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 6550
StoPowerwall® ExtraSeal® MVES

Air and Water-Resistive Barrier with Direct Applied Stucco and Adhered Masonry Veneer

Section 09 24 23
Portland Cement Stucco

This specification is intended for use by the design/construction professional and user of Sto products to assist in developing project specifications for the direct application of Sto ExtraSeal and StoPowerwall Stucco with Adhered Masonry Veneer (AMV) to exterior or interior vertical above grade concrete or concrete masonry wall construction with an adhered masonry veneer. Sto ExtraSeal is designed for use as an air and water-resistive barrier, and stucco scratch coat, on prepared concrete and CMU beneath StoPowerwall Stucco (ICC ESR 2323, IAPMO ER 382) brown coats or any other Sto listed ASTM C926 compliant stucco brown coat.

An air and water-resistive barrier system minimizes the risk of condensation within the building envelope by eliminating mass transfer of warm moisture laden air into the wall assembly to a cold surface where it can condense. A complete air and water-resistive barrier system consists of individual air and water-resistive barrier components and the connections between them. The air and water-resistive barrier components must be continuous to become an effective air and water-resistive barrier assembly. The design/construction professional must take material compatibility and construction sequencing into account when designing an "airtight" assembly to ensure continuity and long term durability. The effects of air tightness on mechanical ventilation should also be included in the overall project evaluation.

The function of an air and water-resistive barrier should not be confused with that of a vapor retarder (vapor impermeable). A vapor retarder is placed in the wall to resist differential vapor pressures, whereas the air and water-resistive barrier is designed to resist the structural live loads induced by air pressure difference. Generally, a vapor retarder is placed on the warm side of the wall. Specifically, it is placed on the interior side of the insulation in cold climates and on the exterior side of the insulation in warm humid climates to minimize condensation within the wall assembly. A vapor retarder may not be necessary depending on the wall components, the range of temperature/humidity conditions inside and outside, and the mechanical ventilation of the building. A vapor retarder should not be used on the interior side of walls in warm humid climates.

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 ExtraSeal MVES, as with any exterior wall assembly, requires proper design detailing and integration with other components, in particular flashing and air and water-resistive barrier transition materials, to provide a wall assembly that resists air

and water infiltration. The weather protection afforded by StoPowerwall ExtraSeal 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 the risk of water intrusion. Flashing must always be integrated in the wall assembly to direct water to the exterior of the wall, not into the wall assembly, particularly at potential leak sources such as windows. Refer to Sto guide details and 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****, and Sto Tech Hotline No. 1001-BSc,* ***Effects of Temporary Heating on Construction Materials in Cold Weather****, at 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. 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. Verify that section titles in this specification are correct for the Project Specifications. Verify that table headers and spacing are aligned after final edit, including table header repeated at top of table, at any new pages.

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PART 1 GENERAL

1.1 RELATED DOCUMENTS

Retain or delete this article in all sections of the Project Manual

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes materials and installation of trowel applied air and water-resistive barrier, stucco scratch coat, and stucco brown coat over vertical above grade concrete and concrete masonry walls.

B. Related Requirements (add/delete, depending on specific project requirements):

1. Section 03 30 00: Cast-In-Place Concrete
2. Section 04 22 00: Concrete Unit Masonry
3. Section 04 42 00: Exterior Stone Cladding
4. Section 04 71 00: Manufactured Brick Masonry
5. Section 04 72 00: Cast Stone Masonry
6. Section 06 16 00: Sheathing
7. Section 07 21 13: Board Insulation
8. Section 07 25 00: Weather Barriers
9. Section 07 26 00: Vapor Retarders
10. Section 07 27 00: Air Barriers
11. Section 07 50 00: Membrane Roofing
12. Section 07 60 00: Flashing and Sheet Metal
13. Section 07 92 00: Joint Sealants
14. Section 08 50 00: Windows

1.3 DEFINITIONS

A. Air Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air Barrier Accessory: A transitional component of the air and water-resistive barrier that provides continuity.

a. Air Barrier Assembly: The collection of air and water-resistive barrier materials, accessory and auxiliary materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference

1. Review water-resistive air barrier and stucco installation requirements and installation details, mock-ups, testing requirements, protection, and sequencing of work.

1.5 REFERENCES

A. Building Codes and Standards

2015, 2018 IBC	International Building Code
2015, 2018 IRC	International Residential Code
2015, 2018 IECC	International Energy Conservation Code
2020 FBC Building	Florida Building Code
ICC ES AC 11	Acceptance Criteria for Cementitious Exterior Wall Coatings

B. Building Code Evaluation Reports

ICC-ESR 2323	StoPowerwall Stucco Systems
IAPMO ER 382	Western 1-Kote Exterior Stucco System

C. ASTM Standards

C482	Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste
C920	Standard Specification for Elastomeric Joint Sealants
C926	Specification for Application of Portland Cement-Based Plaster
C1088	Specification for Thin Veneer Brick Units Made from Clay or Shale
C1242	Guide for Selection, Design, and Installation of Dimension Stone Attachment Systems
C1670	Specification for Adhered Manufactured Stone Masonry Veneer Units
D4541-09	Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
E96-00	Test Method for Water Vapor Transmission of Materials
E283-04 (2012)	Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
E330-14	Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
E331- 00 (2009)	Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
E514-14(a)	Standard Test Method for Water Penetration and Leakage Through Masonry
E779-10	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
E783-02	Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
E1186-03 (2009)	Standard Practices for Air Leakage Site Detection in Building Envelopes and Air and Water-resistive Barrier Systems
E1827-96 (2007)	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door
E2178-13	Test Method for Air Permeance of Building Materials

D. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)

2016 ASHRAE Handbook – Fundamentals

2019 ASHRAE 90.1	Energy Standard for Buildings Except Low-Rise Residential Buildings

E. American National Standards Institute (ANSI)

ANSI 118.7	High Performance Cement Grouts for Tile Installation
ANSI 118.15	Improved Modified Dry-Set Cement Mortar
ANSI 137.1	Specification for Ceramic Tile

F. South Coast Air Quality Management District (South Coast AQMD)

Rule 1113 (2019)	Building Envelope Coatings

1.6 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)

A. Provide minimum 28 day cure of concrete and concrete masonry units before the installation of air and water-resistive barrier and stucco components.

B. Sequence work such that placement of stucco closely follows air and water-resistive barrier installation (60 days maximum between coats) to prevent surfaces from being contaminated by atmospheric conditions, dust, dirt, salts, trades, or other sources of surface contamination.

C. Commence the stucco installation after completion of all floor, roof construction and other construction that imposes dead loads on the wall to prevent excessive deflection (and potential cracking) of the stucco.

D. Provide site grading such that stucco terminates above earth grade minimum 4 inches (100 mm) and above finished grade (pavers/sidewalk) minimum 2 inches (51mm). Provide increased clearance in freeze/thaw climate zones.

E. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air barrier.

F. Install primary air and water-resistive barrier and connecting air and water-resistive barrier components BEFORE installing stucco accessories.

G. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall.

H. Provide sill flashing before windows and doors are installed to direct water beyond the finished exterior wall surface.

I. Install window and door head flashing immediately after windows and doors are installed.

J. Install diverter flashings wherever water can enter the assembly to direct water beyond the finished exterior wall surface.

K. Install sealants, parapet cap flashing and similar flashing at copings and sills to prevent water entry into the wall assembly immediately after installation of the stucco/AMV assembly.

L. Attach penetrations through the stucco/AMV assembly into structural support and provide watertight seal at penetrations.

1.7 SUBMITTALS

A. Manufacturer's specifications, details and product data.

B. Manufacturer's standard warranty.

C. Samples for approval as directed by architect or owner.

D. Shop drawings: substrate joints, cracks, flashing transitions, penetrations, corners, terminations, and tie-ins with adjoining construction, interfaces with separate materials that form part of the water-resistive air barrier and stucco/AMV wall assembly.

1.8 QUALITY ASSURANCE

A. Manufacturer requirements

1. Manufacturer of exterior wall air and water-resistive barrier materials for a minimum of 30 years in North America.
2. Current ISO 9001 Certified Quality System and ISO 14001 Certified Environmental Management System

B. Contractor requirements

1. Knowledgeable in the proper use and handling of Sto materials.
2. Employ skilled mechanics who are experienced and knowledgeable in waterproofing, air barrier, and stucco application, and familiar with the requirements of the specified work.
3. Provide the proper equipment, manpower and supervision on the job-site to install the air and water-resistive barrier, and stucco/AMV assembly in compliance with the project plans & specifications, shop drawings, and Sto's published specifications and details.

C. Regulatory Compliance

1. Primary air and water-resistive barrier material:
   a. Comply with VOC requirements of South Coast AQMD Rule 1113.
   b. Comply with allowable air leakage requirements of ASHRAE 90.1 – 2019
   c. Comply with IRC, IBC, and IECC – 2015, 2018, or 2021
2. Stucco brown coat
   a. Comply with ASTM C926
   b. Manufactured or listed by Sto Corp.
3. Joint Sealant
   a. Comply with ASTM C920
4. Masonry veneer adhesive
   a. Comply with ANSI 118.15
5. Masonry veneer grout
   a. Comply with ANSI 118.7
6. Masonry veneer
   a. Thin brick: comply with ASTM C1088
   b. Manufactured stone: comply with ASTM C1670

c. Natural stone: comply with ASTM C1242

d. Ceramic or porcelain tile: comply with ANSI 137.1

e. All veneer units: comply with size, weight, and durability requirements of the applicable building code

D. Mock-ups

1. Build stand-alone site mock up or sample wall area on as-built construction to incorporate back-up wall construction, typical details covering substrate joints, cracks, flashing transitions, penetrations, corners, terminations, tie-ins with adjoining construction, and interfaces with separate materials that form part of the water-resistive air barrier and stucco/AMV wall assembly. Apply air and water-resistive barrier and scratch coat, stucco brown coat, and AMV consistent with specified materials and methods of construction. For stucco wall assemblies applied directly to concrete, build full assembly for field adhesion tests as determined by design professional.

1.9 TESTING

A. Conduct site testing by qualified test agency or building envelope consultant as directed by design professional

1. Construct full-scale mock-up of typical stucco/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E283, 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 assembly air leakage testing in accordance with ASTM E783.

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 wet sealant adhesion testing in accordance with sealant manufacturer's field quality control test procedure.

5. Notify design professional minimum 7 days prior to testing.

1.10 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.

1.11 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 temperatures and temperatures in excess of 90 degrees F (32 degrees 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 and store accessory and auxiliary products in accordance with manufacturer's written instructions.

1.12 PROJECT/SITE CONDITIONS

A. Maintain ambient and surface temperatures above 40 degrees F (4 degrees C) and below 100 degrees F (38 degrees C), during application and drying period, minimum 24 hours after application of materials.

B. Maintain ambient and surface temperatures between 45 and 95°F (7 and 35°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 degrees F (4 degrees C) or if surface temperature is likely to fall below 40 degrees F (4 degrees C).

D. Prevent uneven or excessive evaporation of moisture from air and water-resistive barrier or stucco during hot, dry or windy weather. Follow hot weather installation practice. For installation under any of these conditions provide special measures to properly moist cure the stucco. Do not install water-resistive air barrier or stucco or AMV if ambient temperatures are expected to rise above 95ºF (35ºC) within a 24-hour period.

E. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.13 WARRANTY

A. Provide manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Sto Corp.

B. Obtain primary air barrier, air barrier detail components, stucco, adhesive mortar for AMV, and joint sealant from single source, except stucco brown coat may be any Sto listed ASTM C926 compliant material.

2.2 MATERIALS

A. Primary water-resistive air barrier: Sto ExtraSeal – single component polymer modified portland cement-based water-resistive air barrier.

B. Water-resistive Air Barrier Detail Components

1. StoGuard Detail Components for: sealing small penetrations or attachments (scupper, pipe, electrical box) and other static transitions in above grade wall construction, rough opening protection, and counterflashing

    a. Sto RapidGuard®: one component gun-applied STPE liquid flashing, rough opening protection, joint treatment and transition detailing material

    b. StoGuard Conformable Membrane: self-adhered membrane flashing, rough opening protection, and transition detailing material

2. StoGuard Detail Components for transitions: sheathing to foundation, dissimilar materials (e.g. CMU to frame wall), wall to balcony floor slab or ceiling and other detailing in above grade wall construction

    a. Sto RapidGuard®: one component gun-applied STPE liquid flashing, rough opening protection, joint treatment and transition detailing material

b. StoGuard Conformable Membrane: self-adhered membrane flashing, rough opening protection, sheathing joint treatment, and transition detailing material

3. StoGuard Detail Components for floor line deflection joints, masonry control joints, expansion joints in masonry or frame construction, and other dynamic joint conditions in above grade wall construction

a. StoGuard Conformable Membrane: self-adhered membrane flashing, rough opening protection, sheathing joint treatment, and transition detailing material

C. Accessories *(PVC and metal accessories by others, spray foam by others)*

1. 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
2. PVC plastic in compliance with ASTM D1784, cell classification 13244C.
3. Zinc in compliance with ASTM B69.
4. Galvanized metal in compliance with ASTM A653 with G60 coating.
5. All accessories shall have perforated or expanded flanges and shall be designed with grounds for the specified thickness of stucco.
6. Joint Sealant: StoSeal STPE Sealant high-movement, medium modulus, non-sag one-component silyl-terminated polyether joint sealant in compliance with ASTM C920 Type S, Grade NS, Use NT, A, M, Class 100/50
7. Spray foam: Dow Great Stuff for Gaps and Cracks

D. Patching and Leveling Material for Prepared Concrete and Masonry

1. Sto Leveler and Skim Coat: polymer modified cement-based patch and leveling material for applications up to 1/4 inch in (6 mm) in depth.

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.

E. Stucco Scratch Coat

1. StoPowerwall ExtraSeal – polymer modified portland cement-based stucco scratch coat for use StoPowerwall ExtraSeal water-resistive air barrier skim coat

F. Stucco Brown Coat *(select one)*

1. 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.
2. 103 StoPowerwall Stucco: fiber reinforced one coat portland cement stucco concentrate in compliance with ICC AC 11. See ICC ESR 2323.
3. ASTM C926 compliant stucco brown coats as listed by Sto Corp. (Refer to Addendum to StoPowerwall Specifications).

G. AMV Adhesive

1. StoColl polymer modified portland cement adhesive mortar in compliance with ANSI 118.15

H. AMV Grout/Pointing Mortar

1. Polymer modified portland cement grout /pointing mortar in compliance with ANSI 118.7

I. AMV

1. Thin brick in compliance with ASTM C1088, manufactured stone in compliance with ASTM C1670, thin natural stone in compliance with ASTM C1242, or ceramic or porcelain tile in compliance with ANSI 137.1
2. AMV in compliance with the applicable building code for allowable weight, size, and durability (refer to Sto Tech Hotline No. 0821-M, *Quick Reference Guide on Adhered Masonry Veneers in Exterior Wall Construction*).

2.3 PERFORMANCE REQUIREMENTS

A. Water-resistive Air Barrier

1. Water Penetration: ASTM E514, no water penetration through concrete masonry after 4-hour spray period
2. Adhesion: ASTM D4541, $\geq$ 50 psi (345 kPA) on prepared CMU substrates
3. Water vapor permeance: ASTM E96 Method B, minimum 5 perms (286 ng/Pa·s·m^2)
4. Air permeance: ASTM E2178, $\leq$ 0.004 cfm/ft^2 (0.02 L/s·m^2) air leakage at 1.57 psf (75 Pa)
5. Field adhesion testing: ASTM D4541, strength requirements as dictated by design professional based on exposure conditions such as building height, orientation, climate, and building design
6. Surface burning: ASTM E84, $\leq$ 25 flame spread and $\leq$ 450 smoke developed
7. Building envelope air leakage: ASTM E779 or E1827, $\leq$ 0.4 cfm/ft^2 (2.0 L/s·m^2)
8. Volatile Organic Compounds: SCAQMD Rule 1113, primary air and water-resistive barrier material, < 50 g/L

B. AMV Adhesive

1. Shear bond strength: ASTM C482, minimum 50 psi (345 kPa)
2. Shear bond strength before and after conditioning: ANSI 118.15 – meet strength requirements for each conditioning phase

C. Masonry Veneer

1. Comply with requirements of applicable building code and ASTM or ANSI standard

2.4 DESIGN REQUIREMENTS

A. Concrete Masonry (CMU)

1. Specify CMU with flush joints for best results and to improve air and water-resistive barrier material coverage

B. Structural (Wind and Axial Loads)

1. Design for maximum allowable deflection normal to the plane of the wall: L/360
2. Design for wind load in conformance with code requirements.

C. Moisture Control

1. Prevent the accumulation of water in the wall assembly and behind the exterior wall cladding:

   a. Minimize condensation within the assembly.

   b. Drain water directly to the exterior where it is likely to penetrate components in the wall assembly (windows and doors, for example).

   c. Provide corrosion resistant flashing to direct water to the exterior in accordance with code requirements, including above window and door heads, beneath window and door sills, at roof/wall intersections, floor lines, decks, intersections of lower walls with higher walls, and at the base of the wall.

   d. Air Leakage Prevention – prevent excess air leakage in the design and detailing of the wall assembly. Provide continuity between air and water-resistive barrier components in the wall assembly.

   e. 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 warm, humid climates.

   f. Protect rough openings with StoGuard rough opening treatment extended no further than the stucco termination accessory expanded flange (as Sto ExtraSeal will not adhere to some StoGuard rough opening treatments). Refer to Sto Guide Details.

   g. Seal accessory butt joints with sealant.

D. Water-resistive air barrier continuity: provide continuous air and water-resistive barrier assembly of compatible air and water-resistive barrier components.

E. Substrates

1. Provide surface plane tolerance not to exceed ¼ inch in 10 feet (6 mm in 3.0m).

2. Remove form ties, trim projecting concrete and fill honeycombs or other surface defects with appropriate patch or levelling material.

3. Concrete – provide for removal of form oil, curing compounds, efflorescence, coatings, salts, or other surface contamination, laitance or other surface conditions that could interfere with adhesion. Provide an absorbent surface, slightly scarified or with surface roughness, or both (refer to Section 3.2A1).

4. Concrete Masonry – provide open texture concrete masonry units with flush joints, free of efflorescence, coatings, salts, or other surface contamination, weak surfaces or other surface conditions that could interfere with adhesion (refer to Section 3.2B1).

5. Do not install air barrier, stucco, primers or finishes over efflorescence, laitance or weak surface conditions, painted, coated, salt-contaminated, non-absorbent, smooth, or any concrete or CMU substrate where adhesion is in question, or when total stucco thickness – skim coat, scratch coat, and brown coat – will exceed 5/8 inch (16mm). Use appropriate metal plaster base in these cases for the stucco assembly.

F. Mechanical Ventilation: maintain pressurization and indoor humidity levels in accordance with recommendations of ASHRAE (see 2016 ASHRAE Handbook – Fundamentals).

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect concrete and concrete masonry surfaces for:

1. Contamination – algae, dirt, dust, efflorescence, form oil, fungus, grease, mildew or other foreign substances.
2. Surface deficiencies – weak, friable, chalkiness, laitance, bugholes, honeycombs, and spalls.
3. Cracks – measure crack width and record location of cracks.
4. Damage or deterioration.
5. Moisture damage – record any areas of moisture damage or excess moisture.

B. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air and water-resistive barrier installation. Do not start work until deviations are corrected.

3.2 SURFACE PREPARATION

A. Concrete

1. Remove form ties and trim projecting concrete so it is even with the plane of the wall. Fill honeycombs or other surface defects with patch or leveling material. Remove form release agents or other surface contamination by chemical or mechanical means. Provide a surface that is structurally sound, free of laitance and other surface defects, absorbent, and slightly scarified or with surface roughness, or both. Ensure that the surface is structurally sound and free of all dust, dirt, grease, efflorescence, coatings, salts or other surface contamination before proceeding with work. Ensure that the surface is sufficiently absorbent and roughened for adequate adhesion. Pre-moisten highly absorbent surfaces with water just prior to placement of air barrier, especially during hot, dry conditions. Verify adhesion with load tests after air and water-resistive barrier/stucco/AMV assembly has fully cured (28 days) on mock-up wall, and throughout the project as directed in 1.9, Testing.

B. Concrete Masonry Units *(Specify CMU with flush joints for best results and to improve air and water-resistive barrier material coverage and to facilitate installation)*

1. Remove projecting joint mortar so it is even with the plane of the wall. Remove surface contaminants such as efflorescence, existing paint or coatings, or any other surface contamination by chemical or mechanical means. Pre-moisten the surface with water just prior to placement of air barrier. Verify adhesion with load tests after air and water-resistive barrier/stucco/AMV assembly has fully cured (28 days) on mock-up wall, and throughout the project as directed in 1.9, Testing.

C. For A and B above, where bond inhibiting material cannot be removed, where concrete or masonry surface irregularities are such that more than 5/8 inch (16 mm) of stucco (including Sto ExtraSeal skim coat and scratch coat, stucco brown coat) must be applied, or where the surface is too smooth, dense, or non-absorbent to receive the air and water-resistive barrier or stucco components, install furred or self-furred lath as specified by the design professional instead of a directly adhered assembly. Verify adequacy of lath attachment with respect to design wind pressures. Do not install the air and water-resistive barrier/stucco/AMV components over unprepared substrates or any substrate where adhesion is in question. (Note: where metal lath is used without Sto ExtraSeal water-resistive air barrier on the substrate, an alternative material such as a fluid applied StoGuard air and water-resistive air barrier in combination with Sto DrainScreen® or a slip sheet [building paper of felt] may be installed, followed by a StoPowerwall Stucco scratch and brown coat installation).

3.3 INSTALLATION

A. Coordinate work with other trades to ensure air and water-resistive barrier continuity with connections at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.

B. Install materials only when surface and ambient temperature are minimum 40 degrees F (4 degrees C) and rising during application and drying period and below 95 degrees F (35 degrees C). Install air and water-resistive barrier material to dry or damp surfaces (no standing or glistening water).

C. Mix, apply, store, and handle materials in accordance with manufacturer's written instructions.

D. Rough Opening Protection:

1. Install Sto RapidGuard over wood buck and lap onto Sto ExtraSeal minimum 2 inches (51 mm). Do not install Sto ExtraSeal over Sto RapidGuard. Limit extension of Sto RapidGuard to coincide with ends of expanded flange accessories. Refer to Sto Guide Details.

E. Skim Coat

1. Concrete – install one coat of Sto ExtraSeal by trowel in a uniform, continuous application at nominal1/8 inch (3mm) thick.
2. Concrete Masonry – install one liberal coat of Sto ExtraSeal in a uniform, continuous application by trowel at nominal 1/8 inch (3mm) thick. Surface must be free of voids and pinholes when dry. Final application must not show CMU surface texture or joints.
3. Do not install Sto ExtraSeal over working or moving joints or joint sealants.

F. Rough Opening Protection:

1. Install StoGuard Detail Component over wood buck and lap onto Sto ExtraSeal minimum 2 inches (51 mm). DO NOT INSTALL STO EXTRASEAL DIRECTLY OVER STO RAPIDGUARD or STOGUARD CONFORMABLE MEMBRANE. Limit extension of StoGuard Detail Component to coincide with ends of expanded flange accessories. Refer to Sto Guide Details.

G. Transitions

1. Install air and water-resistive barrier accessory material or auxiliary material at transition areas: foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line. Refer to Sto Guide Details. Limit extension of transition materials to dimension of expanded flange accessories at stucco terminations.

H. Stucco Accessories

1. Install stucco accessories – casing beads, expansion and control joints – over air and water-resistive barrier with appropriate fasteners into supporting construction as required by ASTM C926.

I. Scratch Coat

1. Scratch coat: allow skim coat to dry minimum 24 hours and apply nominal 1/4 inch (6mm) scratch coat of Sto ExtraSeal by trowel. Scratch the surface horizontally with a stucco rake tool.

J. Brown Coat

1. Brown coat: allow scratch coat to dry minimum 24 hours and install stucco brown coat in accordance with applicable codes and manufacturer's requirements. Limit total thickness, including Sto ExtraSeal skim coat and scratch coat, and stucco brown coat, to 5/8 inches (16mm) maximum. Moist cure the brown coat in accordance with ASTM C926.

K. Adhered Masonry Veneer 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 5/8 inch (16mm) thick: ¼ x 3/8 x ¼ inch (6x10x6mm) square notched trowel.
    b. AMV units up to 2-5/8 inch (67mm) thick: ½ x ½ x ½ 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 or AMV 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 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 2-5/8 inch (67mm) thick: clean and dampen the back surface with a wet sponge, then apply a nominal ½ 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 24 hours before grouting/pointing. Allow additional drying time during cool and/or humid weather conditions to ensure adequate bond and to minimize the risk of efflorescence.

L. Grouting/Pointing

1. Use an ANSI 118.7 compliant grout or pointing mortar in conformance with the manufacturer's instructions.

3.4 FIELD QUALITY CONTROL

A. Owner's qualified testing agency or building envelope consultant shall perform inspections and tests.

B. Inspections: air and water-resistive barrier materials are subject to inspection to verify compliance with requirements.

1. Condition of substrates and substrate preparation.

2. Installation of primary air and water-resistive barrier material, accessory materials, and compatible auxiliary materials over structurally sound substrates and in conformance with architectural design details, contractor's shop drawings, project mock-up, and manufacturer's written installation instructions.
3. Air and water-resistive barrier continuity and connections without gaps and holes at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roofing.

C. Tests: air and water-resistive barrier materials and assembly are subject to tests to verify compliance with performance requirements:

1. Qualitative air leakage test: ASTM E1186
2. Quantitative air leakage test: ASTM E779, ASTM E783, and ASTM E1827
3. Adhesion test: ASTM D4541

IMPORTANT: for direct applications to concrete establish testing frequency to verify adhesion to prepared substrates as determined by design professional.

4. Qualitative adhesion and compatibility testing: wet sealant manufacturer's field quality control adhesion test

D. Repair non-conforming substrates and air and water-resistive barrier material installation to conform with project requirements.

E. Take corrective action to repair and replace, or reinstall materials, seal openings, gaps, or other sources of air leakage to conform with project performance requirements.

3.5 PROTECTION

A. Provide protection of installed materials from water infiltration into or behind them.

B. Provide protection of installed material from dust, dirt, salts, or other surface contamination, precipitation, freezing and continuous high humidity until fully dry.

C. Protect installed materials from construction damage.

D. 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 the stucco/AMV assembly abuts dissimilar materials – doors, windows, pipes, scuppers, and other penetrations through the wall – so these joints remain watertight.

E. Provide weeps at floor lines, window and door heads, and other areas to conduct water to the exterior.

3.6 CLEANING, REPAIR AND MAINTENANCE

A. Clean and maintain the stucco/AMV assembly for a fresh appearance and to prevent water entry into and behind the stucco. Repair cracks, impact damage, spalls or delamination promptly.

B. Maintain adjacent components of construction such as sealants, joints in construction, 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.

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