

ICC-ES Evaluation Report

ESR-2214

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DIVISION: 09 00 00—FINISHES
Section: 09 24 00—Portland Cement Plastering
REPORT HOLDER:
SUPERWALL MANUFACTURING, INC.
 1117 WEST RANCH ROAD
 TEMPE, ARIZONA 85284
 (480) 705-0909

EVALUATION SUBJECT:
SUPERWALL STUCCO SYSTEM
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Weathering and durability
- Fire-resistance-rated construction
- Racking shear strength

2.0 USES

The Superwall Stucco System is an alternative to the exterior cement plaster specified in IBC Chapter 25, IRC Section R703 and UBC Chapter 25. The system may be used in one-hour fire-resistance-rated wall assemblies when installed in accordance with Section 4.4.

3.0 DESCRIPTION
3.1 General:

The Superwall Stucco System is a proprietary mixture of portland cement, sand, fibers, water and proprietary ingredients reinforced with wire fabric or metal lath and applied to substrates of expanded polystyrene (EPS) insulation board, fiberboard, plywood, gypsum sheathing, concrete or masonry. The system is installed on exterior walls of wood-framed, masonry or concrete construction.

3.2 Materials:

3.2.1 Premixed Superwall Glass Fiber-reinforced Exterior Stucco Mix: The product is a factory-prepared mixture consisting of Type I or II portland cement complying with ASTM C 150, chopped glass fibers, proprietary fibers, sand, and proprietary polymer-modified

additives. The dry stucco mixture is packaged in 80-pound (36.3 kg) bags. Approximately 5 gallons (19 L) of water and 215 pounds (97.5 kg) of sand are added to each bag in the field. These components are mixed in the field in accordance with the manufacturer's instructions.

3.2.2 Superwall Acrylic Finish Mixture: The product is a factory-prepared dry mixture of integrally colored acrylic latex containing quartz aggregates. The mixture is packaged in an 80-pound (36.3 kg) container. Approximately 2 gallons (7.6 L) of water are added to each container. These components are mixed in the field in accordance with the manufacturer's instructions.

3.2.3 Field-blended Stucco: The product is a field-prepared mixture consisting of 1 gallon (3.8 L) of liquid Superwall Polymer, one 10¹/₂-pound (4.8 kg) bag of Superwall Polymer Powder, one 94-pound (42.6 kg) bag of Type I or II portland cement complying with ASTM C 150, approximately 430 pounds (195 kg) of sand, and approximately 5¹/₂ gallons (20.9 L) of water. These components are mixed in the field in accordance with the manufacturer's instructions.

3.2.4 Sand: Sand must be clean and free from deleterious amounts of loam, clay, silt, soluble salts and organic matter. Sampling and testing must comply with ASTM C 144 or ASTM C 897 within the following limits:

RETAINED ON U.S. STANDARD SIEVE	PERCENT RETAINED BY WEIGHT ± 2 PERCENT	
	Minimum	Maximum
No. 4	—	0
No. 8	0	10
No. 16	10	40
No. 30	30	65
No. 50	70	90
No. 100	95	100

3.2.5 Insulation Board: EPS insulation boards have a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 (UBC Standard 8-1).

All boards must be recognized in a current evaluation report. See Section 7.0 for board identification.

3.2.5.1 Insulation Board over Open Framing: EPS boards installed over open framing, without solid sheathing, must comply with ASTM C 578, Type II, with a minimum nominal density of 1.5 pounds per cubic foot (24 kg/m³) and a maximum thickness of 1¹/₂ inches (38 mm) with ³/₈-inch-high (9.5 mm) tongues with compatible grooves for horizontal joints. See Figure 1 for joint detail.

3.2.5.2 Insulation Board over Solid Sheathing: Boards installed over solid sheathing must comply with ASTM C 578, Type I, with a minimum nominal density of 1.0 pound per cubic foot (16 kg/m³) and a minimum thickness of 1/2 inch (12.7 mm) and a maximum thickness of 1 1/2 inch (38 mm). Square-edge boards are permitted to be used on solid substrates, except when installed as part of the water-resistive barrier over wood-based sheathing as described in Section 3.2.11, in which case the boards must have horizontal tongue-and-groove edges complying with Figure 1 with a minimum thickness of 1 inch (25.4 mm) and a maximum thickness of 1 1/2 inches (38 mm).

When installation is over solid backing, as described in Section 4.3, the boards must have minimum 1/4-inch-wide-by-1/8-inch-deep (6.4 mm by 3.2 mm) vertical grooves spaced at a maximum 12 inches (305 mm) on the back face of the boards. As an alternate to the vertical grooves on the foam plastic board, installation of flat faced back of boards over a solid sheathing may incorporate the Tyvek Stucco Wrap (ESR-2375) or equal water-resistive barrier.

3.2.6 Lath:

3.2.6.1 Wire Fabric Lath: Wire fabric lath must comply with the ICC-ES Acceptance Criteria for Metal Plaster Bases (Lath) (AC191). Minimum No. 20 gage [0.035 inch (0.89 mm)], 1-inch (25.4 mm) galvanized steel, woven-wire fabric must be used. Lath must be furred when applied over all substrates except unbacked EPS insulation board. Furring must comply with the following requirements:

1. When maximum total coating thickness is 1/2 inch (12.7 mm) or less, the body of lath must be furred a minimum of 1/8 inch (3.2 mm) from the substrate after installation.
2. When total coating thickness is greater than 1/2 inch (12.7 mm), No. 17 gage [0.058 inch (1.47 mm)] by 1 1/2-inch (38 mm) woven-wire fabric lath must be used. The body of the lath must be furred a minimum of 1/4 inch (6.4 mm) from the substrate after installation.

3.2.6.2 Metal Lath: Metal lath must comply with AC191 and, when applicable, UBC Table 25-B. Furring requirements are as set forth in Section 3.2.6.1.

3.2.7 Gypsum Board: Minimum 1/2-inch-thick (12.7 mm), water-resistant core gypsum sheathing complying with ASTM C 79. Gypsum wallboard must comply with ASTM C 36.

3.2.8 Fiberboard: Minimum 1/2-inch-thick (12.7 mm), asphalt-impregnated fiberboard complying with ASTM C 208 as a regular density sheathing.

3.2.9 Wood-based Structural Panels: Minimum 5/16-inch-thick (7.9 mm) plywood with exterior glue for studs spaced 16 inches (406 mm) on center, and minimum 3/8-inch-thick (9.5 mm) plywood with exterior glue for studs spaced 24 inches (610 mm) on center. Plywood must be exterior grade or Exposure 1 and comply with DOC PS-1 or UBC Standard 23-2, as applicable.

3.2.10 Caulking: An acrylic latex caulking material complying with ASTM C 834.

3.2.11 Water-resistive Barrier: Minimum No. 15 asphalt nonperforated felt complying as Type I in accordance with ASTM D 226 (IBC or IRC); minimum Grade D kraft building paper complying with UBC Standard 14-1; asphalt-saturated rag felt complying with UL Standard 55A (UBC); or material recognized in a current ICC-ES evaluation report as complying with the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38), is required. Application

of the barrier must comply with IBC Section 1404.2, IRC Section R703.2 or UBC Section 1402.1. When applied over any wood-based sheathing, the barrier must be either:

1. A minimum of two layers of Grade D kraft building paper as set forth in IBC Section 2510.6 or UBC Section 2506.4; or
2. One layer of EPS insulation board, having horizontal tongue-and groove edges as described in Section 3.2.5, over one layer of Grade D kraft building paper having a minimum water-resistance rating of 60 minutes.

3.2.12 Vapor Retarder: A vapor retarder complying with the requirements set forth in the *International Energy Conservation Code*® (IECC) must be provided, unless its omission is permitted under the exceptions in IECC Section 402.5 or 502.5.

3.2.13 Flashing, Trim and Accessories: All trim, screeds and corner reinforcement must be galvanized steel or approved plastic. Flashing complying with IBC Section 1405.3, IRC Section R703.8 or UBC Section 1404.2, as applicable, must be provided. Rigid flashing must be sloped towards the exterior, with an upturned leg on the interior side and at the ends. Flashing must extend beyond the surface of the exterior wall.

4.0 INSTALLATION

4.1 General:

The exterior cementitious coating is applied by hand-troweling in one coat to a minimum 3/8-inch (9.5 mm) thickness. The lath must be embedded in the minimum coating thickness and therefore cannot be exposed. The finish coat, if required, must be applied in accordance with Superwall Manufacturing's instructions. The coating is applied at ambient air temperatures between 40°F and 110°F (4°C and 43°C) by applicators approved by Superwall Manufacturing. An installation card as illustrated in Figure 3 must be on the jobsite with the name of the applicator and the product to be used before any water-resistive barrier or exterior sheathing is installed. Also, see Section 5.6.

4.2 Application over Open Framing:

The water-resistive barrier is placed, as set forth in Section 3.2.11, over open wood studs, with a specific gravity of 0.5 or greater, spaced a maximum of 24 inches (610 mm) on center. The EPS insulation board, described in Section 3.2.5, is then placed horizontally with tongues faced upward, and is temporarily held in place with galvanized staples or roofing nails. Vertical butt joints must be staggered a minimum of one stud space from adjacent courses and occur directly over studs. The lath must be applied tightly, with 1 1/2-inch (38 mm) end and sidelaps, over the EPS insulation board, and is fastened through the EPS insulation board and water-resistive barrier to wood studs, sills and plates with either No. 11 gage galvanized roofing nails with 1/2-inch-diameter (12.7 mm) heads, spaced 6 inches (152 mm) on center, or No. 16-gage galvanized staples with a minimum crown width of 1/2 inch (12.7 mm), spaced 6 inches (152 mm) on center. Fasteners must penetrate wood framing at least 1 inch (25.4 mm). Avoid overdriving fasteners.

Wall bracing in accordance with IBC Section 2308.9.3 or 2308.12, IRC R602.10 or R602.11, UBC Sections 2320.11.3 and 2320.11.4, or an alternate, must be installed. Outside wall corners and parapet corners must be covered with extra metal corner reinforcements attached to the framing members with approved fasteners spaced 18 inches (457 mm) on center, or as necessary to

hold plumb. Weep screeds must comply with, and be installed at the bottom of the wall in accordance with IBC Section 2512.1.2, IRC Section R703.6.2.1 or UBC Section 2506.5. Galvanized metal, $1\frac{3}{8}$ -inch (35 mm), J-shaped trim pieces must be installed at other areas where insulation board is exposed. At windows and doors, flashing described and installed in accordance with IBC Section 1405.3, IRC Section R703.8 or UBC Section 1402.2, butting J-trim metal edges, must be caulked. Holes for hose bibbs, electrical panels and other penetrations of substrate surfaces, except those caused by fasteners, must also be caulked. The coating must be applied as described in Section 4.1.

4.3 Application over Solid Substrates:

4.3.1 Fiberboard: Fiberboard sheathing is installed directly over wood studs spaced a maximum of 24 inches (610 mm) on center. The fiberboard is temporarily held in place with corrosion-resistant staples or roofing nails. A water-resistive barrier, as described in Section 3.2.11, must be applied over the fiberboard prior to installation of lath or optional foam board. When an optional layer of foam board is used, either Tyvek Stucco Wrap ([ESR-2375](#)) must be used as the water-resistive barrier, or grooved foam as described in section 3.2.5.2 must be used. Grooves in the insulation board must face the water-resistive barrier and the grooves must be vertically oriented but may be offset a maximum of 6 inches (152 mm) from adjacent boards. The vertical joints of EPS insulation boards must be staggered from adjacent courses a minimum of 3 inches (76 mm). Insulation boards must be attached to the framing, but the vertical joints of the insulation board are not required to align with the framing. The wire fabric or expanded metal lath and optional EPS insulation board must be attached to studs, through the water-resistive barrier and sheathing, with fasteners and spacings as described in Section 4.2 for EPS insulation board, or as described for fiberboard in IBC Table 2304.9.1, IRC Table R602.3(1), or UBC Table 23-II-B-1, whichever is most restrictive.

Wall bracing in accordance with IBC Section 2308.9.3 or UBC Sections 2320.11.3 and 2320.11.4, or an acceptable alternate, is required. Outside wall corners and parapet corners must be covered with extra metal corner reinforcements attached to the framing members with approved fasteners spaced a maximum of 18 inches (457 mm) on center, or as necessary to hold plumb. Weep screeds must comply with, and be installed at the bottom of the wall in accordance with, IBC Section 2512.1.2, IRC Section R703.6.2.1 or UBC Section 2506.5. Galvanized steel, $1\frac{3}{8}$ -inch (35 mm), No. 22 gage [0.025-inch (0.635 mm)], J-shaped trim pieces must be installed in other areas where insulation board is exposed. See Figure 2 for typical installation details. At windows and doors, butting J-trim metal edges must be caulked. Holes for hose bibbs, electrical panels and other penetrations of substrate surfaces, except those caused by fasteners, must also be caulked. The coating must be applied as described in Section 4.1.

4.3.2 Gypsum Sheathing: Water-resistant core gypsum sheathing is installed directly over wood studs spaced a maximum of 24 inches (610 mm) on center. Gypsum sheathing must be fastened in accordance with ASTM C 1280 (IBC), IRC Table R702.3.5, or UBC Table 25-G. A water-resistive barrier must be applied over the gypsum sheathing before application of lath or optional EPS insulation board. The lath must be attached to studs through the sheathing, with fasteners and spacings as described for EPS insulation board in Section 4.2 of this report. All walls must be braced in accordance with the

requirements of the applicable code. Exposed sheathing edges must be protected with screeds. Holes in the substrate surface must be caulked, and the coating applied as described in Section 4.1.

4.3.3 Wood-based Structural Panels: Plywood sheathing is attached directly to wood studs under the conditions set forth in Section 3.2.9 and either IBC Table 2308.9.3(3), IRC Table 602.3(3), or UBC Tables 23-IV-D-1 and 23-II-B-1. The water-resistive barrier, optional EPS insulation board, wire fabric lath, and coating must be applied as described in Section 4.3.1 for fiberboard. The lath must be applied over the plywood as set forth in Section 4.2. All walls must be braced in accordance with the requirements of the applicable code.

4.3.4 Concrete and Masonry: Vertical wood furring strips must be attached to the wall at a maximum spacing of 24 inches (610 mm) on center. The top and bottom of each wall must have horizontal furring strips. The furring strips must be fastened with concrete or masonry fasteners recognized in a current ICC-ES evaluation report, spaced a maximum of 16 inches (406 mm) on center, with minimum 1-inch (25.4 mm) penetration into the concrete or masonry. The furring strips must be minimum 1-by-2 lumber. The insulation board and lath must be applied as set forth in Section 4.3.2. The coating must be applied in accordance with Section 4.1.

4.4 One-hour Fire-resistance-rated Wall Assemblies:

4.4.1 Assembly 1:

4.4.1.1 Interior Face: One layer of $\frac{5}{8}$ -inch-thick (15.9 mm), Type X gypsum wallboard, water-resistant backer board or veneer base applied parallel or at right angles to the interior face of 2-by-4 wood studs (minimum specific gravity of 0.50) spaced a maximum of 24 inches (610 mm) on center. The wallboard must be attached with 6d coated nails, $1\frac{7}{8}$ inches (47.6 mm) long with $\frac{1}{4}$ -inch-diameter (6.4 mm) heads, at 7 inches (178 mm) on center to studs, plates and blocking. All wallboard joints must be backed with minimum 2-by-4 wood framing. All joints and fastener heads must be taped and treated with joint compound in accordance with ASTM C 840 or GA216.

4.4.1.2 Exterior Face: The exterior face consists of one of the following:

1. One layer of minimum $\frac{5}{8}$ -inch-thick (15.9 mm), Type X, water-resistant core gypsum sheathing, 48 inches (1219 mm) wide, applied parallel to studs with No. 11 gage galvanized roofing nails, $1\frac{3}{4}$ inches (45 mm) long with $\frac{7}{16}$ - or $\frac{1}{2}$ -inch-diameter (11.1 or 12.7 mm) heads, at 4 inches (102 mm) on center at board edges and 7 inches (178 mm) on center at intermediate studs. The sheathing must be nailed to top and bottom plates at 7 inches (178 mm) on center. A water-resistive barrier must be applied over the sheathing.
2. One layer of EPS insulation board, a maximum of 1 inch thick (25.4 mm), applied, over the water-resistive barrier, to studs and fastened in place as described in Section 4.2. One layer of wire lath must be applied over the EPS and fastened with No. 11 gage galvanized nails, 2 inches (51 mm) long with $\frac{3}{8}$ -inch-diameter (9.5 mm) heads, at 6 inches (152 mm) on center to studs and plates.

The coating must be applied as described in Section 4.1.

4.4.1.3 Axial Load Design: Axial loads applied to the wall assembly must be limited by the lesser of the following:

The wood stud axial design stress for the wall assembly calculated in accordance with Sections 3.6 and 3.7 of ANSI AF&PA NDS-05 (IBC and IRC) or ANSI/NFoPA NDS-91 (UBC), is limited to $0.78 F'_c$.

The maximum stress must not exceed $0.78 F'_c$ at a maximum l_e/d ratio of 33.

4.4.2 Assembly 2:

4.4.2.1 Interior Face: As described in Section 4.4.1.1.

4.4.2.2 Exterior Face: One layer of EPS insulation board complying with Section 3.2.5.1, a maximum of 1 inch thick, is applied, over the water-resistive barrier, to open studs and fastened in place as described in Section 4.2. One layer of wire lath must be applied over the EPS and fastened with No. 11 gage galvanized nails, 2 inches (51 mm) long with $\frac{3}{8}$ -inch-diameter (9.5 mm) heads, at 6 inches (152 mm) on center to studs and plates. The coating must be applied as described in Section 4.1. Where the wall assembly consists of both open studs and solid sheathing, the EPS board, as described above, must be installed over the open framing and one layer of EPS, complying with Section 3.2.5.2, with a minimum thickness of $\frac{1}{2}$ inch and a maximum thickness of $\frac{5}{8}$ inch, may be installed over the solid sheathing to maintain a uniform wall surface.

4.4.2.3 Axial Load Design: Axial loads applied to the wall assembly must be limited by the lesser of the following:

The wood stud axial design stress for the wall assembly calculated in accordance with Sections 3.6 and 3.7 of ANSI AF&PA NDS-05 (IBC and IRC) or ANSI/NFoPA NDS-91 (UBC), is limited to $0.78 F'_c$.

The maximum stress must not exceed $0.78 F'_c$ at a maximum l_e/d ratio of 33.

4.5 Miscellaneous for Stucco System:

4.5.1 Inspection Requirements: Building department inspection is required for lath installation prior to application of the coating, as noted in IBC Section 109.3.5 in areas enforcing the IBC or IRC, or in UBC Section 108.5.5 for areas enforcing the UBC. The Superwall Stucco System requires special inspections, in accordance with IBC Section 1704 or UBC Section 1701, for field-batching and mixing of components. As an alternative, when approved by the code official, continuous field inspection of all batching and mixing operations, by an authorized inspector trained and approved by Superwall Manufacturing, Inc., may be used. The authorized inspector must be independent of the plastering contractor. A declaration, such as that shown in Figure 4, must be completed and signed in duplicate, for presentation to the building owner and the code official with the plastering contractor's installation card.

4.5.2 Control Joints: Control joints must be installed as specified by the architect, designer, builder or exterior coating manufacturer, in that order. In the absence of other details, conventional three-coat plastering details must be used.

4.5.3 Curing: Moist curing must be provided for a minimum of 24 hours or as long as necessary to hydrate the cement after the coating application, by misting or light spraying after the finish coat is applied. Moist curing is not required where job and weather conditions are favorable to the retention of moisture in the cement plaster for the required time period.

4.5.4 Soffits: The system may be applied to soffits, provided the coating is applied over metal lath complying with AC191 or UBC Table 25-B in lieu of applying the

coating over wire fabric lath. Metal lath fastening must comply with IBC Section 2510.3, IRC Section R703.6.1.3.5 or UBC Table 25-C, except the length of the fastener must be increased by the thickness of the substrate.

4.5.5 Sills: The system may be applied to sills at locations such as windows and other similar areas. Sills with depths of 6 inches (152 mm) or less may have the coating and lath applied to any substrate permitted in this report, provided the coating, lath, water-resistive barrier and substrate are installed in accordance with the appropriate sections of this report. Sills with depths exceeding 6 inches (152mm) must have substrates of solid wood or plywood. The substrate must be fastened in accordance with IBC Table 2304.9.1, IRC Section R602.3., or UBC Table 23-II-B-1, and a double layer of a code-complying Grade D water-resistive barrier must be applied over the substrate. The optional EPS board, lath and coating must be applied in accordance with Section 4.1.

5.0 CONDITIONS OF USE

The Superwall Stucco System described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Materials and methods of installation must comply with this report and the manufacturer's published installation instructions. In the event of a conflict between the installation instructions and this report, this report governs. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.
- 5.2** Installation must be by contractors approved by the manufacturer.
- 5.3** The system is limited to walls of Type V construction (IBC and UBC) and structures constructed in accordance with the IRC.
- 5.4** The system is recognized as a one-hour fire-resistance-rated wall assembly when installed in accordance with one of the assemblies described in Section 4.4.
- 5.5** The interior of the building must be separated from the EPS insulation boards by a thermal barrier complying with IBC Section 2603.4, IRC Section R314.1.2 and Table R702.3.5, or UBC Section 2602.4 and Table 25-G.
- 5.6** An installation card, such as that shown in Figure 3 of this report, must be completed and left at the jobsite for the owner, and a copy must be filed with the building department.
- 5.7** EPS insulation board must not be placed on exterior walls of wood construction located within 6 inches (152 mm) of the ground where hazard of termite damage is very heavy, in accordance with IRC Section R320.5 or IBC Section 2603.8.
- 5.8** The allowable wind load on the system applied to wood studs spaced a maximum of 24 inches (610 mm) on center is 29 psf (1388 Pa), positive or negative. Support framing must be adequate to resist the required wind load.

6.0 EVIDENCE SUBMITTED

- 6.1** Data in accordance with the ICC-ES Acceptance Criteria for Cementitious Exterior Wall Coatings (AC11), dated April 2007 (editorially revised April 2008).
- 6.2** Reports of fire-resistance testing in accordance with ASTM E 119 (UBC Standard 7-1).

7.0 IDENTIFICATION

7.1 The system components must be delivered to the jobsite in water-resistant bags or containers that have labels bearing the following information:

- The name and address of Superwall Manufacturing, Inc.
- The evaluation report number (ESR-2214).
- Identification of components.
- Weight or volume of packaged mix.

- Storage instructions.
- Maximum amount of water and other components that may be added, and conditions that must be considered in determining actual amounts.
- Curing instructions.

7.2 EPS insulation boards must be identified in accordance with their respective ICC-ES evaluation reports. Additionally, the board density shall be noted.

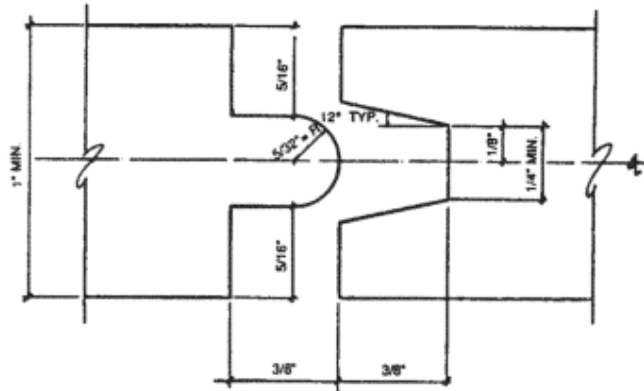


FIGURE 1

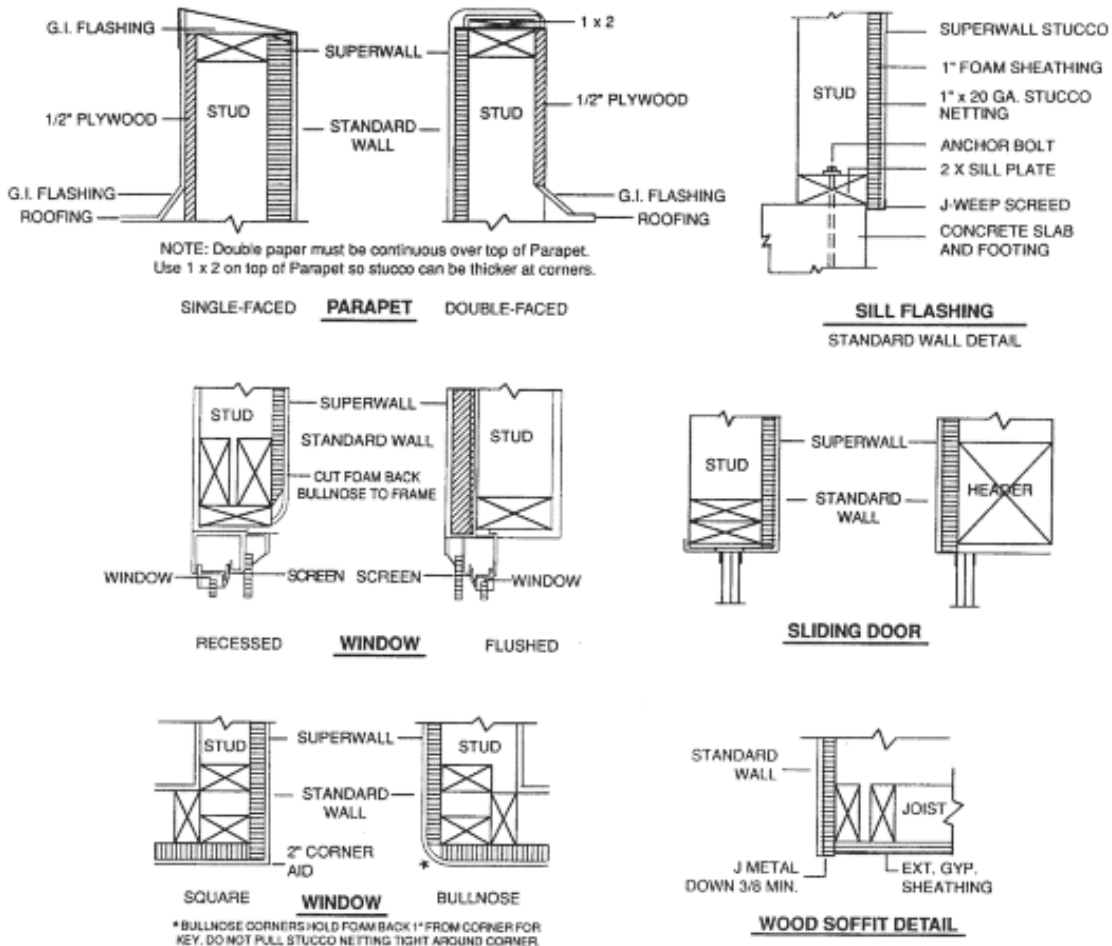


FIGURE 2

INSTALLATION CARD
(Coating system trade name)
(Name of coating manufacturer)

Project Address

ICC Evaluation Service, Inc.
Report ESR-2214

Date Completed: _____

Plastering Contractor

Name: _____

Address: _____

Telephone No. _____

Approved contractor number as issued by the coating manufacturer. _____

This is to certify that the exterior coating system on the building exterior at the above address has been installed in accordance with the evaluation report and the manufacturer's instructions.

Signature of authorized representative of plastering contractor

Date

This installation card must be presented to the building inspector after completion of work and before final inspection

FIGURE 3

(Coating system trade name)
(Name, address, phone number of coating manufacturer)

Project Address

Date: _____

The field batching and mixing of all components of the exterior wall coating at the address noted above have been continuously inspected. The field batching and mixing have been found to comply with current evaluation report ESR-2214 and approved plans.

Authorized Inspector's Signature: _____

Authorized Inspector's Name (print): _____

Employer's Name: _____

Employer's Address: _____

Telephone Number: () Fax Number: ()

This is to certify that the exterior coating system on the building exterior at the above address has been installed in accordance with the evaluation report and the manufacturer's instructions.

Superwall Officer Signature: _____

Signer's Name (print): _____

Date: _____

*Signature required only if inspector is not an employee of the coating manufacturer.

FIGURE 4