



Most Widely Accepted and Trusted

ICC-ES Report

ESR-3435

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

Reissued 07/2016
This report is subject to renewal 07/2017.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 42 43—COMPOSITE WALL PANELS

REPORT HOLDER:

ALCOA ARCHITECTURAL PRODUCTS

**50 INDUSTRIAL BOULEVARD
EASTMAN, GEORGIA 31023**

EVALUATION SUBJECT:

REYNOBOND® FR AND PE METAL COMPOSITE MATERIAL (MCM) PANELS



Look for the trusted marks of Conformity!

“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”



ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



ICC-ES Evaluation Report

ESR-3435

Reissued July 2016

This report is subject to renewal July 2017.

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 42 43—Composite Wall Panels
REPORT HOLDER:
**ALCOA ARCHITECTURAL PRODUCTS
50 INDUSTRIAL BOULEVARD
EASTMAN, GEORGIA 31023
(800) 841-7774
www.reynobond.com**
EVALUATION SUBJECT:
**REYNOBOND® FR AND PE METAL COMPOSITE
MATERIAL (MCM) PANELS**
1.0 EVALUATION SCOPE
1.1 Compliance with the following codes:

- 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Fire performance (Fire-resistance rating and Types I-IV construction)
- Interior finish
- Structural

1.2 Evaluation to the following green code(s) and/or standards:

- 2013 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2012 and ICC 700-2008)

Attributes verified:

- See Section 2.0

2.0 USES

Reynobond® FR and PE MCM panels are used in MCM systems (the assembled panels) as exterior wall panels in accordance with Chapter 14 or as interior wall finish in accordance with Chapter 8 of the IBC. The panels may be used in all Construction Types under the IBC.

When Reynobond® FR MCM panels are used on exterior walls required to have a fire-resistance rating, they must be installed in accordance with Section 4.4 of this report.

When Reynobond® FR MCM panels are used on exterior walls of Types I–IV Construction, they must be installed in accordance with Section 4.5 of this report.

When Reynobond® PE MCM panels are used on exterior walls of Types I–IV Construction, they must be installed in accordance with Section 4.6 of this report.

The attributes of the Reynobond® FR and PE MCM panels have been verified as conforming to the provisions of (i) CALGreen Sections A4.405.1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); (ii) ICC 700-2012 Sections 601.7, 11.601.7, and 12.1(A).601.7 (site-applied finishing materials); and (iii) ICC 700-2008 Section 601.7 (site-applied finishing materials). Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. The code may provide supplemental information as guidance.

3.0 DESCRIPTION
3.1 General:

Reynobond® FR and PE MCM panels are panels complying with IBC Section 1407. The MCM panels are bonded to extruded aluminum profiles used to stiffen the field of the panels and to provide perimeter fastening to attach the panels to walls. The fabricated panels are available in widths from 34 to 60 inches (0.864 m to 1.57 m), and in lengths up to 20 feet 3 inches (6.17 m).

3.2 Panels:

Reynobond® FR MCM panels, consist of two nominally 0.020-inch-thick aluminum skins, bonded to both surfaces of a polyethylene-based core containing inorganic fillers. The panels are available in two overall panel thicknesses, 0.157 inch (4 mm) and 0.236 inch (6 mm). The 4-millimeter- and 6-millimeter-thick panels weigh 1.5 lbf/ft² (71.8 N/m²) and 2.0 lbf/ft² (95.8 N/m²), respectively. The core material has a nominal density of 94 lb/ft³. The aluminum skins are available in anodized, brushed, or coil-applied-painted finishes.

Reynobond® PE MCM panels consist of two nominally 0.020-inch-thick aluminum skins, bonded to both surfaces of a polyethylene-based core containing inorganic fillers. The panels are available in two overall panel thicknesses, 0.157 inch (4 mm) and 0.236 inch (6 mm). The 4-millimeter- and 6-millimeter-thick panels weigh 1.0 lbf/ft² (47.9 N/m²) and 1.5 lbf/ft² (71.8 N/m²), respectively. The core material has a nominal density of 57.4 lb/ft³ (0.919 g/cm³). The aluminum skins are available in anodized, brushed, or coil-applied-painted finishes.

The panels have a flame spread index of no more than 25 and a smoke developed index no more than 450 when tested in accordance with ASTM E84, and have a Class A interior finish classification.

3.3 Aluminum Exteriors:

The perimeter fastening profiles and stiffeners are extruded from 6063-T5 alloy aluminum complying with ASTM B317. The Reynobond® FR and PE MCM panels are cut, shaped, and assembled by the MCM system fabricators. The fabricators assemble the MCM systems using structural silicone sealant/adhesive complying with ASTM C1184 and $\frac{3}{16}$ -inch-diameter (4.76 mm) 3105-H25 alloy aluminum pop rivets at a maximum 8 inches (203 mm) on center to fasten the MCM panels to the perimeter profiles. Three fastening systems are available: Rout and Return Dry (RRDRY), Rout and Return Wet (RRWET), and Rout and Return Rain Screen (RRPER). See Figures 1, 2, and 3, respectively, for images of the installations and the profiles of the extrusions used in each system.

Extrusions used to stiffen the field of the panels are installed by the fabricators at a maximum 24 inches (610 mm) on center. The aluminum stiffeners (see Figure 5) are bonded to the MCM panels using thermal bond tape and approved structural silicone sealant/adhesive complying with ASTM C1184.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The maximum allowable design wind load pressure for the Reynobond® FR and PE MCM panels and systems installed in accordance with this report is 40 psf (1.92 kPa), positive or negative. The panels supporting framing, such as wall studs, must be designed in accordance with the applicable code to be adequate for these loadings.

4.2 Installation:

The MCM systems are assembled in fabrication facilities; field fabrication is limited to minor adjustments and cutting of the assembled panels to fit as necessary. The appropriate installation procedures must be followed for each system. The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the manufacturer's instructions must be available on the jobsite during installation.

The MCM systems must be attached to walls by use of perimeter fastening systems provided with the panels. The panels must be attached using No.12-14 Dril-Flex screws into 16 gage metal studs at 16 inches (406 mm) on center. The screws must be long enough to penetrate through intervening materials, such as gypsum sheathing, and through the flange of the stud to provide a minimum of three fully developed threads beyond the stud.

In the RRWET system, silicone caulking is used around the perimeter of each panel to keep water out. The RRDRY system is designed to prevent water intrusion by incorporating gaskets and extrusions that are shaped to prevent water from entering behind the panels and to divert water to the exterior. With the RRPER system, air and water may enter behind the MCM panels, but the water is diverted back out and air circulation dries out the cavity behind the panel.

4.3 Installation over Foam-plastic Insulation:

MCM systems may be installed over Hunter Panels Xci Class A polyisocyanurate insulation ([ESR-3174](#)) when installed in accordance with this section (Section 4.0)

and [ESR-3174](#). The insulation must be at a maximum thickness of $3\frac{1}{2}$ inches (89 mm) and must be labeled in accordance with IBC Section 2603.5.6. Minimum 16 gage galvanized Z-girt (minimum yield strength 50 ksi) stand-off brackets must be used to provide the space for the insulation between the wall and the MCM panels. The Z-girts must be a minimum of 6 inches (152 mm) long, must be a maximum of $3\frac{1}{2}$ inches (89 mm) deep and must have minimum 2-inch-wide (51 mm) flanges. The Z-girts must be fastened to the 16-inch-on-center (406 mm) 16 gage studs, and MCM systems perimeter extrusions must be fastened to the Z-girts using No.12-14 Dril-Flex screws. The insulation must be secured in place using 2 No.10 by $4\frac{3}{8}$ -inch (111 mm) Wind Devil fasteners at each stud location. See Figure 4 for details.

4.4 One- and Two-hour Fire-resistance-rated Nonload-bearing Wall Assembly—Reynobond® FR MCM panels:

When installed in accordance with the following instructions, the Reynobond® FR MCM systems may be exposed to the fire in fire-resistance-rated wall assemblies. The wall must be framed as described in Section 4.2 and must not include the Z-girts and foam plastic insulation described in Section 4.3. Each surface of the stud framework must be clad with one (for one-hour fire-resistance) or two (for two-hour fire-resistance) layers of $\frac{5}{8}$ -inch-thick (15.9 mm) Type X gypsum wallboard attached with Type S self-tapping screws [1 inch (25.4 mm) for the first layer and $1\frac{5}{8}$ inches (41.3 mm) for the second layer] spaced 12 inches (305 mm) on center. The joints of the adjacent wallboard layers must be staggered a minimum of 12 inches (305 mm). The surface of the outer layer of gypsum must be finished with paper tape and joint compound in accordance with ASTM C840 or GA216 over all joints, and with joint compound over all exposed screw heads. The Reynobond® FR MCM systems must be attached in accordance with Section 4.2 and all joints in the Reynobond® FR MCM panels must be closed with 1-inch diameter Tundra Foam open-cell polyurethane backer rod and caulked. The caulking must be Dow Corning 795 Silicone Building Sealant for the 1-hour fire-resistance-rated walls, and 3M Fire Barrier 2000 Silicone Sealant for two-hour fire-resistance-rated walls.

4.5 Exterior Walls of Buildings of Type I, II, III or IV (Noncombustible) Construction—Reynobond® FR MCM panels (IBC Section 1407.10):

Where exterior walls are required to be of noncombustible construction, the walls must be built in accordance with the following:

The walls must be framed with minimum 16 gage C-channel steel studs at 16 inches (406 mm) on-center. The interior of the wall must be faced with one layer of $\frac{5}{8}$ -inch-thick (15.9 mm), Type X gypsum wallboard, finished and taped in accordance with ASTM C840 or GA216. The walls must be filled with 4 pcf (64 kg/m³) mineral wool insulation at the intersection of the floors and exterior walls in accordance with 2012 IBC Section 714.4, 2009 IBC Section 713.4 or 2006 IBC Section 712.4, as applicable. The exterior face of the wall must be sheathed with $\frac{5}{8}$ -inch-thick (15.9 mm) Dens-Glass® Gold gypsum sheathing recognized in [ESR-3087](#). Opening headers must be flashed with minimum 24 gage galvanized steel window header flashing to provide a drip edge flush with the exterior surface of the Reynobond® FR MCM panels. The opening jambs and sills must be flashed with minimum 16-gage galvanized steel flashing. Foam plastic insulation installed in accordance with Section 4.3 of this report is optional for this assembly.

The following additional materials may be used as options in the assemblies:

- DuPont Tyvek Liquid Applied Flashing and Joint Compound may be applied to the sheathing joints and fastener heads. (Documentation must be submitted to the code official demonstrating compliance of this product for use as a component in a weather-resistant exterior wall envelope, under Section 1403.2 of the IBC and Section R703.1.1 of the 2012 and 2009 IRC, R703.1 of the 2006 IRC.)
- DuPont Tyvek Fluid Applied Weather Barrier may be roller applied over the sheathing to a maximum wet thickness of 25 mils (0.635 mm). (Documentation must be submitted to the code official demonstrating compliance of this product for use as a component in a weather-resistant exterior wall envelope, under Section 1403.2 of the IBC and Section R703.1.1 of the 2012 and 2009 IRC, R703.1 of the 2006 IRC.)
- DuPont Tyvek Commercial Wrap water-resistive barrier (ESR-2375) may be installed immediately beneath the MCM systems, including over the foam plastic insulation, if any.

4.6 Exterior Walls of Buildings of Type I, II, III or IV (Noncombustible) Construction—Reynobond® PE MCM panels (IBC Section 1407.11):

Where exterior walls are required to be of noncombustible construction, installation of Reynobond® PE MCM panels is limited to the following heights;

- A maximum of 40 feet in height above the grade plane, under the limitations specified in Section 1407.11.1 of the IBC.
- A maximum of 50 feet in height above the grade plane, under the limitations specified in Section 1407.11.2 of the IBC.

Where interior walls are required to be noncombustible construction, Reynobond® PE MCM panels which have a Class A interior finish classification must be installed in accordance with Section 803.11.2 of the 2009 IBC or Section 803.4.2 of the 2006 IBC.

4.7 Interior Wall Covering:

Reynobond® FR and PE MCM panels may be used as an interior wall finish in compliance with IBC Chapter 8. The panels must be installed on the interior side of the wall in accordance with Section 4.2 of this report. The panels have a Class A interior finish classification.

5.0 CONDITIONS OF USE

Reynobond® FR and PE MCM panels described in this report comply with, or are suitable alternatives to what is specified in, the codes indicated in Section 1.0 of this report subject to the following conditions:

- 5.1** Installation must comply with this report, the manufacturer's published instructions, the applicable code and the approved plans. If there are any conflicts between this report and the manufacturer's installation instructions, this report governs. A copy of the manufacturer's instructions must be available on the jobsite during installation.
- 5.2** The design of the structural support system (building framing, attachment accessories, and silicone adhesive) and panel connections provided by the MCM systems fabricator must be submitted to and approved by the code official for each project. The allowable transverse load capacity for the MCM panels and their interlock with their attachment

accessories must be submitted to and approved by the code official for each project. The allowable transverse load capacity must not equal or exceed the design loads determined in accordance with Chapter 16 of the IBC. Allowable transverse loads for the MCM materials are set forth in Section 4.1 of this report.

- 5.3** The MCM systems fabricator must provide a certificate of compliance to the code official attesting that the MCM system fabrication includes the use of adhesives approved for use, that the adhesive application complies with the adhesive manufacturer's installation guidelines, and that the MCM system fabrication complies with approved construction documents. Additionally, when the attachment methods employ adhesives other than to adhere stiffeners to the backs of the panels, special inspections are required in accordance with IBC Section 1704.2, or the fabricator must be approved by the code official in accordance with IBC Section 1704.2.2, as such operations are outside the scope of this report.
- 5.4** Where exterior walls are required to be noncombustible on buildings of Types I, II, III or IV construction, MCM systems must be installed as specified in Section 4.5 or 4.6 of this report, as applicable. Where the MCM panels are elements of a balcony or similar projection, such as architectural trim or embellishments in accordance with IBC 1407.3, the panels are not required to be installed as specified in Section 4.5 of this report.
- 5.5** Installation of Reynobond® FR MCM systems onto a fire-resistance-rated exterior wall must be performed in accordance with Section 4.4 of this report. For this type of construction, the assembly attachments must not penetrate through the entire exterior wall assembly.
- 5.6** Evidence of weather protection of the wall cladding system must be submitted to the code official in accordance with Section 1407.6 of the IBC.
- 5.7** The Reynobond® FR and PE panels are manufactured by Alcoa Architectural Products—North America, in Eastman, Georgia, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1** Data in accordance with the ICC-ES Acceptance Criteria for Metal Composite Material (MCM) (AC25), dated October 2010 (editorially revised August 2014).
- 6.2** Reports of strength testing in accordance with ASTM E72.
- 6.3** Reports of surface burning testing in accordance with ASTM E84.
- 6.4** Reports of fire-resistance testing in accordance with ASTM E119 for Reynobond® FR MCM panels.
- 6.5** Reports of flammability testing in accordance with NFPA 285 for Reynobond® FR MCM panels.
- 6.6** Report of self-ignition temperature tests in accordance with ASTM D1929 for Reynobond® PE MCM panels.

7.0 IDENTIFICATION

The panels are identified by a label noting the name and address of ALCOA Architectural Products, the product name, the thickness, the flame-spread and smoke developed indices, and the evaluation report number (ESR-3435).

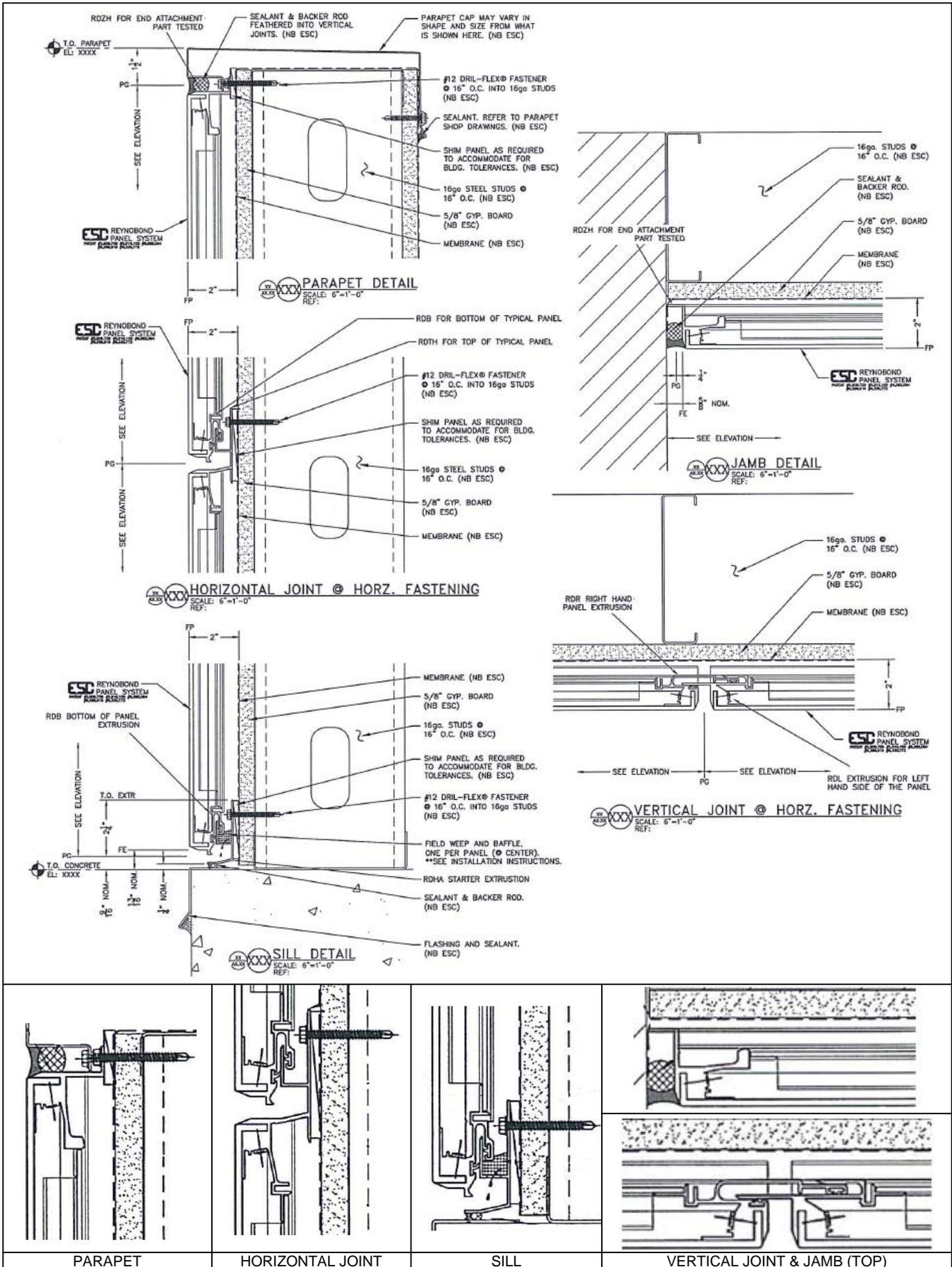


FIGURE 1—ROUTE AND RETURN DRY SYSTEM

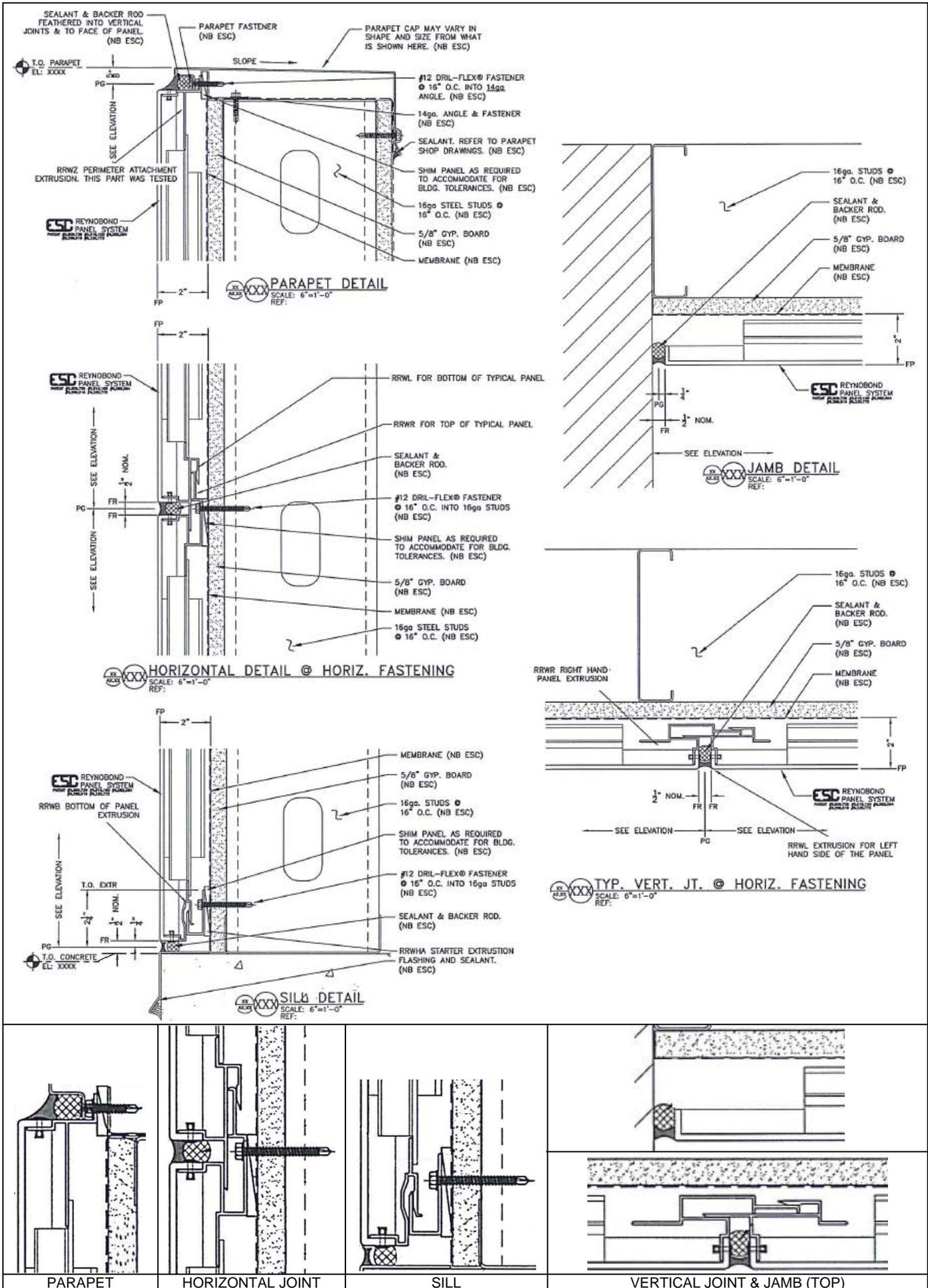


FIGURE 2—ROUTE AND RETURN WET SYSTEM

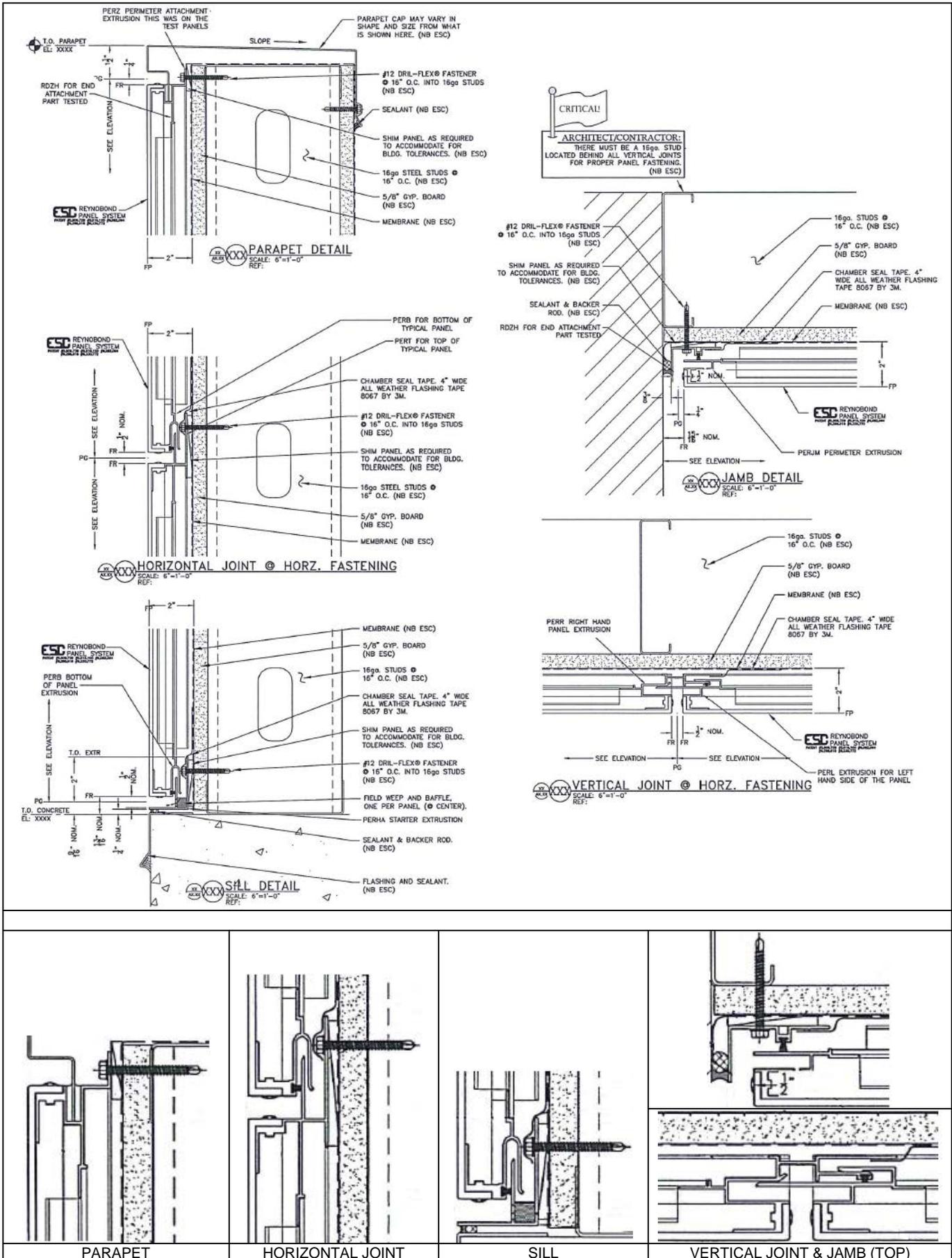


FIGURE 3—ROUTE AND RETURN RAIN SCREEN SYSTEM

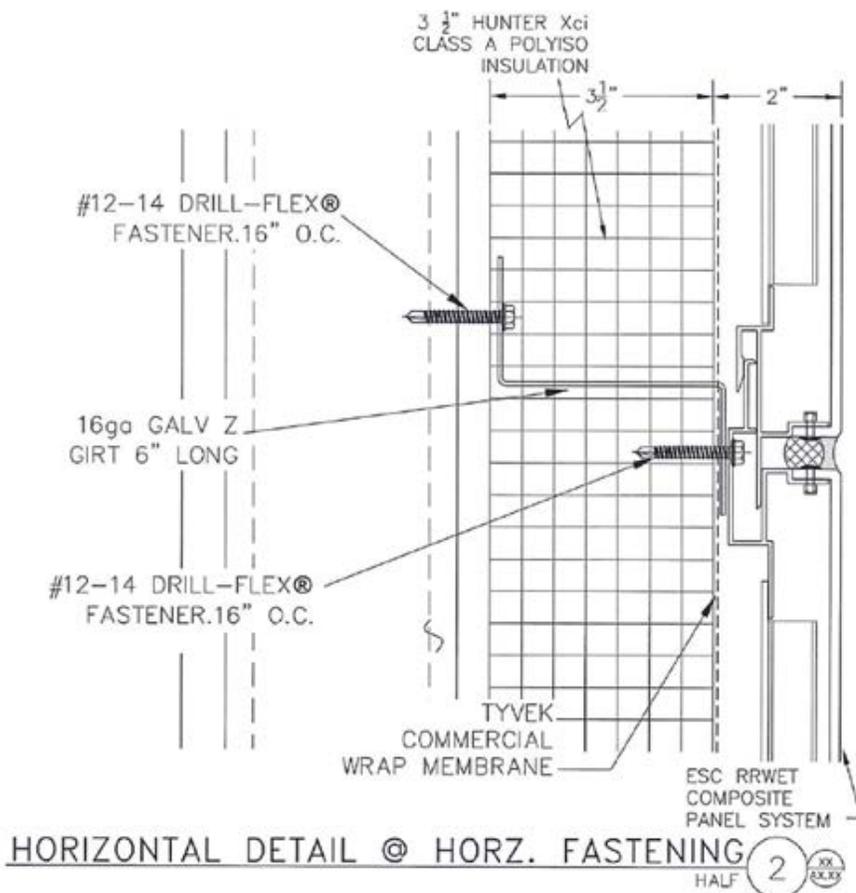
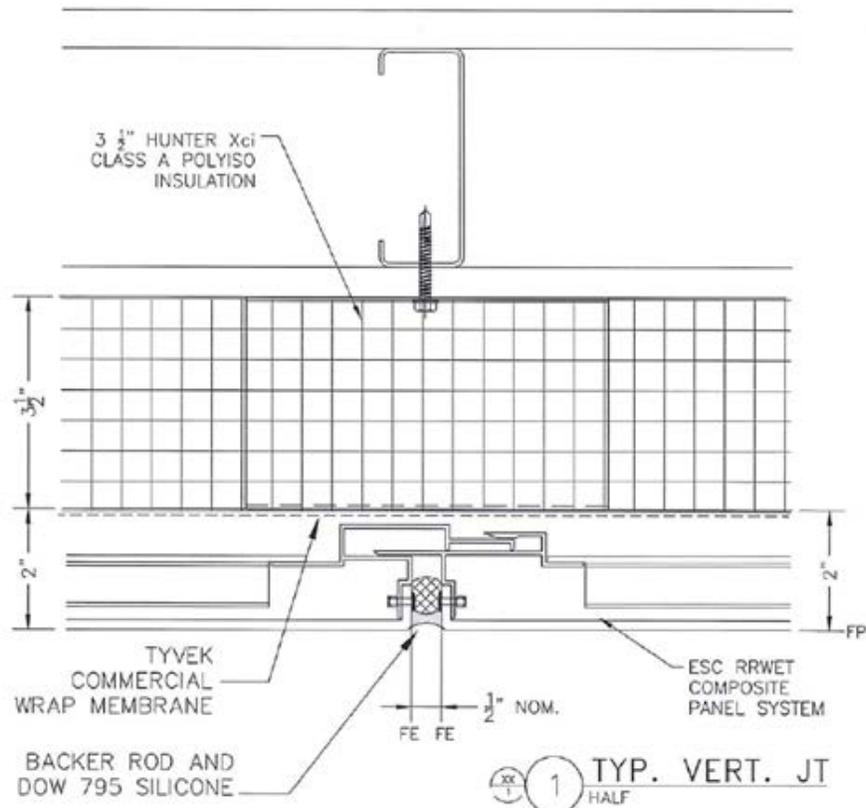
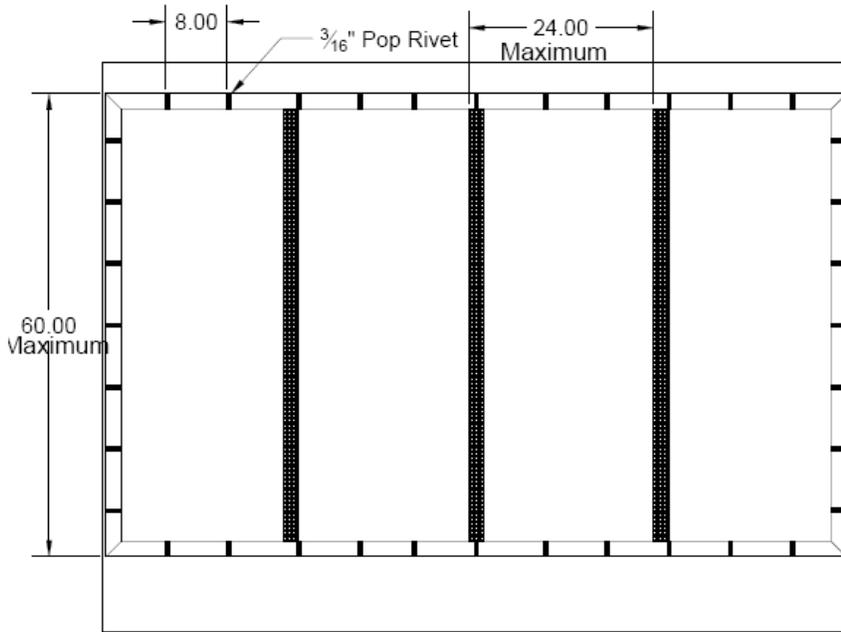


FIGURE 4—Z-GIRT STAND-OFF BRACKET WITH INSULATION BEHIND PANELS



LOCATIONS OF STIFFENERS
ON MCM PANELS

STIFFENER PROFILE

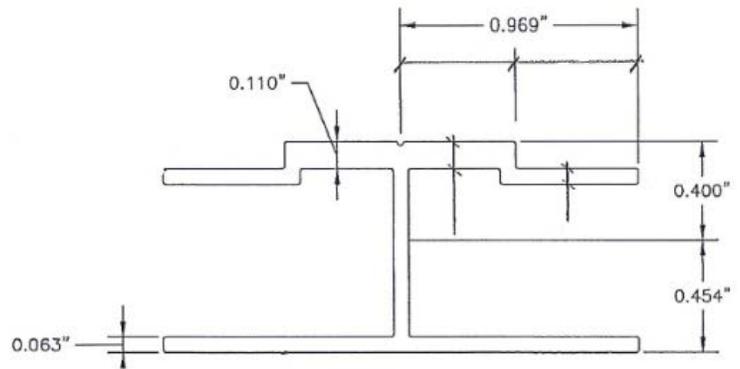


FIGURE 5—PANEL STIFFENER PROFILE AND PLACEMENT ON PANELS