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DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07210—Building Insulation
Section: 07280—Water-resistive Barrier

REPORT HOLDER:

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EVALUATION SUBJECT:

INSULFOAM EXPANDED POLYSTYRENE (EPS) AND R-TECH™ INSULATION BOARDS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2003 *International Building Code*® (IBC)
- 2003 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Surface-burning characteristics
- Attic and crawl space installation
- Thermal performance
- Water-resistive barrier

2.0 USES

Insulfoam Expanded Polystyrene (EPS) and R-TECH™ insulation boards are EPS foam plastic boards used as nonstructural thermal insulation in wall cavities or ceiling assemblies, door cavities, roofs, or foundations, or on the outside faces of exterior walls of Type V-B (IBC) or Type V-N (UBC) construction, or structures constructed in accordance with the IRC. The insulation boards may be used on walls in attics and crawl spaces with no covering applied to the attic or crawl space side of the foam plastic, when the boards are installed in accordance with Section 4.2. The R-TECH boards may be used as an alternative to the water-resistive barriers specified in the IBC, IRC and UBC, when installed as set forth in Section 4.3.

3.0 DESCRIPTION

3.1 EPS Board:

EPS board is available with flat faces and square edges in various lengths and widths and in thicknesses up to 6 inches (152 mm). The foam plastic boards are Type I, II, VIII or IX boards complying with ASTM C 578, and having densities and thermal resistance values as shown in Table 1. The foam plastic boards have a flame-spread index not exceeding 75 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1).

3.2 EIFS Grade (IEG) EPS Board:

IEG board is available with flat faces and square edges in various lengths and widths and in thicknesses up to 4 inches (102 mm). The foam plastic board is a Type I board complying with ASTM C 578. The board has a minimum density of 0.90 pcf (14.4 kg/m^3) and is used as a component of exterior insulation and finish systems (EIFS). The foam plastic board has a flame-spread index not exceeding 75 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1). The foam plastic IEG board has more restrictive requirements than the EPS board for conditioning, product dimensions, marking and packaging.

3.3 R-TECH™ Board:

R-TECH™ board is available with flat faces and square edges in various lengths and widths, and in thicknesses up to 5 inches (127 mm). The foam plastic boards are Type I, II, VIII or IX boards complying with ASTM C 578. The boards have densities and thermal resistance values as shown in Table 1. The foam plastic boards consist of an EPS core with the faces laminated with polyethylene and polypropylene films. The foam plastic boards are manufactured in a fanfold or standard configuration. An optional reflective metalized film facer is also available. The foam plastic boards have a flame-spread index not exceeding 75 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1).

3.4 R-TECH™ One-Coat Stucco Board:

R-TECH™ One-Coat Stucco Boards are available with flat faces or with nominally $^1/_2$-inch-wide-by-$^1/_4$-inch-deep (12.7 by 6.35 mm) channels spaced a maximum of 12 inches (305 mm) on center on the back face of the board, with nominally 1.5-mil-thick (0.38 mm) plastic facers laminated to both sides of the board. The boards are produced in a 1-inch (25.4 mm) thickness and in the following configurations:

- Two or 4 feet wide by 8 feet long (610 or 1219 mm by 2438 mm) with either $^1/_2$-by-$^1/_2$-inch (12.7 by 12.7 mm) shiplap joints or tongue-and-groove joints on the long edges
- Forty-nine inches wide by 8 to 10 feet long (1245 mm by 2438 to 3048 mm) with shiplap joints on the long edges
- Four feet wide by 8 to 10 feet long (1219 mm by 2438 to 3048 mm) with square edges

See Figure 2 for additional details on the board edges. The foam plastic boards are Type I boards, complying with ASTM C 578, and have a nominal density of 1 pcf (16 kg/m^3). The foam plastic boards have a flame-spread index not exceeding

75 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1).

3.5 R-TECH™ Gable-Guard:

R-TECH™ Gable-Guard board is available with flat faces and square edges in 4-foot (1219 mm) widths and 8-foot (2438 mm), 10-foot (3048 mm) and 12-foot (3658 mm) lengths, and with a nominal thickness of $^1/_2$ inch (12.7 mm). The foam plastic boards are Type I boards complying with ASTM C 578. The boards have a nominal density of 1 pcf (16 kg/m^3) and a nominal 1.5-mil (0.38 mm) polymeric facer laminated to both sides of the board, and a thermal resistance value as shown in Table 1. The foam plastic boards have a flame-spread index not exceeding 75 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1).

3.6 Poly-Guard 136 Tape:

Poly-Guard 136 tape shall be used with the R-TECH™ One-Coat Stucco Board when the board is used as an alternative water-resistive barrier as described in Section 4.3. The tape consists of a polyethylene backing with a rubber-based adhesive, and has a nominal thickness of 9.0 mils (0.23 mm) and a width of 2 inches (51 mm). The tape is supplied in 36-yard (32 918 mm) rolls.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of Insulfoam EPS™ and R-TECH™ insulation boards shall comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions shall be available at the jobsite at all times during installation.

Except as described in Section 4.2, the interior of the building shall be separated from the insulation boards with an approved thermal barrier as required by IBC Section 2603.4, IRC Section R314 or UBC Section 2602.4. The use of the insulation boards in areas of "very heavy" termite infestation probability shall comply with IRC Section R320.4 when boards are used in structures regulated by the IRC. A vapor retarder shall be installed, in accordance with IBC Section 1403.3 or IRC Section R318, as applicable. A vapor barrier may be required by the code official for installations in jurisdictions adopting the UBC. The insulation board may be applied to exterior faces of walls to a maximum thickness of $1^1/_2$ inches (38 mm), except insulation board thicknesses greater than $1^1/_2$ inches (38 mm) may be permitted if such installation is recognized in a current ICC-ES evaluation report on a wall covering. The attachment of finish materials over the insulation board shall allow for a minimum 1-inch (25.4 mm) penetration of the fasteners into wood framing. Sheathing or a wall covering over the insulation shall be structurally adequate to resist horizontal forces perpendicular to the wall. All walls shall be braced in accordance with IBC Section 2308.9.3, IRC Section R602.10.3, or UBC Section 2320.11.3 or 2320.11.4, as applicable.

Insulation boards shall not be used as a nailing base for exterior siding materials. All nailing shall be made through the insulation into the wall framing or structural sheathing as required by the siding manufacturer's instructions or the applicable code.

Use of insulation boards as roof insulation shall be limited to installations recognized in a current ICC-ES evaluation report for the roof covering system.

4.2 Special Uses:

Insulfoam EPS™ or R-TECH™ insulation boards may be used on walls of crawl spaces and attics without a thermal barrier being applied to the interior side of the foam plastic, provided all of the following conditions are met:

a. Entry to the crawl space is only to service utilities, and heat-producing appliances are not permitted.

b. There are no interconnected basement areas.

c. Air in the crawl space is not circulated to other parts of the building.

d. Attic ventilation is provided that complies with IBC Section 1203.2, IRC Section R806 or UBC Section 1505; and combustion air complying with Sections 701 and 703.1 of the 1997 ICBO *Uniform Mechanical Code* or Sections 701 and 703.1 of the 2003 *International Mechanical Code*®, is provided, as applicable. Under-floor ventilation is provided that complies with IBC Section 1203.3, IRC Section R408.1 or UBC Section 2306.7, as applicable.

e. EPS boards having a maximum nominal density of 1 pcf (16 kg/m^3) are permitted to be a maximum of 3 inches (76 mm) thick, and boards having a maximum nominal density of 2 pcf (32 kg/m^3) are permitted to be a maximum of 2 inches (51 mm) thick.

f. R-TECH™ boards having a maximum nominal density of 1.0 pcf (16 kg/m^3) are permitted to be a maximum of 1 inch thick (25.4 mm).

4.3 Water-resistive Barrier:

4.3.1 General: When installed in accordance with this section, the R-TECH™ One-Coat Stucco Boards may be used as an alternative to Type I felt complying with ASTM D 226 or Grade A, B or C building paper as specified in UBC Standard 14-1. The boards shall be covered with exterior plaster complying with IBC Section 2512, IRC Section R703.6, or UBC Section 2508, or with one of the cementitious exterior wall coatings noted in Section 4.4 of this report.

The 2- or 4-foot-wide (610 and 1219 mm) R-TECH™ boards with tongue-and-groove joints on the long edges shall be oriented horizontally, with the tongues facing upward. The 2- or 4-foot-wide (610 and 1219 mm) boards with shiplap joints, and the 48- or 49-inch-wide (1219 mm and 1245 mm) boards with square edges, shall be oriented vertically. Shiplap joints shall occur over framing and shall overlap a minimum of $^1/_2$ inch (12.7 mm).

The R-TECH™ One-Coat Stucco Boards shall be installed directly to framing and fastened to exterior framing spaced a maximum of 24 inches (610 mm) on center, except where further limited by the requirements for the wall covering. Fasteners used to attach the boards to framing shall be minimum 6d ring-shank nails and $^{15}/_{16}$-inch-diameter (23.8 mm) plastic washers, or equivalent, spaced at 12 inches (305 mm) on center, or 1-inch-wide-crown (25.4 mm), $1^3/_4$-inch-long (45 mm), No. 16 gage staples spaced at 6 inches (152 mm) on center. Joints between boards, and corners created with the board, shall be taped with Poly-Guard 136 polyethylene tape centered over the joint. R-TECH™ One Coat Stucco Boards shall be installed with a weep screed. See Figure 3 for installation details. R-TECH™ One Coat Stucco Board used as a water-resistive barrier requires the use of self-adhering flashing, complying with the ICC-ES Acceptance Criteria for Flashing Materials (AC148), around penetrations as shown in Figure 4.

For exterior plaster complying with IBC Section 2512, IRC Section R703.6 or UBC Section 2508, the length of the fasteners used to attach the lath shall be proportionally increased based on the thickness of the R-TECH™ One Coat Stucco Board. The increase in fastener length is to maintain penetration into framing that is equivalent to that of fasteners attaching the lath without insulation.

4.3.2 Penetrations: Flashing of flange-type window penetrations when R-TECH™ One Coat Stucco Board is used as a water-resistive barrier shall be accompanied by installation of flashing complying with AC148, completely covering the framing sill and extending a minimum of 6 inches (51 mm) up the sides of the opening and approximately $1^1/_2$ inches (38 mm) beyond the face of the foam board at the front of the window opening. The flashing shall be flush with the inside edge of the framing members on the inside of the wall. The flashing extending outside of the R-TECH™ One Coat Stucco Board shall be folded over the front face of the foam board. The flashing material shall then be cut over the channels in the foam board and gently pushed down into the channels to allow for drainage. See Figure 4 for details.

Flashing of pipe penetrations shall be accomplished by sealing around the pipe with flashing complying with AC148. Flashing of other penetrating items shall be in accordance with the wall covering manufacturer's published installation instructions.

4.4 Cementitious Exterior Wall Coatings:

R-TECH™ One Coat Stucco Board and R-TECH™ Gable-Gard may be used with cementitious exterior wall coatings when installed in accordance with this section (Section 4.4).

When used with a cementitious exterior wall coating recognized in an ICC-ES evaluation report, the R-TECH™ One Coat Stucco Boards are an alternative to 1-inch-thick (25.4 mm), 1.5 pcf density (24 kg/m^3), EPS foam plastic insulation specified in the ICC-ES evaluation report on the coating. When installed in accordance with Section 4.3 of this report, the R-TECH™ One-Coat Stucco Boards may be used as an alternative to Type I felt complying with ASTM D 226 or Grade A, B or C building paper as specified in UBC Standard 14-1. R-TECH™ One Coat Stucco Boards used in conjunction with stucco systems where the R-TECH™ One Coat Stucco Board is not the water-resistive barrier, are not required to be taped.

When used with ICC-ES–recognized cementitious exterior wall coatings, the R-TECH™ Gable-Guard installed on attic wall framing is an alternative to 1-inch-thick (25.4 mm), 1.5 pcf density (24 kg/m^3), EPS foam plastic insulation specified in the ICC-ES evaluation report on the coating. The R-TECH™ Gable-Guard shall be installed, with a water-resistive barrier, directly to open framing with blocked insulation board joints, or shall be installed over solid sheathing. Conditions in the evaluation report for the foam plastic insulation as part of the coating system, such as orientation, tongue-and-groove edges, square edges and taping, shall be observed. Acceptable coating manufacturers and their respective evaluation reports are as follows:

El Rey Stucco Company, Inc.	ER-5129
Incide Technologies, Inc.	ER-4327
E-Z Wall Pre-Mix Co., Inc.	ER-5146
Highland Products, Inc.	ER-3878
Magna Wall, Inc.	ER-4776
Omega Products International, Inc.	ESR-1194
The QUIKRETE Companies	ER-4441
San-Kote, Inc.	ER-5144
American Building and Cement Products	ER-4988
Superwall Manufacturing, Inc.	ER-4867
UltraKote Products, Inc.	ESR-1471
Western Stucco Products, Co., Inc.	ER-3899

When installation is over wood-based sheathing, two layers of a Grade D water-resistive barrier are required in accordance with IBC Section 2510.6 or UBC Section 2506.4.

5.0 CONDITIONS OF USE

The Insulfoam EPS boards described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Installation shall comply with this report, the manufacturer's published installation instructions and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report shall govern.

5.2 The insulation board shall be covered with an approved exterior wall covering, including a water-resistive barrier complying with IBC Section 1404.2, IRC Section R703.2, or UBC Section 1402.1, as applicable.

5.3 The exterior wall covering spanning between wall framing members shall provide the necessary structural resistance to wind and seismic forces.

5.4 Insulation boards shall not be used as a nailing base for exterior siding materials. All nailing shall be made through the insulation into the wall framing or structural sheathing as required by the siding manufacturer's instructions or the applicable code.

5.5 Except as noted in Section 4.2 of this report, the insulation boards shall be separated from the interior of the building with a thermal barrier complying with IBC Section 2603.4, IRC Section R314.1.2 or UBC Section 2602.4, as applicable.

5.6 For structures required to comply with the IRC, use of the foam plastic insulation in areas where the probability of termite infestation is "very heavy" shall be in accordance with IRC Section R320.4.

5.7 In jurisdictions adopting the UBC, use of R-Tech One-Coat Stucco Boards as an alternative to Grade A, B or C weather-resistive barriers shall be as described in Sections 4.3 and 4.4.

5.8 For buildings in which the R-Tech One-Coat Stucco Board described in this report is used as a water-resistive barrier, all plans shall be accompanied by drawings, consistent with the illustrations in this report, that include the following:

a. Installation at all openings, corners and insulation board terminations.

b. Location, configuration and method of sealing of joints between boards and at corners.

c. Typical cross section, showing all components of the wall.

d. Typical wall pipe and window penetrations.

5.9 Insulfoam insulation boards are produced at the locations listed in Table 2 of this report, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

6.0 EVIDENCE SUBMITTED

6.1 Manufacturer's published installation instructions and descriptive literature.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated February 2005.

6.3 Data in accordance with the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38), dated June 2004.

6.4 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Sheathing Panels Used as Weather-resistive Barriers (AC71), dated February 2003.

6.5 Report containing results of testing performed in accordance with ASTM C 578.

6.6 Report containing results of comparative crawl space fire tests.

6.7 Report containing results of testing performed in accordance with UL 1715 (UBC Standard 26-3).

6.8 A quality control manual.

7.0 IDENTIFICATION

The insulation board packaging shall bear a label with the Insulfoam name; the manufacturing facility location; the date of manufacture; the evaluation report number (ESR-1788); the density; the name of the inspection agency (Underwriters Laboratories Inc.); the flame-spread index (75 or less); and the smoke-developed index (450 or less).

The Poly-Guard 136 polyethylene tape is identified with the product name and in accordance with the requirements of evaluation report ESR-1788.

TABLE 1—DENSITIES AND *R*-VALUES FOR BOARDS

EPS TYPE	NOMINAL DENSITY (pcf)	MINIMUM DENSITY (pcf)	MINIMUM *R*-VALUE FOR 1-INCH THICKNESS AT 75°F (ft^2-hr-°F/Btu)
I	1	0.9	3.6
VIII	1.25	1.15	3.8
II	1.5	1.35	4
IX	2	1.8	4.2

For **SI:** 1 inch = 25.4 mm, 1 pcf = 16.018 kg/m^3, 1 ft^2-hr-°F/Btu = 0.176 m^2-K/W.

TABLE 2—MANUFACTURING LOCATIONS

LOCATIONS OF PREMIER INDUSTRIES, INC./dba INSULFOAM	LOCATION NUMBERS FOR PRODUCT IDENTIFICATION
Insulfoam 628 Western Drive Anchorage, Alaska 99501	I-62
Insulfoam 3401 West Cocopah Street Phoenix, Arizona 85009	I-65
Insulfoam 5635 Schaefer Avenue Chino, California 91710	I-64
Insulfoam 1155 Business Park Dr., Bldg. A Dixon, California 95620	I-63
Insulfoam 12601 East 33rd Avenue—Unit 114 Aurora, Colorado 80011	I-42
Insulfoam RR1 Box 101 Mead, Nebraska 68041	I-41
Insulfoam 4500 South Frontage Road Lakeland, Florida 33815	I-46
Insulfoam 1820 South 4370 W Salt Lake City, Utah 84104	I-43
Insulfoam 19041 80th Avenue South South Kent, Washington 98032	I-61
Insulfoam 4849 Groveport Road Columbus, Ohio 43207	I-44
Insulfoam 109 Service Road Anderson, South Carolina 29625	I-49

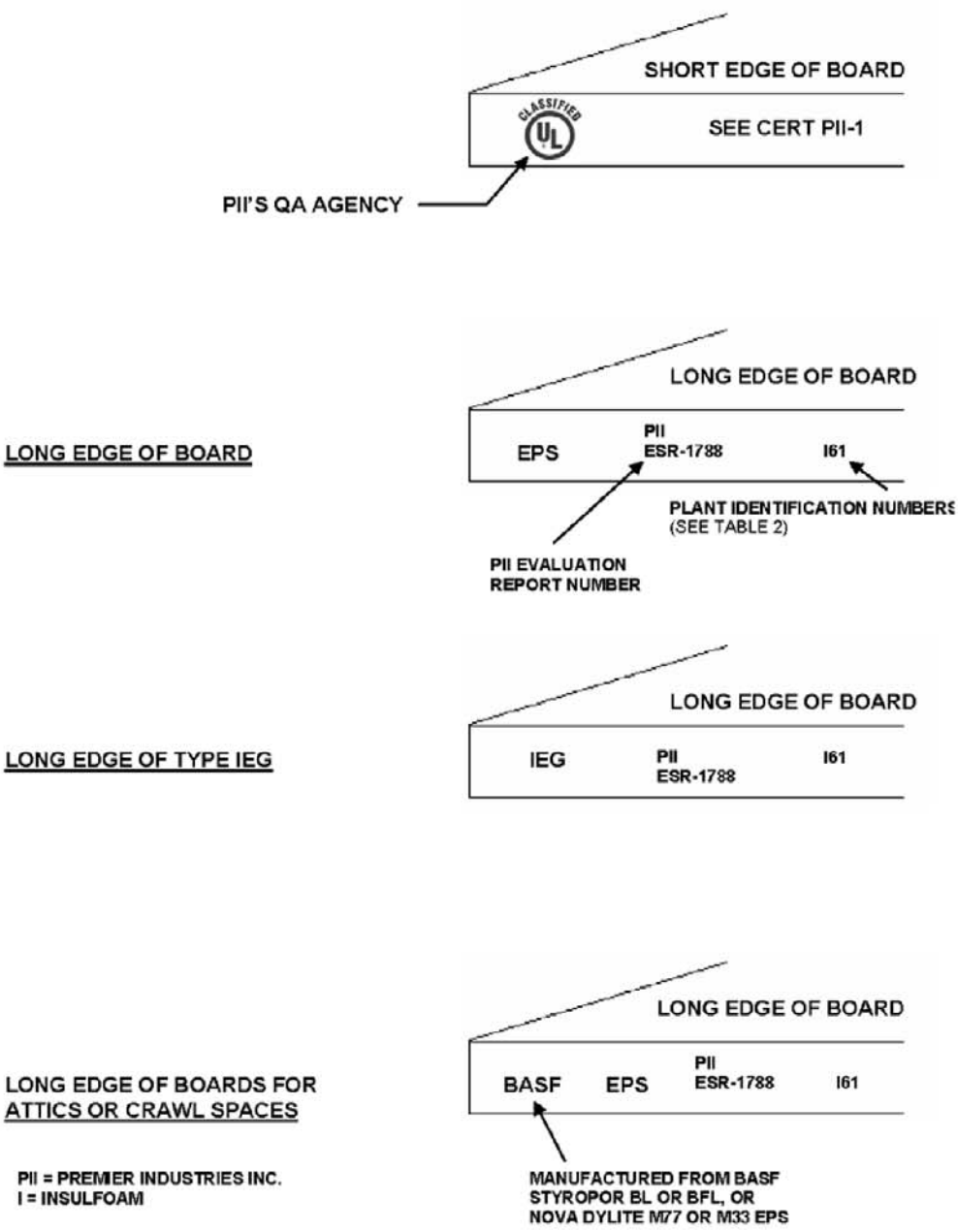


FIGURE 1—MARKINGS

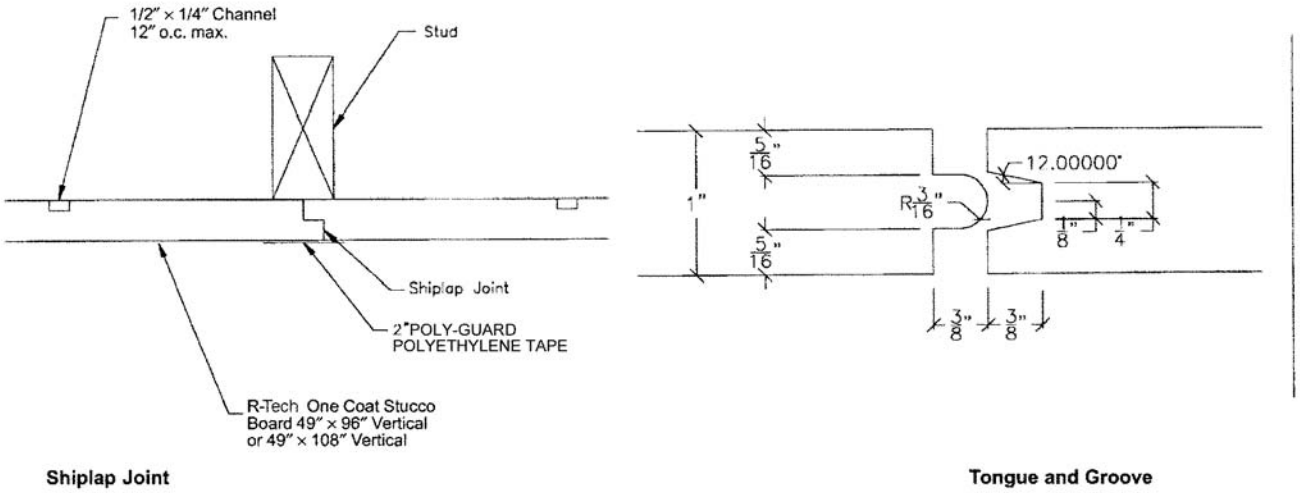


FIGURE 2—R-TECH EDGE DETAILS

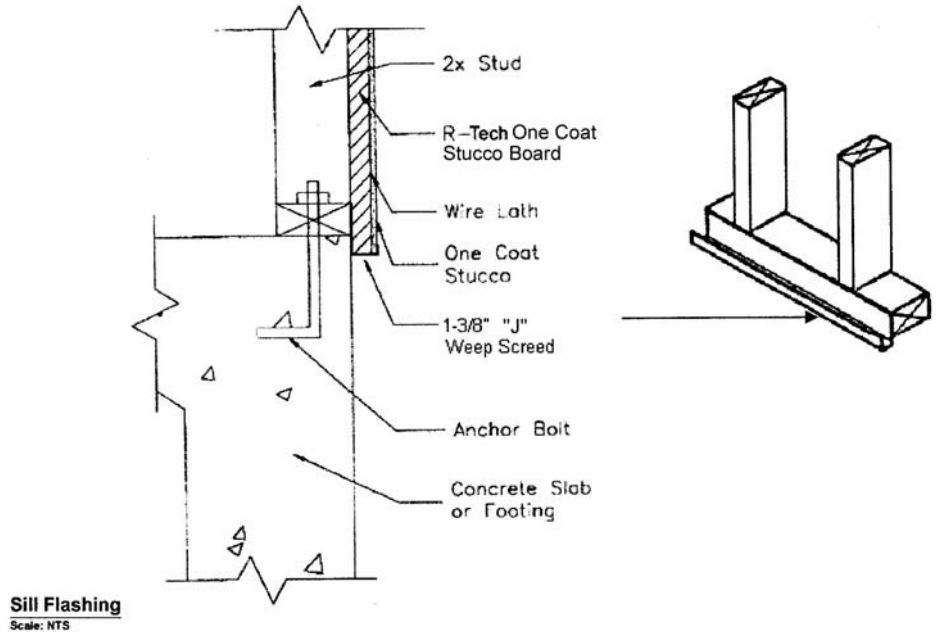
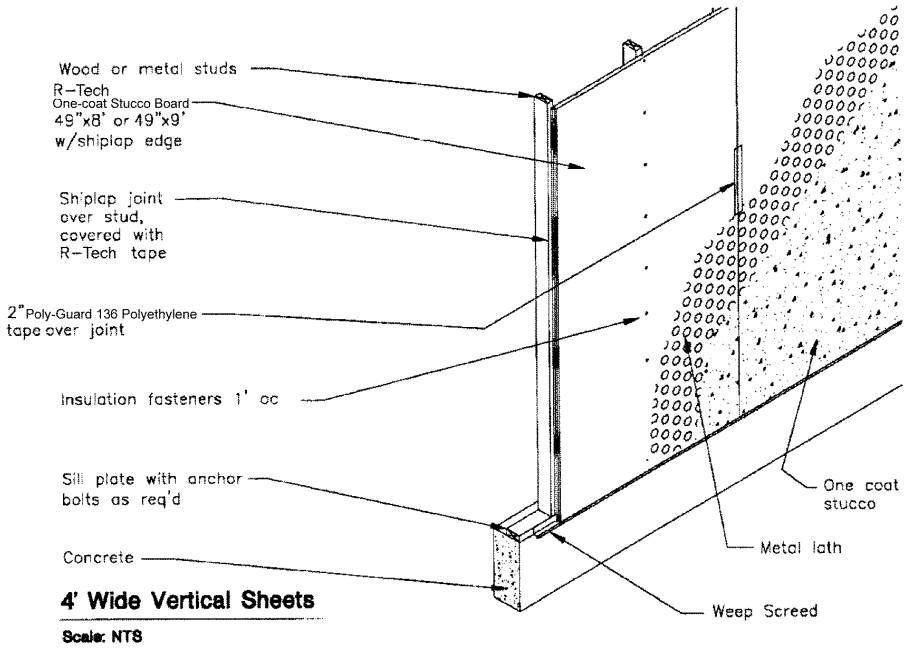
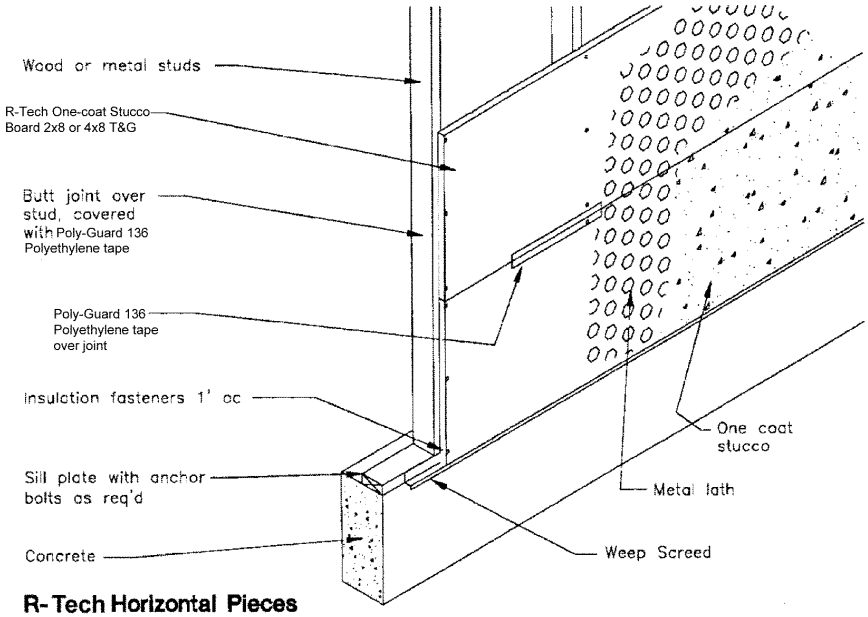


FIGURE 3—INSTALLATION DETAILS FOR R-TECH ONE COAT STUCCO BOARD INSULATION USED AS A WEATHER-RESISTIVE BARRIER



4' Wide Vertical Sheets

Scale: NTS



R-Tech Horizontal Pieces

Scale: NTS

FIGURE 3—INSTALLATION DETAILS FOR R-TECH ONE COAT STUCCO BOARD INSULATION USED AS A WEATHER-RESISTIVE BARRIER (Continued)

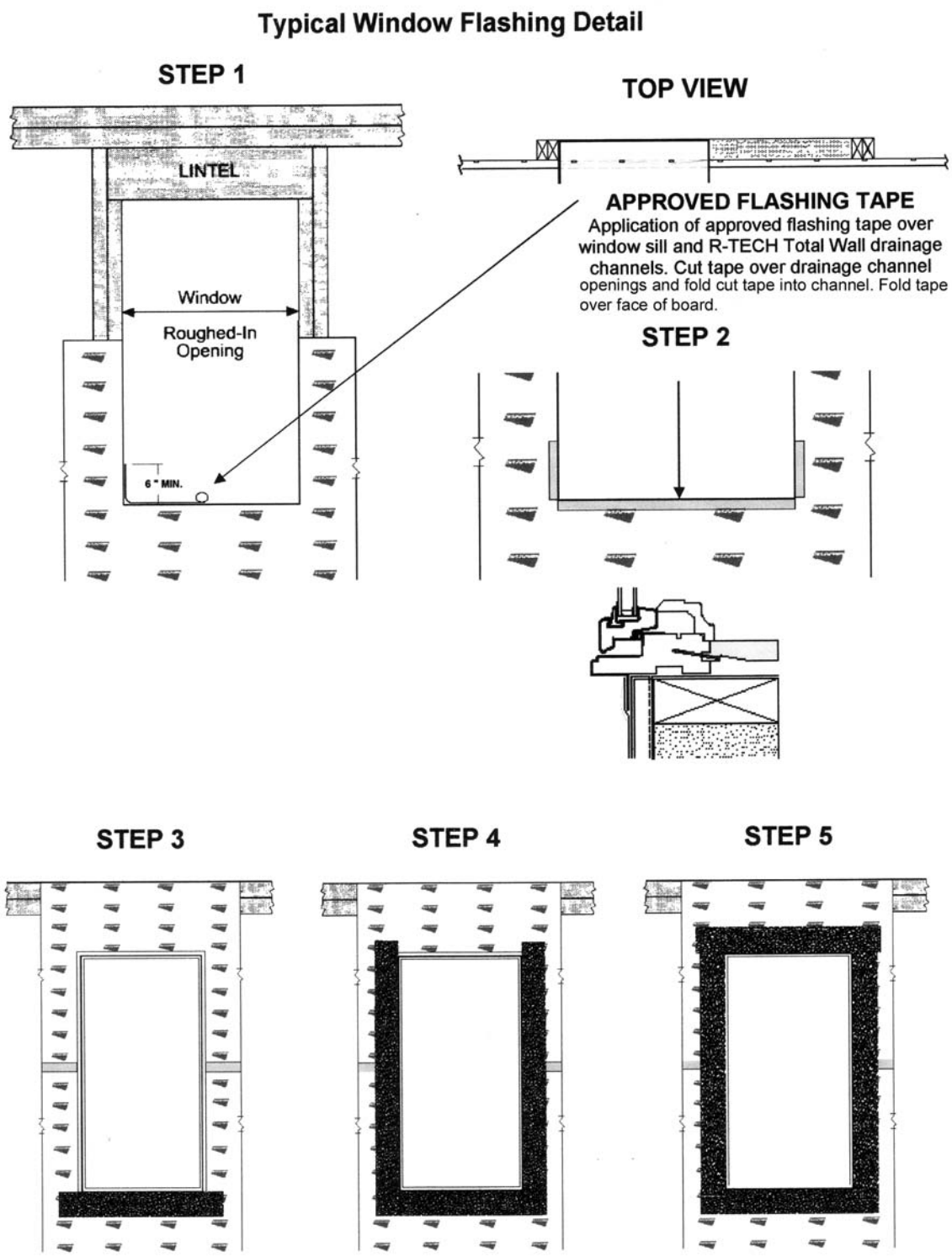


FIGURE 4—INSTALLATION DETAILS FOR R-TECH ONE-COAT STUCCO BOARD INSULATION USED AS A WEATHER-RESISTIVE BARRIER

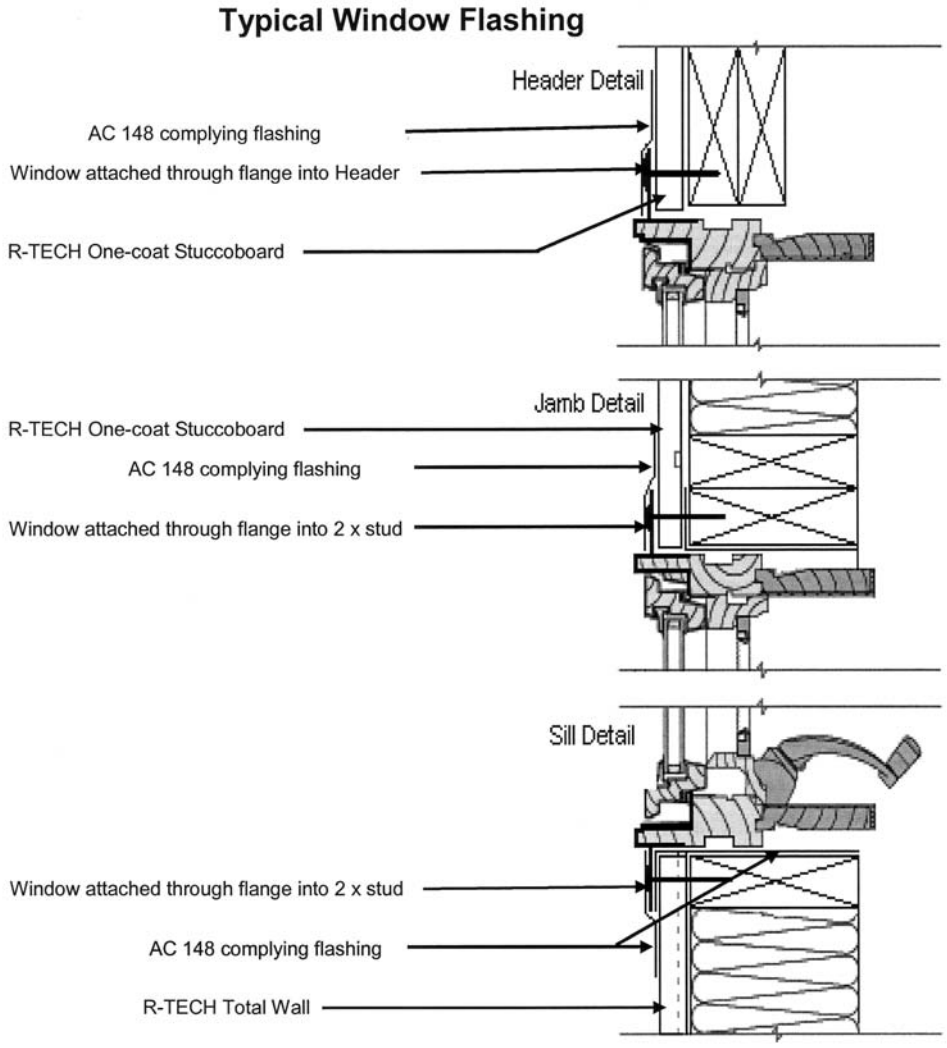


FIGURE 4—INSTALLATION DETAILS FOR R-TECH ONE-COAT STUCCO BOARD INSULATION USED AS A WEATHER-RESISTIVE BARRIER (Continued)