

ICC-ES Evaluation Report

ESR-2772

Reissued June 1, 2010

This report is subject to re-examination in two years.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

DIVISION: 09—FINISHES
Section: 09220—Portland Cement Plaster

REPORT HOLDER:

EAGLE BUILDING MATERIALS
 1407 NORTH CLARK STREET
 FRESNO, CALIFORNIA 93703
 (559) 485-4100
tgraves422@sbcglobal.net

EVALUATION SUBJECT:
EAGLE ONE-COAT EXTERIOR STUCCO SYSTEM
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)
- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)
- 1997 *Uniform Building Code*™

Properties evaluated:

- Structural
- Durability
- Fire-resistance-rated construction

2.0 USES

The Eagle One-Coat Exterior Stucco System is an alternative exterior wall covering to the wall coverings specified in IBC Chapter 25, IRC Section R703 and UBC Chapter 25. The system may be used to construct a one-hour fire-resistance-rated wall assembly when installed in accordance with Section 4.4 of this report.

3.0 DESCRIPTION
3.1 General:

Eagle One-Coat Stucco is a proprietary cementitious mix reinforced with wire fabric or metal lath for use as an exterior wall coating, and is applied to substrates of expanded polystyrene (EPS) or extruded polystyrene (XPS) insulation board, fiberboard, plywood, oriented strand board (OSB), or gypsum sheathing on exterior walls of wood-framed, steel-framed, concrete or masonry construction.

3.2 Materials:

3.2.1 Eagle One-Coat Stucco: Eagle One-Coat Stucco is a factory-prepared mixture of Type I or II portland cement complying with ASTM C 150, lime, chopped glass fibers and proprietary additives. The mixture is packaged in 80-pound (36.3 kg) bags. Approximately 5 gallons (19 L) of water and 240 pounds (109 kg) of sand, complying with Section 3.2.2 of this report, are added to each bag in the field and mixed in accordance with the manufacturer's recommendations.

3.2.2 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 C 897. Sand must be graded in accordance with ASTM C 144 or 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

3.2.3 Insulation Board:

3.2.3.1 Expanded Polystyrene (EPS) Insulation Board: EPS insulation boards must have a minimum nominal density of 1.5 pounds per cubic foot (24 kg/m³), and 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 ICC-ES evaluation report as complying with ASTM C 578 Type II. See Section 7.2 for board identification. Boards installed without sheathing over open framing must be 1 inch to 1½ inches (25.4 to 38.1 mm) thick and have ¾-inch-high (9.5 mm) tongues with compatible grooves for horizontal joints. See Figure 1 for joint detail. Square-edge boards can be used on solid substrates except when installed as a part of the water resistive barrier over wood-based sheathing as described in Section 3.2.9.1, in which case the boards must be 1-inch (25.4 mm) thick and have horizontal tongue-and-groove edges.

When installed over solid sheathing as described in Section 4.3, the insulation boards must have ¼-inch-wide-by ⅛-inch-deep (6.4 mm by 3.2 mm) vertical grooves spaced at 12 inches (305 mm) on the back face of the board.

As an alternate to the vertical grooves on the insulation board, installation of flat-faced boards over solid substrates may incorporate Tyvek StuccoWrap water-resistive barrier recognized in [ESR-2375](#).

3.2.3.2 Extruded Polystyrene (XPS) Insulation Board: XPS boards must have a minimum density of 1.6 pounds per cubic foot (25.6 kg/m³) and must comply with ASTM C 578, Type 3. See Section 3.2.3.1 for other details and requirements.

3.2.4 Lath:

3.2.4.1 Wire Fabric Lath: Wire fabric lath must comply with the ICC-ES Acceptance Criteria for Metal Plaster Bases (Lath) (AC191) and must be recognized in a current ICC-ES evaluation report. 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 insulation board. Furring must comply with the following requirements:

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

3.2.4.2 Metal Lath: Metal lath must comply with AC191 and, as applicable, IBC Table 2507.2, IRC Section R703.6 or UBC Table 25-B. Furring and self-furring requirements are as set forth in Section 3.2.4.1 for wire fabric lath.

3.2.5 Gypsum Board: Water-resistant core-treated gypsum sheathing must comply with ASTM C 79 or ASTM C 1396. Gypsum wallboard must comply with ASTM C36 or ASTM C 1396.

3.2.6 Fiberboard: Minimum $\frac{1}{2}$ -inch-thick (12.7 mm), asphalt-impregnated fiberboard must comply with ASTM C 208 as a Type IV, Grade 1 wall sheathing.

3.2.7 Wood Structural Panel Sheathing: The sheathing must be minimum $\frac{3}{8}$ -inch-thick (9.5 mm) plywood with exterior glue, or Exposure 1 OSB. Plywood must comply with U.S. DOC PS-1 or UBC Standard 23-2, as applicable. OSB must comply with U.S. DOC PS-2 or UBC Standard 23-3, as applicable. Wood structural panel sheathing must be installed in accordance with the limitations of the applicable code.

3.2.8 Caulking: The caulking must be acrylic latex caulking material complying with ASTM C 834.

3.2.9 Weather Protection:

3.2.9.1 Water-resistive Barrier: A water-resistive barrier is required and must comply with IBC Section 1404.2, IRC Section R703.2 or UBC Section 1402.1, as applicable. The barrier must be minimum No. 15 asphalt nonperforated felt complying as Type I in accordance with ASTM D 226 (IBC or IRC); minimum Grade D kraft 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 equivalent to ASTM D 226, Type I or better.

When applied over any wood-based sheathing, the barrier must be one of the following:

1. A minimum of two layers of Grade D kraft building paper as set forth in IBC Section 2510.6, IRC Section 703.6.3 or UBC Section 2506.4, as applicable; or an equivalent recognized in a current ICC-ES evaluation report.
2. One layer of EPS or XPS insulation board, having horizontal tongue-and-groove edges as described in Section 3.2.3.1 over one layer of Grade D kraft building paper having a minimum water-resistance rating of 60 minutes; or an equivalent recognized in a current ICC-ES evaluation report.

When Tyvek Stucco Wrap is used as the water-resistive barrier, the grooves in the insulation board described in Section 3.2.3.1 are not required. The Tyvek Stucco Wrap must be installed accordance with [ESR-2375](#).

3.2.9.2 Vapor Retarder: Protection against condensation must be provided in accordance with 2009 IBC Section 1405.3 or 2006 IBC Section 1403.2, as applicable. Under the 2009 IRC, a vapor retarder must be provided in accordance with 2009 IRC Section R601.3 unless its omission is permitted under the exceptions in 2009 IRC Section R601.3. Under the 2006 IRC, a vapor retarder must be provided in accordance with 2006 IRC Section R318.1 unless its omission is permitted under the exceptions in IRC Section R318.1.

3.2.10 Flashing: Flashing complying, and installed in accordance with 2009 IBC Section 1405.4, 2006 IBC Section 1405.3, 2009 or 2006 IRC Section R703.8 or UBC Section 1404.2, as applicable, must be provided.

3.2.11 Trim and Accessories: All trim, screeds and corner reinforcement must be galvanized steel or approved plastic.

4.0 INSTALLATION

4.1 General:

The exterior cementitious coating must be applied by hand-troweling or machine-spraying. Unless otherwise noted in this report, Eagle One-Coat Stucco is applied in one or two coats to a minimum $\frac{3}{8}$ -inch (9.5 mm) thickness. The lath must be embedded in the minimum coating thickness and must not be exposed. The finish coat, if required, must be applied in accordance with Eagle Building Materials instructions. The coating must be applied at ambient air temperatures ranging from 40°F to 110°F (4.4°C to 43.3°C) by applicators approved by Eagle Building Materials. An installation card as illustrated in Figure 2 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.

4.2 Application over Open Framing:

4.2.1 Assemblies with Insulation Board:

4.2.1.1 Wood Studs: The water-resistive barrier must be placed, as set forth in Section 3.2.9.1, over open wood studs (SG=0.42) spaced a maximum of 24 inches (50.8 mm) on center. The EPS or XPS insulation board, described in Section 3.2.3, must then be placed horizontally with tongues facing upward, and must be 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 $1\frac{1}{2}$ -inch (38 mm) end laps and side laps, over the insulation board, and must be fastened through the insulation board and water-resistive barrier to wood studs, sills and plates. Fasteners must be No. 11 gage galvanized roofing nails with $\frac{7}{16}$ -inch-diameter (11.1 mm) heads, spaced 6 inches

(152 mm) on center, or No. 16 gage [0.065-inch leg diameter (1.65 mm)] galvanized staples with a minimum crown width of $1^{5/16}$ inch (23.8 mm), spaced at 6 inches (152 mm) on center. Fasteners must penetrate wood framing (SG=0.42 minimum) at least 1 inch (25.4 mm). Care must be taken to avoid overdriving the fasteners.

Wall bracing in accordance with IBC Section 2308.9.3 or 2308.12, IRC Section R602.10 or R602.11, or UBC Sections 2320.11.3 and 2320.11.4, or an alternate, is required. Outside wall corners and parapet corners must be covered with extra metal corner reinforcement 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 R703.6.2.1 or UBC Section 2506.5, as applicable. Galvanized metal, $1^{3/8}$ -inch (35 mm), J-shaped trim pieces must be installed at other areas where insulation board is exposed. At windows and doors, butting J-trim metal edges must be flashed in accordance with the applicable code. Holes for hose bibbs, electrical panels and other penetrations of substrate surfaces, except those caused by fasteners, must also be flashed in accordance with the applicable code. The coating must then be applied as described in Section 4.1.

4.2.1.2 Steel Studs: Application of the Eagle One-Coat Stucco System to minimum No. 20 gage [0.035 inch (0.889 mm)] galvanized steel studs spaced a maximum of 24 inches (50.8 mm) on center is the same as for wood studs described in Section 4.2.1.1, except that the lath must be fastened with No. 8, self-drilling, tapping screws having minimum 0.426-inch-diameter (10.8 mm) waferheads, installed at 12 inches (305 mm) on center for 16-inch-on-center framing and 8 inches (203 mm) on center for 24-inch-on-center framing. Screws must penetrate beyond studs at least $1/4$ inch (6.4 mm).

4.3 Application over Solid Substrates:

4.3.1 Fiberboard: Minimum $1/2$ -inch-thick (12.7 mm) fiberboard sheathing must be installed directly over wood studs or minimum No. 20 gage [0.035-inch (0.889 mm)] steel studs spaced a maximum of 24 inches (50.8 mm) on center. The fiberboard must be temporarily held in place with corrosion-resistant staples or roofing nails for wood studs, or self-tapping screws for steel studs. A water-resistive barrier, as set forth in Section 3.2.9, must be applied over the fiberboard prior to installation of wire fabric or metal lath. For maximum 16-inch-on-center-framing applications, $1/2$ -inch- to $1^{1/2}$ -inch thick (12.7 to 38 mm) foam insulation board may be installed, as an option, over the fiberboard or fiberboard and water-resistive barrier. For framing spacing greater than 16 inches (406 mm) on center, foam plastic insulation board, described in Section 3.2.3, must be installed. When insulation board is used, the foam plastic boards must have grooves as described in Section 3.2.3 or ungrooved foam plastic boards may be used provided the water-resistive barrier is Tyvek Stucco Wrap as described in Section 3.2.9.1 When the grooved plastic boards are used, they must face the water-resistive barrier and must be aligned vertically, but may be offset a maximum of 6 inches (152 mm) from adjacent boards. The vertical joints of insulation boards must be staggered from adjacent courses. Insulation boards must be attached to the framing, but the vertical joints of the insulation board are not required to align with the 16-inch-on-center framing. The lath and insulation board must be attached to studs, through the water-resistive barrier and sheathing, with fasteners and spacings as described for insulation boards

in Section 4.2.1 of this report, or as described for fiberboard in IBC Table 2304.9.1, IRC Table R602.3(1), or UBC Table 23-II-B-1, as applicable, whichever is more restrictive.

Wall bracing in accordance with IBC Section 2308.9.3 or 2308.12, IRC Section R602.10 and R602.11, or UBC Sections 2320.11.3 and 2320.11.4, or an acceptable alternate, is required (see section 4.2.1.1 for details).

4.3.2 Gypsum Sheathing: Minimum $1/2$ -inch-thick (12.7 mm), water-resistant core-treated gypsum sheathing must be installed in a manner similar to the installation of fiberboard as described in Section 4.3.1 for 16-inch-on-center applications, directly over wood or minimum No. 20 gage [0.035 inch (0.889 mm)] steel studs spaced at a maximum of 24 inches (50.8 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 in accordance with Section 3.2.9.9 before application of the wire lath and coating as described in Section 4.2. As an option, grooved insulation board, $1/2$ -inch to $1^{1/2}$ -inch (12.7 to 38 mm) thick, may be installed over the water-resistive barrier prior to installation of the lath and coating. All walls must be braced in accordance with IBC Section 2308.9.3 or 2308.12, IRC Section R602.10 and R602.11, or UBC Sections 2320.11.3 and 2320.11.4, as applicable.

4.3.3 Wood Structural Panel Sheathing: Plywood or OSB sheathing must be applied directly to wood studs as set forth in IBC Table 2308.9.3(3), IRC Table 602.3(3), or UBC Table 23-IV-D-1. The water-resistive barrier, optional $1/2$ - to $1^{1/2}$ -inch-thick (12.7 to 38 mm) insulation board, lath and coating must be applied as described in Section 4.3.1 for fiberboard. Fasteners must penetrate wood framing (SG = 0.42 minimum) at least 1 inch (25.4 mm). Care must be taken to avoid overdriving the fasteners.

4.3.4 Concrete or Masonry: The Eagle One-Coat Stucco coating may be applied directly over concrete and masonry substrates without lath. The concrete or masonry surface must be prepared in accordance with the applicable code. The substrate must be clean and free of loose or otherwise deleterious materials. Application of the Eagle One-Coat Stucco coating must be in accordance with Section 4.1 and the manufacturer's instructions.

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

4.4.1 Interior Face: One layer of $5/8$ -inch-thick (16 mm), Type X gypsum wallboard, water-resistant backerboard or veneer base must be applied parallel or at right angles to the interior face of nominal 2-by-4 wood studs (minimum specific gravity of 0.50) spaced a maximum of 16 inches (406 mm) on center. The wallboard must be attached with 6d coated nails, $1^{7/8}$ inches (47.8 mm) long with $1/4$ -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 nominal 2-by-4 wood framing, and must be taped and treated with joint compound in accordance with ASTM C 840 or GA-216. Fastener heads must also be treated with joint compound in accordance with ASTM C 840 or GA -216.

4.4.2 Exterior Face: One layer of minimum $5/8$ -inch-thick (16 mm), Type X, water-resistant core-treated gypsum sheathing, 48 inches (1.22 m) wide, is applied parallel to studs with No. 11 gage, galvanized roofing nails, $1^{3/4}$ inches (44.5 mm) long with $7/16$ -inch- or $1/2$ -inch-diameter (11.1 or 12.7 mm) heads at 4 inches (101.6 mm) on center at board edges and 7 inches (178 mm) on center at

intermediate studs. The sheathing is nailed to top and bottom plates at 7 inches (178 mm) on center. A water-resistive barrier is required over the sheathing. The lath and Eagle One-Coat Stucco are then applied, without insulation board, as described in Section 4.3.2.

4.4.3 Axial Load Design: Axial loads applied to the wall assembly are limited by the lesser of the following:

1. 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 $0.78 F'_c$.
2. The maximum stress must not exceed $0.78 F'_c$ at a maximum l_e/d slenderness ratio of 33.

4.5 Miscellaneous:

4.5.1 Inspection Requirements: Building department inspection is required on lath installation prior to application of the coating, as noted in 2009 IBC Section 110.3.5 (2006 IBC Section 109.3.5) for jurisdictions enforcing the IBC or IRC, or in UBC Section 108.5.5 for jurisdictions enforcing the UBC.

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: Wet curing is accomplished with a water-fog spray applied to the finished wall surface for a minimum of two days after coating application.

4.5.4 Soffits: The system may be applied to soffits, provided the coating is applied over metal lath complying with Section 3.2.4.2 of this report in lieu of the coating being applied over wire fabric lath. Metal lath fastening must comply with IBC Section 2510.3, IRC Section R703.6.1 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 section of this report. Sills with depths exceeding 6 inches (152 mm) must have substrates of solid wood or plywood. The substrate must be fastened in accordance with Section 4.3.3 of this report, and a double layer of a code-complying, Grade D, water-resistive barrier must be applied over the substrate. The lath, optional insulation board and coating are then applied in accordance with Section 4.3.1 of this report.

5.0 CONDITIONS OF USE

The Eagle One-Coat Exterior 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 Eagle Building Materials.

5.3 The system is limited to Type V construction under the IBC, Type V construction under the UBC, and construction permitted by the IRC.

5.4 The interior of the building must be separated from the insulation boards by a thermal barrier complying with 2009 and 2006 IBC Section 2603.4, 2009 IRC Section R316.4 (2006 IRC Section R314.4) and IRC Table R702.3.5, or UBC Section 2602.4 and UBC Table 25-G.

5.5 An installation card, such as that shown in Figure 2 of this report, must be completed and left at the jobsite for the owner, and a copy must be filed with the building department.

5.6 Building Department inspections must be performed in accordance with Section 4.5.1 of this report.

5.7 Where the hazard of termite damage is "very heavy" in accordance with 2009 and 2006 IBC Section 2603.8 and 2009 IRC Section R318.4 (2006 IRC Section R3205), insulation boards must not be placed on exterior walls of wood construction located within 6 inches (152 mm) of the ground.

5.8 The allowable wind load for the Eagle One-Coat Exterior Stucco System applied to wood studs (SG=0.42 minimum) spaced a maximum of 24 inches (610 mm) on center is 33 psf (1580 Pa) positive or negative. The allowable wind load on the system applied to No. 20 gage [0.035 inch (0.89 mm) base metal thickness] steel studs spaced a maximum of 24 inches (610 mm) on center is 33 psf (1580 Pa) positive or negative. Support framing must be adequate to resist the required wind load, and must be designed for a maximum deflection of $1/240$ of span.

5.9 When used in a one-hour fire-resistance-rated assembly installation must be in accordance with Section 4.4 of this report.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Cementitious Exterior Wall Coatings (AC11), dated February 2010.

7.0 IDENTIFICATION

7.1 The factory-prepared mix is delivered to the jobsite in water-resistant bags with labels bearing the following information:

1. Name and address of the manufacturer (Eagle Building Materials).
2. The evaluation report number (ESR-2772).
3. Identification of components
4. Weight of packaged mix.
5. Storage instructions.
6. Maximum amount of water and sand that may be added.
7. Curing instructions.

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

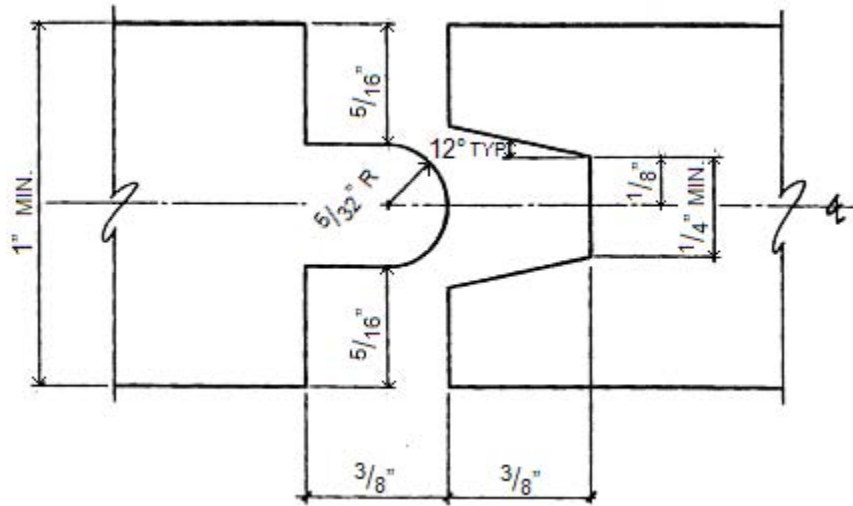
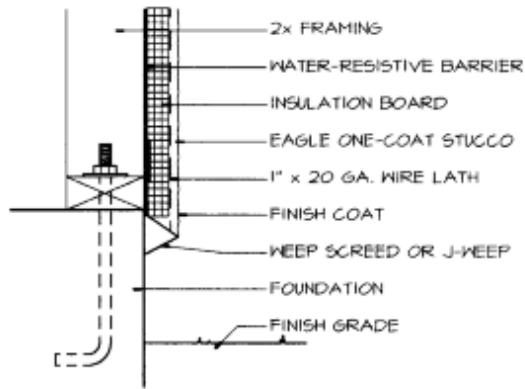


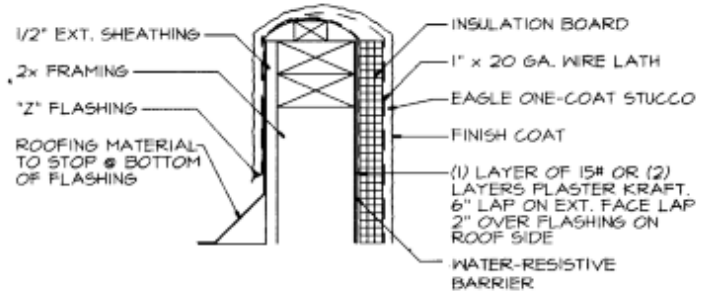
FIGURE 1—TONGUE AND GROOVE DETAILS

INSTALLATION CARD (Coating system Trade Name) (Name of coating manufacturer)	
Job Address _____ _____ _____	ICC-ES Evaluation Report Number _____ Date of Job Completion _____
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 specified above 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.	

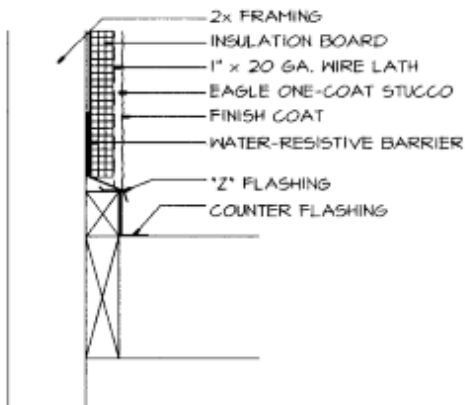
FIGURE 2—INSTALLATION CARD



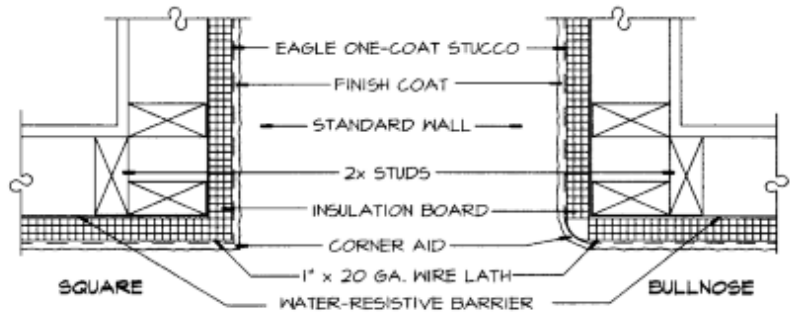
1 STUCCO @ FOUNDATION



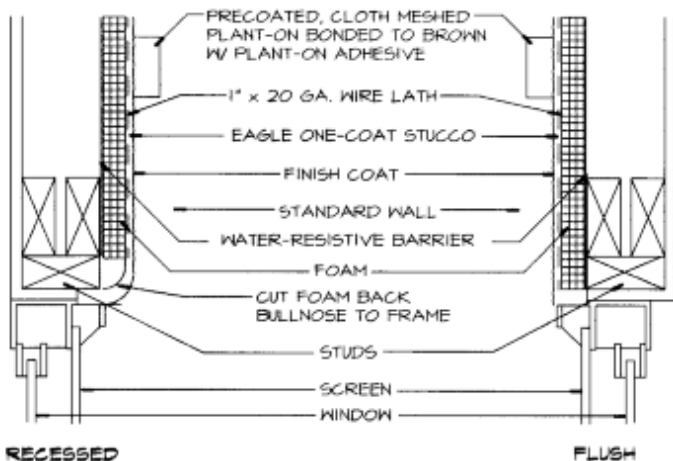
2 STUCCO @ PARAPET



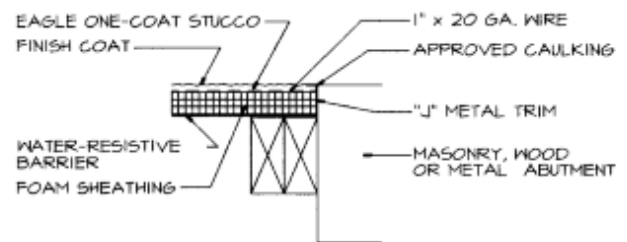
3 DECK/GABLE TERMINATION



4 OUTSIDE CORNER



5 SLIDING DOOR/WINDOW



6 PLASTER GROUND

FIGURE 3—TYPICAL INSTALLATION DETAILS