SECTION 09 24 23

PORTLAND CEMENT STUCCO

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\*\* NOTE TO SPECIFIER \*\* Sto Corporation; Integrated exterior wall systems; Portland cement stucco
This section is based on the products of Sto Corporation, which is located at:
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[Click Here] for more information
Sto is the leading global producer of a broad range of next-generation building envelope solutions and coating systems for building construction, maintenance and restoration. For more than 35 years, we have led the way in building technology, while providing customers with the most experienced technical support in the industry.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Portland Cement Stucco:
			1. Insulation outbound of sheathing for frame wall construction. (S5071x - StoPowerwall)
			2. Insulation inbound of sheathing for frame wall construction. (S5071i - StoPowerwall)
			3. Metal plaster base on concrete, concrete masonry (CMU), and frame wall construction. (S504 - StoPowerwall)
			4. Metal plaster base on concrete, concrete masonry (CMU), and frame wall construction. (S505 - StoPowerwall)
		2. Trowel applied air barrier and stucco brown coat over vertical above grade concrete and concrete masonry walls. (S6500 - StoPowerwall ExtraSeal)
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
		2. Section 04 20 00 - Unit Masonry.
		3. Section 06 16 36 - Wood Panel Product Sheathing.
		4. Section 07 27 19 - Plastic Sheet Air Barriers .
		5. Section 07 27 00 - Air Barriers.
		6. Section 07 50 00 - Membrane Roofing.
		7. Section 07 62 00 - Sheet Metal Flashing and Trim.
		8. Section 07 91 23 - Backer Rods.
		9. Section 08 40 00 - Entrances, Storefronts, and Curtain Walls.
		10. Section 08 50 00 - Windows.
	1. DEFINITIONS
		1. Air Barrier Material: A primary element that provides a continuous barrier to the movement of air.
		2. Air Barrier Accessory: A transitional component of the air barrier that provides continuity.
		3. Air Barrier Auxiliary Material: A transitional component that provides air barrier continuity furnished by a source other than the primary air barrier manufacturer.
		4. Air Barrier Assembly: The collection of air 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.
	2. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Incorporated (ASHRAE):
			1. 2013 ASHRAE Handbook - Fundamentals.
			2. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
		2. ASTM International (ASTM):
			1. ASTM A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
			2. ASTM A653 - Standard Specification for Sheet Steel Zinc coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
			3. ASTM B69 - Standard Specification for Rolled Zinc.
			4. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
			5. ASTM C297 - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
			6. ASTM C578 - Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation.
			7. ASTM C847 - Standard Specification for Metal Lath.
			8. ASTM C897 - Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters.
			9. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster.
			10. ASTM C1063 - Standard Specification for Installation of Lathing and Furring for Portland Cement Plaster.
			11. ASTM C1177 - Standard Specification for Glass Mat Gypsum for Use as Sheathing.
			12. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
			13. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
			14. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
			15. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
			16. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
			17. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
			18. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
			19. ASTM E330 - Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
			20. ASTM E514 - Standard Test Method for Water Penetration and Leakage Through Masonry.
			21. ASTM E779 - Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.
			22. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
			23. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
			24. ASTM E1186 - Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
			25. ASTM E1827 - Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door.
			26. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.
			27. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
			28. ASTM E2430 - Standard Specification for Expanded Polystyrene ("EPS") Thermal Insulation Boards For Use in Exterior Insulation and Finish Systems ("EIFS").
			29. ASTM G154 - Recommended Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials.
		3. APA - Engineered Wood Association:
			1. PS 1 - Voluntary Product Standard, Structural Plywood.
			2. PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
			3. E30 - APA Engineered Wood Construction Guide.
		4. American Iron and Steel Institute (AISI):
			1. AISI S200 - North American Standard for Cold-Formed Steel Framing-General Provisions.
		5. International Code Council (ICC):
			1. 2012 and 2015 IBC (International Building Code).
		6. International Code Council Evaluation Service (ICC ES):
			1. AC 11 - Acceptance Criteria for Cementitious Exterior Wall Coatings.
			2. AC 212 - Acceptance Criteria for Water-resistive Coatings used as Water-resistive Barriers over Exterior Sheathing.
			3. ICC ESR 1233: StoGuard with Gold Coat, StoGuard with EmeraldCoat, and StoGuard VaporSeal Water-resistive Barriers, and StoEnergy Guard.
			4. ICC ESR 2323: StoPowerwall Stucco Systems.
			5. ICC ESR 2142: Brand Insulation Boards and Dow Fan-Fold Products.
		7. National Fire Protection Association (NFPA):
			1. NFPA 285 - Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus.
			2. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source.
		8. South Coast Air Quality Management District (SCAQMD):
			1. Rule 1113 (2007) - Architectural Coatings.
		9. Sto Corporation. Addendum to Sto Stucco Specifications.
		10. United Stated Environmental Protection Agency (EPA):
			1. CFR 40 Part 59 - Code of Federal Regulations Title 40, Part 59 - National Volatile Organic Compound Emission Standards for Consumer and Commercial Products.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data:
			1. Manufacturer's specifications, details, installation instructions and product data.
			2. Manufacturer's code compliance report and UL Listing for continuous insulation.
			3. Manufacturer's code compliance report for air barrier and water-resistive barrier.
			4. Manufacturer's NFPA 285 assembly report or ICC ESR indicating compliance of stucco assembly, including continuous insulation, air/moisture barrier, and drainage mat, with requirements of NFPA 285 for use on Types I, II, III, and IV construction.
			5. Manufacturer's code compliance report for stucco where ICC listed one coat stucco is used.
			6. Manufacturer's standard warranty.
			7. Fastener manufacturer's pull-out or withdrawal capacity testing for frame construction.
			8. Preparation instructions and recommendations.
			9. Storage and handling requirements and recommendations.
			10. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern and color.
		2. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications:
			1. Stucco and air barrier products manufacturer for a minimum of 20 years.
			2. Stucco finish products and air/moisture barrier products manufactured under ISO 9001 - Quality System, and 14001 - Environmental Management System.
		2. Installer Qualifications:
			1. Licensed, insured and engaged in application of Portland cement stucco for a minimum of 3 years.
			2. Knowledgeable in proper use and handling of Sto materials.
			3. Employ skilled mechanics who are experienced and knowledgeable in Portland cement stucco application, and familiar with the requirements of the specified work.
			4. Successful completion of 3 projects of similar size and complexity to the specified project.
			5. Provide 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.
		3. Insulation Board Manufacturer Requirements: Listed by an approved agency. Label insulation board with information required by Sto Corporation, approved listing agency, and applicable building code.
		4. Testing:
			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 per ASTM E283, ASTM E331, and ASTM E330, respectively, through an independent laboratory.
			2. Mock-up shall comply with requirements of project specifications.
			3. Where mock-up is tested at job site maintain approved mock-up at site as reference standard.
			4. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.
			5. Conduct air barrier adhesion testing per ASTM D4541.
			6. Conduct air barrier assembly testing per ASTM E783.
			7. Verify adequacy of pull-out or withdrawal capacity of fasteners used for frame construction with manufacturer in relation to negative design wind pressures.
			8. Conduct pH testing to check stucco surface alkalinity before application of primer or finish materials. Where alkaline resistant primer is used pH testing may be waived.
			9. Conduct wet sealant adhesion testing in accordance with sealant manufacturer's field quality control test procedure.
			10. Notify design professional minimum 7 days prior to testing.
		5. Inspections:
			1. Independent third party inspection where required by code or contract documents.
			2. Conduct inspections per code requirements and contract documents.
		6. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up on might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
			1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
			2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
			3. Retain mock-up during construction as a standard for comparison with completed work.
			4. Do not alter or remove mock-up until work is completed or removal is authorized.
	1. PRE-INSTALLATION CONFERENCE
		1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions, labeling and recommendations.
		2. Deliver materials in their original sealed containers bearing manufacturer's name and identification of product.
		3. Protect insulation materials from prolonged UV exposure, keep away from sources of heat, sparks, flame, flammable or volatile materials. Store on a clean, flat surface, off the ground in a dry area.
		4. Protect coatings, pail products, from freezing and temperatures in excess of 90 degrees F (32 degrees C). Store away from direct sunlight.
		5. Protect Portland cement based materials, bag products, from moisture and humidity. Store under cover off the ground in a dry location.
		6. Protect from damage due to weather, excessive temperature, and construction operations.
	3. PROJECT CONDITIONS

\*\* NOTE TO SPECIFIER \*\* Weather conditions affect application, drying time and curing requirements. Hot or dry conditions limit working time and accelerate drying and may require adjustments in application, scheduling and curing to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing.

* + 1. Maintain ambient and surface temperatures above 40 degrees F (4 degrees C) during application and for 24 hours after set of stucco, and application of waterproof air barrier and finish materials.
		2. Provide supplementary heat for installation in temperatures less than 40 degrees F (4 degrees C) such that material temperatures are maintained as specified. Prevent concentration of heat on uncured stucco and vent fumes and other products of combustion to the outside to prevent contact with stucco.
		3. Prevent uneven or excessive evaporation of moisture from stucco during hot, dry or windy weather. For installation under any of these conditions provide special measures to properly moist cure the stucco. Do not install stucco if ambient temperatures are expected to rise above 100 degrees F (38 degrees C) within a 24 hour period.
		4. Provide protection of surrounding areas and adjacent surfaces from application of materials.
	1. COORDINATION AND SCHEDULING

\*\* NOTE TO SPECIFIER \*\* 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.

* + 1. Protect continuous insulation from prolonged UV exposure. Protect with wall covering within 60 days of installation.
		2. Protect sheathing from climatic conditions to prevent weather damage until the installation of the waterproof air barrier.
		3. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.
		4. 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/moisture barrier components with window and door installation to provide weather proofing of the structure and to prevent moisture infiltration and excess air infiltration.
		5. Install window and door head flashing immediately after windows and doors are installed.
		6. Protect air/moisture barrier with stucco cladding within 180 days of installation.
		7. Protect drainage mat with stucco cladding within 30 days of installation.
		8. Commence the stucco installation after completion of all floor, roof construction and other construction that imposes dead loads on the walls to prevent excessive deflection (and potential cracking) of the stucco.
		9. Sequence interior work such as drywall installation prior to stucco installation to prevent stud distortion (and potential cracking) of the stucco.
		10. Provide site grading such that the stucco terminates above earth grade minimum 4 inches (102 mm) and above finished grade (pavers and sidewalk) minimum 2 inches (51 mm). Provide increased clearance in freeze/thaw climate zones.
		11. Install copings and sealant immediately after installation of the stucco and when finish coatings are dry.
		12. Attach penetrations through stucco to structural support and provide air tight and water tight seals at penetrations.
	1. WARRANTY
		1. Warranty: Provide manufacturer's standard limited warranty.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturers: Sto Corporation which is located at: 3800 Camp Creek Parkway, Building 1400, Suite 120; Atlanta, GA 30331; ASD Toll Free: 800-221-2397; Phone: 404-346-3666; Fax: 404-346-3119; Email: \_\_\_\_\_\_\_\_; Web: www.stocorp.com

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. PORTLAND CEMENT STUCCO
		1. Basis of Design: Insulation outbound of sheathing for frame wall construction as supplied by the Sto Corporation. (S5071x - StoPowerwall)
		2. Basis of Design: Insulation inbound of sheathing for frame wall construction as supplied by the Sto Corporation. (S5071i - StoPowerwall)
		3. Basis of Design: Metal plaster base on concrete, concrete masonry (CMU), and frame wall construction as supplied by the Sto Corporation. (S504 - StoPowerwall)
		4. Basis of Design: Metal plaster base on concrete, concrete masonry (CMU), and frame wall construction as supplied by the Sto Corporation. (S505 - StoPowerwall)
		5. Design Requirements:

\*\* NOTE TO SPECIFIER \*\* Paragraph is for S504 and S505. Delete if not required.

* + - 1. Structural: Wind and axial loads.
				1. Design for maximum allowable deflection, normal to the plane of the wall of L/360.
				2. Design for wind load in conformance with building code requirements.
				3. Refer to applicable ICC ESR for wind load limitations that may apply.

\*\* NOTE TO SPECIFIER \*\* Paragraph is for S5071x and S5071i. Delete if not required.

* + - 1. Structural: Wind and axial loads.
				1. Maximum allowable deflection normal to the plane of the wall to be L/360.
				2. Wind Load: Conform with code requirements.
				3. Metal Framing: 18 gage (0.043 mil) or heavier, maximum 1-5/8 inch (41 mm) flange width, cold formed steel stud framing per AISI Standard S200-07.
				4. Maximum Stud Spacing: 16 inches (406 mm) on center.
				5. Sheathing: 5/8 inch (19 mm) glass mat faced gypsum sheathing per ASTM C1177.
				6. Insulation Board: Minimum 1 inch (25 mm), maximum 2 inch (51 mm) XPS (extruded polystyrene) insulation board per ASTM C578 Type IV requirements.
				7. Drainage Mat: Maximum 1/4 inch (6 mm) thick tangled filament nylon core with fabric facing.
				8. Metal Lath per ASTM C847: Minimum 2.5 lbs per sq yd (1.4 kg per sq m) self-furred galvanized steel diamond mesh metal lath.
				9. Lath Fasteners and Plates: Corrosion resistant fasteners per AISI S200 and ASTM C1513 with minimum three thread penetration beyond steel framing members, and minimum 1-1/4 inch (32 mm) corrosion resistant lath plates.

Minimum Fastener Size and Length:

No. 8 x 3 inch (76 mm) for 1 inch (25 mm) insulation board thickness.

No. 10 x 3-1/2 inches (89 mm) for 1-1/2 inch (38 mm) insulation board thickness.

No. 10 x 4 inch (102 mm) for 2 inch (51 mm) insulation board thickness.

* + - * 1. Lath fastener spacing: maximum 6 inches (152 mm) vertically along studs.
				2. Stucco: 3/4 inch (19 mm) or 7/8 inch (22 mm) Portland cement stucco per ASTM C 926 of uniform thickness applied in two coats, scratch and brown coat.
			1. Moisture Control: Prevent accumulation of water into or behind stucco, either by condensation or leakage into wall construction, in design and detailing of wall assembly:
				1. Corrosion Resistant Flashing: Protect exposed elements and direct water to 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.
				2. 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.
				3. Vapor Diffusion and Condensation: Dew point analysis of wall assembly to determine potential for accumulation of moisture in 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.
				4. StoGuard Air/Moisture Barrier over sheathing.
				5. At through wall expansion joints and at joints formed with back-to-back casing beads, back joints with StoGuard Transition Membrane, refer to Sto Guide Details at [www.stocorp.com](http://www.stocorp.com) .
				6. Seal stucco terminations and accessory butt joints with appropriate sealant.
				7. Seal penetrations through the stucco wall assembly with appropriate sealant, or backer rod and sealant, as dictated by joint type.
			2. Grade Condition:
				1. Do not specify stucco for use below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure.
				2. Minimum 4 inch (102 mm) clearance above earth grade.
				3. Minimum 2 inch (51 mm) clearance above finished grade (pavers and sidewalk). Increased clearance in freeze/thaw climate zones.
			3. Sloped Surfaces, Including Foam Trim and Projecting Architectural Features Attached to Stucco:
				1. Avoid use of stucco on build-outs or weather exposed sloped and horizontal surfaces.
				2. Build out trim and projecting architectural features from the stucco wall surface with code compliant EPS foam.

Foam trim and projecting architectural features must have a minimum 1:2 (27 degrees) slope along their top surface.

Foam horizontal reveals must have a minimum 1:2 (27 degrees) slope along their bottom surface.

Increase slope for northern climates to prevent accumulation of ice/snow and water on surface.

Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the wall plane, protect the top surface with waterproof base coat.

Limit foam thickness to a maximum of 4 inches (102 mm).

Periodic inspections and increased maintenance may be required to maintain surface integrity of finishes on weather exposed sloped surfaces.

Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance burden. Refer to Sto Guide Details at www.stocorp.com.

* + - * 1. Do not use foam on weather exposed projecting ledges, sills, or other projecting features unless supported by framing or other structural support and protected with metal coping or flashing. Refer to Sto Guide Details at www.stocorp.com.
			1. Joints and Accessories:
				1. Two piece expansion joints in stucco system where building movement is anticipated.

Joints in the substrate or supporting construction.

Where system is installed over dissimilar construction or substrates,

At changes in building height, floor lines, columns and cantilevered areas.

* + - * 1. One piece expansion joints every 144 sq ft (13 sq m).

Cut and wire tie lath to the expansion joint accessory so lath is discontinuous at or beneath the accessory.

Do not exceed length to width ratio of 2-1/2:1 in expansion joint layout and do not exceed more than 18 feet (5.5 m) in any direction without an expansion joint.

Where casing bead is used back-to-back as the expansion joint, back the joint with StoGuard Transition Membrane.

* + - * 1. One piece expansion joints at through wall penetrations, for example, above and below doors or windows.
				2. Minimum 3/8 inch (9 mm) wide joints where the system abuts windows, doors and other through wall penetrations.
				3. Appropriate accessories at stucco terminations and joints.
				4. Avoid the use of channel reveal accessories which can interfere with proper drainage and proper stress relief.
				5. Appropriate sealant at stucco terminations and at stucco accessory butt joints.
				6. Indicate location of joints, accessories and accessory type on architectural drawings.
			1. Fire Protection:

\*\* NOTE TO SPECIFIER \*\* Thermal barrier is applicable to S5071i and S5071x. delete if not required.

* + - * 1. Thermal Barrier: 15 minute, minimum 1/2 inch (13 mm) thick interior gypsum wall board, to separate foam plastic insulation from interior.
				2. Noncombustible Type Construction: Full width firestops at floor lines, typically 4 lbs per cu ft (64 kg per cu m) semi-rigid mineral wool, where metal framing runs continuously past floor line and provide minimum 3/4 inch (19 mm) stucco thickness.
				3. Fire Resistance Rated Non-load Bearing Wall Assembly: provide 3/4 or 7/8 inch (19 or 22 mm) uniform stucco thickness. Refer to Sto Guide Details for one hour non-load bearing fire-resistive rated wall assembly.

\*\* NOTE TO SPECIFIER \*\* Paragraph refers to S504 and S505. Delete if not required.

* + - 1. Solid Substrates (Concrete and CMU):
				1. Surface plane tolerance not to exceed 1/4 inch in 10 feet (6 mm in 3.0 m).
				2. Concrete Masonry: Open texture concrete masonry units with flush joints.
				3. Do not install air/moisture barrier materials over efflorescence, weak surface conditions, painted, coated, non-absorbent, salt-contaminated, or any concrete or CMU substrate where adhesion is in question. Proof test adhesion to prepared poured-in-place or pre-cast concrete surfaces and impose a regimen of quality control tests to verify adhesion throughout the project.
			2. Stucco Thickness: Does not include primer or textured finish coat.
				1. Application to Metal Plaster Bases: Stucco thickness; uniform 3/4 inch or 7/8 inch (19 or 22 mm). Stucco thickness not to exceed 7/8 inch (22 mm).
				2. Apply stucco in 2 coats, scratch and brown coat, to achieve the prescribed thickness.
				3. Thickness shall be uniform throughout the wall area.
		1. Performance Requirements:

\*\* NOTE TO SPECIFIER \*\* Continuous Insulation is applicable to S5071x and S5071i. Delete if not required.

* + - 1. Continuous Insulation: Compliant with ASTM C 578 Type IV requirements.
			2. Waterproof Air Barrier:
				1. Compliant with ICC ES Acceptance Criteria AC 212 (ICC ESR 1233).
				2. Material Air Leakage Resistance, ASTM E 2178: less than 0.004 cu ft per min per sq ft (0.02 L per sec per sq m) at 1.57 psf (75 Pa).
				3. Assembly Air Leakage Resistance, ASTM E 2357: less than 0.004 cu ft per min per sq ft (0.02 L per sec per sq m) at 1.57 psf (75 Pa).
				4. Water Vapor Permeance, ASTM E 96, Method B: greater than 10 perms (573 ng/Pa/s/sq m).
				5. Surface Burning per ASTM E 84: Class A Building material.

Flame Spread: Less than 25

Smoke Developed: Less than 450.

* + - * 1. Tensile Adhesion per ASTM C 297:

Gypsum Sheathing: Greater than 85 psi (590 kPa).

OSB: Greater than 30 psi (206 kPa).

\*\* NOTE TO SPECIFIER \*\* Plywood is applicable to S5071i and S504. Delete if not required.

Plywood: greater than 85 psi (590 kPa).

* + - * 1. VOC, Calculation: Less than 100,000 ppm (100 g/L).
				2. Waterproofing and Sealer: Per US EPA 40 CFR 59 and South Coast AQMD Rule 1113.

\*\* NOTE TO SPECIFIER \*\* Drainage mat is applicable to S5071x and S5071i and S505. Delete if not required.

* + - 1. Drainage Mat:
				1. Surface Burning per ASTM E 84: Class A Building material.

Flame Spread: Less than 25.

Smoke Developed: Less than 450.

* + - * 1. Flame Propagation, NFPA 285: Meets requirements for use on noncombustible construction. Types I, II, III, and IV.
			1. Stucco Base:

\*\* NOTE TO SPECIFIER \*\* Delete base coat option not required.

* + - * 1. Stucco scratch and brown coat material per ASTM C 926 and manufactured or listed by Sto Corporation. See Addendum for more information.
				2. One coat stucco material per ICC AC 11, listed by ICC ES, and manufactured or listed by Sto Corporation. See Addendum for more information.
			1. Primers:

\*\* NOTE TO SPECIFIER \*\* Delete primer option not required.

* + - * 1. Alkaline Resistant Primer: For freshly placed (minimum 4 day old) stucco surfaces:

Resistant to alkaline surfaces with pH of 13 or less.

Surface Burning, ASTM E 84: Class A building material.

Flame Spread less than 25.

Smoke Developed less than 450.

VOC compliant with South Coast AQMD Rule 1113 for architectural coatings. Less than 50,000 ppm (50 g/L).

* + - * 1. Acrylic primer for fully cured stucco surfaces. Minimum 28 day old or pH less than 10.

Surface Burning per ASTM E 84: Class A building material.

Flame Spread less than 25.

Smoke Developed less than 450.

VOC Compliant with South Coast AQMD Rule 1113 for architectural coatings. Less than 50,000 ppm (50 g/L).

* + - 1. Finishes:

\*\* NOTE TO SPECIFIER \*\* Delete finish options not required.

* + - * 1. Lotus-Effect Technology: Stolit Lotusan.

Super-hydrophobic textured finish with Lotus-Effect Technology.

Accelerated Weathering per ASTM G 154: 2500 hours, no blistering, checking cracking, crazing, or other deleterious effects.

Water Vapor Permeability per ASTM E 96, Method B: Greater than 30 perms (1172 ng per Pa per sec per sq m).

Surface Burning, ASTM E 84: Class A building material.

Flame Spread less than 25.

Smoke Developed less than 450.

VOC Compliant with South Coast AQMD Rule 1113 for architectural coatings. Less than 50,000 ppm (50 g/L).

* + - * 1. Silicone Enhanced Elastomeric: Sto Powerflex Silco.

Accelerated Weathering per ASTM G 154: 2000 hours, no blistering, checking cracking, crazing, or other deleterious effects.

Water Vapor Permeability per ASTM E 96, Method B: Greater than 10 perms (574 ng per Pa per sec per sq m).

Surface Burning, ASTM E 84: Flame Spread less than 25, Smoke Developed less than 450, Class A building material.

VOC: less than 50,000 ppm (50 g/L), compliant with South Coast AQMD Rule 1113 for architectural coatings.

* + - * 1. Elastomeric: Sto Powerflex.

Accelerated Weathering, ASTM G 154: 2000 hours, no blistering, checking cracking, crazing, or other deleterious effects

Water Vapor Permeability, ASTM E 96, Method B: Greater than 5 perms (287 ng per Pa per sec per sq m).

Surface Burning, ASTM E 84: Class A building material.

Flame Spread less than 25.

Smoke Developed less than 450.

VOC Compliant with South Coast AQMD Rule 1113 for architectural coatings. Less than (50,000) 50 g/L.

* + - * 1. Flexible Acrylic: StoPowerwall.

Accelerated Weathering, ASTM G 154: 2000 hours, no blistering, checking cracking, crazing, or other deleterious effects.

Water Vapor Permeability, ASTM E 96, Method B: Greater than 15 perms (861 ng per Pa per sec per sq m).

Surface Burning, ASTM E 84: Class A building material.

Flame Spread less than 25.

Smoke Developed less than 450.

VOC Compliant with South Coast AQMD Rule 1113 for architectural coatings. Less than (50,000 ppm) 50 g/L.

* + - * 1. Acrylic: Stolit, Stolit X, and Sto Essence DPR, Sto Powercryl.

Accelerated Weathering, ASTM G 154 or G 155: 2000 hours, no blistering, checking cracking, crazing, or other deleterious effects

Water Vapor Permeability, ASTM E 96, Method B: greater than 10 perms (572 ng per Pa per sec per sq m).

Surface Burning, ASTM E 84: Class A building material.

Flame Spread less than 25.

Smoke Developed less than 450.

VOC Compliant with South Coast AQMD Rule 1113 for architectural coatings. Less than (50,000) 50 g/L.

* + 1. Air/Moisture Barrier:
			1. StoGuard: Fluid applied waterproof air barrier for sheathing, concrete, and concrete masonry substrates consisting of multiple compatible components.
				1. Sto EmeraldCoat: Ready mixed flexible waterproof coating for wall sheathing, concrete and CMU wall surfaces.
				2. Sto RapidGuard: One component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle lap over flashing, wall to balcony floor slab or ceiling, and through wall penetrations; pipes, electrical boxes, and scupper penetrations.
				3. Sto Gold Fill: Ready mixed acrylic based flexible joint treatment for rough opening protection, joint treatment of wall sheathing, CMU crack repair, and detail component for shiplap connections with flashing, weep screed, and similar ship lap details.
				4. Sto AirSeal: Ready mixed medium-high build 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 shingle lap details.
				5. StoGuard Mesh: Nominal 4.2 oz per sq yd (142 g per sq m), self-adhesive, flexible, symmetrical interlaced glass fiber mesh, with alkaline resistant coating for compatibility with Sto materials, used with Sto Gold Fill to reinforce rough openings, inside and outside corners, sheathing joints, and shiplap connections with flashing, weep screed, and similar shingle lap details.
				6. StoGuard Fabric: Nonwoven cloth reinforcement used with Sto EmeraldCoat for rough opening protection, joint treatment of wall sheathing, and detail component for shiplap connections with flashing, weep screed, and similar shingle lap details.
				7. StoGuard RediCorner: A preformed fabric piece used in the corners of rough openings in tandem with StoGuard Fabric for quicker installation.
				8. StoGuard Tape: Self adhering rubberized asphalt tape for rough opening protection in wood or metal frame construction.
				9. StoGuard Primer: Primer for use with StoGuard Tape.
				10. StoGuard Transition Membrane: Flexible air barrier membrane for continuity at static transitions: sheathing to foundation, dissimilar materials (CMU to frame wall), wall to balcony floor slab or ceiling, flashing shingle lap transitions. Also used for dynamic joints: floor line deflection joints, masonry control joints, and through wall joints in masonry or frame construction.

\*\* NOTE TO SPECIFIER \*\* Continuous insulation is supplied by others, not the Sto Corporation. Applicable to S5071x and S5071i. Delete if not required.

* + 1. Continuous Insulation:
			1. Owens Corning Type IV XPS rigid insulation board per ASTM C 578.
			2. Dow Type IV XPS rigid insulation board per ASTM C 578.

\*\* NOTE TO SPECIFIER \*\* Spray foam adhesive is supplied by others, not the Sto Corporation. Applicable to S5071x and S5071i. Delete if not required.

* + 1. Spray Foam Adhesive, CI Seam and Gap Filler:
			1. Sto TurboStick Mini: Single component polyurethane spray foam adhesive for attaching foam insulation and filling seams and gaps in insulation board surface.
			2. Sto TurboStick: Single component polyurethane spray foam adhesive for attaching foam insulation and filling seams and gaps in insulation board surface.

\*\* NOTE TO SPECIFIER \*\* Supplied by others. Water resistive barrier is supplied by others, not the Sto Corporation. Applicable to S5071x and S5071i and S505 Delete if not required.

* + 1. Water Resistive Barrier: Minimum No. 15 asphalt saturated felt complying with ASTM D 226, Type 1, or one layer of Grade D Kraft building paper, or paper-backed stucco lath conforming to 2.07.

\*\* NOTE TO SPECIFIER \*\* Drainage mat is applicable to S5071x and S5071i and S505. Delete options not required.

* + 1. Drainage Mat:

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

* + - 1. Sto DrainScreen 6 mm: Nominal 1/4 inch (6 mm) tangled filament nylon core drainage mat with fabric facing.
			2. Sto DrainScreen 10 mm: Nominal 3/8 inch (10 mm) tangled filament nylon core drainage mat with fabric facing.

\*\* NOTE TO SPECIFIER \*\* Supplied by others. Metal lath is susceptible to corrosion in coastal environments. Provide weather protection to prevent moisture entry into wall construction as outlined in Design Requirements. Consider the use of stainless steel lath for coastal environments. Exercise care when attaching metal lath and accessories through the water-resistive barrier so that fasteners go into, not between, framing supports. Do not use power, powder-actuated or other fastening tools/methods that can damage the air barrier, water-resistive barrier or substrate.

* + 1. Lath per ASTM C847: 2.5 lbs per sq yd (1.4 kg per sq m) self-furred galvanized steel diamond mesh metal lath.

\*\* NOTE TO SPECIFIER \*\* Supplied by others.

* + 1. Mechanical Fasteners for Metal Lath:
			1. Non-Corroding Fasteners per AISI S200 and ASTM C1513:
				1. Wood Framing: No. 10 Type S wafer head fully threaded corrosion resistant screws with minimum 1 inch (25 mm) penetration into studs.
				2. Steel Framing: Corrosion resistant fasteners and plates with minimum three thread penetration beyond steel framing members.

\*\* NOTE TO SPECIFIER \*\* 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.

Minimum Fastener Size and Length:

No. 8 x 3 inch (76 mm) for 1 inch (25 mm) insulation board thickness.

No. 10 x 3-1/2 inches (89 mm) for 1-1/2 inch (38 mm) insulation board thickness.

No. 10 x 4 inch (102 mm) for 2 inch (51 mm) insulation board thickness.

\*\* NOTE TO SPECIFIER \*\* Applies to S504 and S505. Delete if not required.

* + - 1. Concrete or Masonry: Minimum No. 8 wafer head fully threaded corrosion resistant screws for masonry with minimum 1 inch (25 mm) penetration into substrate.
			2. Tie Wire: 18 gauge galvanized and annealed low-carbon steel per ASTM A 641 with Class I coating.
		1. Accessories per ASTM C1063 and its Referenced Documents:
			1. Weep screed, casing bead, corner bead, corner lath, expansion and control joint accessories.

\*\* NOTE TO SPECIFIER \*\* Supplied by others. 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 and not between framing supports. Powder actuated or other fastening devices that can damage the water-resistive barrier, sheathing, or CI should be avoided. Avoid the use of channel reveal accessories that interfere with proper drainage and stress relief.

* + - * 1. PVC plastic per ASTM D 1784, cell classification 13244C.
				2. Zinc per ASTM B 69.
				3. Galvanized metal per ASTM A 653 with G60 coating.
			1. All accessories shall have perforated or expanded flanges and shall be designed with grounds for the specified thickness of stucco.

\*\* NOTE TO SPECIFIER \*\* Supplied by others.

* + 1. Job Mixed Ingredients:
			1. Water: Clean and potable.
			2. Sand Per ASTM C897 or C144: For use with one coat and C 926 stucco concentrates.
		2. Stucco: Refer to Addendum for other stucco products that may apply.
			1. StoPowerwall Stucco Pre-Blended No. 102: Fiber reinforced one coat Portland cement stucco pre-blended with graded sand, and per ICC AC 11. See ICC ESR 2323.
			2. StoPowerwall Stucco Pre-Blended No. 103: Fiber reinforced one coat Portland cement stucco concentrate per ICC AC 11. See ICC ESR 2323.
			3. StoPowerwall Scratch and Brown No. 108: Portland cement-based stucco concentrate per ASTM C 926.
			4. Other code compliant Portland cement stucco as listed by Sto Corporation. Refer to Addendum.
		3. Foam Trim and Build-Outs:
			1. Adhesive and Base Coat:

\*\* NOTE TO SPECIFIER \*\* Delete adhesive and base coats not required.

* + - * 1. Sto BTS Plus: One component polymer modified cement-based high build base coat material.
				2. Sto BTS Xtra: Light weight one component polymer modified cement-based extra high build base coat material.
				3. Sto Primer/Adhesive-B: One component polymer modified cement-based base coat material.
				4. Sto Primer/Adhesive: Two component acrylic based base coat material field mixed with Portland cement.
				5. Sto RFP: Ready mixed non-cementitious fiber reinforced base coat material.

\*\* NOTE TO SPECIFIER \*\* Sto Flexyl is to be uses as a waterproof base coat to waterproof foundations, parapets, splash areas, trim and other projecting architectural features.

* + - * 1. Sto Flexyl: Two component fiber reinforced acrylic based waterproof base coat material field mixed with Portland cement.

\*\* NOTE TO SPECIFIER \*\* Minimum required thickness is 1 inch (25 mm) and maximum allowable thickness is typically 4 inches (102 mm) for noncombustible type construction unless thicker dimensions are approved by the code official.

* + - 1. Foam Insulation Board for Trim: Sto EPS Insulation Board: Nominal 1.0 lbs/cu ft (16 kg/cu m) Expanded Polystyrene (EPS) Insulation Board per ASTM C 578 Type I requirements, and ASTM E 2430.

\*\* NOTE TO SPECIFIER \*\* Used for standard foam backwrapping and aesthetic detailing. Delete if not required.

* + - 1. Reinforcing Mesh:
				1. Sto Mesh: Nominal 4.5 oz per sq yd (153 g per sq m), symmetrical, interlaced open-weave glass fiber mesh treated with alkaline resistant coating for compatibility with Sto materials.

\*\* NOTE TO SPECIFIER \*\* Achieves Standard Impact Classification over foam insulation board.

* + - * 1. Sto Detail Mesh: Nominal 4.2 oz per sq yd (143 g per sq m), flexible, symmetrical, interlaced open-weave glass fiber fabric treated with alkaline resistant coating for compatibility with Sto materials.

\*\* NOTE TO SPECIFIER \*\* Crack defense is optional for additional protection. Delete if not required.

* + 1. Crack Defense: Components for added crack resistance.
			1. Base Coat:

\*\* NOTE TO SPECIFIER \*\* Delete base coat options not required.

* + - * 1. Sto BTS Xtra: Light weight one component polymer modified cement-based extra high build base coat material.
				2. Sto BTS Plus: One component polymer modified cement-based high build base coat material.
				3. Sto Primer/Adhesive-B: One component polymer modified cement-based base coat material
				4. Sto Primer/Adhesive: Two component acrylic based base coat material field mixed with Portland cement
				5. Sto RFP: Ready mixed non-cementitious fiber reinforced base coat material
				6. Sto Flexyl: Two component fiber reinforced acrylic based waterproof base coat material field mixed with Portland cement. For use as a waterproof base coat to waterproof foundations, parapets, splash areas, trim and other projecting architectural features.
			1. Reinforcing Mesh: Sto Mesh. Nominal 4.5 oz per sq yd (153 g per sq m), symmetrical, interlaced open-weave glass fiber mesh made with alkaline resistant coating for compatibility with Sto materials.
		1. Primer:

\*\* NOTE TO SPECIFIER \*\* Priming is recommended to provide uniform substrate absorption and finish color, to improve adhesion and water resistance, and to retard efflorescence. StoPrime Hot may be applied 48 hours after moist curing the brown coat. Other Sto primers require 28 days curing of brown coat or pH less than 10 before application. Delete primer options not required.

* + - 1. StoPrime Hot: Acrylic based primer/sealer for freshly placed (minimum 4 days old) and high pH stucco surfaces.
			2. StoPrime: Acrylic based tinted primer for fully cured (minimum 28 day olds or pH less than 10) stucco surfaces.
			3. StoPrime Sand: Acrylic based tinted, sanded primer for fully cured (minimum 28 days old or pH less than 10) stucco surfaces.
		1. Finish Coat:

\*\* NOTE TO SPECIFIER \*\* Delete finish coat options not required.(select one)

* + - 1. Stolit Lotusan: Integrally colored, factory blended textured Lotus-Effect Technology wall finish with graded marble aggregate.
			2. Sto Powerflex Silco: Integrally colored, factory blended, silicone enhanced elastomeric textured wall finish with graded marble aggregate.
			3. Sto Powerflex: Integrally colored, factory blended, elastomeric textured wall finish with graded marble aggregate.
			4. StoPowerwall: Integrally colored, factory blended, flexible acrylic textured wall finish with graded marble aggregate.
			5. Stolit Finish: Integrally colored, factory blended, acrylic textured wall finish with graded marble aggregate.
			6. Stolit X: Acrylic based textured wall finish with graded marble aggregate and enhanced polymer technology for easy spread and float application.
			7. Sto Essence DPR: Integrally colored, factory blended, acrylic textured wall finish with graded marble aggregate.
			8. Sto Powercryl: Integrally colored, factory blended, acrylic textured wall finish with graded marble aggregate.
	1. TROWEL APPLIED AIR BARRIER AND STUCCO BROWN COAT OVER VERTICAL ABOVE GRADE CONCRETE AND CONCRETE MASONRY WALLS
		1. Basis of Design: Primary Air Barrier Material: Sto ExtraSeal No. S6500. Single component polymer modified Portland cement-based air barrier material.
		2. Performance Requirements: Air barrier.
			1. Water Penetration per ASTM E 514: No water penetration through concrete masonry after 4 hour spray period.
			2. Adhesion per ASTM D 4541: Greater than 50 psi (345 kPA) on prepared CMU substrates.
			3. Shear Bond Strength: Lab Method. Greater than 50 psi (345 kPA) on prepared CMU substrates.
			4. Water Vapor Permeance per ASTM E 96 Method B: 5 perms (286 ng per Pa per sec per sq m)
			5. Air permeance per ASTM E 2178: Less than 0.004 cu ft per min per sq ft (0.02 L per sec per sq m) air leakage at 1.57 psf (75 Pa).
			6. Field Adhesion Testing per ASTM D 4541: Strength requirements as dictated by design professional based on exposure conditions such as building height, orientation, climate, and building design.
			7. Surface Burning per ASTM E 84:
				1. Less than 25 flame spread.
				2. Less than 450 smoke developed.
			8. Building Envelope Air Leakage per ASTM E 779 or 1827: Less than 0.4 cu ft per min per sq ft (2.0 L per sec per sq m).
			9. Volatile Organic Compounds per SCAQMD Rule 1113: Primary air barrier material, less than (50,000) 50 grams per L.
		3. Design Criteria:
			1. 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.
			2. Moisture Control: Prevent the accumulation of water in the wall assembly and behind the exterior wall cladding:
				1. Minimize condensation within the assembly.
				2. Drain water directly to the exterior where it is likely to penetrate components in the wall assembly (windows and doors, for example).
				3. 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.
				4. 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.
				5. 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.
				6. 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.
				7. Where casing bead is used back-to-back at expansion joints, back joints with appropriate StoGuard Transition Membrane. Refer to Sto Guide Details.
				8. Seal accessory butt joints with sealant.
			3. Air Barrier Continuity: Continuous air barrier assembly of compatible air barrier components.
			4. Substrates:
				1. Surface plane tolerance not to exceed 1/4 inch in 10 feet (6 mm in 3.0 m).
				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 as specified.
				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 as specified.
				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 (including finish coat) will exceed 5/8 inch (16 mm). Use appropriate metal plaster base in these cases.
			5. Mechanical Ventilation: Maintain pressurization and indoor humidity levels in accordance with recommendations of ASHRAE. See 2013 ASHRAE Handbook - Fundamentals.
		4. Accessory Materials:
			1. Rough Opening Protection:

\*\* NOTE TO SPECIFIER \*\* Delete rough opening protection option not required. Refer to Sto Detail 65c.25 for more detail.

* + - * 1. Sto RapidGuard: One component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle laps over flashing, wall to balcony floor slab or ceiling, and through wall penetrations; pipes, electrical boxes, and scupper penetrations.
			1. Transition Detail Component

\*\* NOTE TO SPECIFIER \*\* Delete transition detail components that are not required or keep all of them.

* + - * 1. StoGuard Transition Membrane: Flexible air barrier membrane for continuity at transitions; sheathing to foundation, dissimilar materials (CMU to frame wall), wall to balcony floor slab or ceiling, shingle lap transitions to flashing, floor line deflection joints, masonry control joints, and through wall joints in masonry or frame construction.
				2. Sto RapidGuard: One component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle laps over flashing, wall to balcony floor slab or ceiling, and through wall penetrations; pipes, electrical boxes, and scupper penetrations.
		1. Auxiliary Materials

\*\* NOTE TO SPECIFIER \*\* Supplied by others.

* + - 1. Wet sealant: Dow Corning 790, 791, and 795 sealants.
			2. Pre-cured sealant tape: Dow 123.
			3. Spray Foam:
				1. Sto TurboStick or TurboStick Mini Adhesive.
				2. Dow Great Stuff for Gaps and Cracks.
		1. Patching and Leveling Material for Prepared Concrete and Masonry: Sto ExtraSeal: polymer modified cement-based patch and leveling material for applications up to 3/8 inch in (10 mm) in depth.
		2. Stucco Brown Coat:

\*\* NOTE TO SPECIFIER \*\* Delete stucco brown coat options not required.

* + - 1. StoPowerwall Stucco Pre-Blended No. 102: Fiber reinforced one coat Portland cement stucco pre-blended with graded sand, and in compliance with ICC AC 11. See ICC ESR 2323.
			2. StoPowerwall Stucco No 103: Fiber reinforced one coat Portland cement stucco concentrate in compliance with ICC AC 11. See ICC ESR 2323.
			3. Stucco brown coats per ASTM C926, as listed by Sto Corporation. Refer to Addendum to StoPowerwall Specifications.

\*\* NOTE TO SPECIFIER \*\* Stucco crack defense is optional for added crack resistance of stucco wall surface. Delete if not required.

* + 1. Stucco Crack Defense Sto Mesh with any Sto Base Coat Product: nominal 4.5 oz per sq yd (153 g per sq m) glass fiber reinforcing mesh with alkaline resistant coating for compatibility with Sto materials for embedment in Sto base coats (refer to base coat product bulletins)
		2. Stucco Primers:

\*\* NOTE TO SPECIFIER \*\* StoPrime Hot is the preferred primer for use on stucco surfaces to "mask" surface alkalinity. Priming is also recommended to provide uniform substrate absorption and finish color, to improve adhesion and water resistance, and to retard efflorescence. StoPrime Hot may be applied 48 hours after moist curing the brown coat. Other Sto primers and finishes require 28 days curing of brown coat or pH less than 10 before application. Refer to Product Bulletins for complete information on textured finish options. Delete primer options not required.

* + - 1. StoPrime Hot: Acrylic based primer/sealer for freshly placed (minimum 4 days old) and high pH stucco surfaces.
			2. StoPrime: Acrylic based tinted primer for fully cured (minimum 28 days old or pH less than 10) stucco surfaces.
			3. StoPrime Sand: Acrylic based tinted, sanded primer for fully cured (minimum 28 days old or pH less than 10) stucco surfaces.
		1. Stucco Finish: Any Sto exterior decorative and protective textured finish as selected and approved by design professional or owner on basis of job site installed mock-ups.

\*\* NOTE TO SPECIFIER \*\* Surface alkalinity (pH) is an important consideration for stucco surfaces to receive acrylic or elastomeric finishes and should be checked.

* + - 1. Verify stucco surfaces have a pH less than 10 before primer or finish is applied.
1. EXECUTION
	1. EXAMINATION

\*\* NOTE TO SPECIFIER \*\* Sheathing attachment can determine ultimate wind load resistance. Verify attachment per design wind pressure requirements as determined by building code requirements and project specific testing. Wood-based sheathing must be gapped 1/8 inch (3 mm) at edge and end joints to prevent cracking in the stucco. Delete sheathing paragraphs if not required.

* + 1. Inspect Sheathing Surfaces for damage and deterioration. Record areas of damage.
		2. Inspect sheathing application for compliance with applicable requirement:
			1. Glass Mat Faced Gypsum Sheathing per ASTM C 1177: Refer to manufacturer's instructions and ICC evaluation report.
			2. Exterior Grade and Exposure 1 Wood Based Sheathing per APA Engineered Wood Association E 30.

\*\* NOTE TO SPECIFIER \*\* The following paragraph refers to S504, S505 and S6500. Delete it not required.

* + 1. Inspect Concrete and Concrete Masonry Surfaces:
			1. Contamination: Algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances.
			2. Surface absorption and chalkiness.
			3. Cracks: Measure crack width and record location of cracks.
			4. Damage and deterioration.
			5. Moisture damage: Record any areas of moisture damage.
		2. Report deviations from the requirements of project specifications or other conditions that might adversely affect the waterproof air barrier, CI, or stucco installation to the General Contractor. Do not proceed with air barrier, CI, or stucco installation until deviations are corrected.
	1. PREPARATION

\*\* NOTE TO SPECIFIER \*\* Delete sheathing paragraph if not required.

* + 1. Sheathing:
			1. Remove surface contaminants and replace damaged sheathing.
			2. All sheathing must be handled and installed per applicable building code and/or manufacturer requirements. Installed sheathing must be clean, dry and free from damage, frost, and all bond-inhibiting materials. Abut gypsum sheathing joints. Gap wood sheathing 1/8 inch (3 mm) at joints. Should gaps exceed 1/8 inch (3 mm) up to 1/2 inch (13 mm) wide, use Sto RapidGuard 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 EmeraldCoat).

\*\* NOTE TO SPECIFIER \*\* The following subparagraph refers to S504 and S505 only. Delete it not required.

* + 1. Concrete and Concrete Masonry (CMU):
			1. Remove surface contamination such as oil, grease, dust, dirt, algae, mildew, salts, paint or coatings. Correct weak surface conditions such as laitance. Use chemical cleaners such as TSP (trisodium phosphate) detergent to remove oil and grease and rinse with potable water. Use chemical cleaners to remove efflorescence or other surface contamination in accordance with manufacturer's written instructions. Use mechanical methods such as waterblasting, sandblasting, and wire brushing to remove weak surface conditions.
			2. Repair cracks up to 1/8 inch (3 mm) wide by raking with a sharp tool to remove loose, friable material and blow clean with oil-free compressed air. Apply joint treatment material over crack, embed reinforcement (where applicable), and smooth joint treatment material with a trowel, drywall or putty knife to cover the reinforcement.
			3. Remove projecting fins, ridges, and mortar by mechanical means.
			4. Fill honeycombs, aggregate pockets, holes and other voids with Sto patching material.
			5. Where the surface is excessively "rough" or out of plane, skim coat the wall surface with Sto base coat material to provide a smooth, level surface.

\*\* NOTE TO SPECIFIER \*\* Paragraph applies to S6500. Delete if not required.

* + 1. Trowel applied air barrier and stucco brown coat over vertical above grade concrete and concrete masonry walls.
			1. Concrete:
				1. Remove form ties and trim projecting concrete even with plane of the wall.
				2. Fill honeycombs or other surface defects with patch or leveling material.
				3. Remove form release agents or other surface contamination by chemical or mechanical means.
				4. Provide a surface that is structurally sound, free of laitance and other surface defects, absorbent, and slightly scarified or with surface roughness, or both.
				5. Surface to be structurally sound and free of dust, dirt, grease, coatings, salts, efflorescence, or other surface contamination before proceeding with work.
				6. Ensure surface is sufficiently absorbent and roughened for adequate adhesion.
				7. Pre-moisten highly absorbent surfaces with water just prior to placement of air barrier, especially during hot, dry conditions.
				8. Verify adhesion with load tests after air barrier/stucco assembly has fully cured (28 days) on mock-up wall, and throughout the project as specified.
			2. Concrete Masonry Units:
				1. Remove projecting joint mortar so it is even with the plane of the wall.
				2. Remove surface contaminants such as efflorescence, paint or coatings, or any other surface contamination by chemical or mechanical means.
				3. Pre-moisten surface with water just prior to placement of air barrier.
				4. Verify adhesion with load tests after stucco/air barrier assembly has fully cured (28 days) on mock-up wall, and throughout the project as specified.
			3. Install furred or self-furred lath as specified by the Design Professional if the following condition present themselves.
				1. Bond inhibiting material cannot be removed
				2. Concrete or masonry surface irregularities such that more than 5/8 inch (16 mm) of stucco, including Sto ExtraSeal skim coat and scratch coat, stucco brown coat, and stucco finish, must be applied.
				3. Where the surface is too smooth, dense, or non-absorbent to receive the air barrier or stucco components.
			4. Verify adequacy of lath attachment with respect to design wind pressures.
			5. Do not install stucco over unprepared substrates or any substrate where adhesion is in question.
			6. Where metal lath is used, Sto Flexyl or Sto Watertight Coat may be installed over the stucco brown coat as an air/moisture barrier with proper integration of other air barrier materials.
	1. INSTALLATION, GENERAL
		1. Install materials in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.
	2. MIXING
		1. 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 AirSeal: Mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with water.
			3. Sto EmeraldCoat: Mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with water.
		2. StoPowerwall Stucco: Refer to mix instructions on packaging. Use only the amount of water necessary for a workable mix. Use of excess water is detrimental to performance.
		3. Adhesive and Base Coats for Sto Crack Defense and Foam Build-Outs: Refer to applicable Sto Product Bulletin for selected adhesive and base coat materials.
		4. Primer: Mix with a clean, rust-free high speed mixer to a uniform consistency.
		5. Finish: Mix with a clean, rust-free high speed mixer to a uniform consistency. A small amount of water, up to 12 oz (0.4 L) may be added to adjust workability. Limit addition of water to amount needed to achieve the finish texture.
		6. Mix only as much material as can readily be used.
		7. Do not add lime, anti-freeze compounds, or other additives to any of the materials.
	3. AIR/MOISTURE BARRIER INSTALLATION

\*\* NOTE TO SPECIFIER \*\* Refer to Sto Guide Details as needed. The air/moisture 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/moisture barrier must be integrated with other air and moisture 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.

* + 1. The following instructions are applicable to:
			1. Exterior or Exposure I Plywood per PS-1.
			2. OSB (Oriented Strand Board) per PS-1 or PS-2.
			3. Glass Mat Faced Gypsum Sheathing per ASTM C 1177.

\*\* NOTE TO SPECIFIER \*\* The following subparagraph refers to S504 and S505 only. Delete it not required.

* + - 1. Concrete and Concrete Masonry surfaces.
		1. Transition Detailing: Detail transition areas with Sto RapidGuard (static joints and seams) or StoGuard Transition Membrane (dynamic joints and seams) to achieve air barrier continuity. For illustrations of installation, refer to Sto Guide Details and Sto RapidGuard Installation Guide or StoGuard Transition Membrane Installation Guide ([www.stocop.com](http://www.stocop.com) ).
		2. Rough Opening Protection:

\*\* NOTE TO SPECIFIER \*\* Select one of the following four subparagraphs for frame construction.

* + - 1. 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 smooth with a trowel to completely cover the mesh (refer to Sto Detail 22s.20M).
			2. Sto EmeraldCoat or Sto AirSeal with StoGuard Fabric: Apply coating liberally by spray or roller to corners of openings, immediately place StoGuard RediCorners in the wet coating, and apply additional coating over the RediCorners to completely embed them. After all corners have been completed apply coating liberally to the entire rough opening, immediately place StoGuard Fabric in the wet coating, smooth any wrinkles with a brush or roller, and apply additional coating over the fabric to completely embed it. Overlap all seams minimum 2 inches (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.

\*\* NOTE TO SPECIFIER \*\* Select one of the two following subparagraphs for concrete or concrete masonry rough openings with wood bucks and similar openings with complex 3-dimensional geometry.

* + - 1. Sto RapidGuard: Apply a fillet bead of material with a caulking gun at interior corners inside the opening to seal jamb/sill and jamb/head seams. Apply material in a zig-zag pattern along sill, jams, and head to form a generous bead of material along the surface to be covered. Use a 6 inch (152 mm) wide plastic drywall knife to spread the material to a uniform thickness of 12 to 20 mils (0.3 to 0.5 mm) before the material skins. Treat the entire rough opening surface in this manner and overlap onto the face of the sheathing 2 inches (51 mm) minimum all the way around.
		1. Sheathing Joint Treatment:

\*\* NOTE TO SPECIFIER \*\* Delete sheathing joint treatment options not required.

* + - 1. Sto Rapid Guard: Apply to properly installed sheathing, joints butted for gypsum sheathing, and joints gapped for plywood and OSB sheathings (wood-based sheathing typically requires 1/8 inch (3 mm) spacing at edge and end joints). Apply a thick bead of Sto RapidGuard with a caulking gun along sheathing joints, or apply in a zig-zag pattern across and down the joints. Spread to a uniform thickness of 20 to 30 mils (0.5 to 0.6 mm) before the material skins. Spread 1 inch (25 mm) beyond the sheathing joint on each side. Follow the same procedure for inside and outside corners.
			2. Sto Gold Fill with StoGuard Mesh: Place 4 inch (102 mm) wide mesh centered along sheathing joints and minimum 9 inch (229 mm) wide mesh centered and folded at inside and outside corners. Immediately apply Sto Gold Fill by spray or trowel and spread smooth with a trowel to completely cover the mesh.
			3. Sto AirSeal or Sto EmeraldCoat with StoGuard Fabric: Apply coating 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).
		1. Air/Moisture Barrier Coating Installation:
			1. 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 thickness of 10 wet mils (0.254 mm) in one coat (Sto EmeraldCoat) or 50 wet mils (1.27 mm) in one coat (Sto AirSeal). Use 1/2 inch (13 mm) nap roller for plywood. Use 3/4 inch (19 mm) nap roller for glass mat faced gypsum sheathing. Protect from weather until dry.
			2. OSB Sheathing: apply waterproof coating by spray or with a 3/4 inch (19 mm) nap roller to sheathing surface to a uniform thickness of 10 wet mils(0.254 mm) (Sto EmeraldCoat) or 50 wet mils (1.27 mm) in one coat (Sto AirSeal). Protect rough openings, joints, and parapets, then apply a second coat of waterproof coating.

\*\* NOTE TO SPECIFIER \*\* The following subparagraph refers to S504 and S505 only. Delete if not required.

* + - 1. CMU Surfaces:
				1. Repair static cracks up to 1/2 inch (13 mm) wide with Sto RapidGuard. 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.
				2. For moving cracks or cracks larger than 1/2 inch (13 mm), consult with a structural engineer for repair method. Protect repair from weather until dry.
				3. Liberally apply coating to the surface with a 3/4 inch (19 mm) nap roller or spray equipment to a wet thickness of 10 to 30 mils (0.254 to 0.762 mm) (Sto EmeraldCoat) or 50 wet mils (1.27 mm) (Sto AirSeal), depending on surface condition. Apply to a uniform thickness. Additional coats may be necessary to provide a void and pinhole free surface. Protect from weather until dry.

\*\* NOTE TO SPECIFIER \*\* 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). Do not allow waterproof barrier installation to remain exposed more than 180 days. Protect with stucco wall covering promptly after installation.

* + 1. Air and Moisture Barrier Connections and Shingle Laps:
			1. Coordinate installation of connecting air barrier components with other trades to provide a continuous air tight 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/moisture barrier such that water is directed to the exterior.

\*\* NOTE TO SPECIFIER \*\* Article applies to S5071i and S5071X Delete if not required.

* 1. CONTINUOUS INSULATION INSTALLATION
		1. Attach insulation boards to framing with corrosion resistant bugle head metal screws and 1-1/4 inch (32 mm) metal lath locks or other corrosion resistant cap fastener. Use only enough fasteners, typically 3 per board mid-span, to temporarily hold the board in place. Lath attachment is intended to permanently hold it in place.
		2. Attach in courses with vertical joint staggered.
		3. Cut insulation board in an "L" shape around openings. Tightly abut insulation board joints and interlock inside and outside corners. Trim or rasp board flush for square corners.
		4. Seal gaps or open joints with Sto TurboStick or Turbostick Mini spray foam and rasp or shave flush with surface.
		5. Do not allow insulation board to be exposed to weather from more than 60 days.

\*\* NOTE TO SPECIFIER \*\* Relates to S5071i. Delete if not required.

* 1. SHEATHING INSTALLATION
		1. Install sheathing in courses over the continuous insulation to permanently hold the insulation boards in place. Install immediately following or in tandem with the continuous insulation.
		2. Abut gypsum sheathing joints. Gap wood sheathing 1/8 inch (3 mm) at joints.
		3. Install in compliance with applicable code and sheathing manufacturer's instructions, except: offset sheathing joints from continuous insulation board joints by a minimum of 6 inches (152 mm). Support all vertical joints with studs, and use minimum #8 corrosion resistant screw fasteners with minimum three thread penetration into metal studs, minimum 1 inch (25 mm) penetration into wood studs. Space fasteners no greater than 8 inches (203 mm) on center along framing members for gypsum sheathing
		4. Verify attachment and installation conforms with requirements for design wind pressures.
	2. SHEET WATER-RESISTIVE BARRIER INSTALLATION

\*\* NOTE TO SPECIFIER \*\* Code requirements may vary. Always consult the applicable code and the manufacturer's code compliance report. Typically building paper per the code is lapped shingle style, upper courses over lower courses, by minimum 2 inches (51 mm), with vertical laps of minimum 6 inches (150 mm). Courses are staggered so that vertical joints do not align. Care must be taken to prevent tears in the paper and to limit penetrations to only those required for attachment. Flashing must be in place and properly integrated with the sheet WRB at sills, above windows and doors, at floor lines, decks and at roof/wall intersections such that water is directed to the exterior)

* + 1. Install per the applicable building code requirements for building paper. Lap paper over foundation weep screed attachment flange, floor line flashing, and window/door head flashings. Refer to Sto Gide Details on the Sto website.

\*\* NOTE TO SPECIFIER \*\* Drainage is applicable to S5071x and S5071i and S505. Delete if not required.

* 1. DRAINAGE MAT INSTALLATION
		1. Place drainage mat against the wall surface and unroll horizontally with the fabric facing out. Hammer-tack or staple into continuous insulation with corrosion-resistant fasteners.
			1. Use as few fasteners as needed to hold the mat in place, starting from the bottom of the wall at base flashing or weep screed and working up.
			2. Do not fasten through flashing.
			3. Shingle lap fabric at horizontal courses.
			4. Shingle lap drainage mat over weep screeds, flashing at floor lines, decks, roof lines, window heads, and other areas where flashing is required, to direct water to the exterior.
			5. Butt ends of rolls and vertical seams.
			6. Trim around windows, doors, vents, or other penetrations through the wall.
			7. Do not install behind window nail flanges.
			8. Immediately follow installation of drainage mat with stucco lath installation.
			9. Where stucco lath installation will not immediately follow installation of drainage mat, use corrosion-resistant cap nails, cap staples, or cap screws every 16 inches (406 mm) on center along framing for more secure attachment.
			10. Cover drainage mat with stucco within 30 days of installation.
	2. STUCCO INSTALLATION (Refer to Sto Guide Details as needed)
		1. Apply stucco in discrete panels without interruption to avoid cold joints and differences in appearance.
			1. Abut wet stucco to set stucco at natural or architectural breaks in the wall such as expansion joints, pilasters, terminations, or changes in plane.
			2. Hot or dry conditions accelerate drying and moisture loss from stucco which can diminish strength and resistance to cracking.
			3. Under these conditions, adjustments in the application, scheduling and curing of stucco to prevent rapid loss of moisture are necessary to achieve a satisfactory stucco installation.
			4. Cold temperatures retard drying and strength gain and adjustments may have to be made in the application, scheduling and curing of stucco to prevent damage from frost and other trades.
			5. Do not install stucco during extremely hot, dry and/or windy conditions.
			6. Do not install stucco during freezing conditions or on frozen substrates.
			7. Do not install stucco onto grounds of accessories.
			8. Completely embed lath and flanges of accessories and completely cover fastener attachments with stucco.
			9. Moist cure stucco minimum 48 hours for optimum strength gain and resistance to cracking.
			10. Allow final stucco application to completely dry (28 days) before applying primer or finish or until pH of stucco surface is less than 10 (except in the case of StoPrime Hot which can be applied 48 hours after completing moist cure of stucco).
			11. The finished installation must be true, plumb and square.
			12. Should stucco get into control or expansion joints, remove the stucco from within the joint before the stucco sets.
			13. After satisfactory inspection of surfaces and correction of any deviations from specification requirements commence the stucco installation as described below:
		2. Installation over StoGuard/Sto DrainScreen:
			1. Weep Screed Installation:

\*\* NOTE TO SPECIFIER \*\* May also be done in conjunction with flashing and air/moisture barrier installation to facilitate shingle lapping of components at base of wall.

* + - * 1. Install foundation weep screed at the base of the wall securely to solid substrate or framing with the appropriate fastener.
				2. Locate foundation weep screed so that it overlaps the joint between the foundation and framing by a minimum of 1 inch (25 mm).
				3. Locate the foundation weep screed nosing minimum 4 inches (100 mm) above earth grade, 2 inches (51 mm) above finished grade (paved surfaces, for example).
				4. Lap waterproof air barrier, sheet water-resistive barrier, and drainage mat over the weep screed attachment flange.

\*\* NOTE TO SPECIFIER \*\* Refer to architectural drawings for joint locations and accessory type. Air barrier and moisture protection must be continuous behind joints and accessories . Refer to Sto Guide Details.

* + - 1. Casing Bead and Two Piece Expansion Joint Installation:
				1. Install casing beads at stucco terminations; doors, windows and other through wall penetrations.
				2. Install two piece expansion joints (or back-to-back casing beads) at building expansion joints, thru-wall joints in concrete or CMU, where the stucco is to be installed over dissimilar construction or substrates, at changes in building height, at floor lines, columns, and cantilevered areas.
				3. Install full accessory pieces where possible and avoid small pieces.
				4. Seal adjoining pieces by embedding ends in sealant.
				5. Abut horizontal into vertical joint accessories except where horizontal movement joints exist that prevent continuous vertical runs of accessories.
				6. Attach at no more than 7 inches (178 mm) into solid substrate/framing with appropriate fasteners.

\*\* NOTE TO SPECIFIER \*\* The type fastener selected, its layout and pullout or withdrawal value from the supporting construction must be verified and approved by the project engineer/architect with respect to design wind load and local building code requirements. Exercise care when attaching metal lath and accessories through the water-resistive barrier so that fasteners go into [not between] framing supports. Do not use power, powder-actuated or other fastening tools/methods that can damage the air barrier, water-resistive barrier or substrate.

* + - 1. Lath Installation:
				1. Diamond Mesh Metal Lath per ASTM C 1063:

General: Install metal lath with the long dimension at right angles to structural framing (horizontally on solid substrates). Terminate lath at expansion joints. Do not install continuously at joints.

Seams/Overlaps: Overlap side seams minimum 1/2 inch (13 mm) and end seams minimum 1 inch (25 mm). Stagger end seams. Overlap casing beads and expansion joints minimum 1 inch (25 mm) over narrow wing accessories, minimum 2 inches (51 mm) over expanded flange accessories. Do not install lath continuously beneath expansion joints.

Attachment: Fasten securely through sheathing into structural framing at 6 inches (152 mm) on center maximum vertically and 16 inches (406 mm) on center horizontally\*. Wire tie at no more than 9 inches (225 mm) on center at: side laps, accessory overlaps, and where end laps occur between supports.

* + - * 1. Paper-Backed Lath: Follow installation as for diamond mesh metal lath.

Lap lath over lath, not paper to lath overlap.

For horizontal overlaps the paper backing must lap shingle style behind the lath to lath overlap.

* + - 1. One Piece Expansion Joint Installation:
				1. Install one piece expansion joints at through wall penetrations, for example, above and below doors and windows.
				2. Install one piece expansion joints at every 144 sq ft (13 sq m).
				3. Wire tie one piece expansion joints to lath at no more than 7 inches (178 mm) on center.
				4. Seal adjoining pieces by embedding ends in sealant. Make certain lath is discontinuous at or beneath joints.
				5. Inside and Outside Corners: Install corner lath at inside corners and corner bead at outside corners over lath.
				6. Attach through lath into solid substrate or framing at no more than 7 inches (178 mm) on center with appropriate fasteners.
			2. Stucco Installation:
				1. Scratch Coat: Apply stucco with sufficient pressure to key into and embed the metal lath. Apply sufficient material, 3/8 or 1/2 inch (9 or 12 mm), to cover the metal lath and to permit scoring the surface. Score the stucco upon completion of each panel in preparation for a second coat. Score horizontally.
				2. Brown Coat: As soon as the first coat is firm enough to receive the second coat without damage, apply the second coat. Alternatively, moist cure the first coat up to 48 hours and dampen the scratched surface with water immediately before applying the second coat. Apply the second coat with sufficient pressure to ensure intimate contact with the first coat and as needed to bring the stucco to a uniform thickness that matches the grounds of the accessories. Use a rod or straight edge to bring the surface to a true, even plane. Fill depressions in plane with stucco. Final thickness of stucco shall be uniform throughout the wall area and shall be either 3/4 inch or 7/8 inch (19 or 22 mm), and shall not exceed 7/8 inch (22 mm).
				3. After the stucco has become slightly firm float the surface lightly with a darby or wood float to densify the surface and to provide a smooth, even surface. The proper time to float is when the wood float no longer sticks to the surface of the stucco.
				4. Moist cure after the stucco has set by lightly fogging for at least 48 hours. Fog as frequently as required during the 48 hour period to prevent loss of moisture from the stucco. Avoid eroding the stucco surface with excess moisture. If relative humidity exceeds 75 percent, the frequency of moist curing can be diminished.

\*\* NOTE TO SPECIFIER \*\* Do not install foam build-outs over joints in the stucco wall assembly. Terminate foam build-outs and backwrap in accordance with instructions above.

* + 1. Foam Trim and Build-Outs:
			1. Where foam build-outs terminate at a dissimilar material such as a window, door or other non-stucco surface, backwrap the foam build-out by installing detail mesh onto the terminating edge of the stucco. Embed the mesh in the foam trim adhesive. Allow the mesh to dangle until the backwrapping procedure is completed.
			2. Install foam build-outs directly over hardened stucco with foam trim adhesive. Apply adhesive with the appropriate size notched trowel to the back of the insulation board and immediately place build-out in the proper location on the wall. Press firmly into place and trim or tool excess adhesive from ends and edges of foam trim for a smooth void-free connection to the stucco substrate.
			3. After the adhesive has cured sufficiently to hold the build-out firmly in place, rasp the entire foam surface smooth.
			4. Complete the backwrapping procedure by applying the foam trim base coat to the exposed edges of the foam build-out and minimum 2-1/2 inches (64 mm) onto the face. Pull the backwrap mesh around the foam build-out and fully embed it into the base coat. Use a corner trowel for neat straight corners.
			5. Apply the base coat to the foam build-out and approximately 3 inches (76 mm) onto the adjacent stucco surfaces to an approximate thickness of 1/8 inch (3 mm). Immediately embed the reinforcing mesh in the wet base coat. Trowel from the center to the edges of the mesh to avoid wrinkles and remove excess base coat. Overlap mesh seams minimum 2-1/2 inches (64 mm). Overlap mesh onto adjacent stucco wall surfaces minimum 2-1/2 inches (64 mm) at terminations of the foam build-out and feather onto the stucco wall surface. Alternatively, If Crack Defense is used apply Crack Defense with its reinforcing mesh continuously from the stucco wall surface over foam build-outs.

\*\* NOTE TO SPECIFIER \*\* Crack Defense is optional. It provides additional crack resistance to the stucco wall surface. Delete if not required.

* + 1. Crack Defense:
			1. Apply base coat over the moist cured stucco (and foam build-outs if not already reinforced with mesh) with appropriate spray equipment or a stainless steel trowel to a uniform thickness of approximately 1/8 inch (3 mm).
			2. 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.
			3. Overlap mesh not less than 2-1/2 inches (64 mm) at mesh seams and at overlaps of detail mesh.
			4. Feather seams and edges. Avoid wrinkles in the mesh.
			5. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry.
			6. Re-skim with additional base coat if mesh color is visible. Do not install base coat or mesh over joints or accessories in the stucco wall assembly.
		2. Primer Installation:
			1. StoPrime Hot: Moist cure stucco for a minimum of 48 hours. Allow stucco to dry an additional 48 hours, then apply primer evenly with brush, roller or proper spray equipment over the clean, dry stucco and foam build-outs, and allow to dry. Final age of primed stucco application must be minimum 7 days before application of finish.
			2. StoPrime Sand: Moist cure stucco for a minimum of 48 hours. Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Final age of primed stucco application must be minimum 28 days before application of finish or pH must be below 10.
			3. StoPrime: Moist cure stucco for a minimum of 48 hours. Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Final age of primed stucco application must be minimum 28 days before application of finish or the pH must be below 10.
		3. Finish Installation:
			1. Apply finish to minimum 28 day old stucco or primed stucco and foam build-outs, or when pH of stucco surface is less than 10. If StoPrime Hot is used as the primer the primed stucco/foam build-out surfaces need only be minimum 7 days old. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:
				1. Avoid application in direct sunlight.
				2. Apply finish in a continuous application, and work a wet edge towards the unfinished wall area. Work to an architectural break in the wall before stopping to avoid cold joints.
				3. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required 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 and provide protection.
				4. Float "R" (rilled or swirl texture) finishes with a plastic float to achieve their rilled texture
				5. Do not install separate batches of finish side-by-side.
				6. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.
				7. Do not apply finish over irregular or unprepared surfaces, or surfaces not per the requirements of the project specifications.
				8. Do not install finish over high pH (> 10) stucco surfaces or surfaces that have not been fully cured.

\*\* NOTE TO SPECIFIER \*\* Article applies to S6500. Delete if not required.

* 1. INSTALLATION OF TROWEL APPLIED AIR BARRIER AND STUCCO BROWN COAT OVER VERTICAL GRADE CONCRETE AND CONCRETE MASONRY
		1. Coordinate work with other trades to ensure air 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.
		2. 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 100 degrees F (38 degrees C). Install air barrier material to dry or damp surfaces (no standing or glistening water).
		3. Rough Opening Protection:
			1. Install Sto RapidGuard over wood buck and lap onto Sto ExtraSeal minimum 2 inches (51 mm).
			2. Do not install Sto ExtraSeal over Sto RapidGuard.
			3. Limit extension of Sto RapidGuard to limit of expanded flange accessories. Refer to Sto Guide Detail 65c.25.
		4. Skim Coat:
			1. Concrete: install one coat of Sto ExtraSeal by spray or trowel in a uniform, continuous application at 1/8 inch (3 mm) thick. "Knock down" spray applications with a trowel. Do not install over working or moving joints or joint sealants.
			2. Concrete Masonry: install one liberal coat of Sto ExtraSeal in a uniform, continuous application by spray or trowel at 1/8 inch (3 mm) thick. "Knock down" spray applications with a trowel. Surface must be free of voids and pinholes when dry. Final application must not show CMU surface texture or joints. Do not install over working or moving joints or joint sealants.
		5. Transitions:
			1. Install air barrier accessory material or auxiliary material at transition areas:
				1. Foundations, floor lines, flashings, lintels, shelf angles.
				2. 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.
				3. Refer to Sto Guide Details 65c.xx. Limit extension of transition materials to limit of expanded flange accessories at stucco terminations.
		6. Stucco Accessories: Install stucco accessories; casing beads, expansion and control joints, over air barrier with appropriate fasteners into supporting construction as required by ASTM C 926.
		7. Scratch Coat: Apply approximate 3/8 inch (9 mm) scratch coat of Sto ExtraSeal by spray or trowel any time after the skim coat application is dry. Scratch the surface horizontally with a stucco rake tool. Moist cure the scratch coat during hot or extremely dry weather conditions.
		8. 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, stucco brown coat, and allowance for finish coat, to 5/8 inches (16 mm) maximum.

\*\* NOTE TO SPECIFIER \*\* Crack defense is optional for added crack resistance of the stucco wall surface. Delete if not required.

* + 1. Crack Defense:
			1. Apply base coat over moist cured stucco brown coat with spray equipment or stainless steel trowel to a uniform thickness of approximately 1/8 inch (3 mm).
			2. Work horizontally or vertically in strips of 40 inches (1016 mm), and immediately embed mesh into wet base coat by troweling from center to edge of the mesh.
			3. Overlap mesh 2-1/2 inches (64 mm) at mesh seams and at overlaps of detail mesh.
			4. Feather seams and edges. Avoid wrinkles in the mesh. The mesh must be fully embedded so no mesh color shows through the base coat when it is dry.
			5. Re-skim with additional base coat if mesh color is visible.
			6. Do not install base coat or mesh over joints or accessories in stucco wall assembly.
	1. Primer Installation: Moist cure stucco brown coat for a minimum of 48 hours.
		+ 1. StoPrime Hot: Allow stucco to dry an additional 48 hours. Apply primer evenly with brush, roller or proper spray equipment over the clean, dry stucco, and allow to dry. Age of stucco must be minimum 7 days before application of finish.
			2. StoPrime Sand: Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Age of stucco must be minimum 28 days before application of finish or pH must be below 10.
			3. StoPrime: Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Age of stucco must be minimum 28 days before application of finish or pH must be below 10.
		1. Finish Installation:
			1. Apply finish to primed stucco and foam build-outs when dry.
				1. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified.
				2. Follow these general rules for application of finish:
			2. Allow 28 day stucco age or check for pH less than 10 before applying finish. If StoPrime Hot is used, allow minimum 7 day age of stucco.
			3. Avoid application in direct sunlight.
			4. Apply finish in a continuous application, and work a wet edge towards the unfinished wall area. Work to an architectural break in the wall before stopping to avoid cold joints.
			5. Weather conditions affect application and drying time.
				1. Hot or dry conditions limit working time and accelerate drying.
				2. Adjustments in the scheduling of work may be required 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.
				3. Adjust work schedule and provide protection.
			6. Float "R" (rilled or swirl texture) finishes with a plastic float to achieve their rilled texture.
			7. Do not install separate batches of finish side-by-side.
			8. Do not apply finish into or over sealant joints or joint accessories. Apply finish to outside face of wall only.
			9. Do not apply finish over irregular, high pH, or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.
	2. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* The remaining paragraphs are applicable to trowel applied air barrier and stucco brown coat over vertical above grade concrete and concrete masonry walls; Sto No. S6500. Delete if not required.

* + 1. Owner's qualified testing agency or building envelope consultant shall perform inspections and tests.
		2. Inspections: Air barrier materials are subject to inspection to verify compliance with requirements.
			1. Condition of substrates and substrate preparation.
			2. Installation of primary air 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 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 roof line.
		3. Tests: Air barrier materials and assembly are subject to tests to verify compliance with performance requirements:
			1. Qualitative air leakage test: ASTM E 1186
			2. Quantitative air leakage test: ASTM E 779, ASTM E 783, and ASTM E 1827
			3. Adhesion test: ASTM D 4541

\*\* NOTE TO SPECIFIER \*\* For direct applications to concrete establish testing frequency to verify adhesion to prepared substrates as determined by design professional.

* + - 1. Qualitative adhesion and compatibility testing: wet sealant manufacturer's field quality control adhesion test
		1. Repair non-conforming substrates and air barrier material installation to conform with project requirements.
		2. 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.
	1. PROTECTION
		1. Protect installed materials from water infiltration into or behind them.
		2. Protect installed stucco from dust, dirt, precipitation, and freezing.
		3. Protect installed primer and finish from dust, dirt, precipitation, freezing and continuous high humidity until fully dry.

\*\* NOTE TO SPECIFIER \*\* Delete the flowing to paragraphs if not applicable.

* + 1. Sealant and backer material at stucco terminations and at fixture penetrations through the stucco to protect against air, water and insect infiltration.
		2. Weeps at floor lines, window and door heads, and other areas to conduct water to exterior.
	1. CLEANING AND PROTECTION
		1. Clean and maintain the stucco finish for a fresh appearance and to prevent water entry into and behind the stucco. Repair cracks, impact damage, spalls or delamination promptly.
		2. Maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into the wall assembly.

\*\* NOTE TO SPECIFIER \*\* Delete if restoration is not applicable.

* + 1. Refer to Sto reStore Repair and Maintenance Guide for detailed information on stucco restoration - cleaning, repairs, recoating, resurfacing and refinishing, or re-cladding.
		2. Clean products in accordance with the manufacturer's recommendations.
		3. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION