

ICC-ES Evaluation Report

ESR-1181

Reissued October 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: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
**Section: 07 24 00—Exterior Insulation and Finish
System**
REPORT HOLDER:
**MASTER WALL INC.
POST OFFICE BOX 397
FORTSON, GEORGIA 31808
(800) 755-0825
www.masterwall.com
tech@masterwall.com**
EVALUATION SUBJECT:
**MASTER WALL EIF SYSTEMS: AGGRE-FLEX CLASS PB
EIFS, AGGRE-FLEX CLASS PB DRAINAGE EIFS,
ROLLERSHIELD DRAINAGE CLASS PB EIFS AND QRW1
DRAINAGE EIFS**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- BOCA® *National Building Code*/1999 (BNBC)
- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)
- 1998 *International One- and Two-Family Dwelling Code*® (I1&2)

Properties evaluated:

- Noncombustible construction (Aggre-flex Class PB only)
- Ignition resistance
- Surface burning characteristics
- Structural—transverse wind load resistance
- Weather resistance
- Water drainage

2.0 USES

Aggre-flex Class PB EIF Systems are used as insulation and exterior wall finishes. Aggre-flex Class PB Drainage EIF Systems, Rollershield EIF Systems and QRW1 Drainage EIF Systems, are used as insulation and exterior wall finishes and to provide water drainage from behind the foam plastic insulation boards.

3.0 DESCRIPTION

3.1 General:

3.1.1 Aggre-flex Class PB EIFS: The Aggre-flex EIFS is a nonload-bearing exterior insulation and finish system (EIFS) applied to exterior walls. The components of the system are field-installed on substrates of masonry, concrete, gypsum sheathing, and wood-based sheathing. The system is a four-component wall system consisting of molded expanded polystyrene (EPS) foam plastic insulation boards, fiberglass reinforcing mesh, base coat and finish coat. The insulation board can be adhesively or mechanically applied, depending upon the substrate. Figure 1 shows application details.

The Aggre-flex EIF system must not be installed on framed walls of Type V construction, Group R1, R2, R3 or R4 Occupancies, under the IBC; framed walls of Type V construction, Group R1 or R3 Occupancies, under the UBC; framed walls of Type 5 construction, Group R-1, R-2, R-3 or R-4 Occupancies, under the BNBC; or framed walls of Type VI construction, Group R1 and R2 Occupancies, under the SBC or the IRC. An exception is masonry or concrete walls of Type V construction under the IBC, Type V under the UBC, Type 5 under the BNBC, and Type VI under the SBC.

3.1.2 Aggre-flex Class PB Drainage EIFS: The Aggre-flex Class PB Drainage EIFS are nonload-bearing EIFS applied to exterior walls. The components of the system when applied to brick, concrete or concrete masonry substrates are molded EPS foam plastic insulation board, mechanical fasteners, fiberglass reinforcing mesh, base coat, and finish coat. When applied over walls of wood-based sheathing attached to wood framing, the EIFS must also include a water-resistive barrier applied over the wood-based sheathing and flashing at penetrations. The insulation board must be mechanically attached to the substrates. Figure 2 shows application details.

The Aggre-flex Class PB Drainage EIFS is recognized for installation only on buildings of Type V Construction under the IBC, Type V under the UBC, Type 5 under the BNBC, and Type VI under the SBC, and on dwellings under the IRC.

3.1.3 Rollershield Drainage Class PB EIFS: The Rollershield Drainage Class PB EIFS is a nonload-bearing exterior insulation and finish system (EIFS) applied to wood or steel-framed exterior walls covered with either plywood sheathing, gypsum sheathing or cement board, or to exterior walls constructed of unglazed brick, concrete or masonry. The system components applied to the substrate are a proprietary liquid-applied water-resistive barrier, an

adhesive, foam plastic insulation board, woven glass mesh, base coat and finish coat. Figure 3 shows application details.

The Rollershield Drainage Class PB EIFS may be installed as an exterior wall cladding on buildings of any construction type.

3.1.4 QRW1 Drainage EIFS: The QRW1 Drainage EIFS is a nonload-bearing EIFS applied to exterior walls. The components of the system when applied to brick, concrete or concrete masonry substrates are polyisocyanurate insulation board, mechanical fasteners, fiberglass reinforcing mesh, base coat, and finish coat. When applied over walls of wood-based sheathing attached to wood framing, the EIFS must also include a water-resistive barrier applied over the wood-based sheathing. The insulation board must be mechanically attached to the substrates. Figure 4 shows typical application details.

The QRW1 Drainage EIFS is recognized for installation only on buildings of Type V Construction under the IBC, Type V under the UBC, Type 5 under the BNBC, and Type VI under the SBC, and on dwellings under the IRC.

3.1.5 Interior Finish: When applied to substrates of brick, concrete, concrete masonry or gypsum wallboard without foam plastic insulation boards, the system lamina comprised of base coat, mesh and finish coat has a Class A interior finish rating, 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. Surfaces must be clean, dry, sound and free of paint, efflorescence or other coatings.

3.2 Materials:

3.2.1 Substrates:

3.2.1.1 Wood-based Sheathing: Wood-based Structural I sheathing must be Exterior or Exposure 1 grade plywood complying with US DOC PS-1(UBC Standard 23-2), or Exposure 1 oriented strand board (OSB) complying with US DOC PS-2 (UBC Standard 23-3). Refer to Table 1 for thicknesses.

3.2.1.2 Gypsum-based Sheathing: Gypsum-based sheathing must be ASTM C 79 gypsum sheathing, ASTM C 1177 sheathing or Dens-Glass[®] Gold Gypsum Board recognized in [ER-4305](#). The sheathing must have a minimum thickness of $\frac{1}{2}$ inch (12.7 mm).

3.2.1.3 Other Substrates: Substrates consisting of unglazed brick, cement plaster, concrete or concrete masonry must comply with the applicable sections of the IBC or IRC.

3.2.2 Water-resistive Barrier: For installations over wood-based sheathing, the water-resistive barrier must be a minimum of one layer of No. 15 asphalt felt, complying with ASTM D 226, Type I, under the IBC, IRC, SBC and BNBC. Under the UBC, the water-resistive barrier must be Grade D kraft building paper complying with UBC Standard 14-1. Two layers of Grade D kraft building paper or one layer of Grade D building paper with a 60-minute water-resistance rating are required over wood-based sheathing. In lieu of the building paper or asphalt felt, one layer of Tyvek Stucco Wrap (recognized in [ESR-2375](#)) is permitted.

3.2.3 Roll-applied Water-Resistive Barrier: The approved roll-applied water-resistive barrier must consist of the following components:

- Master Wall Rollershield water-resistive coating. Rollershield is a premixed fully-formulated, noncementitious polymer-based coating. Rollershield is

recognized for application over the substrates described in Section 3.2.1 of this evaluation report.

- Drywall mesh tape. A self-adhesive fiberglass mesh tape.

The material is supplied in 5-gallon (18.9 L) pails and has a shelf life of two years when stored at 40°F (4.4°C) or higher and out of direct sunlight.

3.2.4 Drainage Track: The drainage track must be a polyvinyl chloride (PVC) starter track with weep holes when used with drainage systems. Weep holes are optional for the Aggre-flex System. The starter track is identified as Part No. STDE, manufactured by Plastic Components, Inc.

3.2.5 Insulation Board:

3.2.5.1 Aggre-flex EIFS: The insulation boards used in the Aggre-flex and Rollershield Drainage Class PB EIFS must be EPS foam plastic with a nominal density of 1 lb/ft³ (16kg/m³), and a flame-spread index of not more than 25 and smoke-developed index of not more than 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1). The boards must comply with ASTM C 578, Type I board. Minimum insulation board thickness is 1 inch (25.4 mm), and the maximum dimensions of the insulation board are 2 feet by 4 feet (610 mm by 1219 mm). For applications to buildings that are required to be noncombustible construction, the foam plastic must have a maximum thickness of 4 inches (102 mm).

3.2.5.2 Aggre-flex Class PB Drainage EIFS: The insulation boards used in the Aggre-flex Class PB Drainage EIFS must be as noted in Section 3.2.5.1. When used as a drainage medium, the insulation boards must have the drainage pattern shown in Figure 2 on the back of each board. The minimum total thickness of the board is $1\frac{1}{2}$ inches (38 mm).

3.2.5.3 QRW1 Drainage EIFS: The insulation board used in the QRW1 Drainage EIFS must be a rigid polyisocyanurate foam plastic core insulation board, with coated glass-fiber facing. The following two insulation boards are recognized for use with these systems:

- Atlas Stucco Shield II is manufactured by Atlas Roofing Corporation and recognized in [ESR-1375](#). The board has a density of 2 pcf (32 kg/m³), and is available in thicknesses of $\frac{1}{2}$ inch to 2 inches (12.7 to 101.6 mm). The board is available in a 48-inch width (1.22 m) and in lengths of 8 and 9 feet (2.44 and 2.74 m).
- Quik-R Wall Insulation is manufactured by the Dow Chemical Company and recognized in [NER-554](#). The board has a nominal density of 1.8 pcf (28.8 kg/m³), and is available in thicknesses of $\frac{5}{8}$ inch, $\frac{3}{4}$ inch, 1 inch, $1\frac{1}{2}$ inches, and 2 inches (15.9, 19.1, 25.4, 38 and 51 mm). At the 1.8 pcf (28.8 kg/m³) density and a maximum thickness of 2 inches (51 mm), the board has a flame-spread index of less than 75 and a smoke-density index of less than 450 when tested in accordance with ASTM E 84. The board is 48 inches wide (1219 mm) and is available in lengths of 96, 108, 120 or 144 inches (2438, 2743, 3048 or 3658 mm).

3.2.6 Fasteners:

3.2.6.1 Aggre-flex and Aggre-flex Class PB Drainage EIFS: Wind-lock Corporation, No. 6 by minimum $1\frac{5}{8}$ -inch-long (41.3 mm), W-1 screws must be used to attach 1-inch-thick (25.4 mm) foam plastic insulation boards to substrates. The screws are used with 2-inch-diameter (51 mm) Wind-lock Corporation Wind Devil 2 plates. For thicker foam plastic, fastener length must be sufficient to provide for a minimum $\frac{1}{8}$ -inch (3.2 mm) fastener

penetration through the wood-based sheathing. See Section 3.2.6.3 for fasteners to attach foam plastic to brick, concrete or concrete masonry substrates.

3.2.6.2 QRW1 Drainage EIFS: Wind-lock Corporation, No. 6, ULP-3-W-1 screws must be used to attach minimum $\frac{5}{8}$ -inch-thick (15.9 mm) foam plastic insulation boards to substrates. The screws must be used with $1\frac{1}{4}$ -inch-diameter (31.8 mm) Wind-lock Corporation ULP-302 plates. For thicker foam plastic, fastener length must be sufficient to provide for a minimum $\frac{1}{8}$ -inch (3.2 mm) penetration into the wall framing. See Section 3.2.6.3 for fasteners to attach foam plastic to brick or concrete masonry substrates.

3.2.6.3 Concrete and Masonry Substrates: Insulation board must be attached to bricks, concrete, or masonry with fasteners described in a current ICC-ES evaluation report and approved by Master Wall, Inc., and the code official. Number 10, corrosion-resistant concrete anchors must be used.

3.2.7 Drainage Medium:

3.2.7.1 Grooved Insulation Boards: Refer to Section 3.2.5.2.

3.2.7.2 Wall Vent Spacers: Closed-cell polyethylene sill spacer, $\frac{1}{4}$ inch by $3\frac{1}{2}$ inches (6.4 mm by 88.9 mm).

3.2.7.3 Tyvek® StuccoWrap®: Refer to Section 3.2.2.

3.2.7.4 Enka Rain Screens: As manufactured by Colbond, Enkamat 5006 or EnkabARRIER 5006.

3.2.7.5 Sill Sealer (QRW1 only): $\frac{1}{4}$ -inch-by- $3\frac{1}{2}$ -inch (6.4 mm by 89 mm) closed-cell polyethylene sill sealer.

3.2.8 Base Coat: Master Wall Foam & Mesh (F & M) Adhesive/Basecoat is a liquid, acrylic-based admixture combined at the jobsite with Type I or I-II Portland cement complying with ASTM C 150, and are the base coats of the EIF systems. The materials are supplied in 5-gallon (18.9 L) pails and have a shelf life of two years when stored at temperatures of 40°F (4.4°C) or higher and out of direct sunlight. The base coat must be used as an adhesive for attaching the insulation board to approved gypsum, unpainted concrete and masonry substrates.

3.2.9 Adhesive: Master Wall EPSA (Expanded PolyStyrene Adhesive) is a noncementitious translucent gray adhesives that are ready to use directly from the pail as adhesives. The materials are supplied in 5-gallon (18.9 L) pails and have a shelf life of two years when stored at temperatures of 40°F (4.4°C) or higher and out of direct sunlight. EPSA adhesive must be used to attach the insulation board to gypsum and wood-based substrates.

3.2.10 Reinforcing Mesh: The reinforcing mesh consists of open-weave, glass-fiber mesh that complies with ASTM D 579 and that has been treated for alkali-resistance and compatibility with other Aggre-flex products. Six grades of mesh are available; refer to Table 2 of this report. Normally, standard mesh must be used. Heavier weight mesh must be used to increase the impact resistance of the EIFS. Rolls must not be stored on end or in direct sunlight.

3.2.11 Finish Coat: Master Wall Superior Finishes are acrylic-based materials, and are available in various colors and textures. Six types of finishes are available, differentiated by their texture: Perfect, Perfect West, Spray, Desert Sand, Refinish and R-Coarse. The materials are supplied in 5-gallon (18.9 L) pails and have a shelf life of one year when stored at temperatures of 40°F (4.4°C) or higher and out of direct sunlight.

3.2.12 Sealants: Sealant must be compatible with the EIFS components and must be recommended by Master Wall Inc. Evidence must be submitted to the code official showing that the EIFS manufacturer-recommended sealant is Type S or M, minimum grade NS, minimum Class 25 and use O sealant complying with ASTM C 920. Under the use O classification, the sealant must be qualified for each material to which sealant is applied. The details for sealant installation, including the width and thickness of the sealant, must be designed by the registered design professional, designer, builder or Master Wall Inc., in that order, to the satisfaction of the code official.

4.0 INSTALLATION

4.1 General:

During application of water-based materials, and for at least 24 hours following application, the air temperature and temperature of the wall surface and the surrounding air must be 40°F (4.4°C) or higher. The EIFS materials must be protected from wind, rain, dust and freezing until fully cured. If water is added to make mixtures usable, the minimum possible amount of potable water must be used. The manufacturer's published instructions, supplied by Master Wall Inc., must be followed for all application procedures.

Expansion joints must be required in the systems at the following locations: where the substrate changes; at floor lines in wood-frame construction in which lumber shrinkage will occur; where the EIFS abuts another material; and where structural movement is anticipated. Control joints must be installed as specified by the designer or design professional.

An approved sealant, described in Section 3.2.12, must be applied at system terminations, exposed joints, floor lines of wood-frame construction, changes in building shape or roof line, substrate changes, and expansion joints. The sealant must be bonded to the base coat, not to the finish coat. All edges of the system, except at drainage track locations, must be back-wrapped or edge-wrapped. The details of sealant installation, including width and thickness of the sealant, must be designed by a registered design professional.

4.1.1 Adjacent Components: Other wall system components must be designed by the designer or design professional and fabricated per trade practices.

4.1.2 Windows and Doors: Assemblies must meet requirements of IBC Section 1714.5.

4.1.3 Flashing and Sheet Metal: Design and fabrication must meet requirements of IBC Section 1405.3 and SMACNA (Sheet Metal and Air Conditioning Contractors, North America) guidelines.

4.1.4 Other Components: Electrical, mechanical and plumbing penetrations must meet requirements of IBC Chapters 27, 28 and 29.

4.2 Application:

4.2.1 General: Master Wall Inc. listed contractors must install Master Wall EIF systems. All exposed edges of the insulation board must be wrapped with the reinforcing fabric and embedded in the base coat; or else there must be use of a plastic trim accessory. Substrates must be structurally sound, clean, dry and smooth, with all dust and deleterious materials removed. There must be no planar irregularities exceeding $\frac{1}{4}$ inch (6.35 mm) in a 10-foot (3.04 m) radius.

The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available on the jobsite during installation.

The instructions within this report govern if there are any conflicts between the manufacturer's instructions and this report.

4.2.2 Aggre-flex Class PB EIF System:

4.2.2.1 Adhesive: The appropriate adhesive must be applied to the back of the insulation board described in Section 3.2.5.1. Foam & Mesh (F&M) adhesive must be applied to the entire back of the insulation board with a $\frac{3}{8}$ -inch-deep-by- $\frac{3}{8}$ -inch-wide-by- $\frac{3}{4}$ -inch-on-center-spacing, square-notched trowel; Expanded PolyStyrene Adhesive (EPSA) must be applied to the entire back of the insulation board with a $\frac{3}{8}$ -inch-deep-by- $\frac{1}{2}$ -inch-wide-by-2-inch-on-center-spacing, U-notched trowel. The coated insulation board must be immediately placed horizontally in a running bond pattern on the substrate and slid into place. Firm pressure must be applied to the entire surface to complete contact between the coated insulation board and the substrate. All board edges must be abutted tightly. Any gaps must be filled with slices of insulation board. Once the insulation boards have been installed, they must be allowed to dry (this will require approximately 12 hours, depending on environmental conditions) prior to any additional work's being done on the surface. The face of the insulation board must be rasped or sanded to promote a flat, planar surface.

4.2.2.2 Fasteners: As an alternative to the adhesive described in Section 3.2.9, the fasteners described in Section 3.2.6 must be used to attach the insulation board to substrates. Fastener spacing and fastener pattern are shown in Figure 1.

4.2.2.3 Base Coat and Reinforcing Mesh: Using a stainless steel trowel, the Aggre-flex Foam & Mesh Adhesive must be applied to the surface of the insulation board to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm). The reinforcing mesh must be placed into the wet base coat and embedded into the wet base coat. The mesh must be continuous at the corners and lapped a minimum of $2\frac{1}{2}$ inches (63.5 mm) at edges. The base coat must be allowed to dry and harden before application of a finish coat (this will require approximately 12 hours).

4.2.2.4 Finish Coat: The Master Wall Superior Finish coat must be applied over the dry reinforced base coat with a stainless steel trowel to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm), and must be textured with a plastic float.

4.2.3 Aggre-flex Drainage:

4.2.3.1 Preparation: The water-resistive barrier described in Section 3.2.2 is required for this system.

4.2.3.2 Drainage Track: The drainage track described in Section 3.2.4 must be installed at all horizontal terminations of the system, such as heads of windows and doors, and at the base of the wall. The termination, at the base of the wall, must be a minimum of 8 inches (203 mm) above grade. The drainage track must be attached to framing with corrosion-resistant, No. 12 $\frac{1}{2}$ gage, annular ring-shank nails at 7 inches (178 mm) on center. The drainage track must be attached to concrete and masonry substrates with power-driven fasteners spaced at 7 inches (178 mm) on center.

4.2.3.3 Insulation Board and Spacers: The Aggre-flex Drainage System must be applied with the insulation boards described in Section 3.2.5.2 and with a drainage medium described in Section 3.2.7.

4.2.3.4 Fasteners: Fasteners, described in Section 3.2.6 must be used to secure the system to substrate following the fastening pattern shown in Figure 1.

4.2.3.5 Insulation Application: The insulation board must be applied horizontally in a running bond pattern on the substrate. All board edges must be abutted tightly. Any gaps must be filled with slices of insulation board. The face of the insulation board must be rasped or sanded to promote a flat, planar surface.

4.2.3.6 Base Coat and Reinforcing Mesh: Using a stainless steel trowel, the Aggre-flex Foam & Mesh Adhesive must be applied to the surface of the insulation board to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm). The reinforcing mesh must be embedded into the wet base coat. The mesh must be continuous at the corners and lapped a minimum of $2\frac{1}{2}$ inches (63.5 mm) at edges. The base coat must be allowed to dry and harden before application of a finish coat (this will require approximately 12 hours).

4.2.3.7 Finish Coat: The Aggre-flex Superior Finish coat is applied over the dry reinforced base coat with a stainless steel trowel to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm), and is textured with a plastic float.

4.2.4 Rollershield Drainage Class PB EIF System:

4.2.4.1 Mesh Application: Fiberglass self-adhesive drywall mesh must be applied along all joints in the sheathing, inside corners, and edges of terminations, and must be immediately covered with Rollershield using a brush, roller or spray application technique. Rollershield must also be applied over all fastener heads. The material must cure until dry to the touch.

4.2.4.2 Rollershield Application: Rollershield must be applied over the surface of the substrate to form a continuous film. Rollershield is ready to use; however, the material must be mixed to a smooth homogeneous consistency in accordance with the manufacturer's application instructions. Rollershield is applied into openings and around penetrations as required. Rollershield must be applied to the surface in a continuous film with a nominal uniform thickness of 10 mills that is free of voids, pinholes and other discontinuities.

4.2.4.3 Drainage Track: The drainage track described in Section 3.2.4 must be installed at all horizontal terminations of the system, such as heads of windows and doors, and at the base of the wall. The termination at the base of the wall must be a minimum of 8 inches (203 mm) above grade. The drainage track must be attached to framing with corrosion-resistant, No. 12 $\frac{1}{2}$ gage, annular ring-shank nails at 7 inches (178 mm) on center. The drainage track must be attached to concrete and masonry substrates with power-driven fasteners spaced at 7 inches (178 mm) on center. Mesh application is required to flash the drainage track as described in Section 4.2.4.1.

4.2.4.4 Adhesive: The Foam & Mesh (F&M) adhesive is applied to the back of the insulation board described in Section 3.2.5.1. The adhesive must be applied to the entire back of the insulation board with a $\frac{3}{8}$ -inch-deep-by- $\frac{3}{8}$ -inch-wide-by- $\frac{3}{4}$ -inch-on-center-spacing, square-notched trowel. Application must be vertical to drain water. The coated insulation board must be immediately placed horizontally in a running bond pattern on the substrate and slid into place. Firm pressure must be applied to the entire surface to complete contact between the coated insulation board and the substrate. All board edges must be abutted tightly. Any gaps must be filled with slices of insulation board. Once the insulation boards have been installed, they must be allowed to dry (this will require approximately

12 hours, depending on environmental conditions) prior to any additional work on the surface. The face on the insulation board must be rasped or sanded to promote a flat, planar surface.

4.2.4.5 Base Coat and Reinforcing Mesh: Using a stainless steel trowel, the F&M Adhesive is applied to the surface of the insulation board to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm). The reinforcing mesh must be placed into the wet base coat and embedded into the wet base coat. The mesh must be continuous at the corners and lapped a minimum of $2\frac{1}{2}$ inches (63.5 mm) at edges. The base coat must be allowed to dry and harden before a finish coat is applied (this will require approximately 12 hours).

4.2.4.6 Finish Coat: The Master Wall Superior Finish must be applied over the dry reinforced base coat with a stainless steel trowel to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm), and must be textured with a plastic float.

4.2.5 QRW1 Drainage:

4.2.5.1 Preparation: The water-resistive barrier described in Section 3.2.2 is required for this system.

4.2.5.2 Drainage Track: The drainage track described in Section 3.2.4 must be installed at all horizontal terminations of the system, such as heads of windows and doors, and at the base of the wall. The termination at the base of the wall must be a minimum of 8 inches (203 mm) above grade. The drainage track must be attached to framing with corrosion-resistant, No. 12 $\frac{1}{2}$ gage, annular ring-shank nails at 7 inches (178 mm) on center. The drainage track must be attached to concrete and masonry substrates with power-driven fasteners spaced at 7 inches (178 mm) on center.

4.2.5.3 Insulation Board and Spacers: The system may be applied with the insulation boards described in Section 3.2.5.3 and with a drainage medium described in Section 3.2.7.

4.2.5.4 Fasteners: Fasteners, described in Section 3.2.6.2, must be used to secure the system to the substrates following the fastening pattern shown in Figure 1.

4.2.5.5 Insulation Application: The insulation board must be applied vertically on the substrate. All board edges must be abutted tightly. Any gaps must be filled with slices of insulation board.

4.2.5.6 Base Coat and Reinforcing Mesh: Using a stainless steel trowel, the Aggre-flex Foam & Mesh Adhesive must be applied to the surface of the insulation board to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm). The reinforcing mesh must be placed into the wet base coat and embedded into the wet base coat. The mesh must be continuous at the corners and lapped a minimum of $2\frac{1}{2}$ inches (63.5 mm) at edges. The base coat must be allowed to dry and harden before application of a finish coat (this will require approximately 12 hours).

4.2.5.7 Finish Coat: The Aggre-flex Superior Finish coat is applied over the dry reinforced base coat with a stainless steel trowel to a nominal thickness of $\frac{1}{16}$ inch (1.58 mm), and is textured with a plastic float.

4.3 Wind Resistant Assemblies:

Reference Table 1 for wind load resistance of the systems.

The wall framing and substrate must be designed for structural adequacy to resist the wind loads shown in Table 1.

4.4 Noncombustible Construction—Aggre-flex PB EIF Systems:

This section applies to Types I, II, III and IV construction under the IBC; Types 1, 2, 3 and 4 under the BNBC; Types I, II, III, IV and V under the SBC; and Types I, II, III and IV under the UBC. When the Aggre-flexPB EIF Systems are installed as an exterior wall cladding on buildings required to be of noncombustible construction, the wall assembly must comply with the following:

4.4.1 Interior Surface: One layer of $\frac{5}{8}$ -inch thick (15.9 mm), Type X gypsum wallboard, installed horizontally in accordance with Chapter 25 of the applicable code, with $1\frac{5}{8}$ -inch-long (41.3 mm) drywall screws spaced 8 inches (203 mm) on center.

4.4.2 Steel Studs: Minimum No. 18 gage [0.0486 inch (1.234 mm) base-metal thickness], 4-inch-deep (102 mm), C-shaped steel studs. Studs must be spaced a maximum of 16 inches (406 mm) on center, without insulation in the stud cavity.

4.4.3 Exterior Surface: One layer of minimum $\frac{1}{2}$ -inch-thick (12.7 mm) gypsum sheathing complying with ASTM C 79 must be attached horizontally to steel studs as described in this report. Maximum 4-inch-thick (102 mm) EPS foam boards are applied as described in this report. The base coat and finish coat are applied as noted in this report.

4.4.4 Fire-stopping: USG Mineral Wool Safing, 4 inches (102 mm) thick and with a 4 pcf (64.1 kg/m³) density, is installed at the floor/wall interfaces.

4.4.5 Openings: Wall openings must be framed with minimum 0.0428-inch-thick (1.09 mm) aluminum or steel framing.

4.5 Special inspection:

In jurisdictions enforcing the IBC, IRC and BNBC, special inspections are required at the jobsite in accordance with IBC Sections 1704.1 and 1704.12, which also apply to the IRC, or Sections 1705.1 and 1705.13 of the BNBC, for the roll-applied water-resistive barrier applied over framed walls. Duties of the special inspector shall include verifying field preparation of materials, expiration dates, installation of components, curing of components, installation of joints and sealant, applied dry-film thickness and interface of coating material with flashing.

5.0 CONDITIONS OF USE

The Master Wall EIF Systems (Aggre-flex Class PB EIFS, Aggre-flex Class PB Drainage EIFS, Rollershield Class PB Drainage EIFS and QRW1 Drainage EIFS), as 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** This evaluation report and the installation instructions, when required by the code official, must be submitted at the time of permit application.
- 5.2** Master Wall EIF Systems must be installed only by contractors listed by Master Wall Inc.
- 5.3** The insulation board used in the finish systems must be separated from the interior of the building by a 15-minute thermal barrier of an approved material or a minimum of 1-inch (25.4 mm) thickness of masonry or concrete.
- 5.4** The design wind load pressures must not exceed the capacities shown in Table 1.

- 5.5** The finish systems must not be used as exterior stud wall bracing. Wall bracing must be provided in accordance with Section 2308.9.3 of the IBC, Section 2305.8.1 of the BNBC, Section 2320.11.3 of the UBC, Section 2308.2.2 of the SBC and Section R602.10 of the IRC.
- 5.6** The insulation board must be limited to 4 inches (102 mm) of thickness except on buildings of Type V construction under the IBC, Type V construction under the UBC, Type 5 construction under the BNBC, and Type VI construction under the SBC, and on dwellings under the IRC.
- 5.7** The Aggre-flex Class PB Drainage EIF System and QRW1 Drainage EIF Systems are limited to installation on buildings of Type V construction under the IBC, Type V construction under the UBC, Type 5 construction under the BNBC, and Type VI construction under the SBC, and on dwellings under the IRC.

The Aggre-flex PB EIFS must not be installed on framed walls of Type V construction, Group R1, R2, R3 or R4 Occupancies, under the IBC; framed walls of Type V construction, Group R1 or R3 Occupancies, under the UBC; framed walls of Type 5 construction, Group R-1, R-2, R-3 or R-4 Occupancies, under the BNBC; framed walls of Type VI construction, Group R1 and R2 Occupancies, under the SBC; or under the IRC. An exception is masonry or concrete walls of Type V construction under the IBC, Type V construction under the UBC, Type 5 construction under the BNBC, and Type VI construction under the SBC.

- 5.8** Termination of the systems must not be less than 6 inches (152 mm) above finished grade, under Section 2304.1.4 of the SBC and Section R320.4 of the IRC and Section 2603.8 of the IBC.
- 5.9** Installation cards, similar to those shown in Figures 5, 6 and 7, must be completed by the applicators and presented to the code official at the completion of each project.

6.0 EVIDENCE SUBMITTED

- 6.1** Data in accordance with the ICC-ES Acceptance Criteria for Exterior Insulation and Finish Systems (AC219), dated October 2003, (editorially revised March 2006 and August 2007).
- 6.2** Data in accordance with the ICC-ES Acceptance Criteria for EIFS Clad Drainage Wall Assemblies (AC235), dated October 2004.
- 6.3** Data in accordance with the ICC-ES Acceptance Criteria for Water-resistive Coatings Used as Water-resistive Barriers over Exterior Sheathing (AC212), dated February 2005.

7.0 IDENTIFICATION

Each container or package of material used as part of the Master Wall EIF Systems covered by this report must be labeled with the Master Wall Inc., name and/or trademark, and address and telephone number; the product trade name; and the evaluation report number (ESR-1181).

Master Wall EPS insulation boards are delivered in sealed polyethylene bags bearing the word "Master Wall," the plant identification number of the block molder, the name of the inspection agency [RADCO (AA-650)], the evaluation report number (ESR-1181). In addition, one board in each bag must bear these same markings on each face.

Other foam plastic boards must be identified in accordance with their respective evaluation reports. When used on walls required to be of noncombustible construction, EPS foam plastic boards must also be identified along the edge of each piece, and on both faces of at least one board from each packaged bundle, with the following information:

- The Aggre-flex Class PB name and the evaluation report number (ESR-1181).
- The name and evaluation report number of the insulation board molder.
- The name of the inspection agency, as indicated in the evaluation report for the foam plastic.

TABLE 1—WIND LOAD RESISTANCE

EIF SYSTEM	FRAMING TYPE	STUD SPACING (inches) o.c.	SHEATHING ¹ EXTERIOR	MINIMUM EPS INSULATION THICKNESS (inches)	INSULATION ATTACHMENT METHOD	MAXIMUM ALLOWABLE DESIGN WIND PRESSURE (psf)	
						Positive	Negative
Aggre-flex PB & Rollershield Drainage	2x4 SPF	16	1/2-inch plywood, exterior grade	3/4	Adhered	65	60
Aggre-flex PB & Rollershield Drainage	2x4 SPF	16	1/2-inch gypsum	3/4	Adhered	55	45
Aggre-flex PB & Rollershield Drainage	4" C, 18 gage	16	1/2-inch gypsum	3/4	Adhered	90	50
Aggre-flex PB & Rollershield Drainage	4" C, 18 gage	16	5/8-inch gypsum	3/4	Adhered	95	75
Aggre-flex PB & Rollershield Drainage	4" C, 18 gage	12	5/8-inch gypsum	3/4	Adhered	90	60
Aggre-flex PB & Rollershield Drainage	4" C, 18 gage	16	1/2-inch Dens Glass Gold	3/4	Adhered	65	45
Aggre-flex PB & Rollershield Drainage	4" C, 18 gage	16	7/16-inch OSB	3/4	Adhered	55	55
Aggre-flex PB, Aggre-flex PB Drainage	2x4 SPF	16	1/2-inch plywood, exterior grade	1	Mechanical	60	25
Aggre-flex PB, Aggre-flex PB Drainage	2x4 SPF	16	1/2-inch plywood, exterior grade	1 1/2	Mechanical	60	35
QRW1 Drainage	2x4 SPF	16	7/16-inch OSB, exterior grade	5/8	Mechanical	55	30

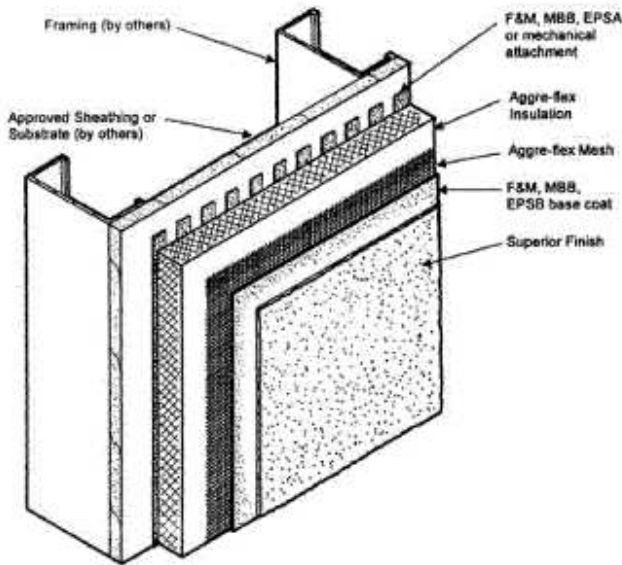
For SI: 1 inch = 25.4 mm, 1 psf = 48 Pa.

¹The interior of the wall is minimum 1/2-inch (12.7 mm) gypsum wall board.

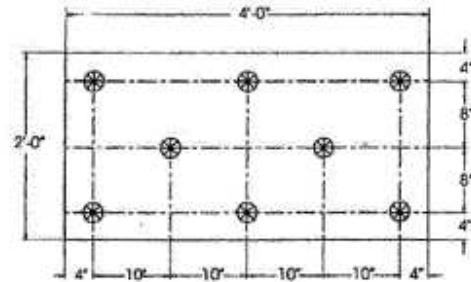
TABLE 2—REINFORCING MESH

MESH MODEL NAME	WEIGHT (oz./yd ²)
Detail	4.5
Standard	4.5
Hi-Tech	6.0
Medium	10.4
Strong	15.4
Ultra	21.0

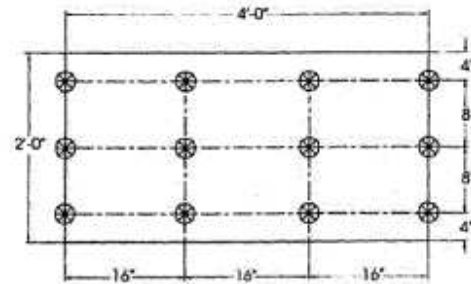
For SI: 1 oz/yd² = 33.9 g/m².



Aggre-flex Cross Section

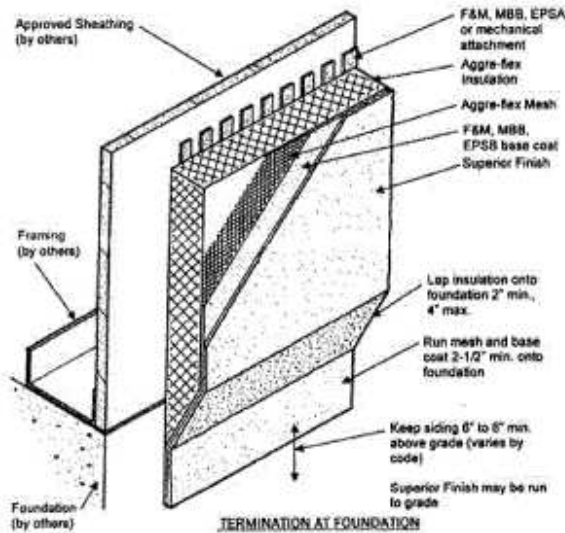


PATTERN 'A' FOR NAULABLE SUBSTRATE

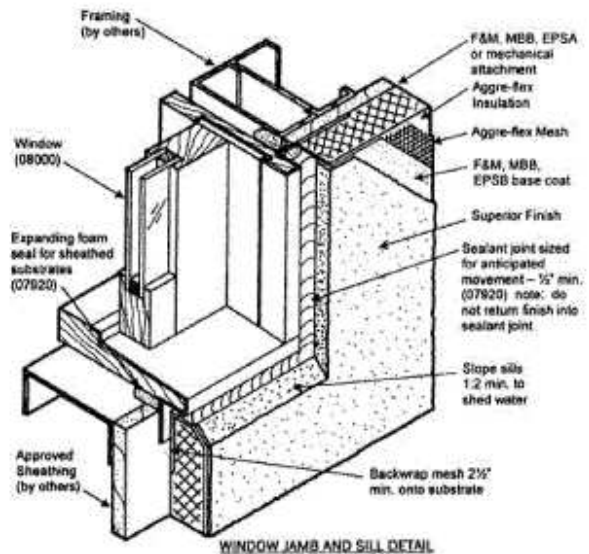


PATTERN 'B' FOR SLIDS @ 16" O.C.

Aggre-flex and Aggre-flex Drainage Fastening Pattern



TERMINATION AT FOUNDATION



WINDOW JAMB AND SILL DETAIL

FIGURE 1—AGGRE-FLEX SYSTEM

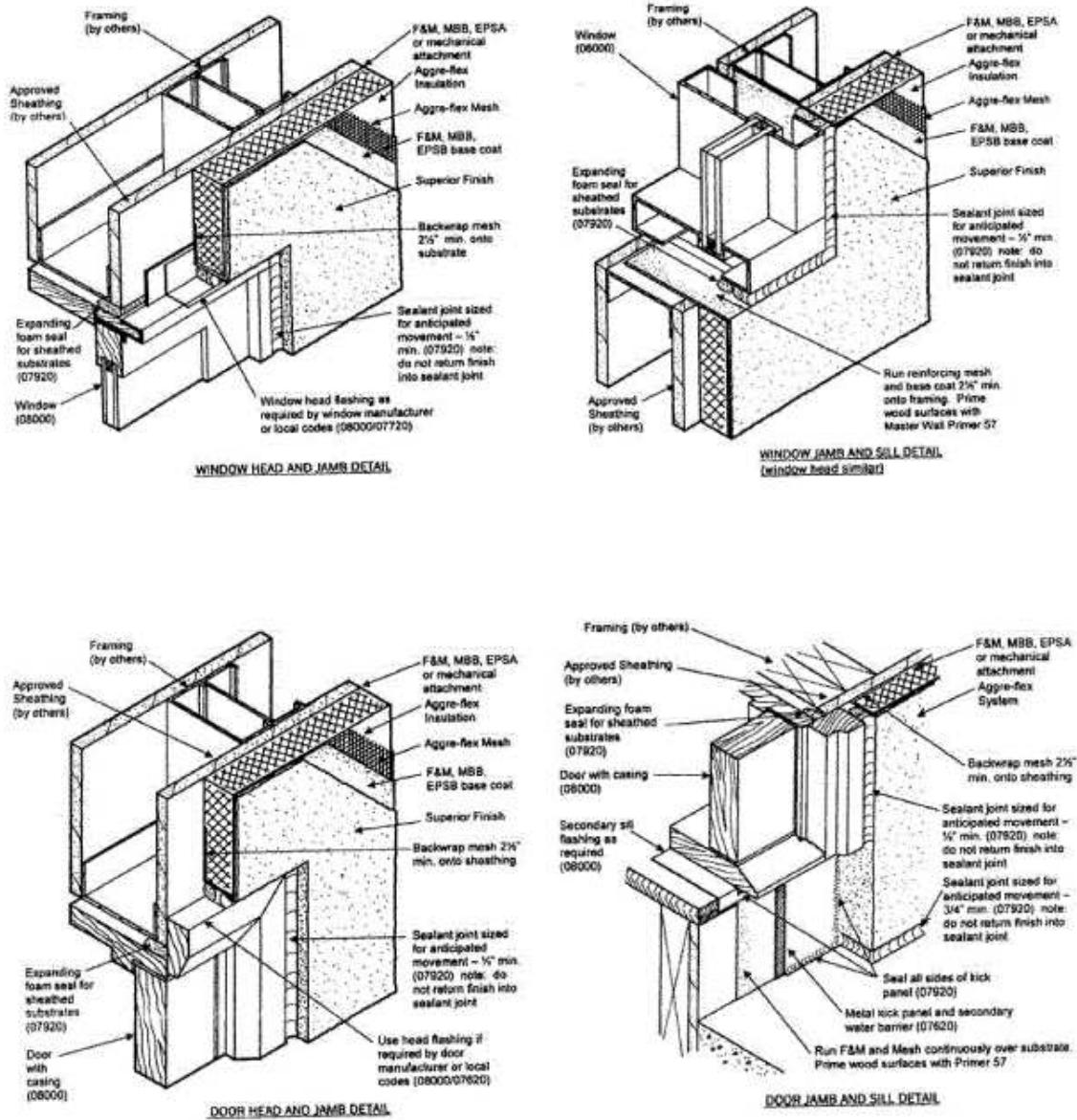


FIGURE 1—AGGRE-FLEX SYSTEM (Continued)

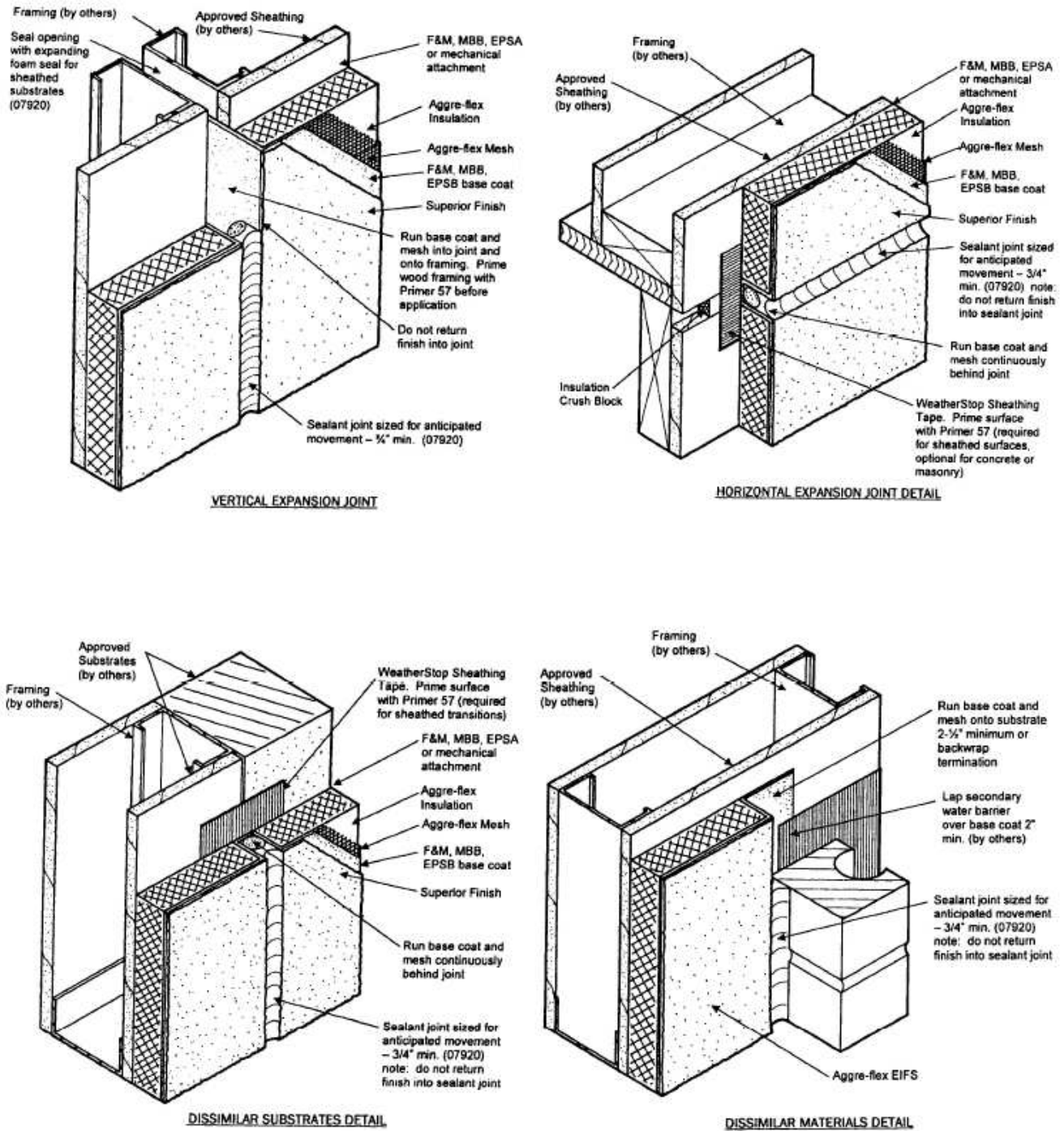


FIGURE 1—AGGRE-FLEX SYSTEM (Continued)

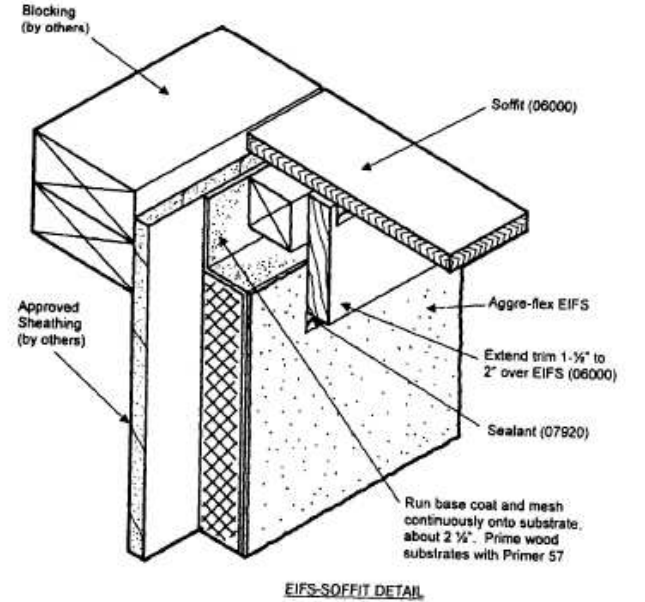
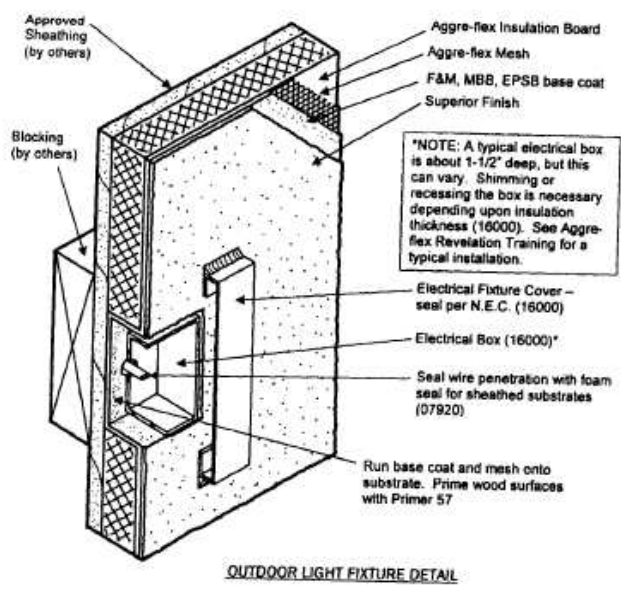
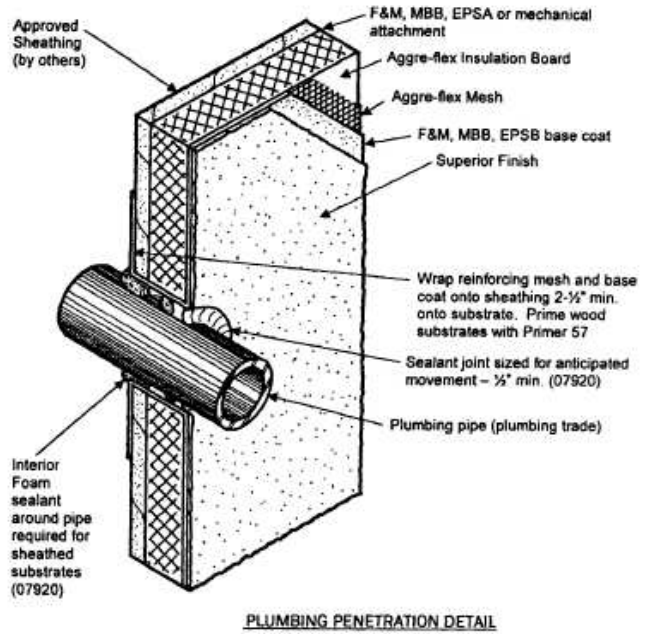
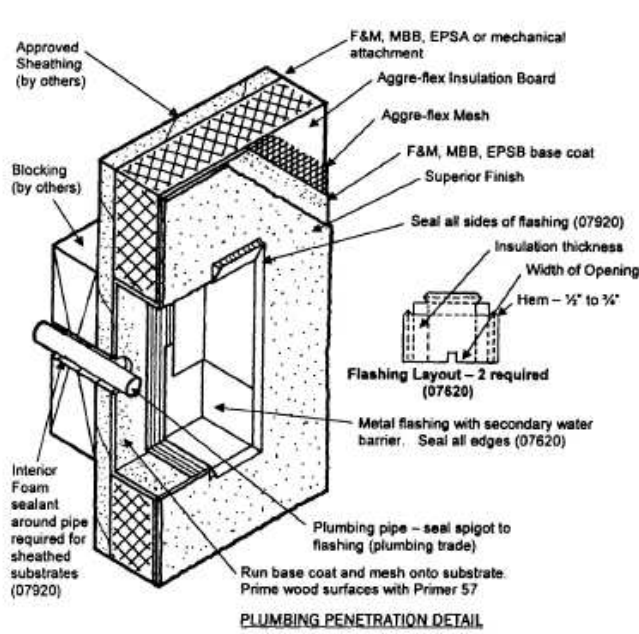


FIGURE 1—AGGRE-FLEX SYSTEM (Continued)

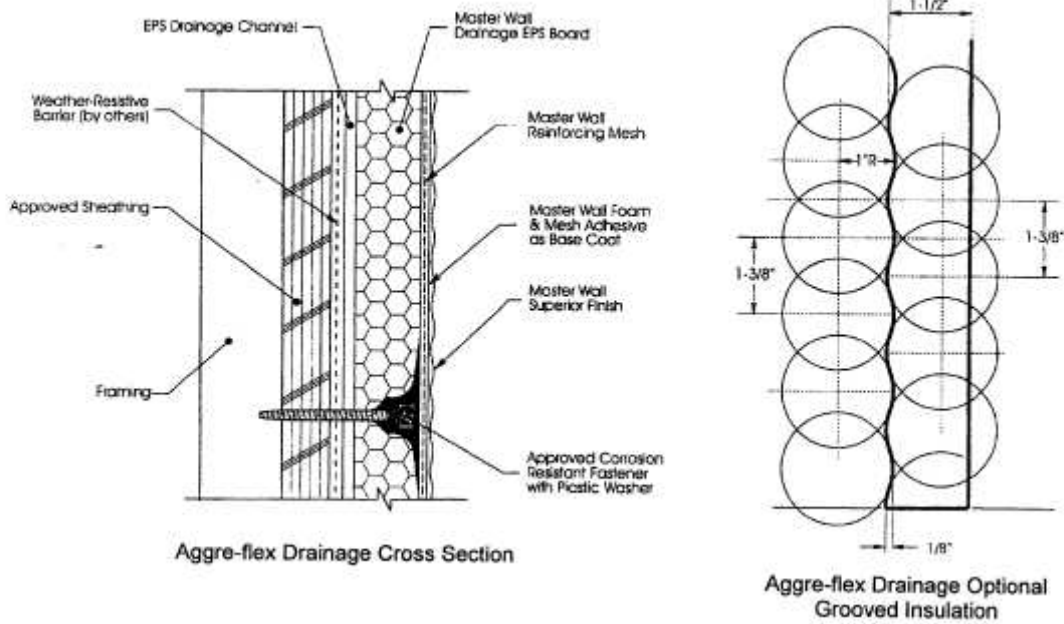
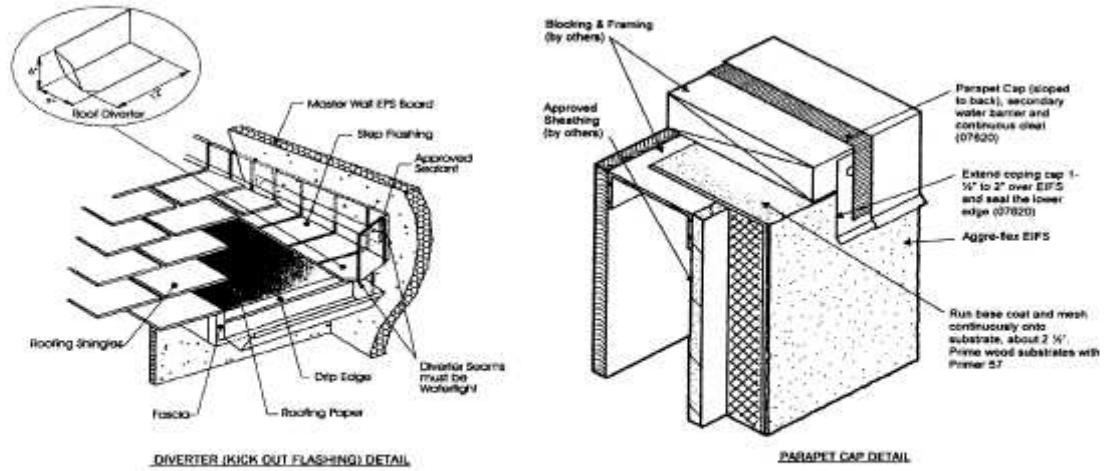
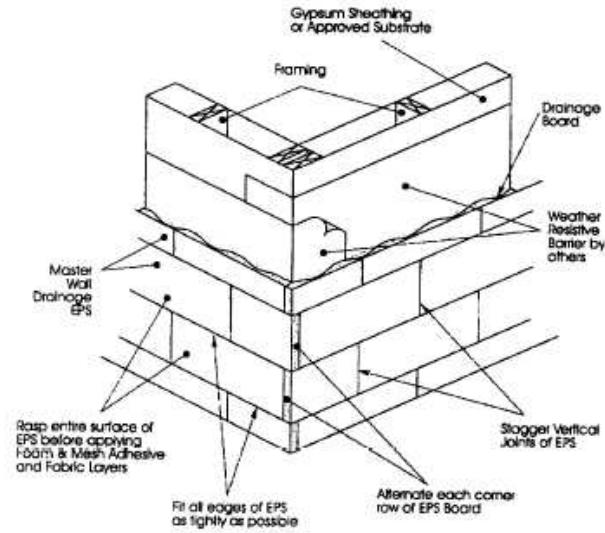
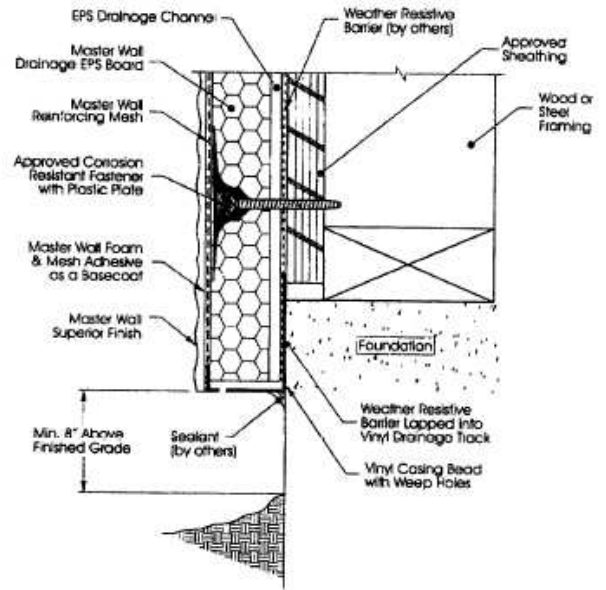


FIGURE 2—AGGRE-FLEX DRAINAGE SYSTEM

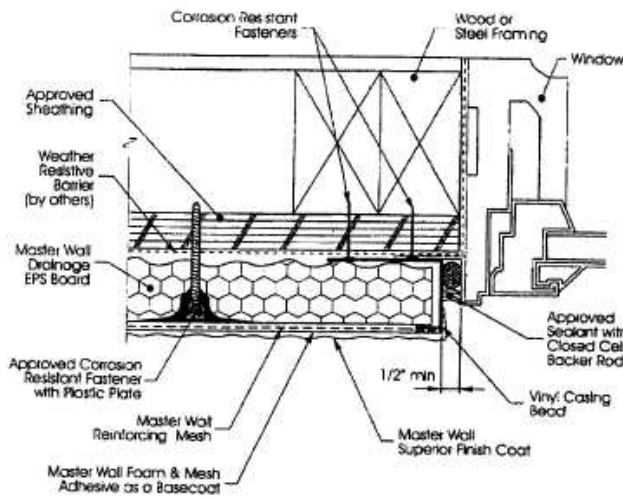


NOTE: MASTER WALL DRAINAGE EPS BOARD SHALL BE MECHANICALLY FASTENED. SEE DETAIL MW-P305-4 FOR FASTENER PATTERNS.

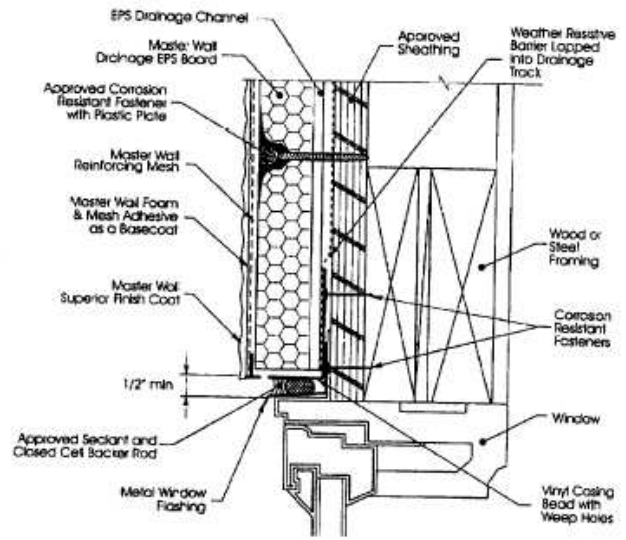
Aggre-flex and Aggre-flex Drainage Insulation Board Layout



Termination at Grade

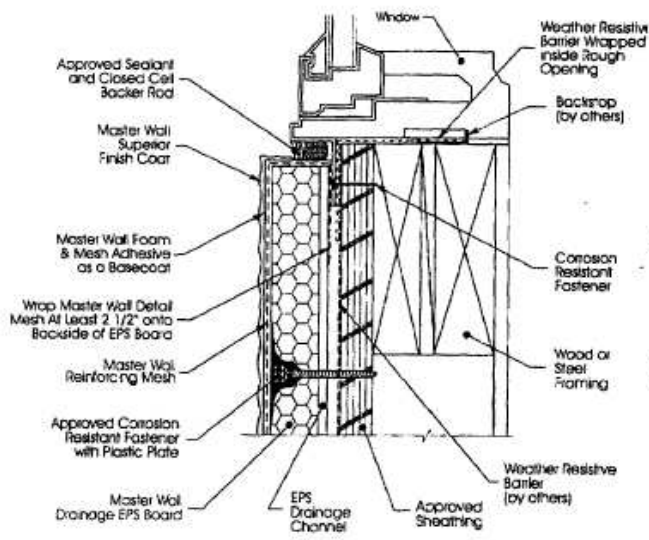


Window Jamb Detail

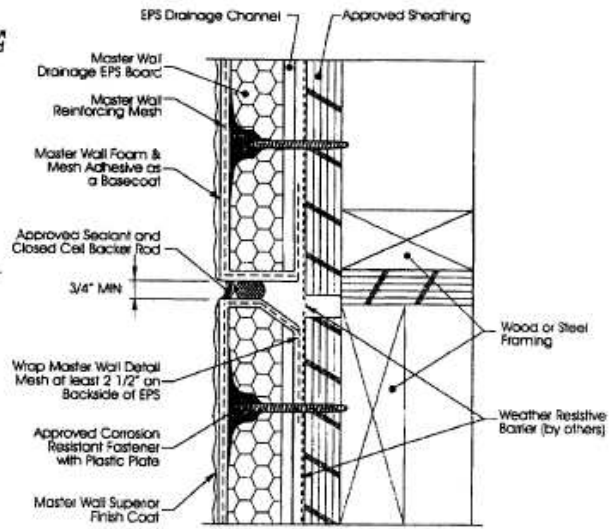


Window Head Detail

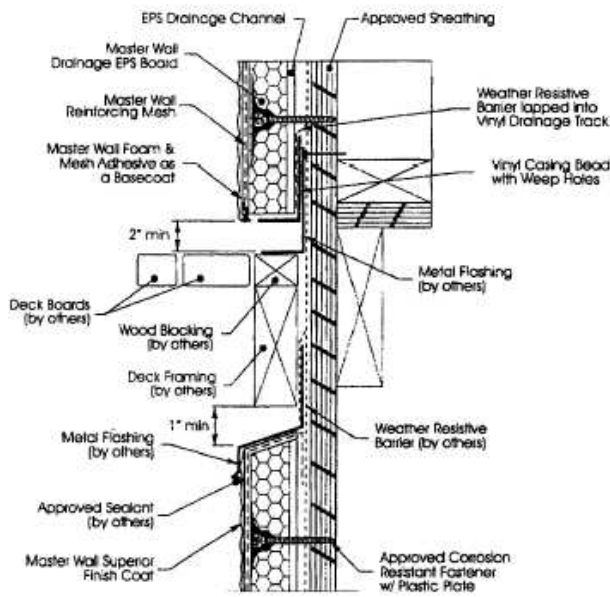
FIGURE 2—AGGRE-FLEX DRAINAGE SYSTEM (Continued)



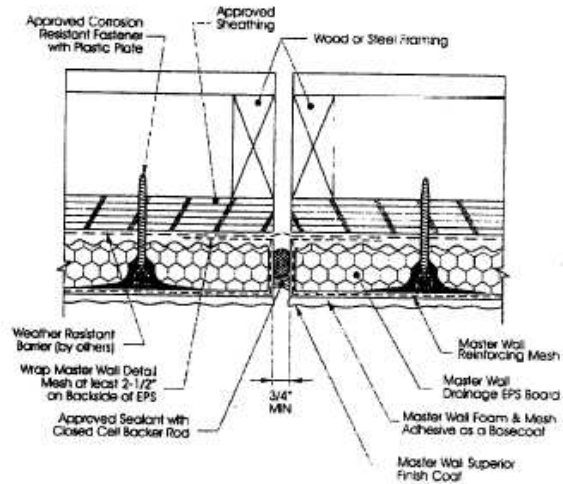
Window Sill Detail



Floor Line Expansion Joint Detail



Deck Flashing Detail



NOTE: Do not return Finish Coat into Expansion Joint

Expansion Joint Detail

FIGURE 2—AGGRE-FLEX DRAINAGE SYSTEM (Continued)

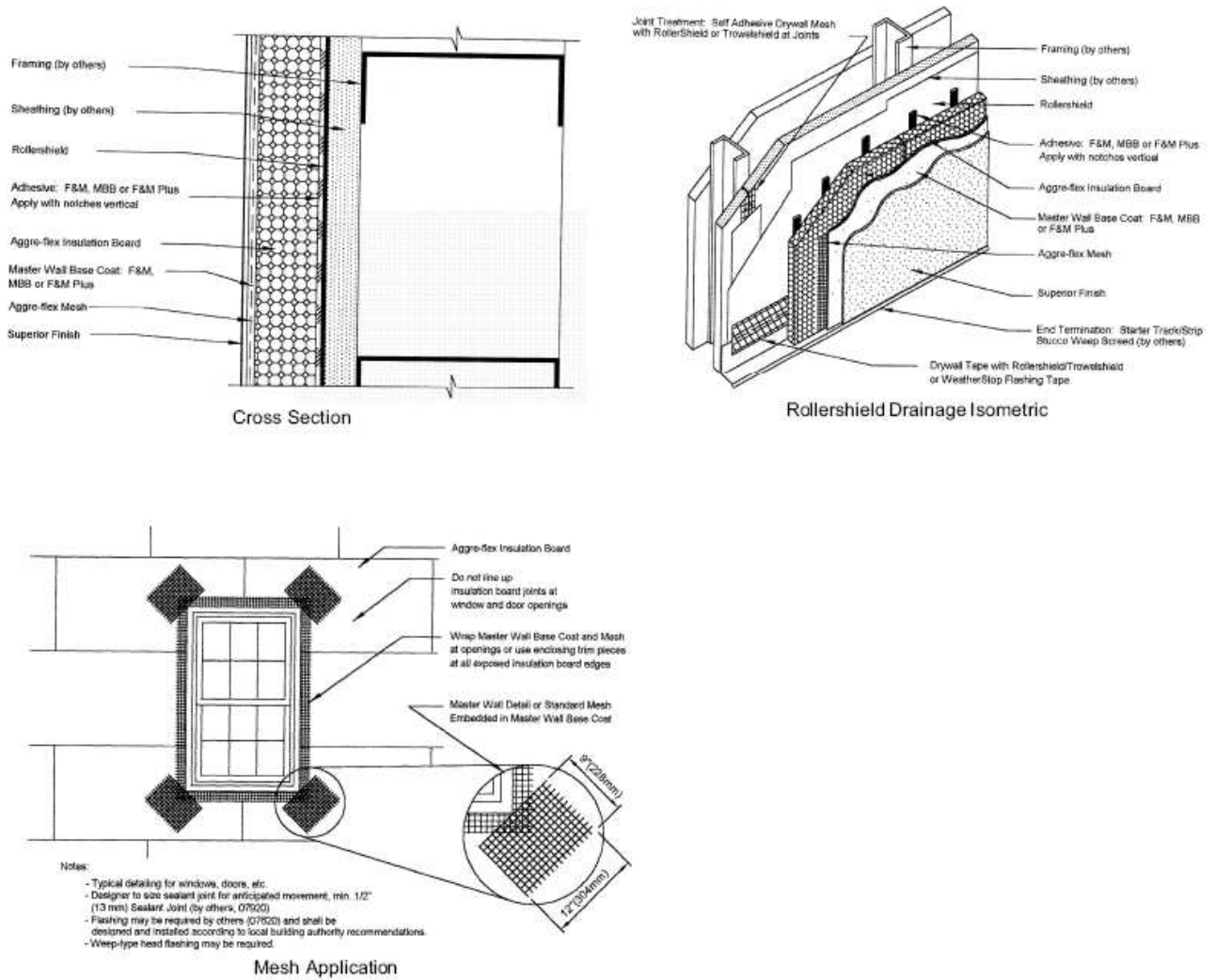


FIGURE 3—ROLLERSHIELD DRAINAGE SYSTEM

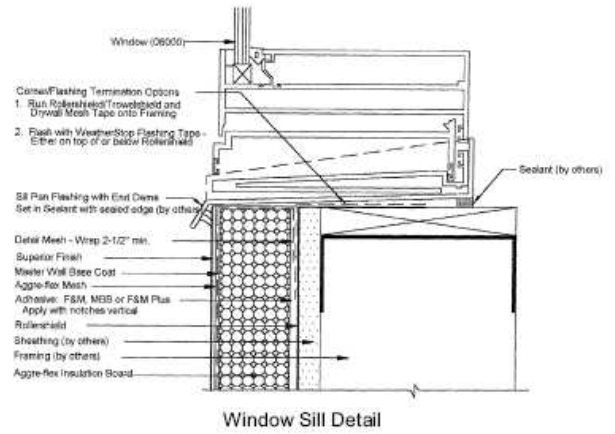
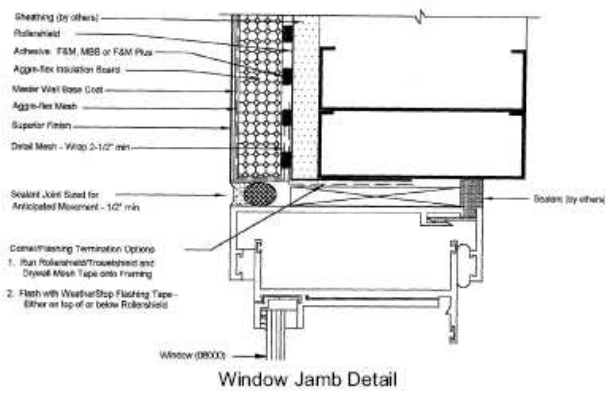
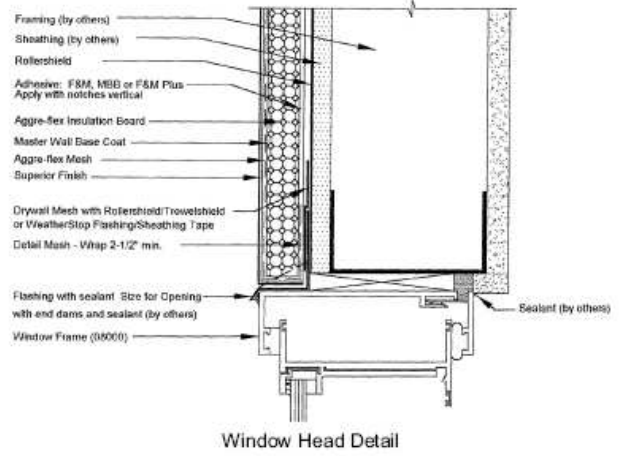
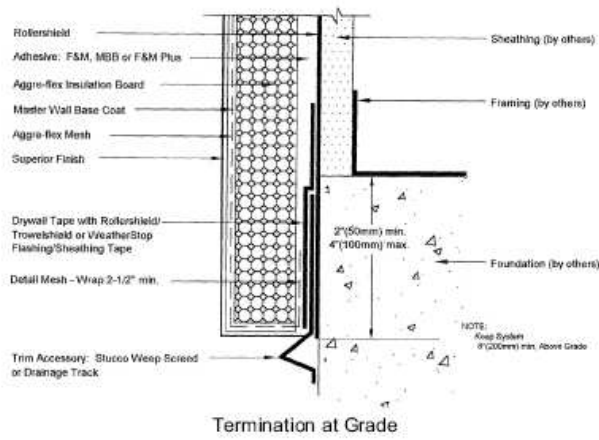


FIGURE 3—ROLLERSHIELD DRAINAGE SYSTEM (Continued)

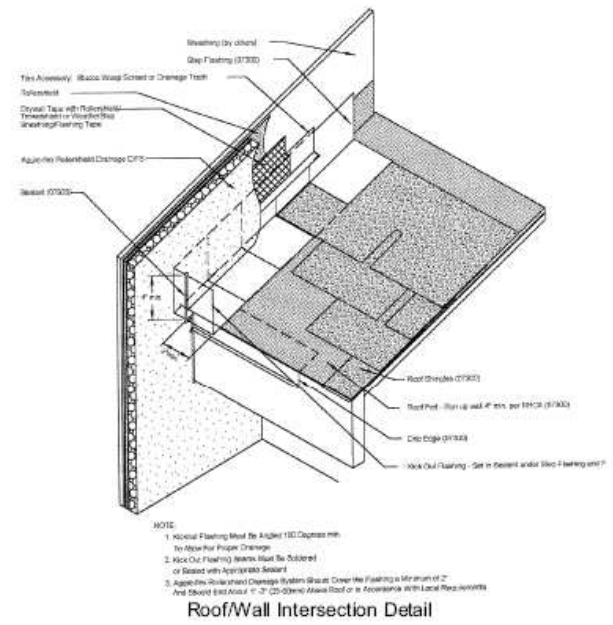
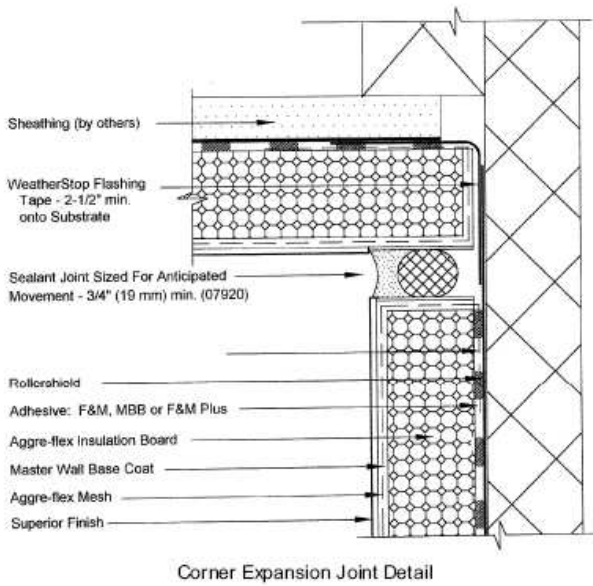
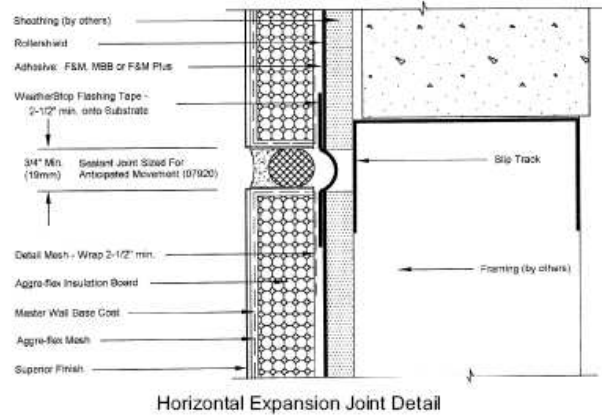
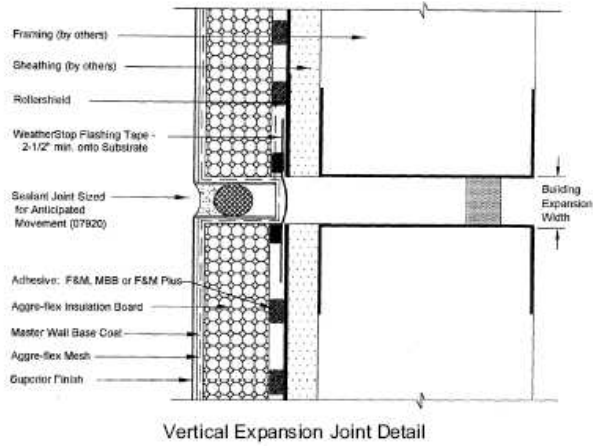
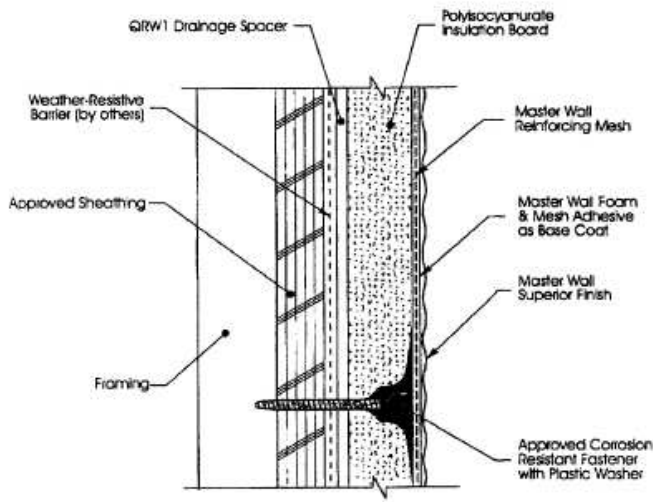
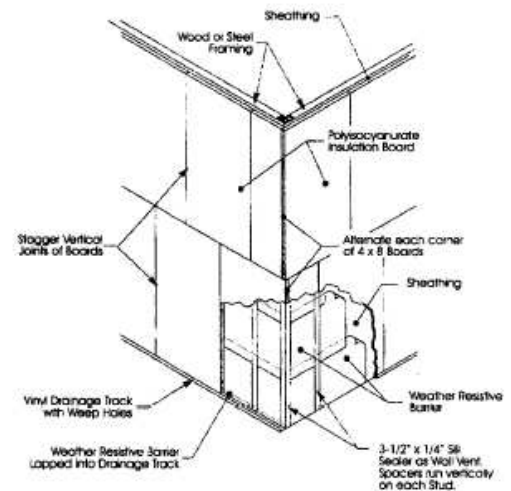


FIGURE 3—ROLLERSHIELD DRAINAGE SYSTEM (Continued)

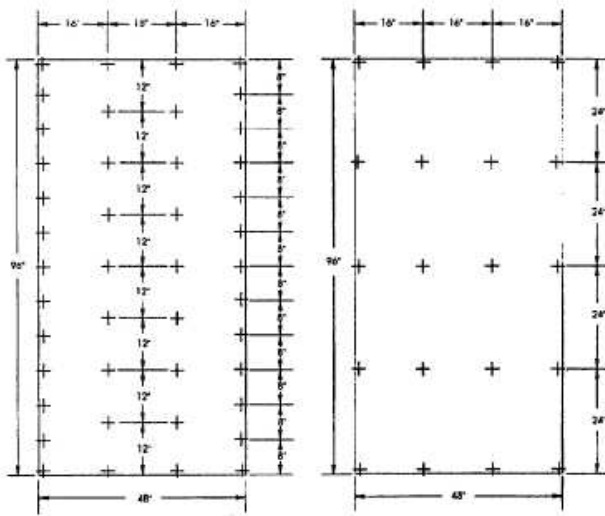


QRW1 Cross Section



Note: Polyisocyanurate board shall be mechanically fastened. See detail MW-QRW1-3 for fastener pattern.

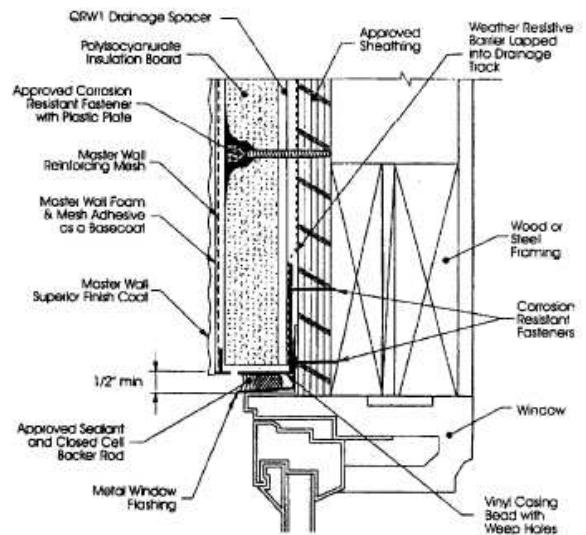
Insulation Board Layout



Fastening Pattern for Studs @ 16" O.C.

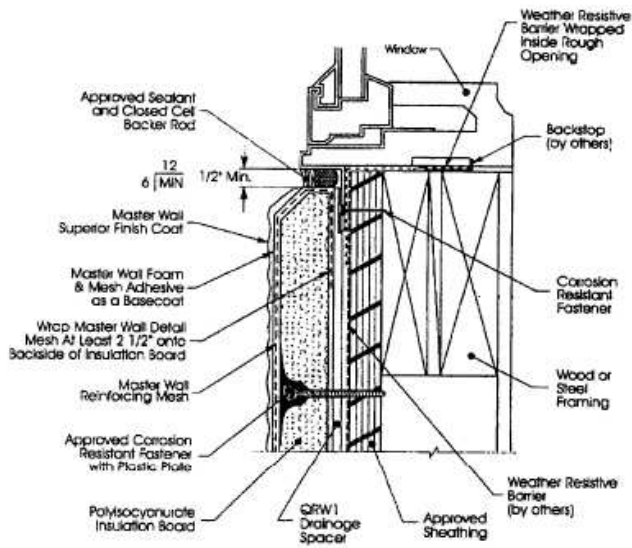
Fastening Pattern for Masonry Walls

Fastening Pattern

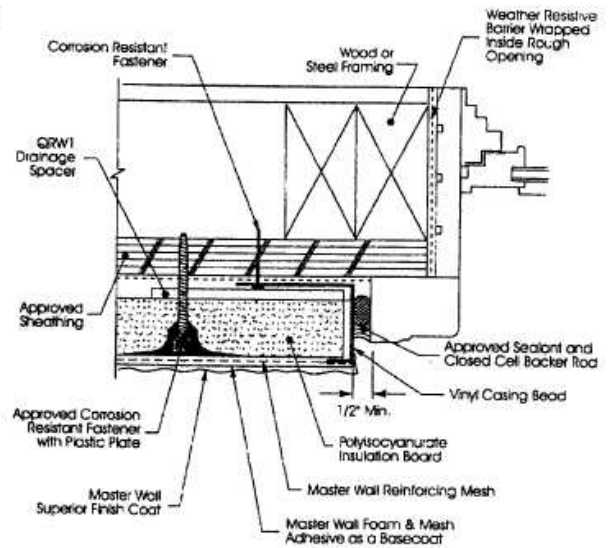


Window Head Detail

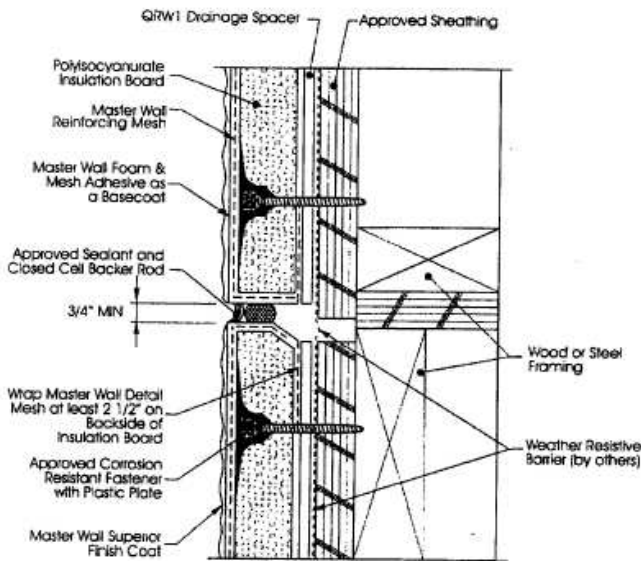
FIGURE 4—QRWI DRAINAGE SYSTEM



Window Sill Detail



Window Jamb Detail



Floor Line Expansion Joint

FIGURE 4—QRWI DRAINAGE SYSTEM (Continued)

EXHIBIT A

[SEALANT INSTALLER NAME]

Completion Date: _____

THE SEALANT INSTALLED IN CONJUNCTION WITH AN EXTERIOR INSULATION AND FINISH SYSTEM (EIFS clad drainage wall assembly) INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW:

CONFORMS _____

TO [EIFS MANUFACTURER NAME] AND [SEALANT MANUFACTURER'S NAME] RECOMMENDED INSTALLATION PRACTICES AND SECTION(S) _____ OF ICC-ES, INC., EVALUATION REPORT ESR-_____

Address of Structure:

Product Component Names:

Primer(s) _____
Sealers _____
Bond Breakers _____
Sealant Materials _____

INSTALLATION

CONFORMS

- A. Designer's requirements, details and instructions
- B. Sealant manufacturer's details and requirements
- C. Exterior insulation manufacturer's requirements

D. The information entered above is offered in testimony that the Sealant installation conforms with the sealant manufacturer's installation methods and procedures, and the EIFS manufacturer's evaluation report.

Sealant Installer Company Name and Address:

Signature of Responsible Officer: _____

Typed Name and Title of Officer: _____

Telephone Number: (____) _____

- cc: Original: Building Department (Must be submitted with EIFS
Copies: EIFS Manufacturer contractor declaration.)
EIFS Contractor
Sealant Manufacturer

FIGURE 5

EXHIBIT B

[EIFS CONTRACTOR NAME]

Completion Date: _____

THE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW:

_____ CONFORMS

TO [EIFS MANUFACTURER NAME] RECOMMENDED INSTALLATION PRACTICES AND SECTION (S) _____ OF ICC-ES, INC., EVALUATION REPORT ESR-_____.

Address of Structure:

Product Component Names:

Adhesive(s) _____
Fasteners (mech) _____
Base Coat _____
Reinforcing Mesh _____
Finish Coat(s) _____

INSTALLATION

CONFORMS

A. Substrate Type and Tolerance _____

B. Weather-resistive Barrier _____

- C. EIFS
 - 1. Adhesive and/or Fasteners _____
 - 2. Insulation _____
 - 3. Reinforcing Mesh _____
 - 4. Base Coat _____
 - 5. Finish _____

D. The information entered above is offered in testimony that the EIFS installation conforms with the EIFS manufacturer's installation methods and procedures, and the EIFS manufacturer's ES report.

NOTE: An installation card must be received from the Sealant Installer indicating that the sealant installation conforms with the EIFS evaluation report and sealant manufacturer's installation methods and procedures must accompany this declaration.

EIFS

Contractor Company Name and Address:

Signature of Responsible Officer: _____

Typed Name and Title of Officer: _____

Telephone Number: (____) _____

cc: Original: Building Department (Must be submitted with sealant
Copy: EIFS Manufacturer installer declaration.)

FIGURE 6

EXHIBIT A

(WATER-RESISTIVE COATING CONTRACTOR NAME)

Completion Date: _____

THE WATER-RESISTIVE COATING INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW:

CONFORMS

TO (WATER-RESISTIVE COATING MANUFACTURER NAME) RECOMMENDED INSTALLATION PRACTICES AND SECTION (S) _____ OF EVALUATION REPORT ESR-_____.

Address of Structure:

Product Component Names:

Reinforcing Fabric _____
Coating _____

INSTALLATION

CONFORMS

A. Substrate Type and Tolerance _____

B. Water-resistive Coating _____

C. The information entered above is offered in testimony that the water-resistive coating application conforms with the manufacturer's installation methods and procedures, and the water-resistive coating manufacturer's evaluation report.

NOTE: An installation card must be received from the water-resistive coating installer indicating that the water-resistive coating application conforms with the water-resistive coating evaluation report and water-resistive coating manufacturer's installation methods and procedures must accompany this declaration.

Water-resistive Coating Contractor Company Name and Address:

Signature of responsible Officer: _____

Typed Name and Title of Officer: _____

Telephone Number: (_____) _____

cc: Original: Building Department
Copy: Water-resistive Coating Manufacturer

FIGURE 7