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Sto Guide Specification 1150
StoQuik® Silver DrainScreen® MVES for Frame Wall Construction

Section 07 24 23
Direct-Applied Finish Systems

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 the application of adhered masonry veneer (AMV) to cement board over code compliant frame wall construction. The assembly incorporates a fluid applied air and water-resistive barrier, drainage mat, cement board, joint treatment for cement board, skim coat for cement board, and adhesive for AMV. The assembly complies with IBC and IRC building code requirements for use on all Types (I, II, II, IV, and V) of construction. Refer to this specification, Sto Guide Details, ICC-ESR Report No.1233, and UL ER 22158-01 for additional information. 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 in the assembly, functions in tandem with other compatible air barrier and flashing components of the building envelope to resist air and water infiltration. Sto DrainScreen, the drainage mat, creates a cavity behind the cement board to promote drainage and drying of the wall assembly in the event of incidental water infiltration through a crack in the outer surface of the assembly. National Gypsum PermaBase® Brand cement board is the substrate for StoColl adhesive mortar that is used as a skim coat to resist water penetration through the cement board and as an adhesive to adhere the AMV – thin brick, natural stone, ceramic tile, or manufactured stone.

StoQuik Silver 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 is "airtight" and resists water infiltration. The weather protection afforded by StoQuik Silver DrainScreen 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 and system bulletins, guide details, and other technical information available 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. This specification should be modified where necessary to accommodate individual project conditions.

Table of Contents

PART 1 GENERAL

1.1 SUMMARY

A. This section includes materials and installation of adhered masonry veneer (AMV) to cement board backed with drainage mat and fluid applied air and water-resistive barrier to frame walls.

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. American National Standards Institute (ANSI)

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

B. ASTM International (ASTM)

C297	Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
C920	Specification of Elastomeric Joint Sealants
C1177	Specification for Glass Mat Gypsum for Use as Sheathing
C1325	Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets
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
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
E779	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
E2178	Standard Test Method for Air Permeance of Building Materials
E2357	Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

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. ICC (International Code Council)

2015 and 2018 IBC (International Building Code)

E. ICC ES (International Code Council Evaluation Service)

ICC ESR 1233	StoGuard Air Barrier and Water-resistive Barrier System

F. 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

G.	South Coast AQMD Rule 1113 (2016)	South Coast Air Quality Management District Building Envelope Coatings
H.	Sto Corp. TH No. 0821-M	Quick Reference Guide on Adhered Masonry Veneers in Exterior Wal Construction
I.	UL ER 22158-01	Underwriters Laboratories Inc Evaluation Report – PermaBase Cementitious Backer Units
J.	USEPA	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. Non-combustible Type Construction: refer to UL ER 22158-01 for NFPA 285 compliant assemblies
2. Fire-Resistance Rated Wall Construction: where an hourly fire-resistance rating is required refer to UL ER 22158-01

3. Provide analysis by qualified fire protection engineer if needed to qualify alternate assemblies.

B. Structural

1. Design for maximum allowable deflection, normal to the plane of the wall of L/360, or stiffer wall construction when required by veneer manufacturer, local building code, or design professional.
2. Design for wind load in conformance with code requirements using framing members designed and assembled to comply with the standards, strength, and stiffness requirements of the applicable code.
3. Minimum Stud Size / Gauge: wood studs, minimum 2x4; metal studs, minimum 16 gauge, 3-5/8 inch deep
4. Maximum stud spacing: 16 inches (406mm) on center
5. Sheathing: minimum ½ inch inch (13 mm) glass mat faced gypsum sheathing in compliance with ASTM C1177 or minimum 7/16 inch (11mm) Exterior or Exposure I plywood or OSB wood-based sheathing in compliance with US DOC PS-2
6. Drainage mat: ¼ or 3/8 inch (6 or 10mm) thick tangled filament nylon core with fabric facing.
7. Screw fasteners for cement board: corrosion-resistant roofing nails or corrosion-resistant wafer head screws for wood studs, or corrosion-resistant wafer head Type S-12 screws for steel studs. Roofing nails must have minimum 7/16 in. (11mm) diameter head and a 0.109 in. (2.8mm) diameter shank with minimum 1 in (25mm) penetration into wood studs. Screws for wood studs must have minimum ¾ in. (19mm) penetration into wood studs. Screws for steel studs must be minimum #8 Type S-12 wafer head with minimum 0.325 in. (8.3 mm) diameter head and minimum three thread penetration of steel studs.
8. Cement board fastener spacing: maximum 8 inches (203mm) vertically along studs
9. Wind load resistance / building height: refer to UL ER 22158-01 for design pressure rating of cement board assemblies. The system is intended for use on vertical above grade walls up to 6-stories or 72 ft (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 cement board/AMV 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 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 and Sto DrainScreen over sheathing.
    e. At through wall expansion joints and at joints formed with back-to-back casing beads, back joints with StoGuard Conformable Membrane. Refer to Sto Guide Details at www.stocorp.com.

f. Seal cement board accessory butt joints with appropriate sealant. Seal all cement board terminations and penetrations through the cement board/AMV wall assembly with appropriate sealant, or backer rod and sealant, as dictated by joint type.

D. Grade Condition

1. Do not use cement board/AMV assembly below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 6 inch (150mm) clearance above grade. Provide increased clearance in freeze/thaw climate zones.

E. Sloped surfaces

1. Avoid the use of cement board/AMV assembly on build-outs or weather exposed sloped and horizontal surfaces

F. Joints and Accessories

1. Joints: provide joints where they exists in the supporting wall construction - at expansion joints, control joints, and cold joints in the supporting wall construction, at changes in support construction (e.g., masonry to frame wall), at junctures with dissimilar construction, at different substrates, at floor 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^2 (13.4m^2) with length or height not more than 12 ft (3.6m) for ceramic tile, 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. Do not bridge expansion joints, control joints, or cold joints in wall construction with AMV. Refer to Sto Detail Booklet.
2. 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*)
3. Provide appropriate accessories at cement board/AMV terminations and joints.
4. Provide appropriate sealant at cement board/AMV terminations and at cement board accessory butt joints.
5. Indicate location of joints, accessories and accessory type on architectural drawings.

G. AMV Weight and Size Limits Based on IBC and IRC

1. Maximum allowable weight: 15 lb/ft2 (70 kg/m2) for thin brick, manufactured stone, and natural stone, 9 lb/ft2 (44 kg/m2) for porcelain and ceramic tile
2. Maximum size: refer to Sto Tech Hotline No. 0821-M, *Quick Reference Guide on Adhered Masonry Veneers in Exterior Wall Construction*

1.5 PERFORMANCE REQUIREMENTS

A. Air and Water-resistive Barrier

1. Compliant with ICC ES Acceptance Criteria AC 212 (refer to ICC ESR 1233)
2. Material Air Leakage Resistance, ASTM E2178: less than 0.02 L/s·m^2 (0.004 cfm/ft^2 at 1.57 psf)
3. Assembly Air Leakage Resistance, ASTM E2357: less than 0.2 L/s·m^2 (0.04 cfm/ft^2 at 1.57 psf)
4. Water Vapor Permeance, ASTM E96, Method B: greater than 10 perms [573 ng/(Pa·s·m^2)]
5. Surface Burning, ASTM E84: Flame Spread less than 25, Smoke Developed less than 450, Class A Building Material
6. Tensile Adhesion, ASTM C297:

a. Gypsum Sheathing, exceeds strength of substrate

b. Plywood, > 85 psi (590 kPa)

c. OSB, > 30 psi (206 kPa)

7. 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. Use on Non-combustible Construction, NFPA 285: meets requirements for use on non-combustible (Types I, II, III, and IV) construction. Refer to UL ER 22158-01 for assemblies

C. Skim coat for Cement Board

1. Polymer modified portland cement adhesive mortar in compliance with ASNSI 118.15

D. Adhesive for Adhered Masonry Veneer (AMV)

1. Polymer modified portland cement adhesive mortar in compliance with ASNSI 118.15

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 cement board

D. Manufacturer's standard warranty

E. Samples for approval as directed by architect or owner

F. Fastener manufacturer’s pull-out or withdrawal capacity testing for frame construction

G. Prepare and submit project-specific details (when required by contract documents)

1.7 QUALITY ASSURANCE

A. Manufacturer Requirements

1. Air and water-resistive barrier products and adhesive mortar manufactured under ISO 9001 Quality System and 14001 Environmental Management System.

B. Contractor Requirements

1. Licensed, insured and engaged in application of air and water-resistive barriers and AMVs 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 air and water-resistive barrier and tile, manufactured stone, or thin brick 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. Cement Board Manufacturer Requirements

1. Manufacturer of ASTM C1325 compliant cement board
2. Cement board listed in a current UL evaluation report

D. Testing

1. Construct full-scale mock-up of typical cement board/AMV/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E283, E331 and E330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.
2. Conduct air and water-resistive barrier adhesion testing in accordance with ASTM D4541.
3. Conduct AMV adhesion testing in accordance with ASTM D4541.
4. Conduct air barrier assembly testing in accordance with ASTM E 779.
5. Verify adequacy of pull-out or withdrawal capacity of fasteners used for frame construction with manufacturer in relation to negative design wind pressures.
6. Conduct wet sealant adhesion testing in accordance with sealant manufacturer’s field quality control test procedure.
7. Notify design professional minimum 7 days prior to testing.

E. Inspections

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

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Store cement board materials inside and protect from damage by the elements. Protect ends, edges, and faces of cement boards from damage.

C. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.

D. Protect portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

E. Handle and store all products as directed on labeling.

1.9 PROJECT/SITE CONDITIONS

Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying and may require adjustments in application and scheduling 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 air and water-resistive barrier and surface temperatures above 40°F (4°C) and below 100°F (38°C) during application and drying period of air and water-resistive barrier products - not less than 24 hours

B. Maintain air and water-resistive barrier and surface temperatures between 45 and 85°F (7 and 29°C) during application and drying period of skim coat and AMV adhesive – not less than 24 hours.

C. Provide supplementary heat for installation in temperatures less than 40°F (4°C) for air and water-resistive barrier products, and less than 45°F (7°C) for AMV adhesive.

D. Prevent uneven or excessive evaporation of moisture from skim coat during hot, dry or windy weather. Do not install materials if ambient temperatures are expected to rise above 100ºF (38ºC) 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 from damage from trades

A. Protect sheathing from climatic conditions to prevent weather damage.

B. 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.

C. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.

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

E. Splice-in head flashing, floor line flashing, diverter flashing, and similar flashing with air and water-resistive barrier detail component to provide a shingle lap that directs water to the exterior.

F. Protect the air and water-resistive barrier with cement board within 180 days of installation.

G. Protect drainage mat with cement board or other protection within 30 days of installation.

H. Commence the cement board/AMV 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) in the cement board/AMV assembly.

I. Sequence interior work such as drywall installation prior to cement board/AMV installation to prevent stud distortion (and potential cracking) of the cement board/AMV assembly.

J. Provide site grading such that the cement board/AMV assembly terminates above earth grade minimum 6 inches (152mm). Provide increased clearance in freeze/thaw climate zones.

K. Install copings and sealant immediately after installation of the cement board/AMV assembly.

L. Attach penetrations through cement board/AMV assembly to structural support and provide air tight and water tight 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, Cement Board Skim Coat, AMV Adhesive, Joint Sealant Accessory, Outside Corner Bead and Drip Edge Accessories

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

B. Cement Board

1. National Gypsum Company, Inc., 2001 Rexford Road, Charlotte, NC 28211

C. Cement Board/AMV Accessories

1. Plastic Components, Inc., 9051 NW 97th Terrace, Miami, Florida 33178

2.2 AIR AND WATER-RESISTIVE BARRIER

Refer to Sto Guide Details, Sto RapidGuard Installation Guide, and StoGuard Conformable Membrane Installation Guide to assist in selecting the proper detail components

A. StoGuard Detail Components

1. Sheathing Joint Treatment, Rough Opening (RO) Protection, Counterflashing, and Penetrations:

a. Sto Gold Coat: brush, spray or roller applied air and water-resistive barrier coating used with StoGuard Fabric reinforcement

b. Sto RapidGuard: single component rapid drying gun-applied STPE detail component

c. Sto Gold Fill: trowel applied detail component used with StoGuard Mesh, glass fiber self-stick reinforcing mesh

d. 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

2. Static Joints and Seams

a. Sto RapidGuard: single component rapid drying gun-applied treatment for static joint transitions to dissimilar construction (i.e., masonry to frame wall), balcony floor slab-to-ceiling, and wall sheathing to foundation

3. Static and Dynamic Joints

a. 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

Choose one coating and select application by Substrate (B1a) Medium Build (B1b), or High Build (B1c) as indicated

B. Air and 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).

2.3 ACCESSORIES FOR CEMENT BOARD/AMV ASSEMBLY

Supplied by others unless indicated otherwise

A. Starter Track – Starter Track Drip Edge (Product No. STDE-xx) or i Drip Track (Product No. iDT-xx), rigid PVC (polyvinyl chloride) plastic tracks with weepholes as furnished by Plastic Components, Inc., for use at terminations such as base of wall, floor lines, roof lines, and similar weep termination lines.

B. Casing Bead – Starter Trac (Product No. ST-xx), a rigid PVC (polyvinyl chloride) plastic accessory as furnished by Plastic Components, Inc., for use at terminations such as windows, doors, and similar through wall penetrations, and used back-to-back at movement joints such as dissimilar materials, through wall expansion joints, and floor line deflection joints. May also be used back-to-back in lieu of a single piece control joint.

C. Outside Corners – Sto-Mesh Corner Bead Standard, one component PVC (polyvinyl chloride) accessory with integral reinforcing mesh for outside corner reinforcement.

D. Drip Edge - Sto Drip Edge Profile, one component PVC (polyvinyl chloride) accessory with integral reinforcing mesh that creates a drip edge and plaster return.

E. Control Joint – "V" Control Joint (Product No. PL 093), rigid PVC (polyvinyl chloride) plastic single piece control joint as furnished by Plastic Components, Inc., for use at intervals in the field of the wall, and at corners of penetrations such as windows, doors, and similar through wall penetrations.

F. Joint Sealant - StoSeal® STPE low modulus joint sealant in conformance with ASTM D920: Type S, Grade NS, Use NT, A, M, Class 100/50

NOTE: *Powder actuated or other fastening devices that can damage the air and water-resistive barrier, or sheathing, should be avoided. CAUTION: AVOID THE USE OF CHANNEL REVEAL ACCESSORIES THAT INTERFERE WITH PROPER DRAINAGE AND STRESS RELIEF.*

2.4 DRAINAGE MAT

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

A. Sto DrainScreen 6mm – nominal 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 CEMENT BOARD

Supplied by others

A. PermaBase Brand Cement Board – minimum ½ inch (13 mm) thick cement board in Compliance with ASTM C 1325

2.6 MECHANICAL FASTENERS FOR CEMENT BOARD

Supplied by others

A. Screw fasteners:

1. Wood Framing – corrosion-resistant roofing nails or corrosion-resistant wafer head screws for wood studs. Roofing nails must have minimum 7/16 in. (11mm) diameter head and a 0.109 in. (2.8mm) diameter shank with minimum 1 in (25mm) penetration into wood studs. Screws for wood studs must have minimum ¾ in. (19mm) penetration into wood studs.

2. Steel Framing – minimum #8 Type S-12 corrosion resistant wafer head screws with minimum 0.325 inch (8.3 mm) head and three thread penetration into steel studs.

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.*

2.7 JOB MIXED INGREDIENTS

Supplied by others

A. Water: clean and potable.

2.8 CEMENT BOARD JOINT REINFORCEMENT

A. StoGuard Fabric embedded in Sto Gold Coat

2.9 CEMENT BOARD ACCESSORY REINFORCEMENT

A. Sto Guard Mesh or Sto Detail Mesh

2.10 CEMENT BOARD SKIM COAT

A. StoColl Adhesive Mortar

2.11 AMV ADHESIVE

A. StoColl Adhesive Mortar

2.12 AMV GROUT / POINTING MORTAR

Supplied by others

A. Polymer modified portland cement grout in conformance with ANSI 118.7

2.13 ADHERED MASONRY VENEER

Supplied by others

A. Thin brick, thin stone, ceramic tile, or manufactured 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.

B. Skim Coat for Cement Board and Adhesive for AMV

1. StoColl - mix ratio with water: 8.5 quarts (8.1L) potable water to one 55 lb. (25kg) bag. 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.

C. Grout / Pointing Mortar

1. Mix in conformance with manufacturer's written instructions

D. Mix only as much material as can readily be used.

E. 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 sheathing surfaces for:

1. Damage and deterioration.
2. Moisture damage – record any areas of moisture damage.

B. Inspect sheathing application for compliance with applicable requirement:

1. Glass Mat Faced Gypsum Sheathing in compliance with ASTM C1177 – refer to manufacturer's instructions and/or ICC evaluation report
2. 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. Gypsum sheathing must be butted at joints. Wood-based sheathing must be gapped 1/8 inch (3mm) at edge and end joints.

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

3.3 SURFACE PREPARATION

A. 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 ⅛ inch (3 mm) up to 1/2 inch (13 mm) wide, use Sto RapidGuard to fill joints, or apply low expanding urethane foam into joints and rasp or shave flush with sheathing surface in preparation for installation of StoGuard joint treatment.
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)

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

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

B. Transition Detailing

1. Detail transition areas with Sto RapidGuard or StoGuard Conformable Membrane 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).

C. Rough Opening Protection (select 1, 2, 3, or 4 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 smooth with a trowel to completely cover the mesh. For deep section studs use minimum 4 inch (102mm) wide strips of StoGuard Mesh to seal sill and head seams at corners. Crease and center the mesh at the sill/head to jamb intersection, press into place and apply Sto Gold Fill over the mesh (refer to Sto Detail 20.20M).
2. Sto Gold Coat with StoGuard Fabric: apply Sto Gold Coat 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. For deep section studs cut minimum 4 inch (102mm) strips of StoGuard Fabric to seal sill and head seams at corners. Crease and center the fabric strips at the sill/head to jamb intersection and embed the fabric strips in Sto Gold Coat. After all corners have been completed apply Sto Gold Coat 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 (51 mm). 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 sill and head seams at corners. 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 or spreader tool to spread the material to a uniform thickness of 12-20 mils (0.3-0.5 mm) before the material skins. Treat the entire rough opening surface in this manner and overlap onto the face of the sheathing 2 inches (51mm) minimum all the way around
4. StoGuard Conformable Membrane: install the membrane in conformance with manufacturer's written installation 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 smooth with a trowel to completely cover the mesh.

2. Sto Gold Coat with StoGuard Fabric: apply Sto Gold Coat 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. 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 (0.5-0.6mm) before the material skins. Spread 1 inch (25mm) beyond the sheathing joint on each side. Follow the same procedure for inside and outside corners.

4. StoGuard Conformable Membrane: install the membrane in conformance with manufacturer's written installation instructions.

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 and water-resistive 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 and water-resistive barrier continuity and for head, jamb, and 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. PROTECT WITH DRAINAGE MAT AND CEMENT BOARD INSTALLATION PROMPTLY

3.5 STARTER TRACK AND BACK MOUNT CASING BEAD ACCESSORY INSTALLATION

A. Strike a level line at the base of the wall to mark where the top of the starter track terminates.

B. Attach the starter track even with the line onto the structure a maximum of 16 inches (406mm) on center with the proper fastener: Type S-12 corrosion resistant screws for steel framing with minimum 3/8 inch (9mm) and three thread penetration, and galvanized or zinc coated nails for wood framing with minimum 3/4 inch (19mm)

penetration. Blocking installed between the studs may be necessary to secure the track flat against the wall surface. For solid sheathing attach directly into sheathing at 12 inches (305mm) on center maximum.

C. Butt sections of starter track together. Miter cut outside corners and abut. Snip front flange of one inside corner piece (to allow the cement board to be seated inside of track) and abut.

D. Install Starter Track at other cement board system terminations as designated on detail drawings: above windows and doors, at floor lines, above roof along dormers or gable end walls, and beneath window sills with concealed flashing.

E. Install casing beads similarly at cement board stucco termination points—window and door openings and other through wall penetrations. Install back-to-back casing beads at building expansion joints, thru-wall joints, where the cement board stucco abuts 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. Where casing bead is used back-to-back as an expansion joint back the membrane with StoGuard Conformable Membrane.

F. Splice-in starter track at base of wall, 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.

3.6 DRAINAGE MAT INSTALLATION

A. Place drainage mat against the wall surface and unroll horizontally with the fabric facing out. Staple into place with corrosion-resistant fasteners. Use as few fasteners as needed to hold the mat in place, starting from the bottom of the wall at the starter track and working up. Do not fasten through flashing. Shingle lap fabric at horizontal courses. Shingle lap drainage mat over starter track and 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 at accessories around windows, doors, vents, or other penetrations through the wall. Do not install behind window nail flanges or accessories. Lap over back leg of installed accessories. Immediately follow installation of drainage mat with cement board installation. Where cement board installation will not immediately follow installation of drainage mat, use corrosion-resistant cap nails, cap staples, or cap screws every 16 inches (406 mm) on center along framing for more secure attachment. Cover drainage mat with cement board within 30 days of installation.

3.7 CEMENT BOARD / AMV INSTALLATION

Refer to Sto Guide Details as needed

After satisfactory inspection of surfaces and correction of any deviations from specification requirements commence the cement board/AMV installation as described below. Ensure the installed cement board surface is straight and true within ¼ inch in 10 feet (6mm in 1m), and is clean, dry and free from damage, frost, and all bond-inhibiting materials before application of coatings, adhesive, or accessories to cement board surface.

A. Cement Board Installation

1. Install cement board horizontally or vertically. Offset joints from sheathing joints by minimum six inches (152mm). Insert bottom edge of board into the starter track, and then attach the board through the sheathing to studs/framing members with fasteners spaced 8 inches (203mm) on center maximum at the perimeter and in the field of the board, making sure that the fasteners seat flush with the surface of the cement board and do not penetrate the surface of the cement board.

2. Install cement boards with vertical joints staggered and with ends and edges closely butted but not forced together and flush at the surface. Cut boards in an "L" shape around openings such as windows, doors, and similar penetrations.

3. Provide for expansion joints and control joints in cement board layout (see Design Requirements, Section 1.4).

NOTE: Cement board fasteners may need to be spaced closer, depending on design wind pressures. Verify fastening schedule is adequate for design wind pressures.

B. Face Mount Accessory Installation

1. Install one-piece control joints at wall penetrations, for example, above and below windows and doors. Do not exceed length to width ratio of 2-1/2:1 in joint layout.

2. Inside Corners: install StoGuard Fabric centered and creased over the inside corner by embedding the fabric in the air and water-resistive barrier coating

3. Outside Corners: install Sto-Mesh Corner Bead accessory adhesively by completely embedding the accessory in the skim coat material.

C. Cement Board Joint Reinforcement, Inside Corners, Accessory Overlaps, and Corners of Wall Penetrations

1. Joint Reinforcement, Including Inside Corners: install StoGuard Fabric centered over cement board joints by embedding the fabric in the air and water-resistive barrier coating.

2. Accessory Overlaps: install StoGuard Mesh or Sto Detail Mesh over perforated accessory flanges up to the "stop bead" on the accessory – starter tracks, casing beads, corner beads, and control joints. Skim coat StoGuard Mesh with the AMV adhesive mortar. Embed Sto Detail Mesh in the AMV adhesive Mortar.

3. At corners of wall penetrations, if no control joint is used, embed 9 x 12 inch (230 x 305 mm) Sto Detail Mesh diagonally in the AMV adhesive mortar.

D. Skim Coat Installation

1. Apply the AMV adhesive mortar in a single uniform coat minimum 1/16 inch (1.6mm) thick over the entire surface of the cement board and allow to dry. If necessary apply additional AMV adhesive mortar to fill slight depressions in plane at cement board joints and other surface depressions and allow to dry.

E. 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 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 the 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 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.

F. 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 cement board/AMV assembly. Install compatible backer rod and sealant at expansion joints and other open joints in wall construction, and where the cement board/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 cement board/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 cement board/AMV assembly.

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