



Building with conscience.

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**Sto Guide Specification 6450  
StoPowerwall® DrainScreen® MVES  
for 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 wall assembly applied to code compliant concrete, concrete masonry, and frame wall construction. The stucco assembly incorporates a fluid applied Air and Water-resistive Barrier, code compliant paper or felt water-resistive barrier (WRB), drainage mat, code compliant metal plaster base, portland cement stucco, and adhesive for Adhered Masonry Veneer (AMV). The assembly complies with the IBC and IRC building code requirements for use on all Types (I-V) of 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.*

*StoGuard, the Air and Water-resistive Barrier component, 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 applied over StoGuard in wood or steel frame wall construction and similarly functions in tandem with flashing to resist water infiltration. Sto DrainScreen, the drainage mat, creates a cavity behind the stucco cladding to promote drainage and drying of the wall assembly in the event of incidental water infiltration through a crack in the stucco. StoPowerwall and Sto listed stuccos are ICC ES listed or ASTM C926 compliant portland cement stuccos. StoColl adhesive mortar applied over properly cured stucco completes the exterior stucco/AMV wall assembly.*

*Efflorescence is a normal occurrence in portland cement based products 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: proper installation of lath, proper incorporation of stress relief joints in the construction, properly graded sand for field mixed stucco, proper proportioning of stucco mix ingredients, use of the minimum amount of water in the stucco mix for placement and avoiding the use of excess water, 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 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, and 0603-BSc, Moisture Control Principles for Design and Construction of Wall Assemblies. 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](http://www.stocorp.com).*

*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. This specification should be modified where necessary to accommodate individual project conditions.*



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**PART 1 GENERAL****1.1 SUMMARY**

- A. This section includes materials and installation of exterior stucco/adhered masonry veneer (AMV) wall covering backed with Air and Water-resistive Barrier (AMB), water-resistive barrier (WRB), and drainage mat.

**1.2 RELATED SECTIONS**

*Add/delete, depending on specific project requirements*

- |    |                   |   |
|----|-------------------|---|
| A. | Section 03 30 00  | Cast-In-Place Concrete                    |
| B. | Section 04 22 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 92 00  | Joint Sealants                            |
| L. | Section 08 40 00  | Entrances, Storefronts, and Curtain Walls |
| M. | Section 08 50 00  | Windows                                   |

**1.3 REFERENCED DOCUMENTS**

*Add/delete depending on specific project requirements*

- |    |                 |   |
|----|-----------------|---|
| A. | ASTM Standards: |   |
|    | A641            | Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire                             |
|    | A653            | Specification for Sheet Steel Zinc coated (Galvanized) by the Hot-Dip Process, Commercial Quality |
|    | B69             | Specification for Rolled Zinc   |
|    | C144            | Specification for Aggregate for Masonry Mortar  |
|    | C297            | Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions                      |
|    | C847            | Standard Specification for Metal Lath   |
|    | C897            | Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters                 |
|    | C920            | Standard Specification for Elastomeric Joint Sealants   |
|    | C926            | Standard Specification for Application of Portland Cement-Based Plaster                           |

- |       |   |
|-------|---|
| C1063 | Standard Specification for Installation of Lathing and Furring for Portland Cement Plaster  |
| C1177 | Specification for Glass Mat Gypsum for Use as Sheathing   |
| C1513 | Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections   |
| D226  | Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing   |
| D1784 | Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds  |
| D4541 | Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers   |
| E84   | Test Method for Surface Burning Characteristics of Building Materials   |
| E96   | Standard Test Methods for Water Vapor Transmission of Materials   |
| E119  | Standard Test Methods for Fire Tests of Building Construction and Materials   |
| E283  | Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen |
| E330  | Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference                                       |
| E331  | Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference                        |
| E783  | Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors  |
| E2178 | Standard Test Method for Air Permeance of Building Materials  |
| E2357 | Standard Test Method for Determining Air Leakage of Air Barrier Assemblies  |
- B. AISI (American Iron and Steel Institute)
- |                |  |
|----------------|--|
| AISI S200-2007 | North American Standard for Cold-Formed Steel Framing-General Provisions |
|----------------|--|
- C. APA Engineered Wood Association
- |      |   |
|------|---|
| PS 1 | Voluntary Product Standard, Structural Plywood            |
| PS 2 | Performance Standard for Wood-Based Structural-Use Panels |
| E 30 | APA Engineered Wood Construction Guide                    |
- D. IAPMO (International Association of Plumbing and Mechanical Officials)
- |            |  |
|------------|--|
| UES 2017   | Structalath No. 17 III SFCR, No. 17 SFCR Twin Track 2.5, Structa Mega Lath, V-Truss Walls and Ceilings Lath, V-Truss Walls and Ceilings Lath II, Structlath III 316 SFCR, Structa Fusion One Coat Lath |
| UES ER 382 | Western 1-Kote Exterior Cementitious One-Coat Wall Coating System  |
- E. ICC (International Code Council)
- |     |   |
|-----|---|
| IBC | 2015 and 2018 IBC (International Building Code) |
|-----|---|
- F. ICC ES (International Code Council Evaluation Service)
- |              |   |
|--------------|---|
| AC 11        | Acceptance Criteria for Cementitious Exterior Wall Coatings   |
| AC 212       | Acceptance Criteria for Water-resistant Coatings used as Water-resistant Barriers over Exterior Sheathing |
| ICC ESR 1233 | StoGuard Air Barrier and Water-Resistive Barrier System   |
| ICC ESR 2323 | StoPowerwall and StoPowerwall NEXt Stucco Systems   |
- G. National Fire Protection Association (NFPA) Standards

- 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
- H. South Coast AQMD South Coast Air Quality Management District  
Rule 1113 (2016) Building Envelope Coatings
- I. Sto Corp. Addendum to Sto Stucco Specifications  
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)  
40 CFR Part 59 Code of Federal Regulations Title 40 Part 59 – National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

## 1.4 DESIGN REQUIREMENTS

- A. Fire Protection
1. Noncombustible Type Construction: provide full width firestops at floor lines, typically 4 pcf (64 kg/m<sup>3</sup>) semi-rigid mineral wool, where metal framing runs continuously past floor line and provide minimum ¾ inch (19 mm) uniform stucco thickness.
  2. Fire Resistance Rated Assemblies: refer to IBC and IRC for fire-resistance rated stucco wall assemblies. Also refer to ICC-ESR 2323 and IAPMO UES Report 382. StoPowerwall MVES does not detract from the hourly rating of listed assemblies.
- B. Wind Load and Building Height
1. Design for maximum allowable deflection of L/360, or stiffer when required by veneer manufacturer, local building code, or design professional. Maximum allowable stud spacing / minimum stud gauge: 16 inches (406mm) on center / 18 gauge. System is capable of achieving design pressures of: +65, -48 lb/ft<sup>2</sup> (+3.11 to -2.29 kPa). Ultimate wind load resistance depends on sheathing, sheathing attachment, and stiffness of supporting wall construction.
  2. Design for wind load in conformance with code requirements.
  3. The system is intended for use on vertical above grade walls up to 6-stories or 50ft (22m) 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.
- C. Moisture Control
1. Prevent the accumulation of water into or behind the stucco/AMV wall assembly, 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.

- c. Vapor Diffusion and Condensation – perform a dew point analysis and/or dynamic hygrothermal modeling 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 warm, humid climates.
  - d. Provide StoGuard Air and Water-resistive Barrier over sheathing, concrete and masonry.
  - e. At through wall expansion joints and at joints formed with back-to-back casing beads, back joints with StoGuard Transition Membrane. Refer to Sto Guide Details at [www.stocorp.com](http://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 sealant, or backer rod and sealant, as dictated by joint type.
- D. 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 (102mm) clearance above earth grade, minimum 2 inch (51mm) clearance above finished grade (pavers/sidewalk). Provide increased clearance in freeze/thaw climate zones.
- E. Sloped surfaces
1. Avoid the use of stucco/AMV on build-outs or on weather exposed sloped and horizontal surfaces.
- F. Joints and Accessories
1. Provide expansion joints where they exist in the supporting wall construction: expansion, control and cold joints, at changes in support construction (e.g., masonry to frame wall), at junctures with dissimilar construction, at different substrates, at floor lines and ceiling lines in multi-story wall construction, at changes in building height and other areas of stress concentration, and within areas of not greater than 144 ft<sup>2</sup> (13.4m<sup>2</sup>) with length or height not exceeding 12 ft (3.6m) for ceramic tile, and not more than 18 ft (5.5m) for brick or stone, and with length/height or height/length ratio not greater than 2-1/2 to 1. Dark colored veneer units may require closer spacing due to increased thermal movement. Consult with design professional. Do not bridge expansion joints, control joints, or cold joints in wall construction with adhered masonry veneer. Size joints to correspond with anticipated movement. Align terminating edges of stucco/AMV with joint edges of through wall expansion joints and similar joints in construction. Refer to Sto Detail Booklet.
  2. Provide minimum 1/2 inch (13 mm) wide perimeter sealant joints at all penetrations through the stucco/AMV assembly (windows, doors, mechanical, electrical, and plumbing penetrations, etc.).
  3. Provide joints so that air barrier continuity is maintained across the joint, and drain joints to the exterior, or provide other means to prevent or control water infiltration at joints
  4. Provide two-piece expansion joint accessories in the stucco/AMV assembly 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.
  5. Provide one piece expansion joint accessories every 144 ft<sup>2</sup> (13m<sup>2</sup>). Cut and wire tie lath to the expansion joint accessory so lath is discontinuous at or beneath the accessory. Where casing bead is used back-to-back as the expansion joint, back the joint with StoGuard Transition Membrane.
  6. Provide one-piece expansion joint accessories at through wall penetrations, for example, above and below doors or windows.



- a. 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. Mortar Joints: must be grouted/pointed except where permitted for manufactured stone (refer to Sto Tech Hotline No. 0821-M, *Quick Reference Guide on Adhered Masonry Veneers in Exterior Wall Construction*).
  - 10. Indicate location of joints, accessories and accessory type on architectural drawings.
- G. Solid Substrates (concrete and CMU)
- 1. Provide surface plane tolerance not to exceed ¼ inch in 10 feet (mm in 3.0 m).
  - 2. Concrete Masonry – provide open texture concrete masonry units with flush joints.
  - 3. Do not install Air and Water-resistive Barrier materials over efflorescence, weak surface conditions, painted, coated, non-absorbent, salt-contaminated, or any concrete or CMU substrate where adhesion is in question. Proof test adhesion to prepared poured-in-place or pre-cast concrete surfaces and impose a regimen of quality control tests to verify adhesion throughout the project.
- H. Stucco Thickness (does not include primer or textured finish coat)
- 1. Application to Metal Plaster Bases: stucco thickness shall be uniform ¾ inch or 7/8 inch (19 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.
- I. AMV Weight and Size Limits Based on IBC and IRC
- 1. Maximum allowable weight: 15 lb/ft<sup>2</sup> (70 kg/m<sup>2</sup>) for thin brick, manufactured stone, and natural stone, 9 lb/ft<sup>2</sup> (44 kg/m<sup>2</sup>) 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*

## 1.5 PERFORMANCE REQUIREMENTS

- A. Air and Water-resistive Barrier
- 1. Compliant with ICC ES Acceptance Criteria AC 212 (ICC ESR 1233)
  - 2. Material Air Leakage Resistance, ASTM E2178: less than 0.02 L/s·m<sup>2</sup> at 75 Pa (0.004 cfm/ft<sup>2</sup> at 1.57 psf)
  - 3. Assembly Air Leakage Resistance, ASTM E2357: less than 0.2 L/s·m<sup>2</sup> (0.04 cfm/ft<sup>2</sup> at 1.57 psf)
  - 4. Vapor Permeable, Water Vapor Permeance, ASTM E96, Method B: greater than 10 perms [573 ng/(Pa·s·m<sup>2</sup>)]
  - 5. Vapor Impermeable, Water Vapor Permeance, ASTM E96, Method B: less than 0.1perms [5.73 ng/(Pa·s·m<sup>2</sup>)]
  - 6. Surface Burning, ASTM E84: Flame Spread less than 25, Smoke Developed less than 450, Class A Building Material

7. Flame Propagation, NFPA 285: meets requirements for use on noncombustible (Types I,II,III, and IV) construction.
  8. Tensile Adhesion, ASTM C297:
    - a. Gypsum Sheathing, exceeds strength of substrate
    - b. Plywood, > 85 psi (590 kPa)
    - c. OSB, > 30 psi (206 kPa)
  9. VOC, calculation:
    - a. Less than 50 g/L
    - b. Compliant with US EPA 40 CFR 59 for waterproofing/sealer
    - c. 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 (Types I,II,III, and IV) construction (refer to ICC ESR 1233)
- C. Stucco Base *(select one)*
1. Stucco scratch and brown coat material in compliance with ASTM C926 and manufactured or listed by Sto Corp. (see Addendum)
  2. One coat stucco material in compliance with ICC AC 11, listed by ICC ES, and manufactured or listed by Sto Corp. (see Addendum)
- D. Adhesive for Adhered Masonry Veneer (AMV)
1. Polymer modified portland cement adhesive mortar
- E. Grout / Pointing Mortar for Adhered Masonry Veneer (AMV)
1. Portland cement-based grout / pointing mortar in compliance with ANSI 118.7

## 1.6 SUBMITTALS

- A. Manufacturer's guide specifications, guide details, installation instructions and product data
- B. Manufacturer's code compliance report for air barrier and water-resistive barrier
- C. Manufacturer's code compliance report for stucco where ICC listed one coat stucco is used
- D. Manufacturer's NFPA 285 stucco assembly report or ICC ESR indicating compliance of Air and Water-resistive Barrier and drainage mat with requirements of NFPA 285 for use on Types I, II, III, and IV construction
- E. Manufacturer's standard warranty
- F. Samples for approval as directed by architect or owner

- G. Fastener manufacturer's pull-out or withdrawal capacity testing for frame and solid substrates
- H. Prepare and submit project-specific details (when required by contract documents)

## 1.7 QUALITY ASSURANCE

- A. Manufacturer requirements
  - 1. Stucco and air barrier products manufacturer for a minimum of twenty (20) years.
  - 2. Air 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, ASTM E331 and ASTM 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 and AMV adhesion testing in accordance with ASTM D4541.
  - 3. Conduct adhesion testing to verify bond to prepared substrates in accordance with ASTM D4541. Conduct tests for the duration of the project at frequency and locations specified by design professional.
  - 4. Conduct air barrier assembly testing in accordance with ASTM E783.
  - 5. Conduct pull-out or withdrawal capacity testing of proposed fasteners for lath attachment into concrete or masonry and verify adequacy with respect to negative design wind pressure. Conduct sufficient tests such that reliable and predictable pull-out values are obtained. 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.
- 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.

## 1.8 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. Handle all products as directed on labeling.

## 1.9 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 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) and below 100 degrees F (38 degrees C) during application and drying period of AMB/Stucco products - not less than 24 hours
- B. Maintain ambient and surface temperatures between 45 and 85°F (7 and 29°C) during application and drying period of AMV adhesive – not less than 24 hours.
- C. Provide supplementary heat for installation in temperatures less than 40°F (4°C) for AMB/Stucco products, and less than 45°F (7°C) for AMV adhesive.
- 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 or AMV 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 until the installation of the Air and Water-resistive Barrier.
- 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 stucco within 180 days of installation.
- F. Protect drainage mat with stucco cladding within 30 days of installation.
- G. Commence the stucco installation after completion of all floor, 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 assembly 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 wall assembly.
- K. Attach penetrations through the wall assembly to structural support and provide airtight and watertight seals at penetrations.

### 1.11 WARRANTY

- A. Provide manufacturer's standard warranty.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Air and Water-resistive Barrier, Drainage Mat, Portland Cement Stucco, Stucco Primer and Finishes, AMV Adhesive, Joint Sealant
  - 1. Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120. Atlanta, GA 30331

### 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 shi lap connections with flashing, weep screed, and similar ship lap details.
  - 2. Sto Gold Coat® -- ready mixed vapor permeable Air and Water-resistive Barrier coating
  - 3. StoAirSeal® -- ready mixed vapor permeable high elongation Air and Water-resistive Barrier coating
  - 4. StoGuard® VaporSeal® -- ready mixed vapor impermeable high elongation Air and Water-resistive Barrier coating

5. StoGuard Mesh-- nominal 4.2 oz/yd<sup>2</sup> (142 g/m<sup>2</sup>), 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 detail component for shiplap connections with flashing, weep screed, and similar shingle lap details
6. StoGuard Fabric – nonwoven cloth reinforcement used with Sto Gold Coat or Sto Air Seal for rough opening protection, joint treatment of wall sheathing, and detail component for shiplap connections with flashing, weep screed, and similar shingle lap details
7. StoGuard RediCorner – a preformed fabric piece used in the corners of rough openings in tandem with StoGuard Fabric for quicker installation
8. StoGuard Tape – self adhering rubberized asphalt tape for rough opening protection in wood or metal frame construction
9. StoGuard Primer – primer for use with StoGuard Tape
10. 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
11. 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

*Choose one coating and select application by substrate (B1a, B2a, or B3), Medium-Build (B1b, B2b, or B3), or High-Build (B1c, B2c, or B3) as indicated*

#### B. Air & Water-Resistive Barrier Coating

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-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
    - Plywood: 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.
    - 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).
3. 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

## 2.3 WATER-RESISTIVE BARRIER

*Supplied by others*

- A. Minimum No. 15 asphalt saturated felt complying with ASTM D 226, Type 1, or one layer of Grade D kraft building paper, or paper-backed stucco lath conforming to 2.5.

## 2.4 DRAINAGE MAT

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

- A. Sto DrainScreen 6mm – nominal ¼" (6mm) tangled filament nylon core drainage mat with fabric facing.
- B. Sto DrainScreen 10mm – nominal 3/8" (10mm) tangled filament nylon core drainage mat with fabric facing.

## 2.5 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./yd<sup>2</sup> (1.4 kg/m<sup>2</sup>) 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 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, water-resistive barrier, or substrate).*

## 2.6 MECHANICAL FASTENERS

*Supplied by others*

- A. Non-corroding fasteners in compliance with AISI S200 – 2007 and ASTM C 1513:
  - 1. Wood Framing--minimum 11 gauge, 7/16 inch (11mm) diameter head galvanized roofing nails with minimum ¾ inch (19mm) penetration into studs or minimum #8 Type S wafer head fully threaded corrosion resistant screws with minimum ¾ inch (19mm) penetration into studs.
  - 2. Steel Framing – minimum #8 Type S or S-12 wafer head fully threaded corrosion resistant screws with minimum 3/8 inch (10mm) and three thread penetration into studs.
  - 3. Concrete or Masonry – minimum # 8 wafer head fully threaded corrosion resistant screws for masonry with minimum 1 inch (25mm) penetration into substrate.

*NOTE: Pull-out or withdrawal capacity of the selected fastener must be verified with respect to anticipated wind load, desired 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 A 641 with Class I coating.

## 2.7 ACCESSORIES

*Supplied by others*

- A. Weep screed, casing bead, corner bead, corner lath, expansion and control joint accessories. All accessories shall meet the requirements of ASTM C1063 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 D920: 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 water-resistive barrier or sheathing*



*should be avoided. CAUTION: AVOID THE USE OF CHANNEL REVEAL ACCESSORIES THAT INTERFERE WITH PROPER DRAINAGE OR STRESS RELIEF.*

## 2.8 JOB MIXED INGREDIENTS

*Supplied by others*

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

## 2.9 STUCCO

*Refer to Addendum for other stucco products that may apply*

- A. 102 StoPowerwall Stucco Pre-Blended: fiber reinforced one coat portland cement stucco pre-blended with graded sand, and in compliance with ICC AC 11. See ICC ESR 2323 or IAPMO UES 308.
- B. 103 StoPowerwall Stucco: fiber reinforced one coat portland cement stucco concentrate in compliance with ICC AC 11. See ICC ESR 2323 or IAPMO UES 308.
- C. 108 Powerwall Scratch & Brown: portland cement-based stucco concentrate in compliance with ASTM C926.
- D. Other code compliant portland cement stucco as listed by Sto Corp. (refer to Addendum)

## 2.10 CRACK DEFENSE

*Optional components for added crack resistance*

- A. Base Coat (*select one*)
  - 1. Sto Primer/Adhesive – two component acrylic-based base coat material field mixed with portland cement
- B. Reinforcing Mesh
  - 1. Sto Mesh – nominal 4.5 oz./yd<sup>2</sup> (153 g/m<sup>2</sup>), 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 AMV

## 2.12 AMV GROUT / POINTING MORTAR

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

*Supplied by others*

## 2.13 ADHERED MASONRY VENER

- A. Thin brick, thin stone, ceramic tile, or cultured stone in conformance with applicable building code requirements.

## 2.14 MIXING

- A. StoGuard
  - 1. Sto Gold Fill – mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with water.
  - 2. Sto Gold Coat – mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with water.
  - 3. Sto AirSeal – mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with water
  - 4. StoGuard VaporSeal – mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with water
- B. StoPowerwall Stucco
  - 1. Refer to mix instructions on packaging. USE ONLY THE AMOUNT OF WATER NECESSARY FOR A WORKABLE MIX. Use of excess water is detrimental to performance.
- C. Base Coat for Sto Crack Defense:
  - 1. Sto Primer/Adhesive - mix ratio with portland cement is 1:1 by volume. Pour Sto Primer/Adhesive into a clean mixing pail. Add portland cement, mix to a uniform consistency and allow to set for approximately five minutes. Adjust mix if necessary by adding up to 8 fluid ounces (0.24L) of water per pail and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent.
- D. Adhesive for AMV
  - 1. StoColl - mix ratio with water: 8.5 quarts (8.1L) potable water to one 55 lb. (25kg) bag of adhesive. Mix with a slow speed electric drill and paddle. Pour water into a clean mixing container. Mix while slowly adding the product to the water. Mix for approximately 2 minutes, allow to set for approximately 5 minutes, then re-mix for approximately 30 seconds to achieve a uniform, lump-free consistency. Avoid retempering. Do not overmix. Keep mix ratio consistent.
- E. Grout / Pointing Mortar
  - 1. Mix in conformance with manufacturer's written instructions
- F. Mix only as much material as can readily be used.
- G. Do not add lime, anti-freeze compounds, or other additives to any of the materials.

## PART 3 EXECUTION

### 3.1 ACCEPTABLE INSTALLERS

- A. Pre-qualify under Quality Assurance requirements of this specification (section 1.7B).

### 3.2 EXAMINATION

- A. Inspect surfaces for:
- B. Contamination – algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances.
- C. Surface absorption and chalkiness.
- D. Crack – measure crack width and record location of cracks.
- E. Damage and deterioration.
- F. Moisture damage – record any areas of moisture damage.
- G. Inspect sheathing application for compliance with applicable requirement:
- H. Glass Mat Faced Gypsum Sheathing in compliance with ASTM C1177 – refer to manufacturer’s instructions and/or ICC evaluation report
- I. Exterior Grade and Exposure 1 wood based sheathing – APA Engineered Wood Association E 30.

*NOTE: Sheathing attachment can determine ultimate wind load resistance. Verify attachment in conformance with design wind pressure requirements through analysis and/or project specific testing. Wood-based sheathing must be gapped 1/8 inch (3mm) at edge and end joints to prevent cracking in the stucco.*

- J. 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.

### 3.3 SURFACE PREPARATION

- A. Concrete and Concrete Masonry (CMU)
  - 1. 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.
  - 2. 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.
  - 3. Remove projecting fins, ridges, and mortar by mechanical means.
  - 4. Fill honeycombs, aggregate pockets, holes and other voids with Sto patching material.
  - 5. 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 (up to 1/8 inch [3mm] thick). For deeper patches and repairs fill, patch, or repair with Sto Leveler and Skim Coat (up to ¼ inch [6mm] thick) or other Sto repair mortar as needed for the depth of repair.

- 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/or 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 (3 mm) at joints. Should gaps exceed 1/8 inch (3 mm) up to 1/2 inch (13 mm) wide, use Sto RapidGuard, 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, Sto RapidGuard, or Sto Gold Coat).

### 3.4 AIR AND WATER-RESISTIVE BARRIER INSTALLATION

*Refer to Sto Guide Details as needed*

*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 rainwater 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.*

- A. The following instructions are applicable to:
  - 1. Exterior or Exposure I Plywood in compliance with PS-1
  - 2. OSB (Oriented Strand Board) in compliance with PS-1 or PS-2
  - 3. Glass Mat Faced Gypsum Sheathing in compliance with ASTM C1177
  - 4. Concrete and Concrete Masonry surfaces
- B. Transition Detailing
  - 1. Detail transition areas with Sto RapidGuard (static joints and seams) or StoGuard Conformable Membrane (dynamic joints and seams) to achieve air barrier continuity. For illustrations of installation, refer to Sto Guide Details, Sto RapidGuard Installation Guide, and StoGuard Conformable Membrane Installation Guide at ([www.stocorp.com](http://www.stocorp.com)).
- C. Rough Opening Protection (*select 1, 2, or 3 for frame construction; for concrete or concrete masonry rough openings with wood bucks and similar openings with complex 3-dimensional geometry, select no. 3, 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 with a trowel to create a smooth surface that completely covers the mesh (refer to Sto Detail 20.20M).
  - 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 top coat 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. 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 (152mm) wide plastic drywall knife to spread the material to a uniform thickness of 12-20 mils (0.3-0.5mm) before the material skins. Treat the entire rough opening surface in this manner and overlap onto the face of the sheathing 2 inches (51mm) minimum all the way around
  4. StoGuard Conformable Membrane – install the membrane in conformance with manufacturer’s written instructions.
- D. Sheathing Joint Treatment (*select one*)
1. Sto Gold Fill with StoGuard Mesh: place 4 inch (102mm) wide mesh centered along sheathing joints and minimum 9 inch (229mm) wide mesh centered and folded at inside and outside corners. Immediately apply Sto Gold Fill by spray or trowel and spread with a trowel to create a smooth surface that completely covers the mesh.
  2. Sto Gold Coat, Sto AirSeal, 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 20-30 mils (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 instructions.
- E. Air and Water-resistive Barrier Coating Installation
1. Install the specified coating to the required wet film thickness as specified by Substrate, Medium-Build, or High-Build (refer to Section 2.2B)
- 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.*

*NOTE: DO NOT ALLOW AIR AND WATER-RESISTIVE BARRIER INSTALLATION TO REMAIN EXPOSED MORE THAN 180 DAYS for Sto Gold Coat and Sto AirSeal, 90 DAYS for StoGuard VaporSeal. PROTECT WITH STUCCO/AMV WALL COVERING PROMPTLY AFTER INSTALLATION.*

### 3.5 SHEET WATER-RESISTIVE BARRIER INSTALLATION

*For frame construction with wood or gypsum-based sheathing, not required for concrete or CMU construction*

- 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](http://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 attached directly to sheathing and 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.*

### 3.6 DRAINAGE MAT INSTALLATION

- A. Place drainage mat against the wall surface over the AMB and unroll horizontally with the fabric facing out. Hammer-tack or staple into sheathing with corrosion-resistant fasteners. 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. Shingle lap fabric at horizontal courses. Shingle lap drainage mat over flashing at floor lines, decks, roof lines, window heads, and other areas where flashing is required, to direct water to the exterior. Butt ends of rolls and vertical seams. 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 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 stucco within 30 days of installation.

### 3.7 STUCCO INSTALLATION

*Refer to Sto Guide Details as needed*

*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. 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.*

After satisfactory inspection of surfaces and correction of any deviations from specification requirements commence the stucco installation as described below:

A. Installation over StoGuard/Sto DrainScreen

1. Weep Screed Installation *(may also be done in conjunction with flashing and AMB installation to facilitate shingle lapping of components at base of wall)*
  - a. 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 (25 mm). Locate the foundation weep screed nosing minimum 4 inches (100mm) above earth grade, 2 inches (51mm) above finished grade (paved surfaces, for example). Lap waterproof air barrier, sheet water-resistive barrier, and drainage mat over the weep screed attachment flange.
2. Casing Bead and Two-Piece Expansion Joint Installation
  - a. 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 in concrete or CMU, 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 barrier and moisture protection must be continuous behind joints and accessories – refer to Sto Guide Details.*

3. Lath Installation
  - a. Refer to Structa Wire Corp. TwinTrac Installation Guide and IAPMO ER 2017
  - b. Diamond Mesh Metal Lath – conform to ASTM C 1063
    - i. 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.
    - ii. 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 (25mm) over narrow wing accessories, minimum 2 inches (51mm) over expanded flange accessories. Do not install lath continuously beneath expansion joints.

iii. Attachment--fasten securely into solid substrates or through sheathing into structural framing at 7 inches (178mm) on center maximum vertically and 16 inches (406 mm) on center horizontally\*. Wire tie at no more than 9 inches (225 mm) on center at: side laps, accessory overlaps, and where end laps occur between supports.

- b. 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 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 and water-resistive barrier, sheet water-resistive barrier, or substrate.*

4. One Piece Expansion Joint Installation
- a. 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 ft<sup>2</sup> (13 m<sup>2</sup>). 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
- a. 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 (178 mm) on center with appropriate fasteners.
6. Stucco Installation
- a. Scratch Coat: apply stucco with sufficient pressure to key into and embed the metal lath. Apply sufficient material, 3/8 or 1/2 inch (9 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.
- b. 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 (19 or 22mm), and shall not exceed 7/8 inch (22mm).
- c. 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.
- d. 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.

- e. Allow the stucco to cure minimum 7 days before the installation of AMV

#### B. Crack Defense

*NOTE: 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  $\frac{1}{8}$  inch (3mm). 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. Allow the base coat to dry minimum 24 hours before installing AMV.

#### C. AMV Installation

1. Mark layout lines in accordance with planning: generally 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.
2. Use the proper size notched trowel for application:
  - a. Thin brick, thin stone, and ceramic tile units up to  $\frac{5}{8}$  inch (16mm) thick:  $\frac{1}{4}$  x  $\frac{3}{8}$  x  $\frac{1}{4}$  inch (6x10x6mm) square notched trowel.
  - b. AMV units up to 2- $\frac{5}{8}$  inch (67mm) thick:  $\frac{1}{2}$  x  $\frac{1}{2}$  x  $\frac{1}{2}$  inch (13x13x13mm) U-shaped or square notched trowel.
3. 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.
4. 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:
  - a. 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.
  - b. 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.
5. 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.
6. 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.

7. 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.
- D. Grouting/Pointing
1. Use an ANSI 118.7 compliant grout or pointing mortar in conformance with the manufacturer's instructions.

### 3.8 PROTECTION

- A. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.
- B. Protect installed materials from construction damage.
- C. Provide protection against water infiltration with proper flashing, parapet coping and other measures necessary to keep water from getting into or behind the stucco/AMV assembly. Install compatible backer rod and sealant at expansion joints and other open joints in wall construction, and where stucco/the AMV assembly abuts dissimilar materials – doors, windows, pipes, scuppers, and other penetrations through the wall – so these joints remain watertight.
- D. Provide weeps at floor lines, window and door heads, and other areas to conduct water to the exterior.

### 3.9 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 stucco/AMV assembly.

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