



Building with conscience.

Sto Corp.

3800 Camp Creek Parkway
Building 1400, Suite 120
Atlanta, GA 30331
Tel: 404-346-3666
Toll Free: 1-800-221-2397
Fax: 404-346-3119
www.stocorp.com

**Sto Guide Specification 6450
StoPowerwall® DrainScreen® MVES
with Metal Plaster Base on Concrete, Concrete Masonry (CMU),
and Frame Wall Construction**

Section 09 24 23 – Portland Cement Stucco

This guide specification is intended for use by the design/construction professional and any user of Sto products to assist in developing project specifications for a stucco/adhered masonry veneer (AMV) wall assembly applied to code compliant concrete, concrete masonry, and frame wall construction. Notes in Italics, such as this one, are explanatory and intended to guide the design/construction professional and user in the proper selection and use of materials.

StoPowerwall DrainScreen MVES incorporates StoGuard air and water-resistive barrier, which functions in tandem with other compatible air barrier and flashing components of the building envelope to resist air and water infiltration. A code compliant asphalt saturated felt or paper WRB is included in the assembly and similarly functions in tandem with flashing to resist water infiltration. Sto DrainScreen creates a cavity behind the stucco cladding to promote drainage and drying of the wall assembly in the event of incidental water infiltration through the stucco.

StoPowerwall Stucco is an ASTM C926 compliant stucco and is applied over code compliant metal plaster base. StoColl adhesive mortar is applied over the properly cured stucco to install code compliant masonry veneer units. The StoPowerwall DrainScreen MVES System has been tested in accordance with NFPA 285 for use on noncombustible construction, and maintains the fire-resistance rating of hourly rated load bearing and non-load bearing concrete, concrete masonry, steel frame and wood frame base wall assembly designs.

Portland cement stucco has limitations, for example, efflorescence is a normal occurrence in portland cement-based materials and can affect final appearance of finish products installed over stucco. Some degree of cracking is normal in portland cement stucco and should be expected. Cracking is generally not caused by a material defect in the stucco and can be minimized by following sound design and construction practice such as the proper installation of lath, the proper incorporation of stress relief joints in the construction, properly graded sand for field mixed stucco, moist curing of the stucco after it has been applied, and proper sequencing of construction to avoid stresses in the freshly placed stucco.

StoPowerwall Drainscreen MVES, as with any exterior wall assembly, requires proper design detailing and integration with other components, in particular flashing and air barrier transition materials, to provide a wall assembly that resists air leakage and water infiltration. The weather protection afforded by StoPowerwall Drainscreen MVES should be evaluated by the design/construction professional in relation to building design, height, orientation, climate zone, and any other factors that affect the severity of exposure to rain and water infiltration. Refer to Sto Tech Hotline Nos. 0403-BSc, [Critical Detail Checklist for Wall Assemblies](#), 0603-BSc, [Moisture Control Principles for Design and Construction of Wall Assemblies](#), and 1001-BSc, [Effects of Temporary Heating on Construction Materials in Cold Weather](#). Modifications should be made to this specification as deemed necessary by the design/construction professional to ensure a watertight building envelope without water entry or accumulation anywhere within the wall assembly, an airtight building envelope, and control of condensation from water vapor diffusion. For complete technical information on Sto components and other reference materials, refer to product bulletins, guide details, and other technical information available at www.stocorp.com.

Other StoPowerwall Systems: refer to StoPowerwall ci specifications where continuous insulation is required. Where ci is not required and no drainage gap is required, refer to StoPowerwall specifications. Refer to StoPowerwall HVHZ System approvals where resistance to High Velocity Hurricane Zone wind is necessary, such as Miami-Dade County, FL. For complete technical information on StoPowerwall Stucco Systems, refer to the technical information available at www.stocorp.com.

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Materials and installation of exterior stucco/adhered masonry veneer (AMV) wall covering with air and water-resistive barrier (AWRB) and drainage, on concrete, concrete masonry, and frame wall construction.

1.02 RELATED SECTIONS

Add/delete, depending on specific project requirements

- A. Section 03 30 00 Cast-In-Place Concrete
- B. Section 04 20 00 Unit Masonry
- C. Section 04 42 00: Exterior Stone Cladding
- D. Section 04 71 00: Manufactured Brick Masonry
- E. Section 04 72 00: Cast Stone Masonry
- F. Section 06 16 00 Sheathing
- G. Section 07 26 00 Vapor Retarders
- H. Section 07 27 00 Air Barriers
- I. Section 07 50 00 Membrane Roofing
- J. Section 07 62 00 Sheet Metal Flashing and Trim
- K. Section 07 84 00 Firestopping
- L. Section 07 92 00 Joint Sealants
- M. Section 08 40 00 Entrances, Storefronts, and Curtain Walls
- N. Section 08 50 00 Windows

1.03 REFERENCED DOCUMENTS

Add/delete depending on specific project requirements

- A. ANSI Standards
 - 1. 118.7 Standard Specifications for High Performance Cement Grouts for Tile Installation
 - 2. 118.15 Standard Specifications for Improved Modified Dry-Set Cement Mortar
 - 3. 137.1 Standard Specifications for Ceramic Tile
- B. 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. C144 Specification for Aggregate for Masonry Mortar
5. C297 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
6. C578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
7. C612 Standard Specification for Mineral Fiber Block and Board Thermal Insulation
8. C847 Standard Specification for Metal Lath
9. C897 Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters
10. C920 Standard Specification for Elastomeric Joint Sealants
11. C926 Standard Specification for Application of Portland Cement-Based Plaster
12. C954 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84mm) to 0.112 in. (2.84mm) in thickness
13. C1002 Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
14. C1063 Standard Specification for Installation of Lathing and Furring for Portland Cement Plaster
15. C1088 Standard Specification for Thin Veneer Brick Units Made from Clay or Shale
16. C1177 Specification for Glass Mat Gypsum for Use as Sheathing
17. C1242 Standard Guide for Selection, Design, and Installation of Dimension Stone Attachment Systems
18. C1513 Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections
19. C1670 Standard Specification for Adhered Manufactured Stone Masonry Veneer Units
20. C1861 Standard Specification for Lathing and Furring Accessories, and Fasteners, for Interior and Exterior Portland Cement-Based Plaster
21. D226 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
22. D1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
23. D4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
24. E84 Test Method for Surface Burning Characteristics of Building Materials
25. E96 Standard Test Methods for Water Vapor Transmission of Materials
26. E283 Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
27. E330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
28. E331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
29. E783 Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
30. E2178 Standard Test Method for Air Permeance of Building Materials
31. E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
32. E2430 Standard Specification for Expanded Polystyrene ("EPS") Thermal Insulation Boards for Use in Exterior Insulation and Finish Systems ("EIFS")
33. F1677 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
34. G154 Recommended Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

B. APA Engineered Wood Association

1. PS 1 Voluntary Product Standard, Structural Plywood
2. PS 2 Performance Standard for Wood-Based Structural-Use Panels
3. E 30 APA Engineered Wood Construction Guide

- C. AISI (American Iron and Steel Institute)
 - 1. AISI S200-2016 North American Standard for Cold-Formed Steel Framing-General Provisions
- D. ICC (International Code Council)
 - 1. 2018 and 2021 IBC (International Building Code)
- E. 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
- F. IAPMO (International Association of Plumbing and Mechanical Officials)
 - 1. IAPMO ER 2017: Structalath No. 17 SFCR Twin Track 2.5
 - 2. IAPMO ER 382: Western 1-Kote Exterior Stucco System
- G. National Fire Protection Association (NFPA) Standards
 - 1. NFPA 285, Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus
 - 2. NFPA 268, Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source
- H. South Coast Air Quality Management District (South Coast AQMD)
 - 1. Rule 1113 (2019) – Building Envelope Coatings, Architectural Coatings
- I. Sto Corp. Publications
 - 1. Sto RapidGuard: Installation Guide
 - 2. StoGuard Conformable Membrane: Installation Guide
 - 3. StoPowerwall Drainscreen MVES Design Guide and Detail Booklet
 - 4. StoShield Self-Adhered Membranes : Installation Guide
 - 5. Sto Tech Hotline No. 0821-M, Quick Reference Guide on Adhered Masonry Veneers in Exterior Wall Construction
- J. 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)

1.04 DESIGN REQUIREMENTS

The system is intended for use on vertical above grade walls up to 6-stories or 50-ft (15.2m) in height, whichever is less, except for manufactured stone and natural stone, which are limited to 30-ft (10m). Refer to Sto Tech Hotline No. 0821-M, [Quick Reference Guide on Adhered Masonry Veneers in Exterior Wall Construction](#) for additional information. Some exceptions permitted based on individual project conditions.

A. Structural (wind and axial loads)

1. Design for maximum allowable deflection, normal to the plane of the wall of L/360, or stiffer when required by the veneer manufacturer, local building code, or design professional
2. Design for wind load in conformance with code requirements
3. Metal framing: minimum 18 gage (43 mils [1.09mm]), 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 (406mm) on center
5. Sheathing: minimum 5/8-inch (19mm) glass mat faced gypsum sheathing in conformance with ASTM C1177
6. Drainage mat: 1/4-inch or 3/8-inch (6mm or 10mm) thick tangled filament core with fabric facing
7. Metal Lath: minimum 2.5 lb/yd² (1.4kg/m²) self-furred galvanized steel diamond mesh metal lath in conformance with ASTM C847 or equivalent self-furring welded wire lath
8. Lath fasteners:
 - a. Self-drilling corrosion resistant minimum 7/16-inch (11mm) diameter round washer head screws in conformance with ASTM C954 with minimum 3/4-inch (19mm) and three thread penetration through steel framing members
 - b. Self-piercing tapping corrosion resistant minimum 7/16-inch (11mm) diameter round washer head screws in conformance with ASTM C1002 for wood studs with minimum 1-inch (25mm) penetration into wood framing members
 - c. Minimum 3/8-inch (10mm) corrosion resistant concrete stub nails in conformance with ASTM F1667 for solid substrates with minimum 3/4-inch (19mm) penetration into solid concrete or CMU substrates
9. Lath fastener spacing: maximum 6-inches (152mm) vertically along studs
10. Stucco: 3/4-inch (19mm) or 7/8-inch (22mm) 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. At through wall expansion joints and at joints formed with back-to-back casing beads, back joints with StoGuard Conformable Membrane. Refer to Sto Guide Details at www.stocorp.com.
 - f. Seal stucco/AMV 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/AMV for use below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 4-inch (100mm) clearance above earth grade, minimum 2-inch (51 mm) clearance above finished grade (pavers/sidewalk). Provide increased clearance in freeze/thaw climate zones.
- D. Sloped surfaces
1. Avoid the use of stucco/AMV on build-outs on weather exposed sloped and horizontal surfaces.
- E. Joints and Accessories
1. Provide two-piece expansion joints or back-to-back casing beads in the stucco/AMV 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. Where casing bead is used back-to-back as the expansion joint, back the joint with StoGuard Conformable Membrane.
 2. Provide one piece expansion joints every 144 ft² (13m²). 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 (5.5m) for thin brick, manufactured stone, or natural stone in any direction without an expansion joint, 12 feet (3.6m) for ceramic tile. Dark colored veneer units may require closer spacing due to increased thermal movement
 3. Where casing bead is used back-to-back as the expansion joint, back the joint with StoGuard Conformable Membrane.
 4. Provide one piece expansion joints at through wall penetrations, for example, above and below doors or windows.
 5. Provide minimum 1/2-inch (12mm) wide joints where the system abuts windows, doors and other through wall penetrations.
 6. Provide appropriate accessories at stucco/AMV terminations and joints.
 7. Avoid the use of channel reveal accessories which can interfere with proper drainage and proper stress relief.
 8. Provide appropriate sealant at stucco/AMV terminations and at stucco accessory butt joints.
 9. Indicate location of joints, accessories and accessory type on architectural drawings.
 10. Mortar Joints: must be grouted/pointed with ANSI 118.7 compliant grout/pointing mortar in accordance with manufacturer's instructions.
- F. Fire Protection
1. Noncombustible Type Construction:
 - a. Provide full width interior wall firestops at floor lines, typically 4 pcf (64kg/m³) semi-rigid mineral wool, where metal framing runs continuously past floor line
 - b. Provide exterior fireblocking where required by local code jurisdiction
 - c. Provide minimum 3/4-inch (19mm) uniform stucco thickness (exclusive of finish).
 2. Fire Resistant-Rated Wall Assemblies: provide minimum 3/4-inch (19mm) uniform stucco thickness based on the applicable fire-resistance rated test wall, base wall assembly design, building code or UL listed design.

Refer to ICC ESR 1233 for compliance with NFPA 285 and use on noncombustible wall construction. The StoPowerwall DrainScreen MVES System maintains the hourly fire-resistance rating of load bearing and non-load bearing concrete, concrete masonry, steel frame and wood frame base wall assembly designs. Other assemblies may also be rated with the StoPowerwall DrainScreen MVES System based on engineering judgements on file at Sto Corp. or by way of modeling or rational analysis applied to the particular assembly in question.

G. Stucco Thickness

1. Application to Metal Plaster Bases: stucco thickness shall be uniform ¾-inch or 7/8-inch (19mm or 22mm). Stucco thickness shall not exceed 7/8-inch (22mm).
 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.
- H. AMV Weight and Size Limits (based on IBC and IRC)
1. Maximum allowable weight: 15lb/ft² (70kg/m²) for thin brick, manufactured stone, and natural stone, 9lb/ft² (44kg/m²) for porcelain and ceramic tile
 2. Maximum size: refer to Sto Tech Hotline No. 0821-M, *Quick reference Guide on Adhered Masonry Veneers in Exterior Wall Construction*

1.05 PERFORMANCE REQUIREMENTS

- A. Air and Water-Resistive Barrier
1. Coatings: compliant with ICC ES Acceptance Criteria AC212
 2. Self-adhered Membranes: compliant with ICC ES Acceptance Criteria AC38
 3. Material Air Leakage Resistance, ASTM E 2178: less than 0.02 L/s·m² (0.004 cfm/ft² at 1.57 psf)
 4. Assembly Air Leakage Resistance, ASTM E 2357: less than 0.2 L/s·m² (0.04 cfm/ft² at 1.57 psf)
 5. Vapor Permeable: Water Vapor Permeance, ASTM E 96, Method B: greater than 10 perms [572 ng/(Pa·s·m²)]
 6. Vapor Impermeable: Water Vapor Permeance, ASTM E96, Method A: less than 0.1 perm [5.72 ng/(Pa·s·m²)]
 7. Surface Burning, ASTM E84: Flame Spread less than 25, Smoke Developed, less than 450, Class A Building Material
 8. Coatings: Tensile Adhesion, ASTM C297: greater than 15 psi (103kPa)
 9. Coatings: VOC 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. Drainage Mat
1. Surface Burning, ASTM E 84: Flame Spread less than 25, Smoke Developed less than 450, Class A Building Material
 2. Flame Propagation, NFPA 285: meets requirements for use on noncombustible construction, **Types I and II.**
- C. Stucco Base
- Select one 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 site.*
1. Portland cement stucco pre-bend with properly graded sand in compliance with ASTM C926
 2. Portland cement stucco concentrate in compliance with ASTM C926 and AC11 with field added sand in compliance with ASTM C897 or ASTM C144
 3. Portland cement stucco scratch and brown coat concentrate in compliance with ASTM C926 with field added sand in compliance with ASTM C897 or ASTM C144.
- D. Adhesive for Adhered Masonry Veneer
1. Polymer modified portland cement adhesive mortar in compliance with ANS 118.15
- E. Grout / Pointing Mortar for Adhered Masonry Veneer

1. Portland cement based grout/pointing mortar in compliance with ANSI 118.17
- F. Adhered Masonry Veneer
1. Thin brick in conformance with ASTM C1088
 2. Manufactured Stone in conformance with ASTM C1670
 3. Natural Stone in conformance with ASTM C1242
 4. Ceramic or PorcelainTile in conformance with ANSI 137.1

1.06 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 NFPA 285 assembly report or ICC ES Evaluation Report indicating compliance of stucco/AMV assembly, air and water-resistive barrier, and drainage mat, with requirements of NFPA 285 for use on noncombustible construction
- D. Manufacturer's standard warranty
- E. Veneer unit manufacturer's certificate of conformance with applicable ASTM standard and statement of suitability for use in applicable climate zone with three references of past projects in similar climates
- F. Samples for approval as directed by architect or owner
- G. Fastener manufacturer's pull-out or withdrawal capacity for applicable substrates
- H. Prepare and submit project-specific details (when required by contract documents)

1.07 QUALITY ASSURANCE

- A. Manufacturer requirements
 1. Stucco and air barrier products manufacturer for a minimum of thirty (30) years.
 2. Stucco, AMV adhesive, 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 and AMV 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/AMV 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/AMV/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. Conduct shear bond strength testing of veneer unit with adhesive mortar and verify bond strength in conformance with applicable code requirement
 5. Verify adequacy of pull-out or withdrawal capacity of fasteners used for frame construction with manufacturer in relation to negative design wind pressures.
 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.
- E. 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.

1.08 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.

1.09 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 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 (4°C) 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. Maintain ambient and surface temperatures between 45°F and 95°F (7.2°C and 35°C) during application and drying period of AMV adhesive for not less than 24 hours
- C. Provide supplementary heat for installation in temperatures less than 45°F (7.2°C) such that material temperatures are maintained as in 1.09A and 10.9B. Prevent concentration of heat on uncured stucco or AMV adhesive and vent fumes and other products of combustion to the outside to prevent contact with stucco.

- D. 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 (38°C) within a 24-hour period.
- E. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.10 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. Protect drainage mat with stucco cladding within 30 days of installation.
- G. 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.
- H. Sequence interior work such as drywall installation prior to stucco installation to prevent stud distortion (and potential cracking) of the stucco.
- I. Provide site grading such that the stucco/AMV terminates above earth grade minimum 4-inches (100 mm) and above finished grade (pavers/sidewalk) minimum 2-inches (51 mm). Provide increased clearance in freeze/thaw climate zones.
- J. Install copings and sealant immediately after installation of the stucco/AMV and when finish coatings are dry.
- K. Attach penetrations through stucco/AMV to structural support and provide air-tight and watertight seals at penetrations.

1.11 WARRANTY

- A. Provide manufacturer's standard warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Air and Water-Resistive Barrier, Drainage Mat, Portland Cement Stucco, AMV Adhesive Mortar, Joint Sealant

1. Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120. Atlanta, GA 30331

2.02 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 shingle 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 coatings 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, back 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:
 - Glass Mat Gypsum: apply one coat at minimum 10 mils WFT
 - Plywood: apply one coat at minimum 10 mils WFT
 - Cement Board: apply one coat at minimum 10 mils WFT
 - OSB: apply one or two coats at minimum 20 mils WFT. If applied by roller, apply two coats. Touch up any bare spots and raised OSB strands.
 - CMU: apply two or three coats at minimum 20-60 mils WFT.
 - Concrete: apply one coat at minimum 10 mils WFT
 - b. To a medium build in one or two coats to achieve minimum 20 mils WFT. If applied by roller apply two coats to achieve minimum 20 mils WFT. For CMU substrates apply two or three coats to achieve 20-60 mils WFT.

- c. To a high film build in two or three coats to achieve 40 mils WFT. If applied by roller apply three or more coats as needed. For CMU substrates apply multiple coats to achieve 40-60 mils WFT.
 2. Sto AirSeal: ready mixed vapor permeable air and water-resistive barrier coating applied,
 - a. By substrate as follows:
 - Glass Mat Gypsum: apply one coat at minimum 20 mils WFT
 - Cement Board: apply one coat at minimum 20 mils WFT
 - OSB: apply one or two coats at minimum 20 mils WFT. If applied by roller, apply two coats. Touch up any bare spots and raised OSB strands.
 - Plywood: apply one coat at minimum 20 mils WFT
 - CMU: apply two or three coats at minimum 20-65 mils WFT.
 - Concrete: apply one coat at minimum 20 mils WFT
 - b. To a Medium-Build in one or two coats to achieve minimum 40 mils WFT. If applied by roller apply two coats to achieve minimum 40 mils WFT. For CMU substrates apply two or three coats to achieve 40-65 mils WFT.
 - c. To a High-Build in one, two or three coats to achieve minimum 65 mils WFT. If applied by roller apply minimum three coats to achieve minimum 65 mils WFT.
 2. StoGuard VaporSeal: Class 1 vapor retarder coating for use over prepared vertical above-grade concrete, concrete masonry, brick masonry, wood sheathing, cementitious sheathing, and glass mat gypsum sheathing, applied by airless spray in one or two coats to achieve minimum 80 mils total WFT
- C. Silyl Terminated Polyether (STPE) Air & Water-Resistive Barrier
 1. Sto GoldSeal STPE: vapor permeable moisture cured STPE air and water-resistive barrier coating applied in one or two coats by spray or roller at minimum 15 mils WFT to prepared vertical above grade glass mat gypsum sheathing, wood-based sheathing – plywood and OSB – cement board, concrete, and concrete masonry (CMU) wall construction.
- D. Self-Adhered Air and Water-Resistive Barrier
 1. StoShield SA VP: self-adhered vapor permeable membrane for use over prepared vertical above-grade glass mat gypsum sheathing, wood-based sheathing – plywood and OSB – cementitious sheathing, concrete, and concrete masonry wall construction
 2. StoShield SA NP: self-adhered vapor impermeable membrane for use over prepared vertical above-grade glass mat gypsum sheathing, wood-based sheathing – plywood and OSB – cementitious sheathing, concrete, and concrete masonry wall construction

2.03 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 2.05B.

2.04 DRAINAGE MAT

Some building code jurisdictions require a 3/8-inch [10 mm] drainage gap. Check local codes and select Sto DrainScreen 10mm where required

- A. Sto DrainScreen 6mm – nominal 1/4-inch (6mm) tangled filament core drainage mat with fabric facing
- B. Sto DrainScreen 10mm – nominal 3/8-inch (10 mm) tangled filament core drainage mat with fabric facing

2.05 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 (1.4 kg/m²) 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.

2.06 MECHANICAL FASTENERS FOR METAL LATH

Supplied by others

- A. Non-corroding fasteners in compliance with ASTM C954, C1002, or F1667:
 - a. Self-drilling corrosion resistant minimum $\frac{7}{16}$ -inch (11mm) diameter round washer head screws in conformance with ASTM C954 with minimum $\frac{3}{4}$ -inch (19mm) and three thread penetration through steel framing members
 - b. Self-piercing tapping corrosion resistant minimum $\frac{7}{16}$ -inch (11mm) diameter round washer head screws in conformance with ASTM C1002 for wood studs with minimum 1-inch (25mm) penetration into wood framing members
 - c. Minimum $\frac{3}{8}$ -inch (10mm) corrosion resistant concrete stub nails in conformance with ASTM F1667 for solid substrates with minimum $\frac{3}{4}$ -inch (19mm) penetration into solid concrete or CMU substrates
- B. Tie Wire—18 gauge galvanized and annealed low-carbon steel in compliance with ASTM A641 with Class I coating.

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

2.07 ACCESSORIES

Metal accessories supplied by others, select one type

- A. 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
 - 1. PVC plastic in compliance with ASTM D1784, cell classification 13244C.
 - 2. Zinc in compliance with ASTM B69.
 - 3. Galvanized metal in compliance with ASTM A653 with G60 coating.
- B. All accessories shall have perforated or expanded flanges and shall be designed with grounds for the specified thickness of stucco.
- C. 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, or sheathing, should be avoided. CAUTION: AVOID THE USE OF CHANNEL REVEAL ACCESSORIES THAT INTERFERE WITH PROPER DRAINAGE AND STRESS RELIEF.

2.08 JOB MIXED INGREDIENTS

Supplied by others

- A. Water: clean and potable.
- B. Sand: in compliance with ASTM C897 or C 144, for use with ASTM C926 stucco concentrates

2.09 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
- B. 80103 StoPowerwall Stucco: fiber reinforced portland cement stucco concentrate in compliance with ASTM C926 and ICC AC11
- C. 80108 StoPowerwall Scratch & Brown: portland cement stucco concentrate in compliance with ASTM C926.

2.10 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 Primer/Adhesive – two component acrylic based base coat material field mixed with portland cement
 - 2. 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 (153 g/m²), symmetrical, interlaced open-weave glass fiber mesh made with alkaline resistant coating for compatibility with Sto materials.

2.11 AMV ADHESIVE

- A. StoColl – polymer modified portland cement adhesive mortar for thin brick, manufactured stone, thin natural stone, ceramic and porcelain tile

2.12 AMV GROUT / POINTING MORTAR

- A. Polymer modified portland cement grout / pointing mortar in conformance with ANSI 118.7

2.13 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

3.01 INSTALLATION

- A. Refer to manufacturers written instructions for installation of StoPowerwall DrainScreen MVES (see Appendix)

3.02 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 until they are fully dry
- C. Provide protection from construction damage.
- D. Provide sealant and backer material at stucco/AMV terminations and at fixture penetrations through the stucco/AMV 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.

3.03 CLEANING, REPAIR AND MAINTENANCE

- A. Maintain the finished wall surface for a fresh appearance and to prevent water entry into or behind the stucco/AMV assembly. Repair cracks, impact damage, spalls, or other damage promptly. Maintain other components of construction such as sealants, windows, doors, and flashing to prevent water entry into or behind the stucco/AMV assembly.
- 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.

APPENDIX

STOPOWERWALL DRAINSCREEN MVES INSTALLATION

INSTALLER QUALIFICATIONS

1. Applicators pre-qualify under Quality Assurance requirements of the specification (see section 1.07B of specification).

SUBSTRATES

1. Inspect sheathing surfaces for damage and deterioration. Record any areas of moisture damage. Inspect sheathing application for compliance with applicable requirement:

- Glass Mat Faced Gypsum Sheathing in compliance with ASTM C1177—refer to manufacturer's instructions and/or ICC evaluation report
- Exterior Grade and Exposure 1 wood based sheathing—refer to APA Engineered Wood Association E 30.

Note: sheathing attachment is often the determinant of ultimate wind load resistance. Verify attachment is sufficient to meet design wind pressure requirements. Wood-based sheathing must be gapped 1/8-inch (3mm) at edge and end joints to prevent cracking in the stucco.

2. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and water-resistive barrier, or stucco/AMV installation to the General Contractor. Do not proceed with air and water-resistive barrier, or stucco/AMV installation until deviations are corrected.

SURFACE PREPARATION

1. 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 water blasting, sandblasting, and wire brushing to remove weak surface conditions.

- 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.
- Remove projecting fins, ridges, and mortar by mechanical means.
- Fill honeycombs, aggregate pockets, holes and other voids with Sto patching material.
- 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.

2. Sheathing

- Remove surface contaminants and replace damaged sheathing.
- 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. Abut gypsum sheathing joints. Gap wood sheathing 1/8-inch (3mm) at joints. Should gaps exceed 1/8-inch (3 mm) up to 1/2-inch (13 mm) 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.
- Space fasteners no greater than 8 inches (203 mm) on center along framing members for gypsum sheathing and in accordance with code requirements for wood-based sheathing. Ensure fasteners are of sufficient length as identified in the specification for proper attachment to framing members.

- Spot surface defects in sheathing with joint treatment (Sto Gold Fill or Sto RapidGuard).
- Verify attachment and installation conforms with requirements for design wind pressures.
- Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and water-resistive barrier, or stucco/AMV installation to the General Contractor. Do not proceed with air and water-resistive barrier, or stucco/AMV installation until deviations are corrected.

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 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

1. The following instructions are applicable to:

- Exterior or Exposure I Plywood in compliance with PS-1
- OSB (Oriented Strand Board) in compliance with PS-1 or PS-2
- Glass Mat Faced Gypsum Sheathing in compliance with ASTM C1177

2. 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)

3. 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

- 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*).
- 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.
- 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.
- StoGuard Conformable Membrane: install the membrane in conformance with manufacturer's written installation instructions (refer to *StoGuard Conformable Membrane Installation Guide*)

4. 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

- 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.
- 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).
- 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.
- StoGuard Conformable Membrane: install the membrane in conformance with manufacturer's written installation instructions (refer to *StoGuard Conformable Membrane Installation Guide*)

5. Primary Air and Water-Resistive Barrier Installation

- 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.
- Self-Adhered Membrane: install the self-adhered membrane in shingle lap fashion following the manufacturer's written instructions. Refer to *StoShield SA Membrane Installation Guide* for detailed installation instructions.

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

- Coordinate installation of connecting air barrier components with other trades to provide a continuous airtight membrane.
- 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).
- 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.

PAPER OR FELT WATER-RESISTIVE BARRIER INSTALLATION

1. 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)

DRAINAGE MAT INSTALLATION

1. Place drainage mat against the wall surface and unroll horizontally with the fabric facing out. Hammer-tack or staple into continuous insulation with corrosion-resistant fasteners.
2. Use as few fasteners as needed to hold the mat in place, starting from the bottom of the wall at base flashing or weep screed and working up. Do not fasten through flashing.
3. Shingle lap fabric at horizontal courses. Shingle lap drainage mat over weep screeds, flashing at floor lines, decks, roof lines, window heads, and other areas where flashing is required, to direct water to the exterior.
4. Butt ends of rolls and vertical seams.
5. Trim around windows, doors, vents, or other penetrations through the wall. Do not install behind window nail flanges.

Immediately follow installation of drainage mat with stucco accessory and lath installation. Where stucco lath installation will not immediately follow installation of drainage mat, use corrosion-resistant cap nails, cap staples, or cap screws every 16-inches (406mm) on center along framing for more secure attachment. Cover drainage mat with metal lath within 30 days of installation.

STUCCO INSTALLATION

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.

Installation over StoGuard/Sto DrainScreen:

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

2. 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.

3. Lath Installation; for welded wire lath refer to Structa Wire Corp. TwinTrac Installation Guide and IAPMO ER 2017

Diamond Mesh Metal Lath: conform to ASTM C1063:

- 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.
- Seams/Overlaps--overlap side seams minimum 1½-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.
- 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.
- Paper-backed lath—follow installation as for diamond mesh metal lath. Lap lath over lath, not paper to lath overlap. For horizontal overlaps the paper backing must lap shingle style behind the lath-to-lath overlap.

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.

4. One Piece Expansion Joint Installation

- Install one piece expansion joints at through wall penetrations, for example, above and below doors and windows. Install one piece expansion joints at every 144 ft² (13 m²). Wire tie one piece expansion joints to lath at no more than 7-inches (178mm) on center. Seal adjoining pieces by embedding ends in sealant. Make certain lath is DISCONTINUOUS at or beneath joints.

5. 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.

6. Stucco Installation

- Scratch Coat: apply stucco with sufficient pressure to key into and embed the metal lath. Apply sufficient material, ¾-inch or ½-inch (9mm or 12mm), 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.
- 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 ¾-inch or 7/8-inch (19mm or 22mm) as dictated by final design requirements and shall not exceed 7/8-inch (22mm).
- 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.

- 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.

8. Crack Defense

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

- Apply base coat over the moist cured stucco with appropriate spray equipment or a stainless steel trowel to a uniform thickness of approximately $\frac{1}{8}$ -inch (3 mm).
- Work horizontally or vertically in strips of 40-inches (1016mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh.
- Overlap mesh not less than 2- $\frac{1}{2}$ -inches (64mm) at mesh seams and at overlaps of detail mesh. Feather seams and edges. Avoid wrinkles in the mesh.
- The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry.
- Re-skim with additional base coat if mesh color is visible.
- Do not install base coat or mesh over joints or accessories in the stucco wall assembly.

9. AMV Installation

- Mark layout lines in accordance with design plans and details, taking into account pattern (e.g., running bond, stacked bond, etc.), size of grout joints, location of expansion joints and other start and stopping points of the installation, and aesthetics.
- Use the proper size notched trowel for application:
 - Thin brick, thin stone, and ceramic tile units up to $\frac{5}{8}$ inch (16mm) thick: $\frac{1}{4} \times \frac{3}{8} \times \frac{1}{4}$ inch (6x10x6mm) square notched trowel.
 - AMV units up to 2- $\frac{5}{8}$ inch (67mm) thick: $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ inch (13x13x13mm) U-shaped or square notched trowel.
- Spread the adhesive with flat side of the trowel to "wet-out" the prepared substrate. Then use the notched side of the trowel to spread additional adhesive with ribbons of adhesive oriented horizontally. Apply in a small area and immediately install thin tile/brick/stone before a "skin" forms on the adhesive. If adhesive "skins," remove and discard the "skinned" adhesive, and re-apply fresh adhesive.
- Just prior to placing units "back-butter" the units by applying fresh adhesive onto the back of the units with the flat side of the trowel, or with a margin trowel:
 - Thin brick, thin stone, and ceramic tile units up to $\frac{5}{8}$ inch (16mm) thick: scrape the adhesive onto the back surface in a thin layer so it "wets out" the surface.
 - AMV units up to 2- $\frac{5}{8}$ inch (67mm) thick: clean and dampen the back surface with a wet sponge, then apply a nominal $\frac{1}{2}$ inch (13mm) layer of adhesive onto the back surface with the flat side of the trowel.
 - Immediately place units slightly offset from their final position in the freshly applied wall adhesive, then slide into place while applying firm pressure to fully bed the units in the adhesive so no voids exist in the adhesive. Use a straight edge to check for evenness of the surface when installing thin brick/stone/tile
- As units are placed, periodically remove a unit to verify full contact of adhesive with the substrate and the back of the unit, and full embedment (no voids) in the adhesive.
- Before the adhesive dries scrape out any excess mortar in the grout joints or on the surface of the units. Allow to cure for at least 7 days before grouting/pointing.
- Grouting/Pointing: Install ANSI 118.7 compliant grout or pointing mortar in conformance with the manufacturer's written instructions.

ATTENTION

Sto products are intended for use by qualified professional contractors, not consumers, as a component of a larger construction assembly as specified by a qualified design professional, general contractor or builder. They should be installed in accordance with those specifications and Sto's instructions. Sto Corp. disclaims all, and assumes no, liability for on-site inspections, for its products applied improperly, or by unqualified persons or entities, or as part of an improperly designed or constructed building, for the nonperformance of adjacent building components or assemblies, or for other construction activities beyond Sto's control. Improper use of Sto products or use as part of an improperly designed or constructed larger assembly or building may result in serious damage to Sto products, and to the structure of the building or its components. **STO CORP. DISCLAIMS ALL WARRANTIES EXPRESS OR IMPLIED EXCEPT FOR EXPLICIT LIMITED WRITTEN WARRANTIES ISSUED TO AND ACCEPTED BY BUILDING OWNERS IN ACCORDANCE WITH STO'S WARRANTY PROGRAMS WHICH ARE SUBJECT TO CHANGE FROM TIME TO TIME.** For the fullest, most current information on proper application, clean-up, mixing and other specifications and warranties, cautions and disclaimers, please refer to the Sto Corp. website, www.stocorp.com.