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ESR-3152

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 41 13—METAL ROOF PANELS
SECTION: 07 42 13—METAL WALL PANELS

REPORT HOLDER:

STRUCTALL BUILDING SYSTEMS, INC.

**350 BURBANK ROAD
OLDSMAR, FLORIDA 34677**

EVALUATION SUBJECT:

SNAP-N-LOCK™ COMPOSITE PANEL



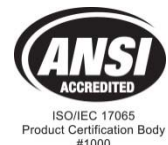
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350 BURBANK ROAD
OLDSMAR, FLORIDA 34677
(813) 855-2627
www.structall.com

EVALUATION SUBJECT:

SNAP-N-LOCK™ COMPOSITE PANEL

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2015 and 2012 *International Building Code*® (IBC)
- 2015 and 2012 *International Residential Code*® (IRC)

Properties evaluated:

- Structural
- Fire resistance

1.2 Evaluation to the following green code:

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

- See Section 3.1

2.0 USES

The Snap-N-Lock™ Composite Panels consist of structural insulated roof panels, and load-bearing or nonload-bearing wall panels for Type V-B construction.

When the panels are installed under the IRC, an engineered design is required in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 General:

The Snap-N-Lock™ Composite Panels are laminated sandwich panels consisting of steel facings adhered to both faces of an expanded polystyrene foam plastic core. The panels are available in nominal thicknesses of 4

and 6 inches, with weights of 2.03 and 2.20 psf (9.92 and 10.75 kg/m²), respectively. The panels are 48 inches (1220 mm) wide and up to 23 feet (7015 mm) long. The longitudinal edges of the panels are designed to allow adjacent panels to interlock.

The attributes of the patio-cover roof panel system have been verified as conforming to the provisions of (i) CALGreen Sections A4.404.3.3, A4.405.1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); and (ii) ICC 700-2012 Sections 601.5, 601.7, 11.601.7, and 12.1(A).601.7 (site-applied finishing materials); and (iii) ICC 700-2008 Sections 601.5 and 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. These codes or standards often provide supplemental information as guidance.

3.2 Material:

3.2.1 Panel Core: The core material is 1.0 pcf nominal density, Type I, expanded polystyrene (EPS) foam plastic board complying with ASTM C578. The foam plastic has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

3.2.2 Panel Facings: The facing material on both sides of the panels is No. 26 gage steel [base metal thickness of 0.019 inch (0.48 mm)] conforming to ASTM A653 CS Type B, having a hot-dip galvanized G90 coating. The material has minimum yield and tensile strengths of 42 ksi and 52.5 ksi (290 to 362 MPa), respectively, and a minimum elongation of 20 percent.

3.2.3 Panel Adhesive: The adhesive used to bond the facings to the core is a Type II, Class 2, adhesive complying with the requirements of the ICC-ES Acceptance Criteria for Sandwich Panel Adhesives (AC05).

3.2.4 Base Channel and Wall Cap: Base channel and wall cap sections are extrusions made from 6063 T5 extruded aluminum, with a 0.055-inch (1.40 mm) wall thickness. The maximum slope of the wall cap is 5:12 (22.6 degrees). See Figures 3 and 4.

3.2.5 Hat Channel: Hat channel sections are 25 gage [base-metal thickness 0.021 inch (0.53 mm)], zinc-coated commercial steel conforming to ASTM A525, with a minimum yield point of 33 ksi (227.5 MPa). The hat channel section has a height of 1¹/₂ inches (38 mm) and an overall width of 2¹¹/₁₆ inches (68 mm).

4.0 DESIGN AND INSTALLATION

4.1 Design:

The allowable uniform transverse load and uniform axial compression load for panels used as bearing walls and shear wall loads are as shown in Tables 1 through 4. Unless noted otherwise, the allowable uniform transverse loads are for panels installed under simply supported, single span conditions. Where loading conditions result in the panels resisting combined stresses, the sum of the ratios of applied loads over allowable loads must be less than 1.0.

When used as shear walls under the IBC or IRC, the panels are limited to use in Seismic Design Categories A, B, and C.

The bottom channel and wall cap and connections must be designed to resist the applied forces.

4.2 Installation:

4.2.1 General: Installation of Snap-N-Lock™ Composite Panels must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation. The panels used as wall panels are installed with base channels and wall caps. Hat channels, jobsite-attached to the panel facings, are used to attach the interior finish to the wall and roof panels.

The panels are connected to each other along their edges using the Structall SNAP-N-LOCK™ fastening system. Wall and roof panels must be installed with a continuous bearing support at each end of the panel span, with the supports providing a minimum bearing width of 1 inch (25.4 mm). As an alternative to restraining the roof panels subjected to uplift wind loads, the panels must be fastened with minimum No. 10 sheet metal screws with a 1.5-inch-diameter (38 mm) plate washer spaced no more than 12 inches (305 mm) on center. The fastener must be at least 1 inch (25.4 mm) longer than the laminated roof panel thickness. Unless noted otherwise in this report, the steel facings of the wall panels must be attached to the top and bottom channels as shown in Figures 1 and 2. When used as racking shear walls, the panels require additional fasteners along the base and top tracks, as well as the vertical seams. See the fastening schedule in Figure 5.

Wall openings must be framed with conventional materials and must be designed to the satisfaction of the code official.

When used as bearing walls, the wall panels must be installed in the manner described in the footnotes to Table 3.

4.2.2 Thermal Barrier:

4.2.2.1 Wall and Roof: One-half-inch-thick (12.7 mm) regular gypsum wallboard, complying with ASTM C36 or ASTM C1396, must be installed on the interior surface of wall and roof panels. The hat sections are spaced 24 inches (610 mm) on center and are fastened to the panel facings with No. 10 by ³/₄-inch-long (19.1 mm) self-tapping screws spaced at 12 inches (305 mm) on center. The gypsum wallboard is fastened to steel hat section channels described in Section 3.2.5, with minimum 1.0-inch-long (25.4 mm), No. 6, Type S drywall screws spaced in accordance with ASTM C840 for use under the IBC, or Table R702.3.5 of the IRC, using 24-inch-on-center (406 mm) framing spacing guidelines.

4.2.3 Panel Cladding:

4.2.3.1 Roof Covering: A roof covering complying with Chapter 15 of the IBC, or Section R901 of the IRC, as

applicable, must be installed on the exterior side of the roof panels. Roofs with hot-asphalt or hot-coal tar pitch are prohibited. Underlayment and flashing must be installed in accordance with the applicable code. The roof covering must be installed to resist the applicable forces, to the satisfaction of the code official. The roof covering must be installed in accordance with Structall's recommendations. Where required by the code official, the attachment of the roofing material to the roof panel must be designed by a registered design professional.

4.2.3.2 Exterior Wall Covering: For the installation of wall panels without a water-resistive barrier, a ¹/₄-inch (6.4 mm) bead of sealant must be applied to the panel joints prior to the panel's being engaged. Panels must be firmly interlocked to make continuous contact with the sealant. Erection proceeds along the wall elevation, with installation of successive panels in accordance with Structall's published installation instructions. Provided the sealants and application of the sealants are satisfactory to the code official, panels exposed to weather do not require a water-resistive barrier complying with Section 1405 of the IBC when panels are installed with sealant as specified in this section (Section 4.2.3.2) and are flashed. Flashing must be placed in accordance with Section 1405.4 of the IBC on both ends of the panels when installation is at the building's base, and at eaves, openings, and horizontal and vertical corners. The flashing and trim are attached to the panels using ¹/₄-14 self-tapping screws or No. 10 by ³/₄-inch (19 mm) self-tapping or self-drilling screws, or pop rivets in accordance with Structall's installation instructions.

For the installation of wall panels with a water-resistive barrier, the exterior face of the wall panels is required to be covered with a wall covering complying with the applicable code or recognized in a current ICC-ES evaluation report. Flashing in accordance with Section 1405.4 of the IBC or 2015 IRC Section R703.4 (2012 IRC Section R703.8), as applicable, must be installed. The water-resistive barrier must be provided in accordance with IBC Section 1404.2. The wall covering must be installed to resist the applicable forces, to the satisfaction of the code official. Where required by the code official, the attachment of the exterior cladding to the wall panel must be designed by a registered design professional.

5.0 CONDITIONS OF USE

The Snap-N-Lock™ Composite Panels described in this report comply with, or are suitable alternatives to what is specified in, the codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Panel fabrication, identification and installation must comply with this report and the manufacturer's published installation instructions. In the event of conflicts between this report and the manufacturer's published instructions, the more restrictive governs.
- 5.2** Design loads must be determined in accordance with the applicable code, and must be equal to, or less than, the values given in Tables 1 through 4 of this report.
- 5.3** All construction documents specifying the building panels must comply with the design limitations of this report. Design calculations and details for the specific applications must be furnished to the code official verifying compliance with this report and applicable codes. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

- 5.4 All wall-to-floor and roof-to-wall details must be designed such that gravity loads are applied to the wall panels as described in the footnotes to Table 3.
- 5.5 Connection and attachments of the panel to the foundation or supporting structure and to other panels are outside the scope of this report and must be addressed in the design calculations and details.
- 5.6 When used as shear walls under the IBC or IRC, the panels are limited to use in Seismic Design Categories A, B and C.
- 5.7 The foam plastic insulation of the panels must be separated from the interior of the building with a thermal barrier, installed in accordance with Section 4.2.2 of this report.
- 5.8 Use of the panels is limited to Type V-B construction.
- 5.9 Use of the foam plastic in areas subject to damage from termites must be in accordance with 2015 IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4, as applicable.
- 5.10 The concrete slab or foundation must be designed by a registered engineer in accordance with applicable codes for the imposed loads.
- 5.11 The sum of the ratio of actual load over allowable axial compressive load and racking shear load must not exceed one.
- 5.12 Use of roof panels as horizontal diaphragms is outside the scope of this report.
- 5.13 For the roof panels, justification must be submitted to the code official demonstrating that the panels with the roof covering comply as a Class A, B, or C roof assembly, as required by IBC Section 2603.6 or IRC

Section R902.1, with the classification complying with the minimum classification required for the building.

- 5.14 The foam plastic cores are manufactured in Ormond Beach, Florida, under a quality control program with inspection by ICC-ES.
- 5.15 The panels are manufactured in Oldsmar, Florida, 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 Sandwich Panels (AC04), dated February 2012 (Editorially revised July 2015).
- 6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (Editorially revised May 2016).
- 6.3 Room corner fire test data in accordance with UL 1715.

7.0 IDENTIFICATION

Each Snap-N-Lock™ Composite Panel is identified by a label bearing the company name (Structall Building Systems, Inc.) and address, the product name, the panel dimensions, and the evaluation report number (ESR-3152). The bottom channel, wall cap, and hat channel are packaged separately and identified by a label bearing the evaluation report number (ESR-3152) and the company name (Structall Building Systems, Inc.).

TABLE 1—ALLOWABLE UNIFORM TRANSVERSE LOADS FOR 4-INCH-THICK WALL PANELS (psf)^{1,2,3}

WALL HEIGHT (ft)	ALLOWABLE UNIFORM APPLIED LOAD	
	Deflection Limit	Wind Load (psf)
8	L/120	43
	L/180	43
	L/240	37
9	L/120	34
	L/180	34
	L/240	32
10	L/120	27
	L/180	27
	L/240	27
11	L/120	23
	L/180	23
	L/240	23
12	L/120	19
	L/180	19
	L/240	19
13	L/120	16
	L/180	16
	L/240	16
14	L/120	14
	L/180	14
	L/240	14
15	L/120	12
	L/180	12
	L/240	12
16	L/120	11
	L/180	11
	L/240	11

For SI: 1 ft= 0.305 m; 1 psf= 47.9 Pa.

¹Allowable load values are based on simply supported spans with loads uniformly distributed. Where non-uniform loads are applied to the panel, an equivalent uniform load must be determined for comparison with the values within this table.

²Deflection limitations are based on Table 1604.3 of the IBC.

³Panels must be installed in accordance with Section 4.2 of this report.

TABLE 2—ALLOWABLE UNIFORM TRANSVERSE LOADS FOR 6-INCH-THICK ROOF PANELS (psf)^{1,2,3,4,5,6,7}

PANEL SPAN (ft)	ALLOWABLE UNIFORM APPLIED LOAD (psf)			
	Gravity Loads			Wind Uplift Load
	Deflection Limit	Allowable Roof Live Load	Allowable Roof Snow Load	
8	L/180	63	39	66
	L/240	49	29	53
	L/360	32	20	35
9	L/180	49	35	53
	L/240	43	26	46
	L/360	28	17	31
10	L/180	39	31	43
	L/240	38	23	41
	L/360	24	16	28
11	L/180	32	28	36
	L/240	32	21	36
	L/360	22	14	25
12	L/180	27	25	30
	L/240	27	19	30
12.5	L/180	24	24	28
	L/240	24	18	28
13	L/180	22	22	26
	L/240	22	17	26
13.5	L/180	21	21	24
	L/240	21	17	24
13.9	L/180	20	20	23
	L/240	20	16	23

For **SI**: 1 foot= 0.305 m; 1 psf= 47.9 Pa.

¹Allowable load values are based on simply supported spans with the loads uniformly distributed. Where non-uniform loads are applied to the panel, an equivalent uniform load must be determined for comparison with the values within this table.

²Deflection limitations are based on Table 1604.3 of the IBC with the exception that creep of the foam core has been considered when panels are subjected to long term snow loads.

³Allowable loads are based on panel strength. Panels must be installed with a continuous width support of 1 inch (25.4 mm) at each end of the panel span. Capacity of end conditions must be evaluated on a site specific basis.

⁴Deflections for allowable roof live loads do not include creep. Site-specific engineering must consider the effects of creep, if applicable.

⁵Panels must be installed in accordance with Section 4.2 of this report.

⁶The roof maintenance worker live load is included in the above spans. A maximum superimposed dead load of 5 psf may be applied to the roof panels.

⁷Where a load combination includes more than one load type [roof live load, snow load, and/or wind load], the minimum allowable load for all load types within the load combination must be used. As an example, for a 6-inch roof panel with a span of 10 feet and a deflection limit of L/240, the allowable applied load for a load combination which includes roof live load and snow load is 23 psf (the lesser of 38 psf for roof live load and 23 psf for snow load).

TABLE 3—ALLOWABLE UNIFORM AXIAL LOADS FOR 4-INCH-THICK WALL PANELS

MAXIMUM PANEL UNSUPPORTED HEIGHT (ft)	ALLOWABLE AXIAL LOAD (plf)
16	614

For **SI**: 1 foot=0.305 m; 1 plf=14.6 N/m.

¹A base channel as shown in Figure 3 of this report shall be installed fully supported on a rigid foundation. A wall cap as shown in Figure 4 of this report must be used to attach the top of the wall panel.

²Allowable axial load is assumed to be uniformly distributed at the top of the wall panel centered on the panel thickness.

TABLE 4—ALLOWABLE RACKING SHEAR LOADS FOR 4-INCH-THICK WALL PANELS

PANEL DIMENSIONS	ALLOWABLE SHEAR LOAD (plf)
8 feet high by 8 feet wide	173

For **SI**: 1 foot=0.305 m; 1 plf=14.6 N/m.

¹A base channel as shown in Figure 3 of this report must be installed and fully supported on a rigid foundation.

²The maximum shearwall aspect (height-to-width) ratio is 1:1.

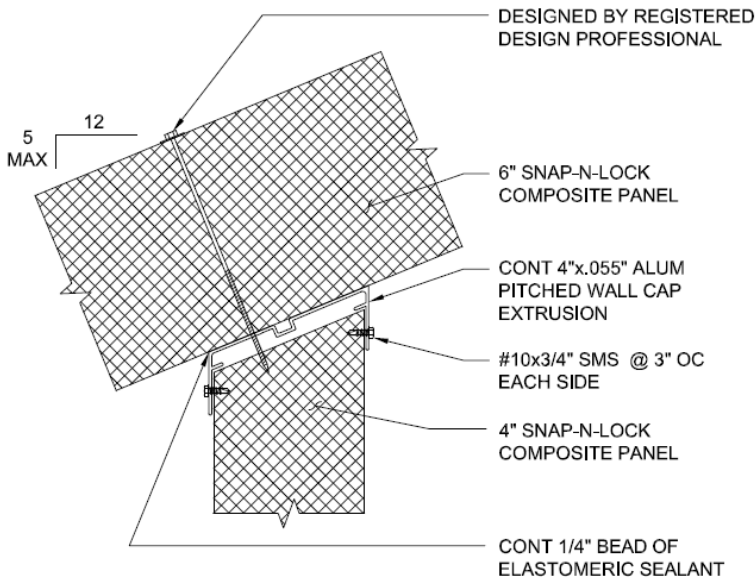


FIGURE 1—PANEL WALL TO PANEL ROOF

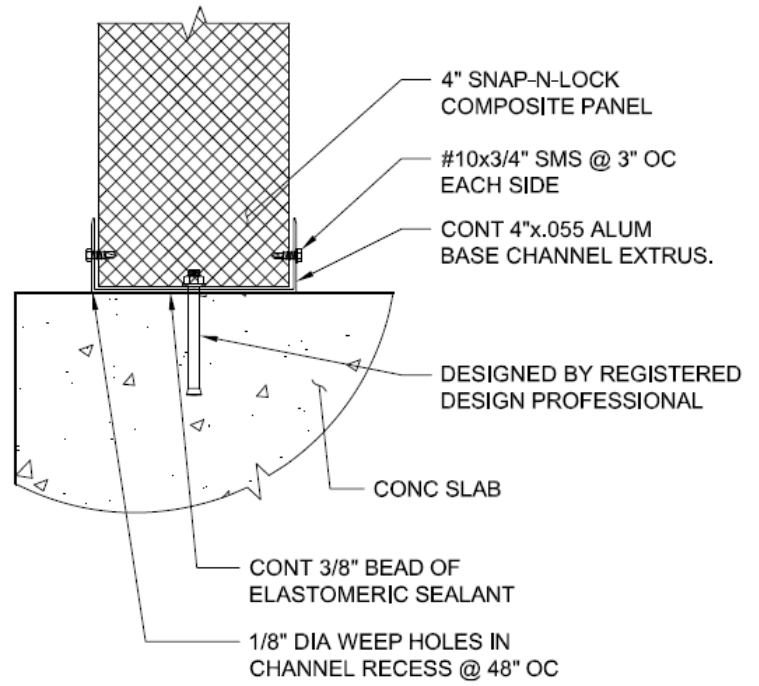
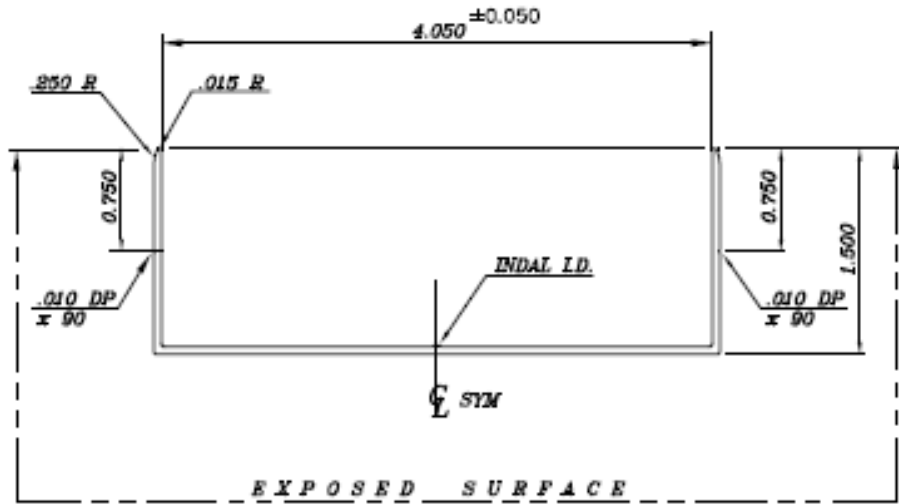


FIGURE 2—PANEL WALL TO SLAB



UNSPECIFIED WALL THICKNESS .055
 ALLOY **6063-T5**

FIGURE 3—BASE CHANNEL

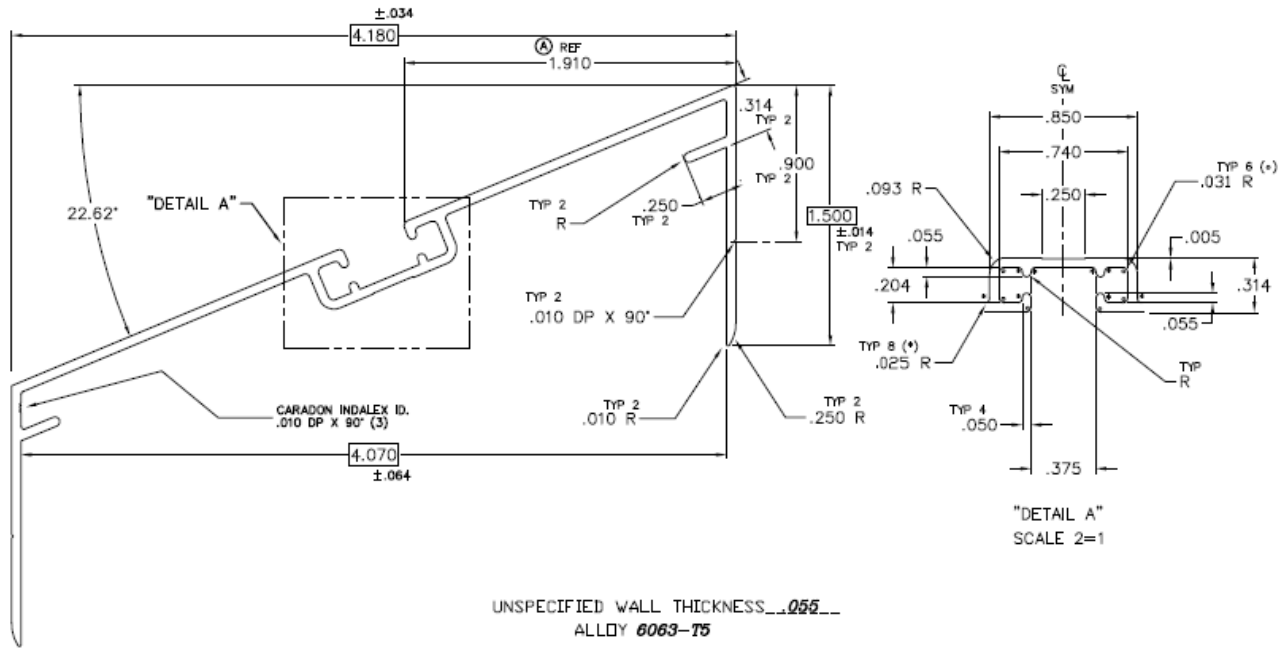


FIGURE 4—WALL CAP

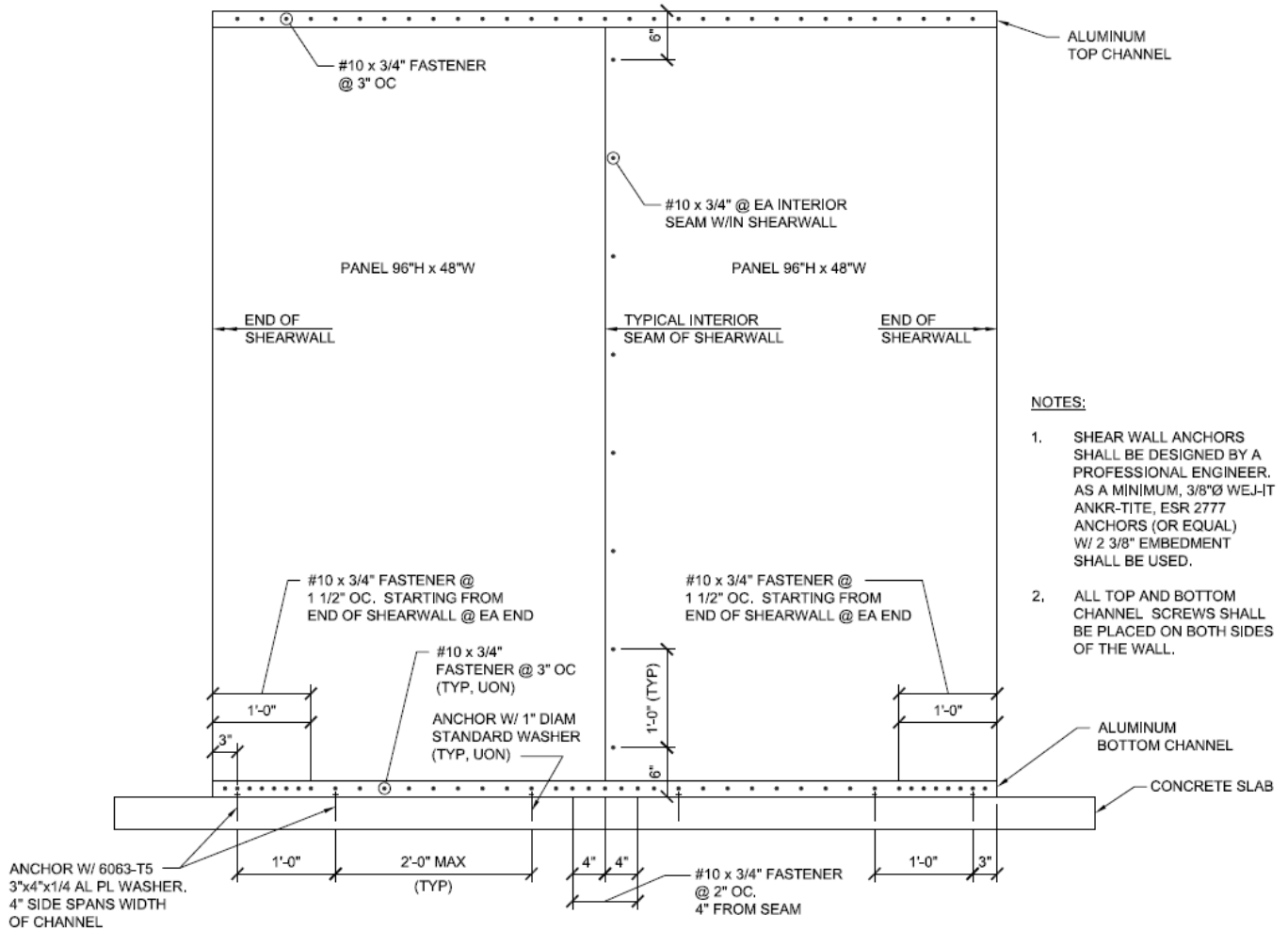


FIGURE 5—SHEAR WALL FASTENING SCHEDULE