DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES  
Section: 06 12 13—Cementitious Reinforced Panels

REPORT HOLDER:  
UNITED STATES GYPSUM COMPANY

EVALUATION SUBJECT:  
USG STRUCTURAL PANEL CONCRETE SUBFLOOR  
USG STRUCTURAL PANEL CONCRETE ROOF DECK

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 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.

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see ESR-1792 LABC and LARC Supplement.

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see ESR-1792 CBC and CRC Supplement.

Properties evaluated:

- Structural
- Combustibility
- Fire propagation

2.0 USES

USG Structural Panel Concrete Subfloor is a noncombustible, cementitious floor sheathing panel used as combination subfloor and underlayment (single floor) or as subfloor only. Installation must be limited to weather-protected, interior locations.

USG Structural Panel Concrete Roof Deck is a noncombustible, cementitious roof sheathing panel which must be protected by an approved roof covering.

USG Structural Panels are fastened to cold-formed steel framing to form a structural floor or roof system. These systems resist gravity and uplift loads and act as horizontal shear diaphragms, resisting wind and seismic loads.

When used in structures regulated under the IRC, floor and roof systems using USG Structural Panels must be designed in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 USG Structural Panel Concrete Subfloor and Structural Panel Concrete Roof Deck:

USG Structural Panels are formed from a composite consisting of glass fibers, cementitious materials and aggregate. USG Structural Panels are nominally \( \frac{3}{4} \) inch (19.1 mm) thick, 4 feet (1219 mm) wide, and 8 feet (2428 mm) long with tongue-and-groove edges along the length of the panel. USG Structural Panel Concrete Roof Deck is also available with square edges. The panels weigh approximately 5 psf (24.4 kg/m²).

Based on tests in accordance with ASTM E136, the panels are noncombustible. The panels yield a flame-spread index of 0 and a smoke-developed index of 5 or less when tested in accordance with ASTM E84.

3.2 Floor and Roof Framing:

Floor and roof framing, web stiffeners, and blocking must be cold-formed from steel complying with AISI S100, with a minimum base-metal thickness of 54 mils [0.0538 inch (1.37 mm)], a minimum yield strength of 50 ksi (345 MPa), and a minimum G60 galvanized coating. The supporting flange of the framing member must be at least 1.625 inches (41 mm) wide.

3.3 Blocking:

When blocking is required, as shown in the tables in this report, it must comply with the following requirements, as applicable:

3.3.1 Strap Blocking: Strap blocking must be minimum Grade 33 cold-formed steel straps which are 4 inches (102 mm) wide with a minimum base steel thickness of 54 mils [0.0538 inch (1.37 mm)], and a minimum G60 galvanized coating.

3.3.2 Track Blocking: Track blocking must be minimum Grade 50 cold-formed steel C-shaped tracks which are 4 inches (102 mm) deep, have a minimum flange width of 1¼ inches (32 mm), have a minimum base steel thickness of 54 mils [0.0538 inch (1.37 mm)], and a minimum G60 galvanized coating. The track sections must be notched where they overlap the supporting joists.

3.4 Fasteners:

The panels must be fastened to the cold-formed steel framing and blocking with Grabber Construction Products, Inc., #8 x 1½” winged self-drilling screws, Part No. CGH8158LG, recognized in ESR-4223.
4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: The cold-formed steel framing components must be designed to comply with the strength and deflection requirements of the IBC and the project specifications. The design of the floor or roof system must address the selection of the framing members, the connections of the framing members to the supporting structure, the layout of the sheathing, and the fastening schedule for attaching the sheathing to the framing members.

4.1.2 Allowable Uniform Gravity and Uplift Loads: The allowable uniform gravity loads for the USG Structural Panel Concrete Subfloor are shown in Table 1A. The allowable uniform gravity loads and the nominal uplift loads for the USG Structural Panel Concrete Roof Deck fastened to cold-formed steel at various fastener spacings are shown in Table 1B. For Allowable Strength Design (ASD), the tabulated values must be divided by a safety factor, \( \Omega \), of 3.0. For Load and Resistance Factor Design (LRFD), the tabulated values must be multiplied by a resistance factor, \( \phi \), of 0.50.

4.1.3 Diaphragm Loads:

4.1.3.1 General: Diaphragm analysis must comply with the applicable requirements of IBC Chapter 16. For horizontal diaphragms constructed with the USG Structural Panels, the length-to-width aspect ratio of the diaphragm must be no greater than 3:1 for unblocked diaphragms and 4:1 for blocked diaphragms. Diaphragm classification as flexible or rigid must be determined in accordance with Section 12.3.1 of ASCE 7. USG Structural Panels used in unblocked diaphragms and diaphragms blocked with steel straps must have tongue-and-groove edges.

Diaphragm design must consider diaphragm loading parallel and perpendicular to the floor framing. For select configurations, the results of testing of simple beam assemblies are shown in Table 2. These values are applicable when the diaphragm load is parallel to the framing members. Results of testing of cantilever assemblies are shown in Table 3. These values apply to diaphragm loads which are parallel and perpendicular to the framing, except where loading parallel to framing is addressed in Table 2. The values in Tables 2 and 3 are nominal diaphragm shear values, which must be adjusted for use in ASD or LRFD. in accordance with the footnotes to the tables. A safety factor, \( \Omega \), of 2.80 must be used for ASD and a resistance factor, \( \Phi \), of 0.60 must be used for LRFD.

4.1.3.2 Deflections: Diaphragm deflection must be calculated as follows:

4.1.3.2.1 Based on Simple Beam Diaphragm Testing: Deflection of diaphragms loaded parallel to the framing, for which diaphragm strength is provided in Table 2, must be calculated as follows:

\[
\Delta = \frac{5VL^3}{36EA} + \frac{VL}{4Gt} + Xle_n
\]

where:
- \( \Delta \) = Diaphragm deflection, inch
- \( V \) = Unit shear parallel to the framing, plf
- \( L \) = Diaphragm length perpendicular to the framing, feet
- \( E \) = Elastic modulus of steel rim members designed as diaphragm chords, 29,500,000 psi
- \( A \) = Net area of steel rim chord cross section, \( \text{in}^2 \)
- \( b \) = Diaphragm width parallel to the direction of the applied load, feet
- \( G \) = Shear modulus of sheathing, 285,714 psi
- \( t \) = Effective thickness of sheathing, 0.73 inch
- \( X \) = Slip coefficient from Table 2
- \( e_n = \) Fastener slip, which is based on the ratio of \( V/S_u \) as follows:
  - \( e_n = 0.011 \) inch at 0.20\( S_u \)
  - \( e_n = 0.019 \) inch at 0.33\( S_u \)
  - \( e_n = 0.032 \) inch at 0.60\( S_u \)
  - \( e_n = 0.084 \) inch at \( S_u \)
  where:
  - \( S_u = \) Nominal shear strength given in Table 2

Other values of \( e_n \) are permitted to be determined by interpolation.

4.1.3.2.2 Based on Cantilever Diaphragm Testing: Deflection of diaphragms loaded parallel or perpendicular to the framing, for which diaphragm strength is provided in Table 3, must be calculated as follows:

\[
\Delta = \frac{5V(2L)^3}{8EA} + \frac{VL}{4Gt} + X(2L)e_n
\]

where:
- \( \Delta \) = Diaphragm deflection, inch
- \( V \) = Unit shear in the direction under consideration, plf
- \( L, E, A, b, G, t \) = See Section 4.1.3.2.1.
- \( X \) = Slip coefficient from Table 3
- \( e_n = \) Fastener slip, which is based on the ratio of \( V/S_u \) as follows:
  - \( e_n = 0.011 \) inch at 0.20\( S_u \)
  - \( e_n = 0.019 \) inch at 0.33\( S_u \)
  - \( e_n = 0.032 \) inch at 0.60\( S_u \)
  - \( e_n = 0.084 \) inch at \( S_u \)
  where:
  - \( S_u = \) Nominal shear strength given in Table 3

Other values of \( e_n \) are permitted to be determined by interpolation.

4.2 Installation:

4.2.1 General: Installation of USG Structural Panels and framing must be in accordance with the IBC, this report, USG’s published installation instructions and the approved plans. Copies of this report, USG’s published installation instructions and the approved plans must be available at the jobsite at all times during installation of the panels.

4.2.2 Framing: The floor or roof framing must be supported on a foundation that is uniform and level, or directly by bearing studs or headers installed at the top of the bearing wall to distribute the load.

Web stiffeners must be provided at reaction points and/or concentrated loads as specified in the approved plans, based on the framing manufacturer’s requirements and the applicable ICC-ES evaluation report on the framing members. End blocking must be provided where joists ends are not otherwise restrained from rotation.

Floor or roof framing must be provided at a spacing indicated in the tables in this report. Additional framing must be provided under parallel partitions and around all openings that interrupt one or more spanning members. Framing members must be fastened to the supporting walls or structure in accordance with the approved plans.

All blocking or bridging for the steel framing must be installed prior to the installation of the USG Structural Panels.
Framing must comply with the manufacturing tolerances specified in the code.

When blocking is required at the abutting edges of the panels, it must be centered under the longitudinal joints between sheathing panels, and installed prior to installation of the sheathing panels.

4.2.3 USG Structural Panels Application:

4.2.3.1 General: The temperature during panel installation must be a minimum of 0°F (-18°C).

4.2.3.2 Panel Layout: USG Structural Panels must be installed with the long edges perpendicular to the framing. Panels may be installed with either surface against the framing. However, because the panel markings that facilitate fastening are on one side only, the panels should preferably be applied with the markings toward the installer.

Panel installation must commence by marking a line across the framing members parallel to the rim joist at a distance equal to the width of the first panel being placed. Whenever possible, the panel layout must be planned so the first and last panel row width is a minimum of 24 inches (610 mm). Panels less than 24 inches (610 mm) wide must be supported by framing on all sides in accordance with the USG installation instructions.

The cut edge or tongue must be placed along the rim joist. Each panel must be supported across two or more framing members, as indicated in the tables in this report. Panels must be trimmed to ensure that the butted ends of each panel are centered on the framing member flanges.

For panels with tongue-and-groove edges, adjacent panels must be butted together so that the tongue of one panel being installed fits into the groove of the installed panel. Panels with square edges must be butted tightly together. No gaps are required between panels. When the framing spacing is 24 inches (610) or less, panel rows must be placed in a running bond pattern so that end joints fall over the center of the framing members and are staggered by at least two framing members from where the end joints fall in the adjacent rows, except when panels less than 8 feet (2440 mm) long are used, in which case an offset of one framing member is allowed. When the framing spacing is greater than 24 inches (610 mm), panel rows must be placed in a running bond pattern so that end joints fall over the center of the framing members and are staggered by at least one framing member from where the end joints fall in the adjacent panel rows.

4.2.3.3 Panel Fastening: Each panel must be fastened to the framing members in accordance with the requirements for the applicable screw pattern shown in Tables 2 and 3, and in accordance with the fastening schedule specified in the approved plans. Fastening must commence at one end and fan out across the panel, and corners must not be fastened initially. Fasteners must be placed sequentially one row at a time. Screws must be installed using tools recommended by the screw manufacturer. Screw fasteners must be installed so the heads are flush with the panel surface. Panels must be fastened in accordance with one of the following patterns, as required by Tables 2 and 3:

- **Screw Pattern A**: Sheathing must be fastened at 4, 6 or 8 inches (102, 152 or 203 mm) on center at the perimeter of the diaphragm and at the panel-to-panel butt joints, as required by Tables 2 and 3. At the panel corners, fasteners must be inset 2 inches (51 mm). In the field of the panel, fasteners must be spaced a maximum of 12 inches (305 mm) on center. Fastener edge distance at all panel edges must be a minimum of \( \frac{1}{2} \) inch (12.7 mm), except at T-joints (intersection of butt joint with tongue-and-groove joint) where two fasteners are required, one placed 1 inch (25.4 mm) and another at 2 inches (61 mm) from the panel edge. Figure 1 illustrates the Screw Pattern A fastener layout.

- **Screw Pattern B**: Sheathing must be fastened at 4, 6 or 8 inches (102, 152 or 203 mm) on center at the perimeter of the diaphragm and at the panel-to-panel butt joints, as required by Tables 2 and 3. At the panel corners, fasteners must be inset 2 inches (51 mm). In the field of the panel, fasteners must be spaced a maximum of 12 inches (305 mm) on center. Fastener edge distance at all panel edges must be a minimum of \( \frac{1}{2} \) inch (12.7 mm), except at T-joints where one fastener must be placed 1 inch (25.4 mm) from the panel edge. Figure 2 illustrates the Screw Pattern B fastener layout.

- **Screw Pattern C**: Sheathing must be fastened at 6 inches (152 mm) on center at the perimeter of the diaphragm, at the panel-to-panel butt joints, and at blocking at the tongue-and-groove joints. At the panel corners, fasteners must be inset 2 inches (51 mm), with an additional fastener installed at the T-joint. In the field of the panel, fasteners must be spaced a maximum of 12 inches (305 mm) on center. Fastener edge distance at panel edges parallel to framing and at cut edges must be a minimum of \( \frac{1}{2} \) inch (12.7 mm). Fastener edge distance at tongue and groove panel joint over blocking must be a minimum of 1 inch (25.4 mm). Figure 3 illustrates the Screw Pattern C fastener layout.

4.2.3.4 Field Modifications: As needed, the panels must be cut to proper length and width in accordance with USG’s installation instructions.

Cut-outs in the panels must be created before installation of the panels. All cut-out ends and edges exceeding 6 inches (152 mm) in any dimension must be supported by framing.

4.2.4 Floor Finish: Before application of floor finish materials, all structural panels must be completely fastened. All voids and depressions in the panel surface must be filled with cement-based patching or leveling compounds. Panel surfaces must be clean and free of moisture.

Before application of floor finish materials, USG Structural Panel Concrete Subfloor must be conditioned in the same environment as required for the finish floors, if applicable, for at least 48 hours.

Underlayment must be secured to USG Structural Panel Concrete Subfloor with fastenings specified for the flooring material. Mechanical fasteners must be long enough to penetrate the USG Structural Panel Concrete Subfloor \( \frac{1}{2} \) to \( \frac{3}{4} \) inch (6.4 to 12.7 mm).

For wood flooring, No. 15 felt or equivalent must first be laid over the USG Structural Panel Concrete Subfloor. For engineered wood flooring, the specified moisture barrier must be used in lieu of the felt. The USG Structural Panel Concrete Subfloor must be kept dry and maintained in a conditioned space for a minimum of 30 days prior to the installation of wood flooring. The wood flooring must then be installed in accordance with the wood flooring manufacturer's installation instructions for application over wood floor sheathing.

Tackless strips, designed for concrete application, must be used for the installation of stretched carpet.

4.2.5 Roof Finish: Before application of approved roof coverings, all structural panels must be completely fastened. Panel surfaces must be clean and free from
moisture. Roof membranes or insulation must be attached directly to the panels.

4.3 Special Inspections: For the purpose of determining special inspection requirements, the floor systems described in this report must be considered special cases, in accordance with Section 1705.1.1 of the IBC (2009 IBC Section 1704.15). Inspection of diaphragm construction is required when the fastener spacing is less than or equal to 4 inches (102 mm).

5.0 CONDITIONS OF USE
The USG Structural 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 The products must be installed in accordance with this report, the manufacturer’s published instructions, the approved plans and the applicable code. In the event of a conflict amongst these documents, the most restrictive requirements govern.

5.2 Calculations and details showing that the applied gravity and uplift loads do not exceed the applicable uniform load capacity, and that the applied diaphragm loads do not exceed the available diaphragm strengths specified in this report, must be submitted to the code official for approval. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.3 Design of the supporting building foundation system or walls is outside the scope of this report.

5.4 The uplift loads in this report apply only to the structural capacity of the panel and its attachment to the supporting framing. Evaluation of allowable uplift loads for roof covering systems applied to the USG Structural Panel Concrete Roof Deck are outside the scope of this report.

5.5 The USG Structural Panels are manufactured 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 Structural Cementitious Floor and Roof Sheathing Panels (AC318), dated March 2018.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Horizontal Diaphragms Consisting of Structural Cementitious Sheathing Panels Attached to Cold-formed Steel Framing (AC319), dated March 2018.

7.0 IDENTIFICATION

7.1 Each panel is labeled with either the USG Structural Panel Concrete Subfloor or USG Structural Panel Concrete Roof Deck brand name; the United States Gypsum Company name and address; the panel thickness; the maximum framing spacing for the panel (referred to as the maximum span); the maximum allowable load (uniform live and dead gravity load); the ICC-ES report number (ESR-1792); and the date of manufacture.

7.2 The report holder’s contact information is the following:

UNITED STATES GYPSUM COMPANY
550 WEST ADAMS STREET
CHICAGO, ILLINOIS 60661
(312) 436-6139
www.usg.com

<table>
<thead>
<tr>
<th>JOIST SPAN (inches)</th>
<th>ALLOWABLE UNIFORM LOAD¹ (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>440</td>
</tr>
<tr>
<td>16</td>
<td>248</td>
</tr>
<tr>
<td>19.2</td>
<td>172</td>
</tr>
<tr>
<td>24</td>
<td>110</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

¹These loads represent the load-carrying capacity of the panels spanning between the floor joists. A minimum of two spans is required. This table does not consider the influence of joist deflection.

<table>
<thead>
<tr>
<th>JOIST SPAN (inches)</th>
<th>ALLOWABLE UNIFORM GRAVITY LOAD (psf)</th>
<th>NOMINAL UNIFORM UPLIFT LOAD (psf)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>80</td>
<td>6/12 192 8/8 240 6/6 240 4/4 240</td>
</tr>
<tr>
<td>48</td>
<td>50</td>
<td>8/12 128 8/8 150 6/6 150 4/4 150</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

¹Values based on panel flexural properties, fastener pull-through and fastener pull-out from the supporting steel. For Allowable Strength Design (ASD), the tabulated values must be divided by a safety factor, Ω, of 3.0. For Load and Resistance Factor Design (LRFD), the tabulated values must be multiplied by a resistance factor, ϕ, of 0.50.
### TABLE 2—NOMINAL SHEAR STRENGTH FOR SIMPLE BEAM DIAPHRAGMS CONSTRUCTED WITH USG STRUCTURAL PANELS¹,²,³,⁴

<table>
<thead>
<tr>
<th>JOIST SPACING (inches)</th>
<th>MINIMUM NUMBER OF SUPPORTS PER PANEL</th>
<th>REQUIRED BLOCKING⁵</th>
<th>MAXIMUM FASTENER SPACING (inches)</th>
<th>SCREW PATTERN</th>
<th>SHEAR STRENGTH, Sₜ (plf)</th>
<th>SLIP COEFFICIENT, X</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE SUBFLOOR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>3</td>
<td>Strap</td>
<td>6</td>
<td>12</td>
<td>C</td>
<td>1,526</td>
</tr>
<tr>
<td>24</td>
<td>3</td>
<td>None</td>
<td>4</td>
<td>12</td>
<td>A or B</td>
<td>1,357</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
<td>None</td>
<td>6</td>
<td>12</td>
<td>A or B</td>
<td>1,072</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
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<td>4</td>
<td>12</td>
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<td>16</td>
<td>3</td>
<td>None</td>
<td>6</td>
<td>12</td>
<td>B</td>
<td>1,429</td>
</tr>
</tbody>
</table>

| **CONCRETE ROOF DECK** |                                       |                     |                                   |                |                          |                     |
| 32                     | 2                                     | Strap               | 8                                 | 12             | C                       | 1,317               | 0.193               |
| 48                     | 2(⁶)                                  | Track               | 8                                 | 12             | C                       | 1,488               | 0.301               |
| 32                     | 2                                     | Strap               | 4                                 | 12             | C                       | 2,035               | 0.216               |
| 48                     | 2(⁶)                                  | Track               | 4                                 | 12             | C                       | 2,812               | 0.415               |

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

¹See Section 3.2 for cold-formed steel framing requirements.
²See Section 3.4 for fastener requirements.
³See Section 4.2.3.3 for a description of the screw patterns.
⁴For Allowable Strength Design (ASD), the tabulated values must be divided by a safety factor, Ω, of 2.8. For Load and Resistance Factor Design (LRFD), the tabulated values must be multiplied by a resistance factor, ϕ, of 0.60.
⁵See Section 3.3 for blocking requirements.
⁶When only two supports are provided (single span) a framing member must be added at the center of the panel, running between the two supports, as illustrated in the USG installation instructions.

### TABLE 3—NOMINAL SHEAR STRENGTH FOR CANTILEVER DIAPHRAGMS CONSTRUCTED WITH USG STRUCTURAL PANELS¹,²,³,⁴

<table>
<thead>
<tr>
<th>JOIST SPACING (inches)</th>
<th>MINIMUM NUMBER OF SUPPORTS PER PANEL</th>
<th>REQUIRED BLOCKING⁵</th>
<th>MAXIMUM FASTENER SPACING (inches)</th>
<th>SCREW PATTERN</th>
<th>SHEAR STRENGTH, Sₜ (plf)</th>
<th>SLIP COEFFICIENT, X</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE SUBFLOOR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>3</td>
<td>Strap</td>
<td>6</td>
<td>12</td>
<td>C</td>
<td>1,148</td>
</tr>
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<td>12</td>
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<td>None</td>
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<td>12</td>
<td>A</td>
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</tr>
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<td>12</td>
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<td>522</td>
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<td>487</td>
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<td>16</td>
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<td>12</td>
<td>A</td>
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<td>16</td>
<td>3</td>
<td>None</td>
<td>6</td>
<td>12</td>
<td>A</td>
<td>956</td>
</tr>
<tr>
<td>16</td>
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<td>6</td>
<td>12</td>
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<tr>
<td>12</td>
<td>3</td>
<td>None</td>
<td>8</td>
<td>12</td>
<td>A</td>
<td>779</td>
</tr>
</tbody>
</table>

| **CONCRETE ROOF DECK** |                                       |                     |                                   |                |                          |                     |
| 32                     | 2                                     | Strap               | 8                                 | 12             | C                       | 1,006               | 0.481               |
| 48                     | 2(⁶)                                  | Track               | 8                                 | 12             | C                       | 1,098               | 0.391               |
| 32                     | 2                                     | Strap               | 4                                 | 12             | C                       | 1,516               | 0.570               |
| 48                     | 2(⁶)                                  | Track               | 4                                 | 12             | C                       | 1,641               | 0.426               |

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

¹See Section 3.2 for cold-formed steel floor framing requirements.
²See Section 3.4 for fastener requirements.
³See Section 4.2.3.3 for a description of the screw patterns.
⁴For Allowable Strength Design (ASD), the tabulated values must be divided by a safety factor, Ω, of 2.8. For Load and Resistance Factor Design (LRFD), the tabulated values must be divided by a resistance factor, ϕ, of 0.60.
⁵See Section 3.3 for blocking requirements.
⁶When only two supports are provided (single span) a framing member must be added at the center of the panel, running between the two supports, as illustrated in the USG installation instructions.
FIGURE 1—SCREW PATTERN A LAYOUT

1. Two-Span offset of Seams w/o Blocking. One Span w/ Blocking

Screw Pattern A

DETAIL - A

Tongue & Groove
FIGURE 2—SCREW PATTERN B LAYOUT

Screw Pattern B

1. Two-Span offset of Seams w/o Blocking

DETAIL - B
FIGURE 3—SCREW PATTERN C LAYOUT

Screw Pattern C

DETAIL -C: Strap Block Detail

1. One Span offset w/ Blocking
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that the USG Structural Panel Concrete Subfloor and Structural Panel Concrete Roof Deck, described in ICC-ES master evaluation report ESR-1792, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:
- 2017 City of Los Angeles Building Code (LABC)
- 2017 City of Los Angeles Residential Code (LARC)

2.0 CONCLUSIONS

The USG Structural Panels, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1792, comply with the LABC and the LARC and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The USG Structural Panels described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the master evaluation report ESR-1792.
- The design, installation, conditions of use and identification of the USG Structural Panels are in accordance with the 2015 International Building Code® (2015 IBC) provisions noted in the master evaluation report ESR-1792.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued January 2020.
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that the USG Structural Panel Concrete Subfloor and Structural Panel Concrete Roof Deck, described in ICC-ES master evaluation report ESR-1792, have also been evaluated for the codes noted below.

Applicable code edition:
- 2016 California Building Code (CBC)
- 2016 California Residential Code (CRC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see Sections 2.1 and 2.2 below.

2.0 CONCLUSIONS

The USG Structural Panels, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1792, comply with CBC and CRC Section R301.1.3, provided the design and installation are in accordance with the 2015 International Building Code® (IBC) provisions noted in the master report, and the additional design and inspection requirements of the CBC Chapter 16 and Section 1705.1.1.

2.1 OSHPD:
The USG Structural Panels, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1792, satisfy CBC amended Section 104.11, provided the design and installation are in accordance with the 2015 International Building Code® (IBC) provisions noted in the master report, and the additional requirements in Sections 2.1.1 and 2.1.2 of this supplement:

2.1.1 Special Inspection Requirements: Special inspection shall be required in accordance with Section 1705.1.1 [OSHPD 2] or Section 1705A.1.1 [OSHPD 1 & 4] of the CBC, as applicable.

2.1.2 Conditions of Use: Framing must comply with the manufacturing tolerances specified in Section A5.4 of AISI S200-12, which is referenced in Section 2211.1 [OSPHD 2] or Section 2211.1A [OSHPD 1 & 4] of the CBC, as applicable.

2.2 DSA:
The USG Structural Panels, described in Sections 2.0 through 7.0 of the master evaluation report ESR-1792, satisfy CBC amended Section 104.11, provided the design and installation are in accordance with the 2015 International Building Code® (IBC) provisions noted in the master report, and the additional requirements in Sections 2.2.1 to 2.2.2 of this supplement:

2.2.1 Special Inspection Requirements: Special inspection shall be required in accordance with Section 1705A.1.1 [DSA-SS & SS/CC] of the CBC.

2.2.2 Conditions of Use: Framing must comply with the manufacturing tolerances specified in Section A5.4 of AISI S200-12, which is referenced in Section 2211A.1 [DSA-SS] or Section 2211.1 [DSA SS/CC] of the CBC, as applicable.

This supplement expires concurrently with the evaluation report, reissued January 2020.