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StoTherm™ RainScreen Class PB Exterior Insulation and Finish System (EIFS)
Sto Specification A900

Section 07240

(This specification is intended for use by the design professional/specifier and user of Sto products to assist in developing project specifications for the application of StoTherm™ RainScreen, a Class PB Exterior Insulation and Finish System (EIFS) with drainage, on exterior wall construction. Notes in italics, such as this one, are explanatory and intended to guide the design professional/specifier and user in the proper selection and use of materials. Although the system is designed to drain incidental moisture that may enter through windows, doors, flashings or other components of the wall construction, it is not a substitute for proper design, construction and performance of these components which should always perform without leakage into the wall construction. Mechanical attachment of EIFS with surface mount fasteners (as called for in this specification) may result in telegraphing of the fasteners. This phenomenon is an inherent limitation of surface mount mechanically attached EIFS. This specification should be modified where necessary to accommodate individual project conditions).

Part 1 GENERAL

1.01 SECTION INCLUDES

A. Materials and installation of mechanically attached Class PB EIFS with drainage.

1.02 RELATED SECTIONS *(add/delete, depending on specific project requirements)*

A. Section 03300: Cast-In-Place Concrete

B. Section 04200: Unit Masonry

C. Section 06100: Rough Carpentry

D. Section 07190: Vapor Barriers

E. Section 07195: Air Barriers

F. Section 07620: Sheet Metal Flashing and Trim

G. Section 07650: Flexible Flashing

H. Section 07920: Sealants and Caulking

I. Section 09200: Lath and Plaster

J. Section 09260: Gypsum Board Systems

1.03 REFERENCED DOCUMENTS *(add/delete depending on specific project requirements)*

A. ASTM Standards:

1. B 117 Test Method for Salt Spray (Fog) Testing
2. C 67 Method of Sampling and Testing Brick and Structural Clay Tile
3. C 79 Test Method for Gypsum Sheathing Board
4. C 150 Specification for Portland Cement
5. C 578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
6. D 968 Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive
7. D 1784 Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds
8. D 2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
9. D 3273 Test for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
10. E 84 Test Method for Surface Burning Characteristics of Building Materials
11. E 330 Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference
12. E 331 Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference
13. G 23 Recommended Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials
14. G 53 Recommended Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

B. EIMA (EIFS Industry Members Association) Standards and Publications

1. 101.01 Standard Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM C-67)
2. 101.02 Standard Test Method for Resistance to Water Penetration of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM E-331)
3. 101.86 Standard Test Method for Resistance of Exterior Insulation and Finish Systems (EIFS), Class PB, to the Effects of Rapid Deformation (Impact)
4. 105.01 Standard Test Method for Alkali Resistance of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finishing Systems (EIFS), Class PB
5. 300.01 Standard Test Method for Determining Tensile Adhesion Properties of Sealants when used with Exterior Insulation and Finish Systems (EIFS), Class PB
6. EIMA Guide for use of Sealants With Exterior Insulation and Finish Systems (EIFS), Class PB
7. EIMA Guideline Specification for Exterior Insulation and Finish Systems (EIFS), Class PB
8. EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board

C. Gypsum Association

1. GA-600 Fire Resistance Design Manual
2. GA-253 Application of Gypsum Sheathing
3. GA-254 Fire Resistant Gypsum Sheathing

D. American Plywood Association

1. J20G Grades and Specifications Guide
2. PS 2-92 Performance Standard for Wood-Based Structural Use Panels

E. Proprietary Specifications

1. A468 Georgia-Pacific Corporation, "Dens Glass Gold Sheathing"
2. C& I 2000..Cerny & Ivey Test Method 2000 for Drainage Performance Exterior Finish Systems

1.04 DESIGN REQUIREMENTS

A. Design for maximum allowable system deflection, normal to the plane of the wall, of L/240.

B. Design for wind load in conformance with code requirements.

C. Design aesthetic joints, reveals, etc. such that the minimum thickness of insulation board at any point is 1" (25.4 mm).

D. Prevent the accumulation of excess moisture behind the system, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly. Provide drainage to exterior where water penetration is expected.

E. Indicate areas with impact resistance other than "Standard" on contract drawings.

F. Select finish coat with a lightness value of 20 or greater. (The use of dark colors is not recommended with EIF Systems that incorporate polystyrene insulation board).

G. Design minimum 3/4 inch (19 mm) wide expansion joints in the EIFS where they exist in the substrate or supporting construction; where the EIFS adjoins dissimilar construction materials; at areas of anticipated structural or building movement (such as changes in building height) and at floorlines in multi-level wood-frame construction.

H. Design minimum 1/2 inch (13 mm) wide sealant joints at penetrations through the EIFS (windows, doors, etc.).

I. Specify compatible backer rod and sealant in accordance with "EIMA Guide for Use of Sealants with Exterior Insulation and Finish Systems (EIFS), Class PB". Specify sealant in compliance with minimum 50% elongation requirement before and after conditioning when tested in accordance with EIMA Standard 300.01.

J. Do not specify EIFS for use on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. For below grade applications and sloped surfaces, specify Sto Flexyl (see Addendum I).

K. Sloped surfaces: minimum slope is 1:2 (27 degrees) and maximum width is 12 inches (300 mm). Sto Mesh embedded in Sto Flexyl is required beneath finish coating for build-outs greater than 2 inches (51 mm). Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Periodic inspections and increased maintenance of finish coating may be required.

1.8 PERFORMANCE REQUIREMENTS

A. System Performance - Durability

TEST	METHOD	CRITERIA	RESULT
Accelerated Weathering	ASTM G-23	2000 hours	No deleterious effects when viewed under 5x magnification
	ASTM G-53	5000 hours	No deleterious effects when viewed under 5x magnification
Freeze/Thaw Resistance	EIMA 101.01	60 cycles	No deleterious effects*
	ASTM C-67(Modified)	90 cycles	No deleterious effects*
Water Penetration	EIMA 101.02 (Modified ASTM E-331)	No water penetration beyond plane of the base coat after 15 minutes @ 6.24 psf (299 Pa)	Passed
Water Resistance	ASTM D-2247	28 day exposure	No deleterious effects*
Salt Spray Resistance	ASTM B-117	700 hour exposure	No deleterious effects*
Abrasion Resistance	ASTM D-968	No cracking, checking or loss of film integrity @ 1057 quarts (1000L) of sand	Passed
Mildew Resistance	ASTM D-3273	No growth after 28 day exposure	Passed
Drainage Efficiency	C & I 2000	N/A	> 95% Drainage Efficiency

* No deleterious effects: no cracking, checking, crazing, erosion, rusting, blistering, peeling or delamination

B. System Performance - Structural

TEST	METHOD	CRITERIA	RESULT
Impact Resistance	EIMA 101.86	Standard: 25-49 in-lbs (2.84 - 5.83J) Medium: 50-89 in-lbs (5.65 - 10.1J) High: 90-150 in-lbs (10.2 - 17.0J) Ultra-High: >150 in-lbs (17.1J)	Standard resistance with one layer Sto Mesh. Medium resistance with two layers Sto Mesh. High resistance with one layer Sto Intermediate Mesh Ultra-High resistance with one layer Sto Armor Mat and one layer Sto Mesh
Wind Load	ASTM E-330	Withstand positive and negative loads required by prevailing building code.	+193, - 53 psf (+9.24, - 2.54 kPa) with 1 pcf (16 kg/m3) density EPS board +193, -82 psf (+9.24, -3.93 kPa) with 2 pcf (32 kg/m3) density EPS board

Note: wind load results are ultimate loads based on average of three panels with loads held for five minutes.

C. Component Performance - Durability

TEST	METHOD	CRITERIA	RESULTS
Alkali Resistance of Mesh	EIMA 105.01	Greater than 120 pli (21dN/cm) retained tensile strength	Pass
Physical Properties and Requirements for EPS Board	ASTM C-578	Refer to EIMA Guideline Specifications for Expanded Polystyrene (EPS) Insulation Board	Pass

D. Component Performance - Fire

TEST	METHOD	CRITERIA	RESULT
Surface Burning	ASTM E-84	Adhesive, insulation board, base coat and finish coat ≤ 25 flame spread and ≤ 450 smoke developed	Pass

1.06 SUBMITTALS

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

B. Applicator's certificate of instruction.

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

D. Manufacturer's code report.

E. Manufacturer's standard warranty.

F. A list of minimum three (3) job references.

G. Manufacturer's certificate of compliance with EIMA standards.

H. EPS board manufacturer's certificate of compliance with the current edition of EIMA Guideline Specifications for Expanded Polystyrene (EPS) Insulation Board

I. Sealant manufacturer's certificate of compliance with EIMA Standard 300.01.

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

1.07 QUALITY ASSURANCE

A. Manufacturer requirements

1. Member in good standing of the EIFS Industry Members Association (EIMA).
2. System manufacturer for a minimum of fifteen (15) years.
3. System recognized for intended use by the national codes and the local code agency with jurisdiction over the project.

B. Contractor requirements

1. Engaged in application of Class PB EIFS 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 Class PB EIFS 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.
6. Maintain minimum one supervisory employee on the project at all times who has attended the Sto system installation seminar.

C. Insulation board manufacturer requirements

1. Recognized by Sto as capable of producing insulation board to meet system requirements, and hold a valid licensing agreement with Sto.
2. Listed by an approved agency.
3. Label insulation board with information required by Sto, the approved listing agency and the applicable building code.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver all EIFS materials in their original sealed container 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.

1.09 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 the scheduling of work 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) during application and drying period, minimum 24 hours after application of EIFS.

B. Provide supplementary heat for installation in temperatures less than 40° F (4° C).

C. 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)

A. Install water resistive barrier and flexible membrane flashing at sills before installing doors, windows and other penetrations through the wall.

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

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

D. Install copings immediately after installation of the system and when EIFS coatings are dry or provide temporary waterproofing until coping is installed.

E. Install sealant immediately after installation of the system and when EIFS coatings are dry or provide temporary waterproofing until sealant is installed.

1.11 WARRANTY

A. Provide manufacturer's standard labor and material warranty.

Part 2 PRODUCTS

2.01 MANUFACTURERS

A. Sto Corp. (EIFS Components and Flexible Flashing)

B. Wind-Lock Corp. (Fasteners)

C. Plastic Components, Inc. (Starter Track)

D. Provide EIFS components from single source EIFS manufacturer or approved supplier

2.02 WATER RESISTIVE BARRIERS

A. Code compliant water resistive barriers (i.e., in accordance to ESR 1030 section 3.5).

2.03 FLASHING

A. Sto Flexible Flashing—rubberized asphalt cold applied, self adhering membrane as furnished by Sto Corp.

B. Sheet Metal Flashing—minimum 0.019 inch (0.48 mm) (No. 26 gage galvanized sheet metal) corrosion-resistant metal.

2.04 FASTENERS

A. Wind-Devil W-2 or equivalent for 1-1/2" (51 mm) Sto Drainage EPS Insulation Board and 7/16” solid sheathing. Increase fastener length for thicker insulation board or sheathing to achieve equivalent penetration into substrate. Refer to fastener patterns and fastener selection charts in addendum to this specification.

(Note: pull-out or withdrawal capacity of fasteners into substrate must be verified with respect to anticipated wind load and required safety factor).

2.05 INSULATION BOARD

A. Minimum 1.0 lb/cu.ft. (16 kg/m3) Expanded Polystyrene (EPS) Insulation Board incompliance with:

1. ASTM C 578 Type I requirements.
2. EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board.
3. Minimum 1-1/2 inch (38 mm) thick.
4. Sto Drainage Expanded Polystyrene (EPS) Insulation Board Requirements (see Sto Drawing No. MADS 9.01).

B. Nominal 2.0 lb/cu.ft. (32 kg/m3) Sto Drainage Expanded Polystyrene (EPS) Insulation Board, or nominal 2.0 lb/cu.ft. (32 kg/m3) Rigid, Extruded Polystyrene (XEPS) Insulation Board, in compliance with ASTM C 578, Type IV requirements, minimum 1-1/2 inch (51 mm) thick, with drainage grooves.

(Note: EPS and XEPS insulation board noted in item "B" are used in below grade system applications [see specification Addendum]. Check local code to determine if below grade insulation is permitted).

2.06 BASE COAT *(Choose one)*

A. Sto RFP—noncementitious, fiber reinforced acrylic base coat.

B. Sto BTS-PLUS—one-component polymer modified cementitious high build base coat with less than 33 percent Portland cement content by weight.

C. Sto Flexyl—fiber reinforced acrylic base coat mixed with Portland cement (for use as a waterproof base coat to waterproof foundations, sloped sills, parapets and build-outs or projections).

D. Sto Primer Adhesive B - one component polymer modified cement based factory blend, base coat with less than 33 percent Portland cement content by weight

E. Sto Primer Adhesive - acrylic based base coat mixed with Portland cement

2.07 REINFORCING MESHES

A. Standard Mesh

1. Sto Mesh—nominal 4.8 oz./sq.yd. (163 g/m2), symmetrical, interlaced open-weave glass fiber fabric made with minimum 25 percent by weight alkaline resistant coating for compatibility with Sto materials (achieves Standard Impact Classification).

B. High Impact Mesh

1. Sto Intermediate Mesh—nominal 11.2 oz./sq.yd. (380 g/m2), high impact, interwoven, open weave glass fiber fabric with alkaline resistant coating for compatibility with Sto
2. materials (achieves High-Impact Classification).

C. Ultra High Impact Mesh

1. Sto Armor Mat—nominal 15 oz./sq.yd. (509 g/m2), ultra-high impact, double strand, interwoven, open-weave glass fiber fabric with alkaline resistant coating for compatibility with Sto materials (recommended to a minimum height of 6'-0" [1.8 m] above grade at all areas accessible to pedestrian traffic [such as ground floors] as indicated on contract drawings). (Achieves Ultra-High Impact Classification when applied beneath Sto Mesh).

D. Specialty Meshes

1. Sto Detail Mesh—nominal 4.5 oz/sq yd (153 g/m2), flexible, symmetrical, interlaced glass fiber fabric with alkaline resistant coating for compatibility with Sto materials (used for standard EIFS backwrapping or pre-wrapping and aesthetic detailing).
2. Sto Corner Mat—nominal 6.25 oz./sq. yd. (212 g/m2), pre-creased, heavy-duty open-weave woven glass fiber fabric with alkaline resistant coating for compatibility with Sto materials (used for maximum impact protection at inside and outside corners).

2.08 PRIMER *(select one depending on finish to be used)*

A. Sto Primer—acrylic based primer (for Sto acrylic based finishes).

(Note: Priming is recommended as a color base for "R" [rilled texture] finishes, and for fine texture finishes. Priming is required for Sto Varilit. The primer may be tinted to match the finish color.)

2.09 FINISH COAT

(Note: specify finish color with a lightness value of 20 or greater over the system)

A. Stolit—acrylic based textured wall coating with graded marble aggregate.

B. Sto Essence Finish—acrylic based textured wall coating with graded marble aggregate.

C. StoSilco Lit—silicone enhanced textured wall coating with graded marble aggregate.

2.10 JOB MIXED INGREDIENTS

A. Portland Cement: ASTM C 150, Type I.

B. Water: Clean and potable.

2.11 ACCESSORIES

A. Starter Track—rigid PVC (polyvinyl chloride) plastic track with weepholes and drip edge as furnished by Plastic Components, Inc. (Part No. STDE).

2.12 MIXING

A. Sto BTS-PLUS: mix ratio with water: 7-9 US quarts (6.6-8.5 L) of water per 60 pound (27 kg) bag of Sto BTS-PLUS. Pour water into a clean mixing pail. Add Sto BTS-PLUS, mix to a uniform consistency and allow to set for approximately 5 minutes, then remix. Adjust mix if necessary with additional Sto BTS-PLUS or water

and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent.

B. Sto Flexyl: mix ratio with Portland cement: 1:1 ratio by weight. Pour Sto Flexyl 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 with additional Sto Flexyl or cement and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent. Do not add water.

C. Sto RFP: mix to a uniform consistency. A small amount of water may be added to adjust workability.

D. Sto Primers: mix to a uniform consistency.

E. Sto Finishes: mix to a uniform consistency. A small amount of water may be added to adjust workability. Limit addition of water to amount needed to achieve the finish texture.

F. Mix materials with a clean, rust-free high speed mixer in a clean mixing pail.

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

H. Do not use anti-freeze compounds or other additives.

Part 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. Prequalify under Quality Assurance requirements of this specification (section 1.07.B).

3.02 EXAMINATION

A. Inspect sheathing application for compliance with applicable requirement:

1. Exterior gypsum sheathing—GA-53
2. Exterior Grade and Exposure I wood based sheathing—APA J20G

B. Inspect flashings at roof/wall transitions, decks and penetrations through wall for compliance with code.

C. Report deviations from the requirements of project specifications or other conditions that might adversely affect the EIFS installation to the General Contractor.

3.03 INSTALLATION

A. Starter Track

1. Strike a level line at the base of the wall to coincide with the top of the attachment flange of the track.
2. Attach the starter track into the structure a minimum of 12 inches (300 mm) on center with the appropriate fastener: galvanized or zinc coated nails for wood framing with minimum 3/4 inch (19 mm) penetration.
3. Butt sections of starter track together. Miter cut corners and abut.

B. Install water-resistive barrier over sheathing of all exterior walls:

Option 1: Apply the StoGuard fluid applied water-resistive air barrier coating.

StoGuard®

Joint Treatment, Rough Opening Protection, and Detail Components:

Sto Gold Fill® – ready mixed coating applied by trowel or knife for rough opening protection of frame walls and joint treatment of sheathing when used with StoGuard Mesh. Also used as a detail component with StoGuard Mesh to splice over back flange of starter track, flashing, and similar ship lap details

Sto Gold Coat® – ready mixed coating applied by brush, roller or spray for rough opening protection of frame walls and joint treatment of sheathing when used with StoGuard Fabric. Also used as a detail component with StoGuard Fabric to splice over back flange of starter track, flashing, and similar ship lap details

StoGuard RapidFill™ – one component rapid drying gun-applied joint treatment for sheathing. Also used at static transition joints or seams in construction and to seal fish mouths, wrinkles, seams, gaps, holes, or other voids in StoGuard air barrier materials. Also used as a detail component to splice over back flange of starter track, flashing, and similar ship lap details

StoGuard RapidSeal™ – one component rapid drying gun-applied rough opening protection for frame and CMU walls without mesh or fabric reinforcement. Also use as a joint treatment for sheathing when used with StoGuard Mesh. Also used to seal fish mouths, wrinkles, seams, gaps, holes, or other voids in StoGuard air barrier materials

Waterproof Coating: Sto Gold Coat® – ready mixed waterproof coating for concrete, concrete masonry, wood-based sheathing, and glass mat gypsum sheathing

INSTALLATION

NOTE:The air/moisture barrier described below is one set of materials in the air barrier system and the moisture protection for the structure. Installation of the air/moisture barrier must be integrated with flashing and other air and moisture barrier materials to ensure that where water is likely to penetrate the wall assembly, it will be drained to the exterior at the source of the leak. Proper air barrier connections and integration of the air/moisture barrier through proper sequencing of work and coordination of trades is necessary for a complete air barrier system and complete moisture protection.

Air/Moisture Barrier Installation over Exterior or Exposure I Wood-Based Sheathing (Plywood and OSB), Glass Mat Faced Gypsum Sheathing in Compliance with ASTM C 1177, and Concrete, or Concrete Masonry (CMU) Wall Construction

Transition Detailing with StoGuard Transition Membrane

At floor line deflection joints up to 1 inch (25 mm) wide, and static joints and transitions such as: sheathing to foundation, dissimilar materials (i.e., CMU to frame wall), flashing shingle-lap transitions, and wall to balcony floor slab or ceiling:

Apply waterproof coating (Sto Gold Coat) liberally to properly prepared surfaces with brush, roller, or spray.

Place pre-cut lengths of StoGuard Transition Membrane centered over the transition in the wet coating. At changes in plane crease the membrane and similarly place the membrane material in the wet coating. At floor line deflection joints achieve a slightly concave profile (recessed into the joint) of the membrane.

Immediately top coat the membrane with additional coating and apply pressure with brush or roller to fully embed the membrane in the coating and achieve a smooth and wrinkle-free surface without gaps or voids.

Apply coating liberally along all top horizontal edges on walls and along all edges on balcony floor slabs to fully seal the edges.

Overlap minimum 2 inches (51 mm) at ends and adhere lap seams together with coating. Shingle lap vertical seams and vertical to horizontal intersections with minimum 2 inch (51 mm) overlap.

At movement joints up to 1 inch (25 mm) wide with up to + 50% movement such as masonry control joints, and through wall joints in masonry or frame construction:

1. Insert backer rod sized to friction fit in the joint (diameter 25% greater than joint width).

Recess the backer rod ½ inch (13 mm).

Apply the waterproof coating liberally to properly prepared surfaces with brush, roller, or spray along the outer surface on each side of the joint (not in the joint).

Immediately place the membrane by looping it into the joint against the backer rod surface to provide slack.

Embed the membrane in the wet coating along the outer surface on the sides of the joint by top coating with additional coating material and applying pressure with a brush or roller.

For all applications, after the membrane installation is complete and the waterproof coating is dry:

1. Apply a final liberal coat of the waterproof coating to all top horizontal edges on walls to ensure waterproofing integrity. Similarly apply coating at all edges on balcony floor slabs.

Inspect the installed membrane for fish mouths, wrinkles, gaps, holes or other deficiencies. Correct fish mouths or wrinkles by cutting, then embedding the area with additional coating applied under and over the membrane.

Seal gaps, holes, and complex geometries at three dimensional corners with StoGuard, RapidFill or StoGuard RapidSeal.

Transition Detailing with StoGuard RapidFill

At flashing shingle laps, and through wall penetrations such as pipes, electrical boxes, and scupper penetrations:

Flashing leg or penetration flange must be seated flat against the wall surface without gaps. Apply StoGuard RapidFill liberally with a caulking gun in a zig-zag pattern across the flashing leg or flange/wall surface seam and spread to a thickness that covers the flange and fastener penetrations and directs water away from the wall. Extend application minimum 1 inch (25 mm) onto both surfaces (flashing leg/flange and wall surface).

At through wall penetrations without flanges ensure the penetrating element (i.e., pipe or scupper) is fitted snug against abutting wall surfaces. Apply a fillet bead with a caulking gun around the penetration and tool against both surfaces (penetration and wall surface) to create a bead profile that directs water away from the penetration. Extend application minimum 1 inch (25 mm) onto both surfaces.

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, StoGuard RapidSeal):*

Sto Gold Fill with StoGuard Mesh: apply 9 inch (229 mm) 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).

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. 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 StoGuard RapidSeal (refer to Sto Detail 20.20F).

StoGuard RapidSeal: apply a generous bead of StoGuard RapidSeal with a caulking gun in a zig-zag pattern along the inside and outside surface of the rough opening. Spread with a 6 inch (152 mm) wide plastic drywall knife all the way around the opening (refer to Sto Details 20.20R and 21.20R)

Sheathing Joint Treatment *(select one)*

Sto Gold Fill with StoGuard Mesh: place 4 inch (102 mm) wide mesh centered along sheathing joints and minimum 9 inch (229 mm) wide mesh centered and folded at inside and outside corners. Immediately apply Sto Gold Fill by spray or trowel and spread with a trowel to create a smooth surface that completely covers the mesh.

Sto Gold Coat with StoGuard Fabric: apply Sto Gold Coat liberally by spray or roller along sheathing joints and immediately place 4 inch (102 mm) wide fabric centered over the joints into the wet coating, and 6 inch (152 mm) 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 (51 mm).

StoGuard RapidFill: apply a thick bead of StoGuard RapidFill 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). Spread 1 inch (25 mm) beyond the sheathing joint on each side. Follow the same procedure for inside and outside corners.

Air/Moisture Barrier Coating Installation

Plywood and Gypsum Sheathing: apply waterproof coating by spray or roller over sheathing surface, including the dry joint treatment, rough opening protection, and transition areas, to a uniform wet mil thickness of 10 mils in one coat. Use

½ inch (13 mm) nap roller for plywood. Use ¾ inch (19 mm) nap roller for glass mat faced gypsum sheathing. Protect from weather until dry.

OSB Sheathing: apply waterproof coating by spray or with a ¾ inch (19 mm) nap roller to sheathing surface to a uniform wet mil thickness of 10 mils. Protect rough openings, joints, and parapets (Paragraph 3.04D), then apply a second coat of waterproof coating.

CMU Surfaces:

Repair static cracks up to 1/2 inch (13 mm) wide with StoGuard RapidFill. Rake the crack with a sharp tool to remove loose or friable material and blow clean with oil-free compressed air. Apply the crack filler with a trowel or putty knife over the crack and tool the surface smooth. *(Note: For moving cracks or cracks larger than ½ inch [13mm]), consult with a structural engineer for repair method).* Protect repair from weather until dry.

Liberally apply two coats of Sto Gold Coat to the surface with a ¾ inch nap roller or spray equipment to a minimum wet thickness of 10 – 30 mils each, depending on surface condition. Additional coats may be necessary to provide a void and pinhole free surface. Protect from weather until dry.

IMPORTANT: Sto Gold Coat functions as an air and moisture barrier on normal weight concrete masonry wall construction with flush (struck flush with the surface of the CMU) or concave joints when minimum two liberal coats are applied. Additional coats may be necessary depending on the condition of the CMU wall surface, CMU porosity, joint profile, and other variables that may exist. For "rough" CMU wall surfaces, skim coat the entire surface with one of Sto's cementious levelers (Sto BTS Plus or Sto BTS Xtra) before application of Sto Gold Coat. A VOID AND PINHOLE FREE SURFACE must be achieved for Sto Gold Coat to properly function as an air and moisture barrier on CMU wall surfaces.

Air /Moisture Barrier Connections and Shingle Laps

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

Coordinate installation of flashing and other moisture protection components with other trades to achieve complete moisture protection such that water is directed to the exterior,

not into the wall assembly, and drained to the exterior at sources of leaks (windows, doors and similar penetrations through the wall assembly).

Splice-in head flashings above windows, doors, floor lines, roof/sidewall step flashing, and similar locations with StoGuard detail component to achieve shingle lap of the air/moisture barrier such that water is directed to the exterior.

NOTE: Windows and doors are typically installed immediately following installation of the air/moisture 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.

C. Install flexible membrane flashing at sills of rough openings with end dams a minimum of 4 inches (100 mm) up sides of opening. Install sill piece with shim to achieve slope and fold down a minimum of 4 inches (100 mm) onto vertical plane of wall over water resistive barrier.

Option 2: Apply water-resistive barrier horizontally with the upper layer lapped over the lower layer by a minimum of 2 inches (50 mm). Lap over attachment flange of starter track a minimum of 2 inches (50 mm). Where vertical joints occur lap a minimum of 6 inches (152mm). Wrap into rough openings at windows, doors and other penetrations through the wall and overlap flexible membrane flashing at sill end dams a minimum of 2 inches (50 mm). Do not make holes or breaks in the barrier other than those created by fasteners.

D. Install Class PB EIFS with drainage in compliance with manufacturer's published written instructions (see addendum).

3.04 PROTECTION

A. Provide protection of installed EIFS materials from water infiltration into or behind the system.

B. Provide protection of installed EIFS from dust, dirt, precipitation, freezing and continuous high humidity until EIFS coatings are fully dry.

ADDENDUM

Instructions for Installation of StoTherm™ RainScreen

A. Backwrapping

1. Attach a strip of detail mesh to the substrate at all system terminations (windows, doors, expansion joints, etc.) except where the Starter Track is used. The mesh must be wide enough to attach approximately 4 inches (100 mm) of mesh onto the wall, be able to wrap around the insulation board edge and cover a minimum of 2 1/2 inches (64 mm) on the outside surface of the insulation board. After attaching mesh strips to the substrate, they will dangle until the backwrap procedure is completed (section E.1).

B. Mechanical Attachment and Installation of Insulation Board

1. Attach EPS board with mechanical fasteners in accordance with the attachment patterns shown in figures 1 or 2. Do not puncture surface of insulation board with fastener disks.
2. Attach insulation boards in a running bond pattern on the walls with the long dimension horizontal. Start by inserting the first course of insulation board in the Starter Track.
3. Butt all board joints tightly together to eliminate any thermal breaks in the EIFS
4. Cut insulation board in an L-shaped pattern to fit around openings. Do not align board joints with corners of openings.

C. Slivering and Rasping of Insulation Board Surface

1. Fill any open joints in the insulation board layer with slivers of insulation or approved spray foam.
2. After insulation boards are firmly attached to the substrate, rasp the surface to achieve a smooth, even surface and to remove any ultraviolet ray damage.

(Note: EPS Insulation board exposed to sunlight for an extended period will develop a powdery residue on the surface. This residue must be entirely removed by rasping the surface)

D. Reveals/Aesthetic Grooves

(Note: Reveals/aesthetic grooves may be designed into the system to accommodate workability on multilevel buildings or lengthy wall sections)

1. Cut reveals/aesthetic grooves with a hot-knife, router or groove-tool in locations indicated on project plans.
2. Offset reveals from fasteners and insulation board joints minimum 3 inches (75 mm).
3. Do not locate reveals at high stress areas such as corners of windows, doors, etc.
4. A minimum of 1 inch (25 mm) thickness of insulation board must remain at any point after cutting the groove.

E. Completion of Backwrapping

1. Complete the backwrapping procedure by applying base coat to exposed edges of insulation board and approximately 4 inches (100 mm) onto the face of the insulation board. Pull mesh tight around the board and embed it in the base coat with a stainless steel trowel. Use a corner trowel for clean, straight lines. Smooth any wrinkles or gaps in the mesh.

F. Base Coat and Reinforcing Mesh Application

1. Pre-spot all fasteners with base coat and allow to dry.
2. Apply minimum 9x12 inch (229 x305 mm) diagonal strips (using detail mesh) at corners of windows, doors, and all penetrations through the system. Embed the strips in wet base coat and trowel from the center to the edges of the mesh to avoid wrinkles.
3. Apply detail mesh at reveals. Embed the mesh in the wet base coat and trowel from the base of the reveal to the edges of the mesh.
4. High Impact mesh application (recommended to a minimum height of 6'-0" [1.8 m] above grade at all areas accessible to pedestrian traffic [such as ground floors] as indicated on contract drawings). Apply base coat over the insulation board with spray equipment or a stainless steel trowel to a uniform thickness of approximately 1/16 inch (1.6mm). Work horizontally or vertically in strips of 40 inches (1016 mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Butt the mesh at seams. Allow the base coat to dry.
5. Standard mesh application: Apply base coat over the insulation board, including areas with high impact mesh, with spray equipment or a stainless steel trowel to a uniform thickness of approximately 1/16 inch (1.6 mm). Work horizontally or vertically in strips of 40 inches (1016mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap

mesh not less than 2 1/2 inches (64 mm) at mesh seams and at overlaps of detail mesh. Feather seams and edges. Double wrap all inside and outside corners with minimum 6 inch (152 mm) overlap in each direction. (Alternate corner treatment: Embed corner mat in wet base coat, allow to dry, then overlap up to corner with standard reinforcing mesh embedded in base coat.) 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.

6. Allow base coat to thoroughly dry before applying primer or finish.

G. Finish Coat Application

(Note: If a primer is used, apply with brush, roller or proper spray equipment over the clean, dry base coat and allow to dry thoroughly before applying finish).

1. Apply finish directly over the base coat (or primed base coat) ONLY AFTER THE BASE COAT/PRIMER HAS THOROUGHLY DRIED. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:
   a. Avoid application in direct sunlight.
   b. Apply finish in a continuous application, and work to a wet edge.
   c. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying and may require adjustments in the scheduling of work to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule accordingly and provide protection as necessary.
   d. Float "R" (rilled texture) finishes with a plastic trowel to achieve their rilled texture.
   e. Do not install separate batches of finish side-by-side.
   f. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.
   g. Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.

For below grade application, sloped sills, parapets, and build-outs or projections greater than 2 inches (51 mm) use the following procedures:

A. Below Grade Installation

1. Adhesive and Insulation Board Installation: Install Type IV insulation board (in compliance with section 2.04.B of this specification) to a minimum 12 inches (300 mm) above grade and to the foundation footing.
2. Base Coat Application: Follow procedure outlined in section F4 and F5 of these instructions
3. Finish Coat Application: Apply finish coat in accordance with Section G1 of these instructions. Do not apply finish below grade. Allow sufficient distance above grade to prevent accumulation of snow, ice and water against coating.

(Note: local codes may prohibit the use of insulation below grade. Check local codes before installing system below grade. Provide means to inspect for and detect termites in areas with termite or insect control problems. Before backfilling, protect the below grade system with insulation board and provide drainage board or other drainage material to prevent damage to the system, then backfill).

B. Sloped EIFS Sills, Parapets and Aesthetic Bands or Projections Greater than 2 inches (51 mm) thick.

1. Apply waterproof base coat and standard mesh over the dry reinforced base coat with spray equipment or a stainless steel trowel in accordance with section F.4 of these instructions on the sloped surface and immediately above and below it (minimum 6 inches [152mm]).
2. Allow base coat to dry and prime with the appropriate primer.
3. Apply finish coat in accordance with section G1 of these instructions.

(Note: Sloped surfaces must maintain a minimum 1:2 [27 degrees] slope and a maximum width of 12" [300 mm]. Increase slope for northern climates to prevent accumulation of ice, snow and water on surface. Sto Flexyl with Sto Mesh and appropriate Sto primer is required for all sloped surfaces or trim more than 2" (51 mm) thick..

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