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MEGABOARD STRUCTURAL FLOOR SHEATHING PANELS

CSI Sections:

06 00 00–Wood, Plastics, and Composites
06 16 00–Sheathing
06 16 23–Subflooring
09 28 15–Magnesium Oxide Backing Panels

1.0 RECOGNITION

MEGABOARD Structural Floor Sheathing Panels described in this report were evaluated for use as floor sheathing to support gravity and diaphragm loads. The strength, surface-burning, non-combustibility, and physical properties were evaluated for compliance with the following codes:

- 2024, 2021, 2018, and 2015 International Building Code® (IBC)
- 2024, 2021, 2018, and 2015 International Residential Code® (IRC)
- 2025 and 2022 California Building Code® (CBC) – Supplement attached
- 2025 and 2022 California Residential Code® (CRC) – Supplement attached
- 2023 Florida Building Code®, Building (FBC, Building) – Supplement attached
- 2023 Florida Building Code®, Residential (FBC, Residential) – Supplement attached

2.0 LIMITATIONS

Use of MEGABOARD Structural Floor Sheathing Panels described in this report is subject to the following limitations:

2.1 The fire-resistance-rating properties of MEGABOARD Structural Floor Sheathing Panels are beyond the scope of this report except as provided in this section. The panels are permitted to be used as a component of a fire-resistance-rated assembly in accordance with IBC Section 703.2, when testing in accordance with ASTM E119 or UL 263 is submitted to and approved by the building official. Fire resistance may also be determined through alternative methods as defined in 2024 and 2021 IBC Section 703.2.2 or 2018 and 2015 IBC Section 703.3. Fire resistance based on testing in accordance with ASTM E119 or UL 263 may be established when the registered design professional specifies, and then the building official approves a fire-resistance-rated assembly with the MEGABOARD Structural Floor Sheathing Panels in a documented design from approved sources.

2.2 Use of the MEGABOARD Structural Floor Sheathing Panels, where a sound transmission classification is required, is outside the scope of this report.

2.3 Support framing, including type and spacing for MEGABOARD Structural Floor Sheathing Panels, shall comply with Tables 1 to 4 of this report, as applicable.

2.4 Metals and metal fasteners in direct contact with MEGABOARD Structural Floor Sheathing Panels shall be non-corrosive or corrosion-resistant.

2.5 The MEGABOARD Structural Floor Sheathing Panels are limited to use as subfloor only with separate underlayment where required. Use as combination subfloor-underlayment (single floor) is not permitted under this report.

2.6 Use as a nail or screw base is beyond the scope of this report. Fasteners shall pass through the MEGABOARD Structural Floor Sheathing Panels and into supports.

2.7 MEGABOARD Structural Floor Sheathing Panels are limited to dry, interior locations protected from weathering conditions.

2.8 Complete construction documents, including plans and calculations verifying compliance with this report, shall be submitted to the building official with the permit application for approval. The construction documents shall be prepared by a registered design professional, where required by the statutes of the jurisdiction in which the project is to be constructed.

2.9 The MEGABOARD Structural Panels are produced at Weihai City, Shangdong, China, facilities.

3.0 PRODUCT USE

MEGABOARD Structural Floor Sheathing Panels are used as subfloor panels in Types I through V Construction. Where a fire-resistance-rated assembly is required, the provisions in Section 2.1 of this report shall apply. The MEGABOARD Structural Floor Sheathing Panels support vertical gravity loads and horizontal in-plane (wind and seismic) loads in buildings and other structures of cold-formed steel or wood light-frame construction. When used to resist horizontal in-plane loads, the panels function as the sheathing component of a horizontal diaphragm.

The MEGABOARD Structural Floor Sheathing Panels are alternatives to floor sheathing complying with IBC Section

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with Section 104.2.3 of the 2024 IBC and Section 104.11 of previous editions. This document shall only be reproduced in its entirety.

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2304.8.1 and IRC Section R503. The panels may also be used where an engineered design is submitted in accordance with Section 301.1.3 of the IRC. When used to resist horizontal in-plane loads, the panels are alternatives to wood structural panel sheathing used in diaphragms complying with IBC Section 2305; or AISI S240 for resistance to wind and other in-plane loads, and AISI S400 for resistance to seismic forces as referenced in 2024 IBC Sections 2204.2 and 2206.1.1, 2021 and 2018 IBC Sections 2211.1 and 2211.1.1; or AISI S213 as referenced in 2015 IBC Section 2211.6.

3.1 Installation

Installation of MEGABOARD Structural Floor Sheathing Panels shall be in accordance with this report, the approved project construction documents, MEGABOARD Installation Manual, and the applicable code. If there are any conflicts, the most restrictive requirements shall govern. The Ectek MEGABOARD installation guide, this report, and the approved plans shall be available at the job site during installation for quality control purposes.

3.1.1 Framing: MEGABOARD Structural Floor Sheathing Panels shall be installed over supporting framing designed and constructed to satisfy the strength and deflection requirements of the IBC or IRC, as applicable. Framing shall be installed in accordance with the IBC or IRC and the framing system manufacturer's instructions. The panels may be fastened to light-gauge cold-formed steel joists or wood joists to form a structural subfloor system. The panels shall be installed with the long dimension perpendicular to framing members, with joints staggered from adjacent courses. The panels shall be installed in accordance with the "This Side Up" mark on the panels and shall be continuous over two or more spans. All panel butt edges shall be supported by framing, except for tongue and groove edges installed in accordance with the Ectek MEGABOARD installation guide. For panels 24 inches (610 mm) wide and less, all edges shall be blocked with lumber or minimum No.16 gauge or 54 mils Designation Thickness cold-formed steel. The spacing of framing members that support panels shall comply with Table 1 of this report and not exceed 24 inches (610 mm) on center.

Steel framing members used in shear diaphragms shall be cold-formed steel having a minimum No.16 gauge or 54 mils Designation Thickness (0.0566-inch base metal thickness) conforming to IBC Section 2211.1, ASTM A1003 Grade 50, and AISI S240 Section B1.5.1.2. The corrosion protection coating shall comply with AISI S240 Section A4.1.1. The flange width of main framing members shall be a minimum of 1⅝ inches (41.3 mm) with a minimum ½ inch (12.7 mm) long return lips, and panel ends shall bear at least 1 inch (25.4 mm) on supports. Wood framing members used in shear diaphragms shall be of minimum nominally 2-by Southern Pine framing conforming to IBC Sections 2303.1.1 and 2304.4.

3.1.2 Fasteners: Fasteners shall be driven through the panels and into the framing. For cold-formed steel framing systems, the fasteners shall be a minimum $1^{5}/_{8}$-inch-long (41.3 mm) No. 8 corrosion-resistant HDG self-countersinking-head screws with a minimum 0.36-inch-diameter (9.1 mm) head conforming to AISI S240 Section B. The minimum fastener edge distance shall be ¾ inch (19 mm) and shall be driven flush with the surface. For wood framing systems, the fasteners shall be a minimum of 0.113-inch-diameter (2.9 mm) by a minimum of $2^{3}/_{8}$-inch-long (60 mm) HDG ring-shank nails conforming to IBC Section 2303.6 and ASTM F1667.

For cold-formed steel-framed cantilever and simple beam diaphragm construction, the fastener spacing shall be in accordance with Tables 2 and 3 of this report, respectively. Fasteners attaching panels shall be installed in one operation through the panels into the framing. The length of screw fasteners shall be sufficient to penetrate at least three exposed threads into steel framing members.

For wood-framed simple beam diaphragm construction, the fastener spacing shall be in accordance with Table 4 of this report. Fasteners attaching panels shall be installed in one operation through the panels into the framing. The length of the fasteners shall be sufficient to penetrate at least 1.5 inches (38.1 mm) into the wood framing members.

For non-diaphragm applications, the fastener spacing shall be no greater than as specified in Tables 2 to 4 of this report.

3.2 Design

3.2.1 General: Assemblies using MEGABOARD Structural Floor Sheathing Panels shall be designed in accordance with Chapter 16 of the IBC or Section R301.1.3 of the IRC, as applicable, Tables 1 through 5, and Figures 1 through 4 of this report, as applicable. The design shall address the selection of the framing members, the layout of the floor sheathing, and the fastening specifications for attaching the sheathing to the framing members. The designs shall be prepared by a structural design professional and shall be submitted to the building official for approval.

3.2.2 Horizontal Diaphragms: The determination of applicable design loads shall be in accordance with ASCE/SEI 7 or IBC Chapter 16. Diaphragm inertial forces shall be determined from ASCE/SEI 7 Sections 12.8 and 12.10.1.1 using the seismic design parameters for the participating vertical SFRS. Uses under seismic design categories C, D, E, or F shall be permitted based on ASCE/SEI 7 Table 12.2-1 for the participating vertical SFRS. Diaphragm transfer forces shall be considered where applicable in accordance with ASCE/SEI Section 12.10.1.1. Diaphragms at each level shall be designed for shear and flexure using the F_{px} design forces. Diaphragm reactions shall be distributed based on whether the diaphragm is flexible, rigid, or semi-rigid in accordance with ASCE/SEI 7 Section 12.3.1. As set forth in AISI S400 Section F2.5.1, where the

seismic response modification coefficient, R, used to determine the lateral forces is taken greater than 3, open front steel-framed structures with rigid diaphragms resulting in a torsional force distribution shall be limited by the following:

(1) The length of the diaphragm normal to the open side shall not exceed 25 feet (7.62 m), and the aspect ratio (length to width) shall be less than 1:1 for one-story structures or shall be less than 2:3 for structures over one story in height, where the length dimension of the diaphragm is perpendicular to the opening.

(2) Where calculations demonstrate that diaphragm deflections may be tolerated, the length normal to the opening shall be permitted to be increased to an aspect ratio (length to width) no greater than 3:2.

The use of wood-framed diaphragms for cantilever or open-front structures is beyond the scope of this report.

Allowable shear strength or factored resistance for horizontal diaphragms to safely resist and support the loads shall be determined from the nominal shear strengths in accordance with Tables 2 through 4 of this report for panels constructed with the MEGABOARD Structural Floor Sheathing Panels with tongue and groove (T&G) joints only. The values for the in-plane nominal strength of the panels were established empirically. Allowable in-plane strength (ASD) values use a safety factor (Ω) of 2.5 for seismic loads and 2.0 for wind loads. Values for in-plane LRFD design use a resistance factor (φ) of 0.60 for seismic loads and 0.65 for wind loads. The shear strength values in Tables 2 through 4 of this report shall not be further increased for loads of short-term duration, such as wind or seismic.

MEGABOARD panels shall be arranged so that the minimum panel width is at least 24 inches (610 mm). The diaphragm length and width shall be limited by one of the following – engineering mechanics; applied loads; shear capacity of the diaphragm; and diaphragm deflection limited by the requirements of ASCE/SEI 7-22 in Sections 12.8.6 titled, "Dispacement and Drift Determination" or ASCE/SEI 7-16 in Sections 12.8.6 titled, "Story Drift Determination"; or Section 12.12 titled, "Drift and Deformation" using one of the deflection equations shown in Figures 2 through 4 of this report. Horizontal diaphragms with MEGABOARD Structural Floor Sheathing Panels shall be constructed with maximum aspect ratios of 3:1 for unblocked diaphragms and 4:1 for blocked diaphragms.

For horizontal diaphragms, the registered design professional shall verify that the framing members at the boundaries of the diaphragm have sufficient capacity to develop the required strength of the diaphragm, including but not limited to prevention of failure in the chords.

Openings in diaphragms shall be designed to transfer the forces around the openings to the vertical elements of the lateral force-resisting system. Detailing is required to provide a continuous load path and avoid stress concentrations.

3.2.3 Vertical Uniform and Concentrated Gravity Loads: The supporting structural members shall be designed to support the uniformly distributed live loads and the concentrated live loads provided in Section 1607.1 of the IBC, whichever produces the greater load effect, or Table R301.5 of the IRC, as applicable. Determination of applicable design loads for dead and live gravity loading applied perpendicular to the panels shall be in accordance with ASCE/SEI 7 or IBC Chapter 16. The allowable uniform gravity loads for floor sheathing to safely resist and support vertical design loads shall be in accordance with Table 1 of this report. The values in Table 1 apply to panels continuously supported over two or more spans. The allowable total uniform gravity loads for MEGABOARD Structural Floor Sheathing Panels installed with the long direction perpendicular to the framing members and supported on a minimum of two spans spaced a maximum of 24 inches (610 mm) on-center, shall be 100 psf (4.79 kPa). The spans shall be reduced for concentrated live loads in accordance with the limitation in Section 2.3 of this report. Supporting framing members directly connected to the panels shall be designed to limit deflection to no more than $\ell/360$ for floor live loads in accordance with the code.

3.2.4 IRC: Floors constructed in accordance with this report may be used in lieu of provisions in IRC Section R505. Framing shall be designed to resist all applicable loading conditions.

3.3 Two-Hour Fire-Resistance-Rated Modular Floor-Ceiling Assembly:

3.3.1 Upper and Lower Module Assembly: A two-hour fire-resistance rating of the Floor-Ceiling Assembly is provided when the upper and lower modules are placed and secured together, any protruding EPDM membrane is trimmed off, and the ¾ inch (19.1 mm) air space between the installed modules is sealed around the perimeter. The assembly is illustrated in Figure 6 of this report. The fire-resistance rating complies with IBC Section 703.2.1 and IRC Section R302.3.2, based on the test procedures outlined in ANSI/UL 263, and has an unrestrained assembly classification in accordance with Section 10.6.1 of ANSI/UL 263. The allowable loading on the assembly shall be the lesser of the allowable loads in Table 1 of this report and the load-carrying capacity of the supporting structural members.

3.3.2 Upper Module Floor Assembly: The upper module floor assembly is framed with minimum 8-inch (203 mm) deep C-shaped joists complying with Section 3.1.1 of this report. Joists are spaced 24 inches (610 mm) on center with joist rim splices bearing on supports. The joist rims are connected using an overlapping section of a 12-inch (610 mm) long splice plate (a joist piece), with four 3/4 inch (19.1 mm) long, No. 10, self-drilling steel TEK screws, complying with AISI S240 Section B, to each rim piece. The

MEGABOARD boards are placed with the long dimension perpendicular to joists, with end joints staggered a minimum of four feet (1219 mm) from adjacent courses and centered over the joists. These boards are secured to steel joists with steel screws described in Section 3.1.2 of this report, spaced a maximum of 12 inches on center in the field with screws located 1 inch (25.4 mm) from the long edge, and a maximum of 8 inches (203 mm) on center along the end joints with screws located ½ inch (12.7 mm) from end joints. Insulation complying with IBC Section 720.2 shall be installed in the joist cavities. The minimum 3½ inch to maximum 8-inch-thick (90 mm to 203 mm) glass fiber batt insulation shall be nominal 0.5 pcf (8 kg/m^3) density. To retain the insulation in place during module transport, steel wire mesh, as a minimum, shall be attached to the underside of the joists. For cold-formed steel-framed cantilever and simple beam diaphragm construction, the fastener spacing shall be in accordance with Tables 2 and 3 of this report, respectively. Fasteners attaching panels shall be installed in one operation through the panels into the framing. The length of screw fasteners shall be sufficient to penetrate at least three exposed threads into steel framing members.

3.3.3 Lower Module Ceiling Assembly: The lower module ceiling assembly is framed with minimum 4-inch (102 mm) deep C-shaped joists complying with Section 3.1.1 of this report. Joists are spaced 24 inches (610 mm) on center. To provide weather protection to the module during transportation, minimum No. 20 gauge (0.0359 inch/ 0.912 mm) corrosion-resistant steel sheets are attached to the top surface using min. ½ inch (12.7 mm) long No. 6 self-drilling pan-head screws, complying with AISI S240 Section B and spaced a maximum of 24 inches (610 mm) on center. The surface is sealed using an EPDM single-ply membrane complying with IBC Section 1507.12.

Resilient channels, formed from ½ inch (12.7 mm) deep No. 25 gauge (0.0209 inch/0.531 mm) galvanized steel, are fastened perpendicular to the ceiling framing, spaced a maximum of 12 inches (305 mm) on center. Any channel splices shall be located beneath joists and overlapped by 4 inches (102 mm). The resilient channels shall be secured to each joist with one ½-inch (12.7 mm) long Type S-12 low-profile steel screw complying with AISI S240 Section B. Two additional channels, spaced 6 inches (152 mm) on center, shall be installed and oriented opposite each gypsum board end joint. These additional channels shall extend 12 inches (305 mm) minimum beyond each side edge of the board.

A single layer of ⅝ inch (15.9 mm) thick, 48-inch-wide (1219 mm) Type C gypsum wallboard panels is then fastened to the resilient channels with the long dimension perpendicular to the resilient channels. The gypsum wallboard shall comply with ASTM C1396, Standard Specification for Gypsum Board. Permitted sources are CGC Type C, National Gypsum Type FSW-C, and United States Gypsum Type C. Other sources shall be justified in accordance with IBC Section 703.2.2 and approved by the building official. All end joints shall be centered on resilient channels. The gypsum panels are secured with minimum 1-inch-long (25.4 mm) Type S bugle-head screws, complying with ASTM C1002, and spaced 12 inches (305 mm) on center in the field and 8 inches (203 mm) on center at the end joints. Each screw shall be located 1¼ inches (31.8 mm) and 4 inches (102 mm) from the end joints and 1½ inches (38.1 mm) from the side edges of the panels. Joints and fasteners shall be treated in accordance with IBC Sections 2508.1 and 2508.5.

3.4 Special Inspections: Periodic special inspections for wind or seismic resistance corresponding to the applicable type (wood or cold-formed steel) of light-framed construction shall be provided when the panels are components of a wind-force-resisting system or seismic-force-resisting system located in areas set forth in Chapter 17 of the IBC. Inspection requirements shall comply with IBC Section 1705.

4.0 PRODUCT DESCRIPTION

MEGABOARD Structural Floor Sheathing Panels are fiberglass-reinforced magnesium oxide cement-based sheets with a factory-applied coating. The sheets consist of a proprietary composition of magnesium oxide, magnesium oxychloride, fiberglass mesh, fibrous materials, aggregate, and additives. Each MEGABOARD panel has two layers of fiberglass mesh embedded just above its denser bottom surface, two layers of fiberglass mesh embedded just beneath its denser top surface, and two layers of fiberglass mesh in the middle of the panel. The top surface is sanded to achieve a uniform 18-mm (nominally ¾-inch) thickness. MEGABOARD panels are 4 feet (1219 mm) wide by 8 feet (2428 mm) long and are available with square edges or tongue-and-groove (T&G) edges along the length of the panel. The tongue and groove edge is shown in Figure 5 of this report. MEGABOARD has a density of 63 pcf (1009 kg/m^3), and the panels weigh approximately 3.75 psf (180 Pa). MEGABOARD panels are classified as noncombustible based on testing in accordance with ASTM E136-24b and are classified as Class A for surface-burning characteristics in accordance with IBC Section 803.1.2 based on results of ASTM E84 testing.

5.0 IDENTIFICATION

MEGABOARD Structural Floor Sheathing Panels are identified by a label with the report holder's name (Ectek) and address, the product name and panel thickness, the words "This Side Up" on the top surface, the production date, the lot number, and the evaluation report number (ER-808).

The IAPMO Uniform Evaluation Service Mark of Conformity may also be used as shown below:

IAPMO UES ER-808

6.0 SUBSTANTIATING DATA

6.1 Applicable data in accordance with the IAPMO-UES Evaluation Criteria for Composite Steel Sheet and Noncombustible Sheathing Panels (EC 012-2022), revised January 2025.

6.2 Reports of physical properties testing in accordance with ASTM C1185 and ASTM C1186.

6.3 Reports of concentrated loads testing in accordance with ASTM E661.

6.4 Reports of horizontal diaphragm testing and analysis in accordance with ASTM E455 and AISI S907.

6.5 Reports of fastener withdrawal and pull-through testing in accordance with ASTM D1037.

6.6 Reports of combustibility characteristics testing in accordance with ASTM E136-24b.

6.7 Reports of surface-burning characteristics testing in accordance with ASTM E84.

6.8 Structural analysis for allowable loading.

6.9 Reports of fire-resistance testing in accordance with UL 263, along with analyses complying with IBC Section 703.2.2.

6.10 Manufacturer's quality control manual, descriptive literature, and installation instructions.

6.11 Test reports submitted are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on MEGABOARD Structural Floor Sheathing Panels to assess conformance to the codes and standards shown in Section 1.0 of this report and serves as documentation of the product certification. The panels are produced at a location noted in Section 2.9 of this report under a quality assurance program with periodic inspections under the supervision of IAPMO UES.

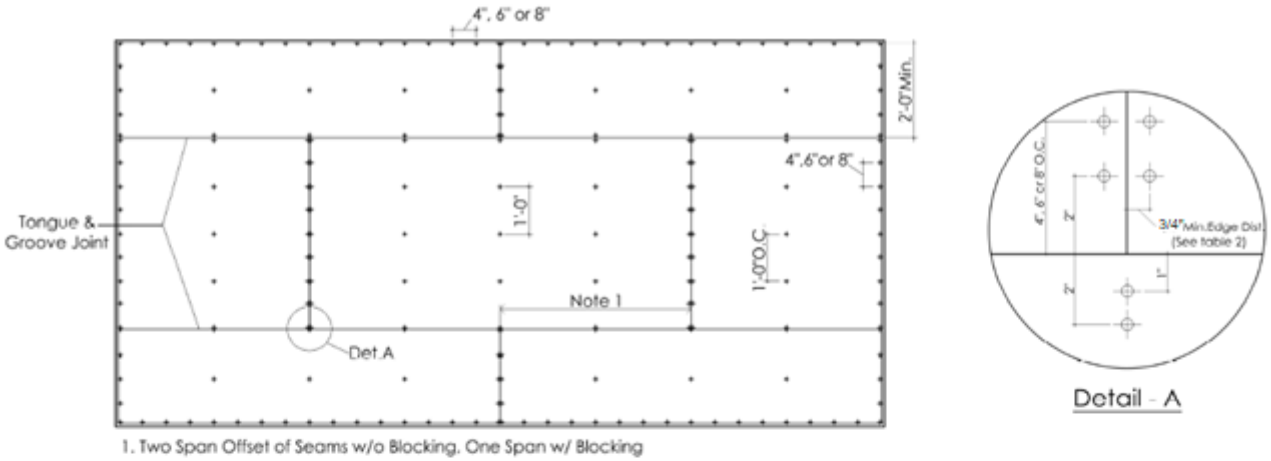
For additional information about this evaluation report please visit www.uniform-es.org or email at us info@uniform-es.org

TABLE 1—ALLOWABLE UNIFORM GRAVITY LOADS FOR MEGABOARD SUBFLOOR PANELS[2,3]

JOIST SPAN (inches)	ALLOWABLE UNIFORM LOAD[1] (psf) L/240	ALLOWABLE UNIFORM LOAD[1] (psf) L/360
12	652	652
16	390	390
24	158	135

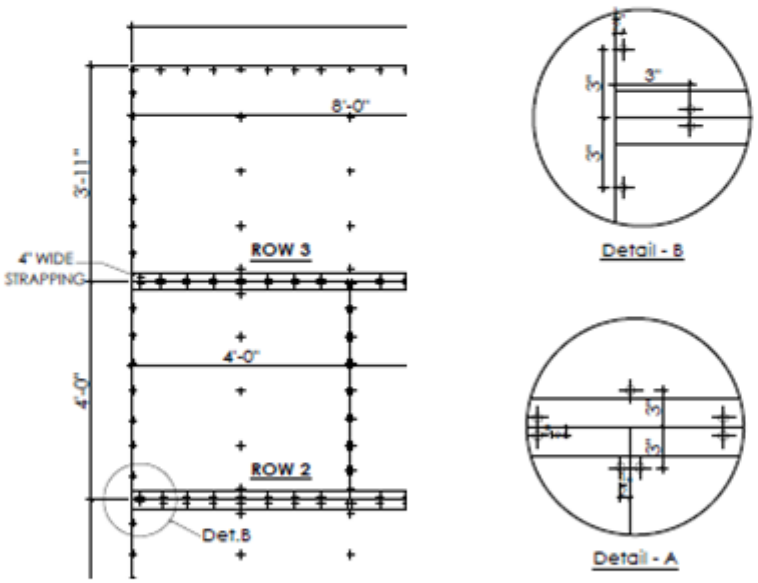
For **SI:** 1 inch = 25.4 mm, 1 psf =47.88 Pa, 1 psi = 6.89475 kPa.

[1] These loads represent the load-carrying capacity of the panels spanning between the floor joists. A minimum of two spans is required.
[2] For occupancies requiring concentrated live load, the maximum allowable load is 2,000 pounds. Additional requirements in IBC Section 1607.4 shall apply.
[3] This table is based on the bending strength of 2842.7 psi and the modulus of elasticity of 8.56×10^5 psi.



1. Two Span Offset of Seams w/o Blocking, One Span w/ Blocking

PATTERN FOR 4-IN OC OR GREATER EDGE FASTENING



PATTERN FOR 3-IN OC EDGE FASTENING

FIGURE 1 - DIAPHRAGM EDGE FASTENING

TABLE 2 — NOMINAL SHEAR STRENGTH FOR COLD-FORMED STEEL FRAMED CANTILEVER DIAPHRAGMS CONSTRUCTED WITH MEGABOARD T &G PANELS[1,2,3,4]

MAXIMUM JOIST SPACING (inches)	MINIMUM NUMBER OF SUPPORTS PER PANEL	REQUIRED BLOCKING[5]	MAXIMUM FASTENER SPACING (inches)		SCREW PATTERN	MINIMUM SHEATHING FASTENER SIZE	NOMINAL SHEAR STRENGTH, S_u (plf)
			Perimeter	Field			
24	2	No	6	12	A	No. 8 Screw	608
24	2	Yes	3	12	A	No. 8 Screw	2,458

For **SI:** 1 inch = 25.4 mm, 1 plf = 14.6 N/m.

[1] Section 3.1.1 of this report summarizes CFS framing requirements.
[2] Section 3.1.2 1 of this report summarizes fastener requirements.
[3] Figure 1 of this report illustrates the screw placement patterns.
[4] For Allowable Strength Design (ASD), the tabulated nominal strengths shall be divided by a safety factor, Ω of 2.5 for seismic loads and Ω of 2.0 for wind loads. For Load and Resistance Factor Design (LRFD), the tabulated nominal strengths shall be multiplied by a resistance factor, ϕ of 0.60 for seismic loads and ϕ of 0.65 for wind loads.
[5] 4-inch wide, No. 16 gauge (54 mils) steel strapping is required to support the T&G joints to achieve a nominal shear strength of 2,458 plf.

TABLE 3 — NOMINAL SHEAR STRENGTH FOR COLD-FORMED STEEL (CFS) FRAMED SIMPLE BEAM DIAPHRAGMS CONSTRUCTED WITH MEGABOARD T &G PANELS[1,2,3,4]

MAXIMUM JOIST SPACING (inches)	REQUIRED BLOCKING	MAXIMUM FASTENER SPACING (inches)		SCREW PATTERN	MINIMUM SHEATHING FASTENER SIZE	NOMINAL SHEAR STRENGTH, S_u (plf)
		Perimeter	Field			
24	No	4	12	A	No.10 Screw	1,797

For **SI:** 1 inch = 25.4 mm, 1 plf = 14.6 N/m

[1] Section 3.1.1 1 of this report summarizes CFS framing requirements.
[2] Section 3.1.2 of this report summarizes fastener requirements.
[3] Figure 1 of this report illustrates the screw placement patterns.
[4] For Allowable Strength Design (ASD), the tabulated nominal strengths shall be divided by a safety factor, Ω of 2.5 for seismic loads and Ω of 2.0 for wind loads. For Load and Resistance Factor Design (LRFD), the tabulated nominal strengths shall be multiplied by a resistance factor, ϕ of 0.60 for seismic loads and ϕ of 0.65 for wind loads.

TABLE 4 – NOMINAL SHEAR STRENGTH FOR WOOD-FRAMED SIMPLE BEAM DIAPHRAGMS CONSTRUCTED WITH MEGABOARD T &G PANELS[1,2,3,4]

MAXIMUM JOIST SPACING (inches)	REQUIRED BLOCKING	MAXIMUM FASTENER SPACING (inches)		SCREW PATTERN	MINIMUM SHEATHING FASTENER SIZE	NOMINAL SHEAR STRENGTH, S_u (plf)
		Perimeter	Field			
24	No	6	12	A	8d-0.113x23/8” ring shank nails	1,037

For **SI:** 1 inch = 25.4 mm, 1 plf = 14.6 N/m.

[1] Section 3.1.1 of this report summarizes wood framing requirements.
[2] Section 3.1.2 of this report summarizes fastener requirements.
[3] Figure 1 of this report illustrates the nail placement patterns
[4] For Allowable Strength Design (ASD), the tabulated nominal strengths shall be divided by a safety factor, Ω of 2.5 for seismic loads and Ω of 2.0 for wind loads. For Load and Resistance Factor Design (LRFD), the tabulated values shall be multiplied by a resistance factor, ϕ of 0.65 for seismic loads and ϕ of 0.80 for wind loads.

$$\Delta_{3/12} = 5V(2L)^3/8EAb + V2L/4Gt + X2Le_n$$
$$\Delta_{6/12} = 5V(2L)^3/8EAb + V2L/4Gt + X2Le_n$$

Where:		Value (units)
V =	Unit shear in the direction under consideration	(plf)
L =	Diaphragm length	(ft)
b =	Diaphragm width	(ft)
E =	Elastic modulus of joist	= 29,500,000 (psi)
A =	Net area of rim track cross-section	= 0.594 (in^2)
G =	Shear modulus of MgO sheathing	= 80,568 (psi)
t =	The effective thickness of the sheathing for shear	= 0.707 (in)
e_n =	Screw-joint slippage, load/screw perimeter of interior panel	= 0.006 (in)
$X_{3/12}$ =	Screw-joint slip coef. for 3/12 fastening	= 1.155
$X_{6/12}$ =	Screw-joint slip coef. for 6/12 fastening	= 2.154
Δ =	Calculated deflection at the end of the diaphragm	(in)

FIGURE 2 CANTILEVER DIAPHRAGM DEFLECTION EQUATIONS
(24 INCHES-ON-CENTER NO. 16 GAUGE COLD-FORMED STEEL FRAMING)

$$\Delta = \frac{5vL^3}{8EAW} + \frac{0.25vL}{Gt} + (3.26\beta^2 - 3.22\beta + 2.47)e_n n$$

Where:		Value (units)
v =	Induced unit shear	(plf)
L =	Diaphragm dimension perpendicular to the direction of force	(ft)
E =	Modulus of Elasticity of diaphragm chords	= 29,500,000 (psi)
A =	Area of chord cross-section	(in^2)
W =	Width of the diaphragm in the direction of the applied force	(ft)
b =	Single sheathing panel dimension perpendicular to the force	(ft)
G =	Shear modulus of MgO sheathing	= 80,568 (psi)
t =	The effective thickness of the sheathing for shear	= 0.707 (in)
e_n =	Screw-joint slippage, load/screw at diaphragm collector	= (in), Per Table 5 of this report
n =	L / b	unitless coefficient
β =	v / 1000 plf	unitless coefficient
Δ =	Calculated deflection at the end of the diaphragm	(in)

FIGURE 3 – SIMPLE BEAM DIAPHRAGM DEFLECTION EQUATIONS
(24 INCHES-ON-CENTER NO. 16 GAUGE STEEL COLD-FORMED FRAMING FASTENED AT 4"/12")

$$\Delta = \frac{5vL^3}{8EAW} + \frac{0.25vL}{Gt} + (5.7\beta + 2.75)e_n n$$

Where:		Value (units)
v =	Induced unit shear	(plf)
L =	Diaphragm dimension perpendicular to the direction of force	(ft)
E =	Modulus of Elasticity of diaphragm chords	= 1,600,000 (psi)
A =	Area of chord cross-section	(in^2)
W =	Width of diaphragm in the direction of applied force	(ft)
b =	Single sheathing panel dimension perpendicular to the force	(ft)
G =	Shear modulus of MgO sheathing	= 80,568 (psi)
t =	The effective thickness of the sheathing for shear	= 0.707 (in)
e_n =	Screw-joint slippage, load/screw at diaphragm collector	= (in), Per Table 5 of this report
n =	L / b	unitless coefficient
β =	v / 1000 plf	unitless coefficient
Δ =	Calculated deflection at the end of the diaphragm	(in)

FIGURE 4 – SIMPLE BEAM DIAPHRAGM DEFLECTION EQUATIONS (24 INCHES-ON-CENTER SOUTHERN PINE LUMBER FRAMING FASTENED AT 6"/12")

TABLE 5 – SCREW-JOINT SLIPPAGE FOR SIMPLE SPAN DIAPHRAGMS (e_n)[1]

Applied Shear Force per Screw (lb)	0	82	134	163	407	1000
Screw Slippage (in), e_n	0	0.004	0.006	0.007	0.044	0.136

For **SI:** 1 inch = 25.4 mm, 1 lb = 4.45 N

[1] For shear forces between the tabulated values, screw slippage may be interpolated.

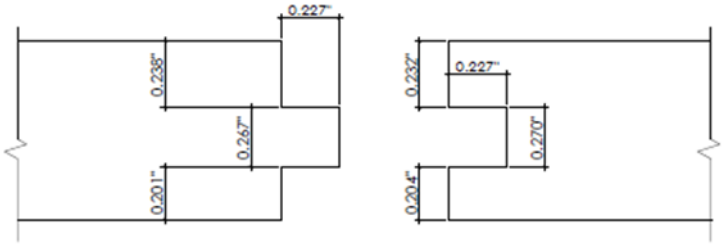
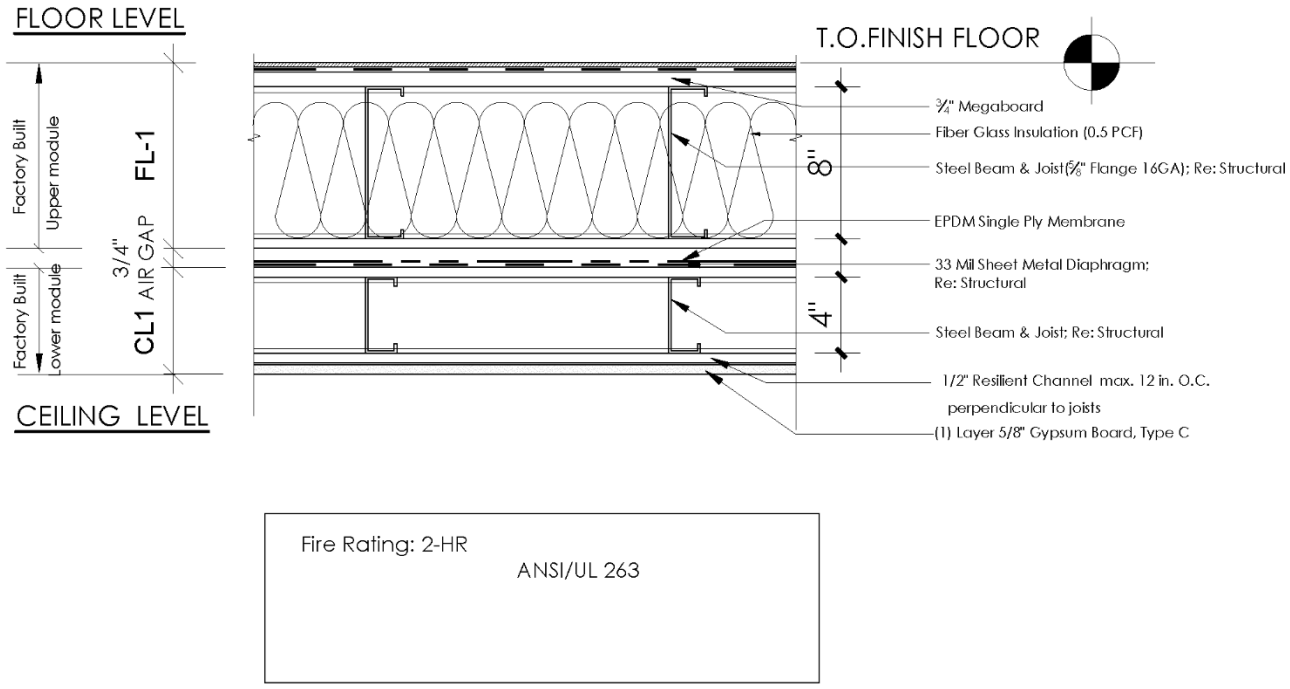


FIGURE 5 – TONGUE AND GROOVE EDGE ILLUSTRATION



MEGABOARD MODULAR FLOOR/CEILING ASSEMBLY

FIGURE 6 – TWO-HOUR-FIRE-RESISTANCE-RATED MODULAR FLOOR-CEILING ASSEMBLY

FLORIDA SUPPLEMENT

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MEGABOARD STRUCTURAL FLOOR SHEATHING PANELS

CSI Sections:

06 00 00–Wood, Plastics, and Composite
06 16 00–Sheathing
06 16 23–Subflooring
09 28 15–Magnesium Oxide Backing Panels

1.0 RECOGNITION

MEGABOARD Structural Floor Sheathing Panels recognized in this report have been evaluated for use as floor sheathing. The strength, durability, surface-burning, non-combustibility, physical properties, and transverse wind load resistance properties of the panels comply with the intent of the provisions of the following codes and regulations:

- 2023 Florida Building Code (FBC, Building)
- 2023 Florida Building Code, Residential (FBC, Residential)

2.0 LIMITATIONS

Use of the MEGABOARD Structural Floor Sheathing Panels recognized in this report is subject to the following limitations:

2.1 FBC, Building: All provisions of ER-808 referencing the 2021 IBC shall apply to use under the 2023 FBC, Building, and all provisions of ER-808 referencing the 2018 IBC shall apply to use under the 2020 FBC, Building.

2.2 FBC, Residential: All provisions of ER-808 referencing the 2021 IRC shall apply to use under the 2023 FBC, Residential, and all provisions of ER-808 referencing the 2018 IRC shall apply to use under the FBC, Residential; along with Section R302 of the FBC, Residential, as applicable.

2.3 Evaluation for use in high-velocity hurricane zones (HVHZ), consisting of Broward and Dade counties as defined in Section 202 of the FBC, Building, and Section 202 of the FBC, Residential, is outside the scope of this report.

2.4 Verification shall be provided that a quality assurance agency audits the manufacturer's quality assurance program and audits the production quality of products, in accordance with Section (5)(d) of Florida Rule 61G20-3.008. The quality assurance agency shall be approved by the Commission (or by the building official when the report holder does not possess an approval from the Commission).

2.5 This supplement expires concurrently with IAPMO UES ER-808.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

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MEGABOARD STRUCTURAL FLOOR SHEATHING PANELS

CSI Sections:

06 00 00–Wood, Plastics, and Composite
06 16 00–Sheathing
06 16 23–Subflooring
09 28 15–Magnesium Oxide Backing Panels

1.0 RECOGNITION

MEGABOARD Structural Floor Sheathing Panels recognized in this report have been evaluated for use as floor sheathing. The strength, durability, surface-burning, non-combustibility, physical properties, and transverse wind load resistance properties of the panels comply with the intent of the provisions of the following codes and regulations:

- 2025 California Building Code (CBC)
- 2025 California Residential Code (CRC)

2.0 LIMITATIONS

Use of the MEGABOARD Structural Floor Sheathing Panels recognized in this report is subject to the following limitations:

2.1 CBC: All provisions of IAPMO UES ER-808 referencing the 2024 IBC shall apply to use under the CBC, except as specifically noted in this supplement.

2.2 CRC: All provisions of IAPMO UES ER-808 referencing the 2024 IRC shall apply to use under the CRC, along with Section R302 of the CRC, as applicable.

2.3 Horizontal (Wind and Seismic) Load Design: The design for horizontal loads shall be as set forth in Section 3.2 of ER-808. For applications involving community colleges, the provisions in CBC Sections 1617 and 2206 shall apply. For applications regulated by DSA or HCAi (OSHPD):

a. Horizontal diaphragm span-width ratios shall comply with CBC Section 1604A.3.8.
b. Provisions in ASCE/SEI 7 shall be modified as set forth in CBC Section 1617A.
c. Provisions in CBC Section 2206A shall apply.

2.4 Installation: Installation requirements shall be as set forth in Section 3.1 of IAPMO UES ER-808.

2.5 Special Inspection: Special inspections shall be provided as set forth in Section 3.3 of IAPMO UES ER-808.

2.6 For applications regulated by DSA or HCAi (OSHPD), structural calculations shall comply with CBC Section 1603A.3.

2.7 This supplement expires concurrently with IAPMO UES ER-808.

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