED DOCUMENTS

Add/delete depending on specific project requirements

- A. ASTM Standards:
 - 1. A641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - 2. A653 Specification for Sheet Steel Zinc coated (Galvanized) by the Hot-Dip Process, Commercial Quality
 - 3. B69 Specification for Rolled Zinc
 - 4. C847 Standard Specification for Metal Lath
 - 5. C897 Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters
 - 6. C926 Standard Specification for Application of Portland Cement-Based Plaster
 - 7. C1063 Standard Specification for Installation of Lathing and Furring for Portland Cement Plaster
 - 8. C1861 Standard Specification for Lathing and Furring Accessories, and Fasteners, for Interior and Exterior Portland Cement-Based Plaster
 - 9. E96 Standard Test Methods for Water Vapor Transmission of Materials
 - 10. E283 Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
 - 11. E330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
 - 12. E331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 - 13. E783 Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
 - 14. E2178 Standard Test Method for Air Permeance of Building Materials

15. E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
16. F1667 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
17. G154 Recommended Practice for Operating Light-and Water-Exposure Apparatus
18. (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

B. ICC (International Code Council)

1. 2018 and 2021 IBC (International Building Code)
2. 2018 and 2021 IRC (international Residential Code)

C. ICC-ES (International Code Council Evaluation Service)

1. AC11, Cementitious Exterior Wall Coatings
2. AC38, Acceptance Criteria for Water-resistive Barriers
3. AC212, Acceptance Criteria for Water-resistive Coatings used as Water-resistive Barriers over Exterior Sheathing
4. ICC ESR-1233: StoGuard Air and Water-Resistive Barrier System and StoEnergy Guard (StoGuard with Continuous Insulation)
5. ICC ESR-2323: StoPowerwall One Coat Stucco System

D. IAPMO (International Association of Plumbing and Mechanical Officials)

1. IAPMO ER 2017: Structural No. 17 SFCR Twin Track 2.5
2. IAPMO ER 382: Western 1-Kote Exterior Stucco System

E. Sto Corp. Publications

1. Sto RapidGuard: Installation Guide
2. StoGuard Conformable Membrane: Installation Guide
3. StoPowerwall Design Guide and Detail Booklet

F. US EPA (United States Environmental Protection Agency)

1. 40 CFR Part 59 (Code of Federal Regulations Title 40 Part 59 – National Volatile Organic Compound Emission Standards for Consumer and Commercial Products)

1.5 DESIGN REQUIREMENTS

A. Structural (wind and axial loads)

1. Design for maximum allowable deflection, normal to the plane of the wall of L/360
2. Design for wind load in conformance with code requirements
3. Metal framing: minimum 18 gage, maximum 1-5/8-inch flange width, cold formed steel stud framing in conformance with AISI Standard S200-16
4. Maximum stud spacing: 16-inches on center
5. Sheathing: minimum 5/8-inch glass mat faced gypsum sheathing in conformance with ASTM C1177
6. Metal Lath: minimum 2.5 lb/yd² self-furred galvanized steel diamond mesh metal lath in conformance with ASTM C847 or equivalent self-furring welded wire lath
7. Lath fasteners:
 - a. Self-drilling corrosion resistant minimum 7/16-inch diameter round washer head screws in conformance with ASTM C954 with minimum 3/4-inch and three thread penetration through steel framing members
 - b. Self-piercing tapping corrosion resistant minimum 7/16-inch diameter round washer head screws in conformance with ASTM C1002 for wood studs with minimum 1-inch penetration into wood framing members
 - c. Minimum 3/8-inch corrosion resistant concrete stud nails in conformance with ASTM F1667 for solid substrates with minimum 3/4-inch penetration into solid concrete or CMU substrates
8. Lath fastener spacing: maximum 7-inches vertically along studs

9. Stucco: 7/8-inch StoPowerwall portland cement stucco in conformance with ASTM C926 of uniform thickness applied in two coats, scratch and brown coat.

B. Moisture Control

1. Prevent the accumulation of water into or behind the stucco, either by condensation or leakage into the wall construction, in the design and detailing of the wall assembly:
 - a. Provide corrosion resistant flashing to protect exposed elements and to direct water to the exterior, including, above window and door heads, beneath window and door sills, at floor lines, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.
 - b. Air Leakage Prevention-prevent excess air leakage in the design and detailing of the wall assembly. Provide continuity between air barrier components in the wall assembly, and connections or tie-ins with foundation and roof air barrier components.
 - c. Vapor Diffusion and Condensation - perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in hot, humid climates.
 - d. **Provide StoGuard air and water-resistive barrier over sheathing.**
 - e. Seal stucco terminations and accessory butt joints with appropriate sealant. Seal all penetrations through the stucco wall assembly with appropriate backer and sealant, as dictated by joint type.

C. Grade Condition

1. Do not specify stucco for use below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 4-inch clearance above earth grade, minimum 2-inch clearance above finished grade (pavers/sidewalk). Provide increased clearance in freeze/thaw climate zones.

D. Joints and Accessories

1. Provide two-piece expansion joints or back-to-back casing beads in the stucco system where building movement is anticipated: at joints in the substrate or supporting construction, where the system is to be installed over dissimilar construction or substrates, at changes in building height, at floor lines, at columns and cantilevered areas.
2. Provide one piece expansion joints every 144 ft². Cut and wire tie lath to the expansion joint accessory so lath is discontinuous at or beneath the accessory. Do not exceed length to width ratio of 2-1/2:1 in expansion joint layout and do not exceed more than 18 feet in any direction without an expansion joint.
3. Provide one piece expansion joints at through wall penetrations, for example, above and below doors or windows.
4. Provide minimum 1/2-inch wide joints where the system abuts windows, doors and other through wall penetrations.
5. Provide appropriate accessories at stucco terminations and joints.
6. Avoid the use of channel reveal accessories which can interfere with proper drainage and proper stress relief.
7. Provide appropriate sealant at stucco terminations and at stucco accessory butt joints.
8. Indicate location of joints, accessories and accessory type on architectural drawings.

E. Stucco Thickness (does not include primer or textured finish coat)

1. Application to Metal Plaster Bases: Stucco thickness shall be uniform 7/8-inch. Stucco thickness shall not exceed 7/8-inch.
2. Stucco shall be applied in 2 coats, scratch and brown coat, to achieve the prescribed thickness.
3. Thickness shall be uniform throughout the wall area.

1.6 PERFORMANCE REQUIREMENTS

A. Air and Water-Resistive Barrier

1. Coatings: Compliant with ICC ES Acceptance Criteria AC 212 (ICC ESR 1233)
2. Self-adhered Membranes: compliant with ICC ES Acceptance Criteria AC 38
3. Material Air Leakage Resistance, ASTM E 2178: less than 0.004 cfm/ft² at 1.57 psf
4. Assembly Air Leakage Resistance, ASTM E 2357: less than 0.04 cfm/ft² at 1.57 psf
5. Vapor Permeable: Water Vapor Permeance, ASTM E 96, Method B: greater than 10 perms
6. Vapor Impermeable: Water Vapor Permeance, ASTM E96, Method A: less than 0.1 perm
7. Surface Burning, ASTM E84: Flame Spread less than 25, Smoke Developed, less than 450, Class A Building Material
8. Coatings: VOC, calculation:
9. Less than 50 g/L:
 - a. Compliant with US EPA 40 CFR 59 for Waterproofing Sealer
 - b. Compliant with South Coast AQMD Rule 1113 for Building Envelope Coating

B. Stucco Base

Review and select one based on job conditions. Pre-blended stucco provides greater quality control than stucco concentrates by eliminating field mixing of sand at the job sit

1. Portland cement stucco pre-bend with properly graded sand in compliance with ASTM C926

C. Stucco Primers

Review and select one based on desired attributes. Refer to Product Bulletins for more detailed information

1. Alkaline resistant acrylic-based primer for freshly placed (minimum 4 day old) stucco surfaces with alkaline resistance up to pH13, Class A building material with VOC less than 50 g/L
2. Standard acrylic-based primer for fully cured (minimum 28 day old) or stucco surfaces with pH less than 10, Class A Building Material with VOC less than 50 g/L

D. Stucco Textured Finishes

Review and select one of the textured finishes based on desired attributes. Refer to Product Bulletins for more detailed information

1. Standard vapor permeable acrylic textured finish, Class A building material with VOC less than 50 g/L

1.7 SUBMITTALS

- A. Manufacturer's specifications, details, installation instructions and product data.
- B. Manufacturer's code compliance report for air and water-resistive barrier or supporting data
- C. Manufacturer's standard warranty
- D. Samples for approval as directed by architect or owner
- E. Fastener manufacturer's pull-out or withdrawal capacity for applicable substrates
- F. Prepare and submit project-specific details (when required by contract documents)

1.8 QUALITY ASSURANCE

A. Manufacturer requirements

1. Stucco and air barrier products manufacturer for a minimum of thirty (30) years.
2. Stucco finish products and air and water-resistive barrier products manufactured under ISO 9001 Quality System and 14001 Environmental Management System.

B. Contractor requirements

1. Licensed, insured and engaged in application of portland cement stucco for a minimum of three (3) years.
2. Knowledgeable in the proper use and handling of Sto materials.
3. Employ skilled mechanics who are experienced and knowledgeable in portland cement stucco application, and familiar with the requirements of the specified work.
4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.
5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.

C. Testing

1. Construct full-scale mock-up of typical stucco/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E283, E331 and E330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.
2. Conduct air barrier adhesion testing in accordance with ASTM D4541.
3. Conduct air barrier assembly testing in accordance with ASTM E783.
4. Verify adequacy of pull-out or withdrawal capacity of fasteners used for frame construction with manufacturer in relation to negative design wind pressures.
5. Conduct pH testing to check stucco surface alkalinity before application of primer or finish materials. Where alkaline resistant primer is used pH testing may be waived.
6. Conduct wet sealant adhesion testing in accordance with sealant manufacturer's field quality control test procedure.
7. Notify design professional minimum 7-days prior to testing.

D. Inspections

1. Provide independent third-party inspection where required by code or contract documents.
2. Conduct inspections in accordance with code requirements and contract documents.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32°C). Store away from direct sunlight.
- C. Protect portland cement-based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.
- D. Protect STPE products and sealant products from freezing and temperatures in excess of 90°F (32°C). Store away from direct sunlight and from sources of ignition.
- E. Handle and store all products as directed on labeling.

1.10 PROJECT/SITE CONDITIONS

Weather conditions affect application, drying time and curing requirements. Hot or dry conditions limit working time and accelerate drying and may require adjustments in application, scheduling and curing to achieve desired results; cool or damp conditions extend working time and retard drying (except for Sto STPE products which cure faster with moisture) and may require added measures of protection against wind, dust, dirt, rain and freezing

- A. Maintain ambient and surface temperatures above 40°F during application and for 24 hours after set of stucco, and during application and curing of air and water-resistive barrier and finish materials.
- B. Provide supplementary heat for installation in temperatures less than 40°F such that material temperatures are maintained as in 1.09A. Prevent concentration of heat on uncured stucco and vent fumes and other products of combustion to the outside to prevent contact with stucco.
- C. Prevent uneven or excessive evaporation of moisture from stucco during hot, dry or windy weather. For installation under any of these conditions provide special measures to properly moist cure the stucco. Do not install stucco if ambient temperatures are expected to rise above 100°F within a 24-hour period.
- D. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.11 COORDINATION/SCHEDULING

The work in this section requires close coordination with related sections and trades. Sequence work to provide protection of construction materials from weather deterioration and damage from trades

- A. Protect sheathing from climatic conditions to prevent weather damage
- B. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.
- C. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air barrier and continuous moisture protection. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing. Coordinate installation of air and water-resistive barrier components with window and door installation to provide weather proofing of the structure and to prevent moisture infiltration and excess air infiltration.
- D. Install window and door head flashing immediately after windows and doors are installed.
- E. Protect air and water-resistive barrier with paper or felt WRB within the period allowed by the manufacturer. Refer to manufacturer's published information. Protect paper or felt WRB from damage during construction
- F. Commence the stucco installation after completion of all floor and roof construction, and other construction that imposes dead loads on the walls to prevent excessive deflection (and potential cracking) of the stucco.
- G. Sequence interior work such as drywall installation prior to stucco installation to prevent stud distortion (and potential cracking) of the stucco.
- H. Provide site grading such that the stucco terminates above earth grade minimum 4-inches and above finished grade (pavers/sidewalk) minimum 2-inches. Provide increased clearance in freeze/thaw climate zones.
- I. Install copings and sealant immediately after installation of the stucco and when finish coatings are dry.
- J. Attach penetrations through stucco to structural support and provide air-tight and watertight seals at penetrations.

1.12 WARRANTY

- A. Provide manufacturer's standard warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Air and Water-Resistive Barrier, Portland Cement Stucco, Stucco Primers, Stucco Finishes, Joint Sealant
 - 1. Basis-of-Design: Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120. Atlanta, GA 30331.
 - 2. Subject to compliance with specifications, products of equal physical characteristics, quality, appearance and function, as manufactured by one of the following:

- a. Dryvit
- b. Finestone (LaHabra/Sika, USA)

2.2 AIR AND WATER-RESISTIVE BARRIER

A. StoGuard Detail Components:

1. Sto Gold Fill -- ready mixed acrylic based flexible joint treatment for rough opening protection, joint treatment of wall sheathing, CMU crack repair, and detail component for shiplap connections with flashing, weep screed, and similar ship lap details.
2. StoGuard Mesh -- nominal 4.2 oz/yd² (142 g/m²), self-adhesive, flexible, symmetrical, interlaced glass fiber mesh, with alkaline resistant coating for compatibility with Sto materials, used with Sto Gold Fill to reinforce rough openings, inside and outside corners, sheathing joints, and shiplap connections with flashing, weep screed, and similar shingle lap details
3. StoGuard Fabric -- nonwoven cloth reinforcement used with AWRB coating for rough opening protection, joint treatment of wall sheathing, and detail component for shiplap connections with flashing, weep screed, and similar shingle lap details. StoGuard Redicorner is a preformed fabric piece used in the corners of rough openings in tandem with StoGuard Fabric for quicker installation
4. StoGuard Conformable Membrane - self-adhered membrane flashing for use over prepared vertical above-grade concrete, concrete masonry, brick masonry, wood sheathing, glass mat gypsum sheathing, and cementitious sheathing used to: seal joints and seams in wall sheathing, seal static joints between dissimilar materials, flash exterior wall openings and protect rough openings, seal between window flange and wall sheathing, connect to above grade foundation waterproofing, connect to roof membrane, seal around wall penetrations such as pipes, scuppers, vents, cack masonry wall ties, seal dynamic joints in wall construction
5. Sto RapidGuard® - one component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle lap over flashing, wall to balcony floor slab or ceiling, and through wall penetrations – pipes, electrical boxes, and scupper penetrations

Note: verify adhesion to foundation waterproofing, roof membrane, and other proprietary substrates with lab and/or field adhesion tests

B. Air & Water-Resistive Barrier Coating

Choose one coating and select application by Substrate, Medium-Build, or High-Build as indicated

1. Sto Gold Coat: ready mixed vapor permeable air and water-resistive barrier coating applied,
 - a. By substrate as follows:
 - 1) Plywood: apply one coat at minimum 10 mils WFT
 - 2) CMU: apply two or three coats at minimum 20-60 mils WFT.
 - 3) Concrete: apply one coat at minimum 10 mils WFT

2.3 PAPER OR FELT WATER-RESISTIVE BARRIER

Supplied by others

- A. Minimum No. 15 asphalt saturated felt complying with ASTM D226, Type 1, or one layer of Grade D kraft building paper, or paper-backed stucco lath conforming with paragraph 2.04B.

2.4 LATH

Supplied by others

- A. Structalath SFCR Twin Track 2.5 self-furring welded wire lath. See IAPMO ER 2017.
- B. Minimum 2.5 lb./yd² self-furred galvanized steel diamond mesh metal lath in compliance with ASTM C847

Note: metal lath is susceptible to corrosion in coastal environments. Provide weather protection to prevent moisture entry into wall construction as outlined in Design Requirements Section 1.04B. Consider the use of stainless steel lath for coastal environments. Exercise care when attaching metal lath and accessories through the air and water-resistive barrier so that fasteners go into [not between] framing supports. Do not use power, powder-actuated or other fastening tools/methods that can damage the air and water-resistive barrier or substrate.

2.5 MECHANICAL FASTENERS FOR METAL LATH

Supplied by others

A. Non-corroding fasteners in compliance with ASTM C954, C1002, or F1667:

1. Self-drilling corrosion resistant minimum 7/16-inch diameter round washer head screws in conformance with ASTM C954 with minimum 3/4-inch and three thread penetration through steel framing members
2. Self-piercing tapping corrosion resistant minimum 7/16-inch diameter round washer head screws in conformance with ASTM C1002 for wood studs with minimum 1-inch penetration into wood framing members
3. Minimum 3/8-inch corrosion resistant concrete stub nails in conformance with ASTM F1667 for solid substrates with minimum 3/4-inch penetration into solid concrete or CMU substrates

Note: pull-out or withdrawal capacity of the selected fastener must be verified with respect to design wind loads, required safety factor and building code requirements. Consult applicable code compliance report for specific assemblies and fastening schedules or conduct project specific testing to verify compliance with design wind pressure requirements

B. Tie Wire—18 gauge galvanized and annealed low-carbon steel in compliance with ASTM A641 with Class I coating.

2.6 ACCESSORIES

Metal accessories supplied by others, select one type

- A. Plastic Accessories: Weep screed, casing bead, corner bead, corner lath, expansion and control joint accessories. All accessories shall meet the requirements of ASTM C1861 and its referenced documents.
- B. Manufactured from high-impact PVC in compliance with ASTM D1784, cell classification 13244C.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following (or approved equal):
 - a. Plastic Components, Inc.
 2. Cornerbeads: With perforated flanges.
 - a. Basis-of-Design: #1A (2 1/2" x 2 1/2" flange)
 - b. Smallnose cornerbead; use at outside corners as indicated on Drawings.
 3. Casing Beads: Square-edge style, with perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated. Provide beads with built-in moisture seal to seal against edges of doors, windows and dissimilar claddings in stucco applications
 - a. Basis-of-Design: #1078UCB.
 4. Control Joints: One-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on exposed face of control joint.
 - a. Basis-of-Design:
 - 1) #2178X for in-plane joints

2) #2078IC for inside corners

- C. All accessories shall have perforated or expanded flanges and shall be designed with grounds for the specified thickness of stucco.
- D. StoSeal® STPE joint sealant in conformance with ASTM C920: Type S, Grade NS, Use NT, A, M, Class 100/50

Note: metal accessories are susceptible to corrosion in coastal environments. Consider the use of zinc alloy or PVC accessories in these environments. Metal corner beads with solid metal noses are susceptible to corrosion in exposed exterior applications. Consider the use of several layers of woven-wire mesh or other corner accessories in lieu of corner bead and completely encase the metal in stucco. Care must be taken when attaching metal lath or other wall assembly components so that fasteners go into [not between] framing supports. Powder actuated or other fastening devices that can damage the air and water-resistive barrier, sheathing, or CI should be avoided. CAUTION: AVOID THE USE OF CHANNEL REVEAL ACCESSORIES THAT INTERFERE WITH PROPER DRAINAGE AND STRESS RELIEF.

2.7 JOB MIXED INGREDIENTS

Supplied by others

- A. Water: clean and potable.
- B. Sand: in compliance with ASTM C897 or C144, for use with ASTM C926 stucco concentrates

2.8 STUCCO

- A. 80102 StoPowerwall Stucco Pre-Blended: fiber reinforced portland cement stucco pre-blended with graded sand and in compliance with ASTM C96 and ICC AC11

2.9 CRACK DEFENSE

Sto Crack Defense is optional and uses the components listed below for added crack resistance

- A. Base Coat

Select one base coat material based on desired attributes. Refer to Product Bulletins for more detailed information.

1. Sto BTS Xtra - lightweight one component polymer modified cement-based extra high build base coat material
2. Sto BTS Plus - one component polymer modified cement-based high build base coat material
3. Sto Primer/Adhesive-B - one component polymer modified cement-based base coat material
4. Sto Primer/Adhesive – two component acrylic based base coat material field mixed with portland cement
5. Sto RFP – ready mixed non-cementitious fiber reinforced base coat material
6. StoArmat Classic Plus – ready mixed non-cementitious fiber reinforced high build base coat material
7. Sto Flexyl – two component fiber reinforced acrylic-based waterproof base coat material field mixed with portland cement (for use as a waterproof base coat to waterproof foundations, parapets, splash areas, trim and other projecting architectural features).

- B. Reinforcing Mesh

1. Sto Mesh - nominal 4.5 oz./yd², symmetrical, interlaced open-weave glass fiber mesh made with alkaline resistant coating for compatibility with Sto materials.

2.10 PRIMER

Optional component. Select one primer based on desired attributes. Refer to Product Bulletins for more detailed information.

- A. StoPrime Hot - acrylic-based primer/sealer for freshly placed (minimum 4 day old) and high pH stucco surfaces.
- B. StoPrime Sand - acrylic-based tinted, sanded primer for fully cured (minimum 28 day old or pH less than 10) stucco surfaces.
- C. StoPrime - acrylic-based tinted primer for fully cured (minimum 28 day old or pH less than 10) stucco surfaces.

Note: priming is recommended to provide uniform substrate absorption and finish color, to improve adhesion and water resistance, and to retard efflorescence. StoPrime Hot may be applied 48 hours after moist curing the brown coat. Other Sto primers require 28 days curing of brown coat or pH less than 10 before application.

2.11 FINISH

Select one or more as dictated by project design requirements

- A. StoPowerwall Finish - integrally colored, factory blended, flexible acrylic textured wall finish with graded marble aggregate.
- B. Sto Essence DPR Finish - integrally colored, factory blended, acrylic textured wall finish with graded marble aggregate

2.12 MIXING

- A. Mix all materials as directed by manufacturer in written instructions on product literature or packaging
- B. Do not add anti-freeze or other foreign ingredients unless instructed to do so in writing by the manufacturer
- C. When mixing stucco batches, only mix as much material as can readily be used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect sheathing surfaces for damage and deterioration. Record any areas of moisture damage. Inspect sheathing application for compliance with applicable requirement:
 - 1. Exterior Grade and Exposure 1 wood based sheathing—refer to APA Engineered Wood Association E 30.
- B. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and water-resistive barrier, or stucco installation to the General Contractor. Do not proceed with air and water-resistive barrier, or stucco installation until deviations are corrected.

3.2 SURFACE PREPARATION

- A. Concrete and Concrete Masonry (CMU): Remove surface contamination such as oil, grease, dust, dirt, algae, mildew, salts, paint or coatings. Correct weak surface conditions such as laitance. Use chemical cleaners such as TSP (trisodium phosphate) detergent to remove oil and grease and rinse with potable water. Use chemical cleaners to remove efflorescence or other surface contamination in accordance with manufacturer's written instructions. Use mechanical methods such as waterblasting, sandblasting, and wire brushing to remove weak surface conditions.
 - 1. Repair cracks up to 1/8-inch (3mm) wide by raking with a sharp tool to remove loose, friable material and blow clean with oil-free compressed air. Apply joint treatment material over crack, embed reinforcement (where applicable), and smooth joint treatment material with a trowel, drywall or putty knife to cover the reinforcement.
 - 2. Remove projecting fins, ridges, and mortar by mechanical means.
 - 3. Fill honeycombs, aggregate pockets, holes and other voids with Sto patching material.

4. Where the surface is excessively “rough” or out of plane, skim coat the wall surface with Sto base coat material to provide a smooth, level surface.

B. Sheathing

1. Remove surface contaminants and replace damaged sheathing.
2. All sheathing must be handled and installed in compliance with applicable building code and manufacturer requirements. Installed sheathing must be clean, dry and free from damage, frost, and all bond-inhibiting materials. Gap wood sheathing 1/8-inch (3mm) at joints. Should gaps exceed 1/8-inch up to 1/2-inch wide, use Sto RapidGuard to fill joints, or apply low expanding urethane foam into joints and rasp or shave flush with sheathing surface in preparation for installation of StoGuard joint treatment.
3. Spot surface defects in sheathing with joint treatment (Sto Gold Fill or Sto RapidGuard).
4. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and water-resistive barrier, ci, or stucco installation to the General Contractor. Do not proceed with air and water-resistive barrier, ci, or stucco installation until deviations are corrected.

3.3 AIR AND WATER-RESISTIVE BARRIER INSTALLATION

Important Note: the air and water-resistive barrier installation described below is one component of the air barrier assembly for the building envelope and the moisture protection of the wall construction. Installation of the air and water-resistive barrier must be integrated with other air and air and water-resistive barrier components in the construction. This requires coordination with other trades to ensure proper sequencing of work, to achieve air barrier continuity, and to direct rain water to the exterior, not into the wall assembly. Always protect rough openings in wall construction BEFORE installing windows, doors, louvers, etc. Where water is likely to penetrate the wall assembly, such as windows, flashing must be installed to direct water to the exterior at the leak source. Refer to Sto Guide Details as needed.

A. The following instructions are applicable to:

1. Exterior or Exposure I Plywood in compliance with PS-1

B. Transition Detailing: Detail transition areas with Sto RapidGuard (static joints and seams) or StoGuard Conformable Membrane (static and dynamic joints and seams) to achieve air barrier continuity. For illustrations of installation, refer to StoPowerwall ci Design Guide and Detail Booklet, Sto RapidGuard Installation Guide, and StoGuard Conformable Membrane Installation Guide (www.stocop.com)

C. Rough Opening Protection

Select one of the options below for frame construction; for concrete or concrete masonry rough openings with wood bucks and similar openings with complex 3-dimensional geometry, select Sto RapidGuard

1. Sto Gold Fill with StoGuard Mesh: apply 9-inch (229mm) wide StoGuard Mesh at rough openings. Immediately apply Sto Gold Fill by spray or trowel over the mesh and spread smooth with a trowel to completely cover the mesh (refer to StoPowerwall ci Design Guide and Detail Booklet).
2. Sto Gold Coat, Sto AirSeal, or StoGuard VaporSeal with StoGuard Fabric: apply coating liberally by spray or roller to corners of openings, immediately place StoGuard RediCorners in the wet coating, and apply additional coating over the RediCorners to completely embed them. After all corners have been completed apply coating liberally to the entire rough opening, immediately place StoGuard Fabric in the wet coating, smooth any wrinkles with a brush or roller, and apply additional coating over the fabric to completely embed it. Overlap all seams minimum 2-inches (51mm). Once completed topcoat with additional coating as needed to completely seal the surface. Allow to dry and inspect for pinholes or voids. If pinholes or voids are present, seal with additional coating or Sto RapidGuard.
3. Sto RapidGuard: apply a fillet bead of material with a caulking gun at interior corners inside the opening to seal jamb/sill and jamb/head seams. Then apply material in a zig-zag pattern along sill, jambs, and head to form a generous bead of material along the surface to be covered. Use a 6-inch (152 mm) wide

- plastic drywall knife or handheld spreader to spread the material to a uniform thickness of 12-20 mils (0.3-0.5 mm) before the material skins. Treat the entire rough opening surface in this manner and overlap onto the face of the sheathing 2-inches (51 mm) minimum all the way around.
4. StoGuard Conformable Membrane: install the membrane in conformance with manufacturer's written installation instructions (refer to StoGuard Conformable Membrane Installation Guide)

D. Sheathing Joint Treatment

Note: sheathing joint treatment is typically not required when working with StoShield SA (Self-Adhered) membranes. Select one of the options below

1. Sto Gold Fill with StoGuard Mesh: place 4-inch (102 mm) wide mesh centered along sheathing joints and minimum 9-inch (229 mm) wide mesh centered and folded at inside and outside corners. Immediately apply Sto Gold Fill by spray or trowel and spread smooth with a trowel to completely cover the mesh.
2. Sto AirSeal, Sto Gold Coat or StoGuard VaporSeal with StoGuard Fabric: apply coating liberally by spray or roller along sheathing joints and immediately place 4-inch (102mm) wide fabric centered over the joints into the wet coating, and 6-inch (152mm) wide fabric centered and folded at inside and outside corners into the wet coating. Smooth any wrinkles with a brush or roller and apply additional coating to completely embed the fabric. Overlap seams minimum 2-inches (51mm).
3. Sto RapidGuard: apply to properly installed sheathing – joints butted for gypsum sheathing, and joints gapped for plywood and OSB sheathings (wood-based sheathing typically requires 1/8-inch [3mm] spacing at edge and end joints). Apply a thick bead of Sto RapidGuard with a caulking gun along sheathing joints, or apply in a zig-zag pattern across and down the joints. Spread to a uniform thickness of 20-30mils (0.5-0.6 mm) before the material skins. Spread 1-inch (25mm) beyond the sheathing joint on each side. Follow the same procedure for inside and outside corners.
4. StoGuard Conformable Membrane: install the membrane in conformance with manufacturer's written installation instructions (refer to StoGuard Conformable Membrane Installation Guide)

E. Primary Air and Water-Resistive Barrier Installation

1. Coating: install the specified AWRB coating uniformly by spray or roller to the required wet film thickness. Refer to individual Product Bulletins for more detailed installation instructions.

F. Air and Water-Resistive Barrier Connections and Shingle Laps

1. Coordinate installation of connecting air barrier components with other trades to provide a continuous airtight membrane.
2. Coordinate installation of flashing and other moisture protection components with other trades to achieve complete moisture protection such that water is directed to the exterior, not into the wall assembly, and drained to the exterior at sources of leaks (windows, doors and similar penetrations through the wall assembly).
3. Splice-in head flashings above windows, doors, floor lines, roof/sidewall step flashing, and similar locations with StoGuard detail component to achieve shingle lap of the air and water-resistive barrier such that water is directed to the exterior.

Note: windows and doors are typically installed immediately following installation of the air and water-resistive barrier and work should be sequenced accordingly. Consult with window manufacturer for installation requirements to maintain air barrier continuity and for head, jamb, sill flashing and perimeter sealant requirements needed to prevent leaks into the wall assembly.

IMPORTANT: do not allow air and water-resistive barrier installation to remain exposed more than allowed by the manufacturer. Refer to product literature for the specific air barrier selected. Protect with continuous insulation promptly after installation.

3.4 PAPER OR FELT WATER-RESISTIVE BARRIER INSTALLATION

- A. Install in compliance with the applicable building code requirements for building paper. Lap paper over foundation weep screed attachment flange, floor line flashing, and window/door head flashings. Refer to Sto Guide Details at www.stocorp.com

Note: code requirements may vary. Always consult the applicable code and the manufacturer's code compliance report. Typically building paper in compliance with the code is lapped shingle style, upper courses over lower courses, by minimum 2-inches (51mm), with vertical laps of minimum 6-inches (150mm). Courses are staggered so that vertical joints do not align. Care must be taken to prevent tears in the paper and to limit penetrations to only those required for attachment. Flashing must be in place and properly integrated with the sheet WRB at sills, above windows and doors, at floor lines, decks and at roof/wall intersections such that water is directed to the exterior.

3.5 STUCCO INSTALLATION

- A. General: after satisfactory inspection of surfaces and correction of any deviations from specification requirements commence the stucco installation. Apply the stucco in discrete panels without interruption to avoid cold joints and differences in appearance. Abut wet stucco to set stucco at natural or architectural breaks in the wall such as expansion joints, pilasters, terminations, or changes in plane. Hot or dry conditions accelerate drying and moisture loss from stucco which can diminish strength and resistance to cracking. Under these conditions, adjustments in the application, scheduling and curing of stucco to prevent rapid loss of moisture are necessary to achieve a satisfactory stucco installation. Cold temperatures retard drying and strength gain and adjustments may have to be made in the application, scheduling and curing of stucco to prevent damage from frost and other trades. Do not install stucco during extremely hot, dry and/or windy conditions. Do not install stucco during freezing conditions or on frozen substrates. Do not install stucco onto grounds of accessories. Completely embed lath and flanges of accessories and completely cover fastener attachments with stucco. Moist cure stucco minimum 48 hours for optimum strength gain and resistance to cracking. Allow final stucco application to completely cure (minimum 28 days) before applying primer or finish or until pH of stucco surface is less than 10 (except in the case of StoPrime Hot which can be applied 48 hours after completing moist cure of stucco). The finished installation must be true, plumb and square. Should stucco get into control or expansion joints, remove the stucco from within the joint before the stucco sets. Refer to Sto Guide Details as needed.
- B. Installation over StoGuard:
 - 1. Weep Screed Installation: install foundation weep screed at the base of the wall securely to solid substrate or framing with the appropriate fastener. Locate foundation weep screed so that it overlaps the joint between the foundation and framing by a minimum of 1-inch (25mm). Locate the foundation weep screed nosing minimum 4-inches (100mm) above earth grade, 2-inches (51mm) above finished grade (paved surfaces, for example). Lap air and water-resistive barrier, sheet water-resistive barrier, and drainage mat over the weep screed attachment flange.

Weep screed may also be installed in conjunction with flashing and air and water-resistive barrier installation to facilitate shingle lapping of components at base of wall

- C. Casing Bead and Two-Piece Expansion Joint Installation: install casing beads at stucco terminations—doors, windows and other through wall penetrations. Install two-piece expansion joints (or back-to-back casing beads) at building expansion joints, thru-wall joints, where the stucco is to be installed over dissimilar construction or substrates, at changes in building height, at floor lines, columns, and cantilevered areas. Install full accessory pieces where possible and avoid small pieces. Seal adjoining pieces by embedding ends in sealant. Abut horizontal into vertical joint accessories (except where horizontal movement joints exist that prevent continuous vertical runs of accessories). Attach at no more than 7-inches (178mm) into solid substrate/framing with appropriate fasteners.

Note: refer to architectural drawings for joint locations and accessory type. Air and water-resistive barrier must be continuous behind joints and accessories – refer to Sto Guide Details.

- D. Lath Installation; for welded wire lath refer to Structa Wire Corp. TwinTrac Installation Guide and IAPMO ER 2017
- E. Diamond Mesh Metal Lath: conform to ASTM C1063
 - 1. General--install metal lath with the long dimension at right angles to structural framing (horizontally on solid substrates). Terminate lath at expansion joints. Do not install continuously at joints.
 - 2. Seams/Overlaps--overlap side seams minimum 1/2-inch (13mm) and end seams minimum 1-inch (25mm). Stagger end seams. Overlap casing beads and expansion joints minimum 1-inch (25 mm) over narrow wing accessories, minimum 2-inches (51mm) over expanded flange accessories. Do not install lath continuously beneath expansion joints.
 - 3. Attachment--fasten securely through sheathing into structural framing at 6-inches (152mm) on center maximum vertically and 16-inches (406mm) on center horizontally. Wire tie at no more than 9-inches (225mm) on center at: side laps, accessory overlaps, and where end laps occur between supports.

Note: the type fastener selected, its layout and pullout or withdrawal value from the supporting construction must be verified and approved by the project engineer/architect with respect to design wind load and local building code requirements. Exercise care when attaching metal lath and accessories through the air and water-resistive barrier so that fasteners go into [not between] framing supports. Do not use power, powder-actuated or other fastening tools/methods that can damage the air barrier, air and water-resistive barrier or substrate.

- F. Inside and Outside Corners: install corner lath at inside corners and corner bead at outside corners over lath. Attach through lath into solid substrate or framing at no more than 7-inches (178mm) on center with appropriate fasteners.
- G. Stucco Installation
 - 1. Scratch Coat: apply stucco with sufficient pressure to key into and embed the metal lath. Apply sufficient material, 3/8-inch or 1/2-inch, to cover the metal lath and to permit scoring the surface. Score the stucco upon completion of each panel in preparation for a second coat. Score horizontally.
 - 2. Brown Coat: as soon as the first coat is firm enough to receive the second coat without damage, apply the second coat. Alternatively, moist cure the first coat up to 48 hours and dampen the scratched surface with water immediately before applying the second coat. Apply the second coat with sufficient pressure to ensure intimate contact with the first coat and as needed to bring the stucco to a uniform thickness that matches the grounds of the accessories. Use a rod or straight edge to bring the surface to a true, even plane. Fill depressions in plane with stucco. Final thickness of stucco shall be uniform throughout the wall area and shall be either 3/4-inch or 7/8-inch as dictated by final design requirements, and shall not exceed 7/8-inch.
 - 3. After the stucco has become slightly firm float the surface lightly with a darby or wood float to densify the surface and to provide a smooth, even surface. The proper time to float is when the wood float no longer sticks to the surface of the stucco.
 - 4. Moist cure after the stucco has set by lightly fogging for at least 48 hours. Fog as frequently as required during the 48-hour period to prevent loss of moisture from the stucco. Avoid eroding the stucco surface with excess moisture. If relative humidity exceeds 75% the frequency of moist curing can be diminished.
- H. Crack Defense

Crack Defense is optional. It provides additional crack resistance to the stucco wall surface.

- 1. Apply base coat over the moist cured stucco with appropriate spray equipment or a stainless steel trowel to a uniform thickness of approximately 1/8-inch.
- 2. Work horizontally or vertically in strips of 40-inches, and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh.
- 3. Overlap mesh not less than 2-1/2 -inches at mesh seams and at overlaps of detail mesh. Feather seams and edges. Avoid wrinkles in the mesh.
- 4. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry.

5. Re-skim with additional base coat if mesh color is visible.
6. Do not install base coat or mesh over joints or accessories in the stucco wall assembly.

I. Primer Installation

Priming is optional. Priming is recommended to provide uniform substrate absorption and finish color, to improve adhesion and water resistance, and to retard efflorescence. StoPrime Hot may be applied 48 hours after moist curing the brown coat. Other Sto primers require 28 days curing of brown coat or pH less than 10 before application.

1. **StoPrime Hot**—Moist cure stucco for a minimum of 48 hours. Allow stucco to dry an additional 48 hours, then apply primer evenly with brush, roller or proper spray equipment over the clean, dry stucco and foam build-outs, and allow to dry. Final age of primed stucco application must be minimum 7 days before application of finish.
2. **StoPrime Sand**—Moist cure stucco for a minimum of 48 hours. Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Final age of primed stucco application must be minimum 28 days before application of finish or pH must be below 10.
3. **StoPrime**— Moist cure stucco for a minimum of 48 hours. Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Final age of primed stucco application must be minimum 28 days before application of finish or the pH must be below 10.

J. Finish Installation

1. **Sto Textured Finish:** apply finish to minimum 28-day old stucco or primed stucco and foam build-outs, or when pH of stucco surface is less than 10. If StoPrime Hot is used as the primer the primed stucco/foam build-out surfaces need only be minimum 7 days old. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:
 - a. Avoid application in direct sunlight.
 - b. Apply finish in a continuous application and work a wet edge towards the unfinished wall area. Work to an architectural break in the wall before stopping to avoid cold joints.
 - c. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results. Cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.
 - d. Do not install separate batches of finish side-by-side.
 - e. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.
 - f. Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.
 - g. Do not install finish over high pH (> 10) stucco surfaces or surfaces that have not been fully cured.

3.6 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them.
- B. Provide protection of installed stucco from dust, dirt, precipitation, and freezing.
- C. Provide protection of installed primer and finish from dust, dirt, precipitation, freezing and continuous high humidity until fully dry.
- D. Provide sealant and backer material at stucco terminations and at fixture penetrations through the stucco to protect against air, water and insect infiltration. Provide weeps at floor lines, window and door heads, and other areas to conduct water to the exterior.

3.7 CLEANING, REPAIR AND MAINTENANCE

- A. Clean and maintain the stucco finish for a fresh appearance and to prevent water entry into and behind the stucco. Repair cracks, impact damage, spalls or delamination promptly.
- B. Maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into the wall assembly.
- C. Refer to Sto reStore Repair and Maintenance Guide ([reStore Program](#)) for detailed information on stucco restoration - cleaning, repairs, recoating, resurfacing and refinishing, or re-cladding.

END OF SECTION 092423