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HEBEL POWER FLOOR PANELS AND HEBEL THIN-BED MORTAR

CSI Sections:
03 41 00 Precast Structural Concrete

1.0 RECOGNITION

Hebel Power Floor Panels and Hebel Thin-Bed Mortar recognized in this report has been evaluated for use as structural floor assemblies. The strength, durability and noncombustibility properties of the Hebel Power Floor Panels and Hebel Thin-Bed Mortar complies with the intent of the provisions of the following codes and regulations:

- 2015, 2012 and 2009 International Building Code® (IBC)

2.0 LIMITATIONS

Use of the Hebel Power Floor Panels and Hebel Thin-Bed Mortar recognized in this report is subject to the following limitations:

2.1 Hebel Power Floor Panels shall be manufactured, identified and installed in accordance with this report and the applicable code. In the event of a conflict the more restrictive governs.

2.2 Construction plans, details and calculations for the Hebel Power Floor Panels shall be approved by the building official. Calculations and details shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

2.3 Supporting joists shall be designed in accordance with the IBC to support design loads, including the self-weight of the floor panels.

2.4 Use of Hebel Power Floor Panels for vibratory or impact loads is outside the scope of this report.

2.5 Use of Hebel Power Floor Panels as a lateral force-resisting system is outside the scope of this report. Use of diaphragm shear values noted in Section 3.2 of this report are limited to Seismic Design Categories A and B.

2.6 Hebel Power Floor Panels and thin-bed mortar are manufactured in Pesqueria, Nuevo Leon, Mexico, under a quality control program with inspections by an accredited inspection agency.

3.0 PRODUCT USE

3.1 General: Hebel Power Floor Panels recognized in this report are used as structural flooring supported by wood or steel structural joists or trusses.

3.2 Design: Hebel Power Floor Panels shall be installed over wood or steel joists or trusses spaced a maximum of 24 inches on-center (610 mm). Joists and trusses shall be designed in accordance with the IBC to support the loads, including the self-weight of the floor panels. The nominally 3-inch thick panels weigh approximately 9 psf (450 Pa). The maximum allowable uniform load shall not exceed 305 psf (14.6 kPa) when supported a maximum of 24-inches (610 mm) on-center. Table 1 of this report lists the maximum allowable diaphragm shear loads.

Systems	Maximum Diaphragm Shear (plf)	Joist Requirements, minimum
Wood systems – parallel to joists	392	2x6 nominal DF lumber spaced 24" o.c., minimum specific gravity of 0.50
Wood systems – perpendicular to joists	258	
Steel systems- parallel to joists	430	1.5" x 5.5" steel joists, minimum No. 22 gage (0.028-inch), spaced 24" o.c.
Steel systems – perpendicular to joists	343	

SI conversions: 1 inch = 25.4 mm; 1 plf = 1.488 kg/m

3.3 Installation:

3.3.1 General: Hebel Power Floor Panels shall be installed in accordance with this report and the approved construction plans. A copy of the plans and this report shall be available at the jobsite at all times during installation.

Typical installation details are illustrated in Figures 1 through 5 of this report. These typical details are intended for general guidance only and shall be substantiated for approval by the code official.

3.3.2 Hebel Power Floor Panels: Hebel Power Floor Panels shall be protected from moisture and abrasion by application of an approved topping.

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 IBC Section 104.11. This document shall only be reproduced in its entirety.



3.4 Fasteners: Fasteners shall be SFSintec's #12 DEKFAST metal screws or similar. For installation to wood joists screws shall be minimum 4½-inch (114 mm) long with minimum 3½-inch (88.9 mm) long threaded ends. Fasteners shall penetrate a minimum of 1½-inch (38 mm) into wood framing. Wood framing shall be of a species with a minimum SG of 0.50 or greater. For use with steel joists, screws shall penetrate a minimum of ¾-inch (19 mm) through steel framing. Table 2 of this report lists the allowable shear load per fastener.

	Shear	Pull-through	Pull-out
Wood	150	108	154 ¹
Steel	151	108	171

SI conversions: 1 lbs = 4.448 N

¹ per inch of penetration

Fasteners shall be spaced nominally 8-inches (203 mm) on-center along each joist line with edge distances as shown in Figure 1 of this report.

3.5 Miscellaneous: Hebel Power Floor Panels shall be installed over wood or steel floor joists or trusses spaced a maximum of 24-inches (610 mm) on-center. Panels shall be installed in a running bond pattern with joints staggered at least 24-inches (610 mm) as shown in Figure 1 of this report. Panels shall be fastened to the joists or trusses with fasteners as described in Section 3.4 of this report. Joints between AAC panels shall be filled with Hebel Thin Bed mortar prior to placement of adjacent panels.

4.0 PRODUCT DESCRIPTION

4.1 General: Hebel Power Floor Panels are manufactured from autoclaved aerated concrete (AAC) and consist of factory-steel reinforced noncombustible panels complying with ASTM C1452 and C1694, as applicable, as strength class AAC-4. See Table 3 of this report for minimum compressive strength and density requirements.

Strength Class	Minimum Compressive Strength (psi)	Nominal Dry Bulk Density (lb/ft ³)
AAC-4	580	31

SI conversions: 1 psi = 0.006895 MPa, 1 lb/ft³ = 16.02 kg/m³

The panels are 24 inches (610 mm) wide by 2⁷/₈ inches (75 mm) thick by 72 inches (1830 mm) or 80 inches (2030 mm) long. The panels have internal reinforcement consisting of 4 mm diameter (0.157 inch) reinforcing bars complying with ASTM C1452 and C1694, as applicable, with a minimum yield strength of 70 ksi (485 MPa) and a minimum tensile strength of 80 ksi (550 MPa). Longitudinal bars are spaced 9½ inches (241 mm) on-center running in the long direction and cross bar reinforcement is spaced 13¾ inches (350 mm)

in the 72-inch (1830 mm) long panel and 15³/₈ inches (390 mm) in the 80-inch (2030 mm) long panel on-center running in the short (width wise) direction. Cross bar reinforcement is welded to longitudinal reinforcement to provide mechanical anchorage.

The Hebel Power Floor Panels have a typical moisture content at delivery of 20 to 35 percent by weight. Moisture content reduces over time and reaches equilibrium at approximately 5 percent by weight after six months to one year.

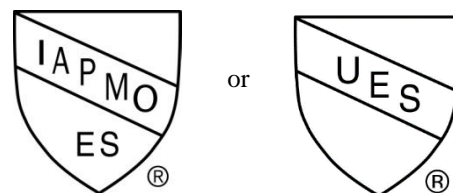
4.2 Thin-Bed Mortar: The thin-bed mortar complies with Section 2103.2.1 of the 2015 IBC (Section 2103.12 of the 2012 IBC, Section 2103.11 of the 2009 IBC). The thin-bed mortar is dry-mixed and pre-bagged from the factory with each bag weighing 48.5 pounds (22 kg). The thin-bed mortar shall be used with Hebel Power Floor Panels recognized in this report. The working life of the thin-bed mortar is four hours. When stored in unopened bags and protected from moisture the thin-bed mortar has a one-year shelf life from the date of manufacture.

5.0 IDENTIFICATION

Hebel Power Floor Panels are identified on the pallets by labels which shall include the manufacturer's name (Litecrete, S.A. de C.V.) and/or trademark (Litecrete), brand name (Hebel), product type, strength class and density, the IAPMO Uniform ES Mark of Conformity, and the Evaluation Report Number (ER-350). A die-stamp label may also substitute for the label.

Hebel Thin Bed Mortar is identified by packaging, which shall include the name Litecrete S.A. de C.V., the brand name (Hebel), the weight, and mixing and application instructions.

Either Mark of Conformity may be used as shown below:



IAPMO UES ER-350

6.0 SUBSTANTIATING DATA

Data in accordance with the ICC-ES Acceptances Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems (AC15), dated February 2010; manufacturer's Quality Control Procedures; manufacturer's descriptive literature and installation instructions. Test results are from laboratories in compliance with ISO/IEC 17025.

6.1 Reports of testing for compliance with the *Standard*



Specification for Autoclaved Aerated Concrete (AAC) in accordance with ASTM C1693.

6.2 Reports of testing for compliance with the *Standard Specification for Reinforced Autoclaved Aerated Concrete (AAC) Elements* in accordance with ASTM C1694.

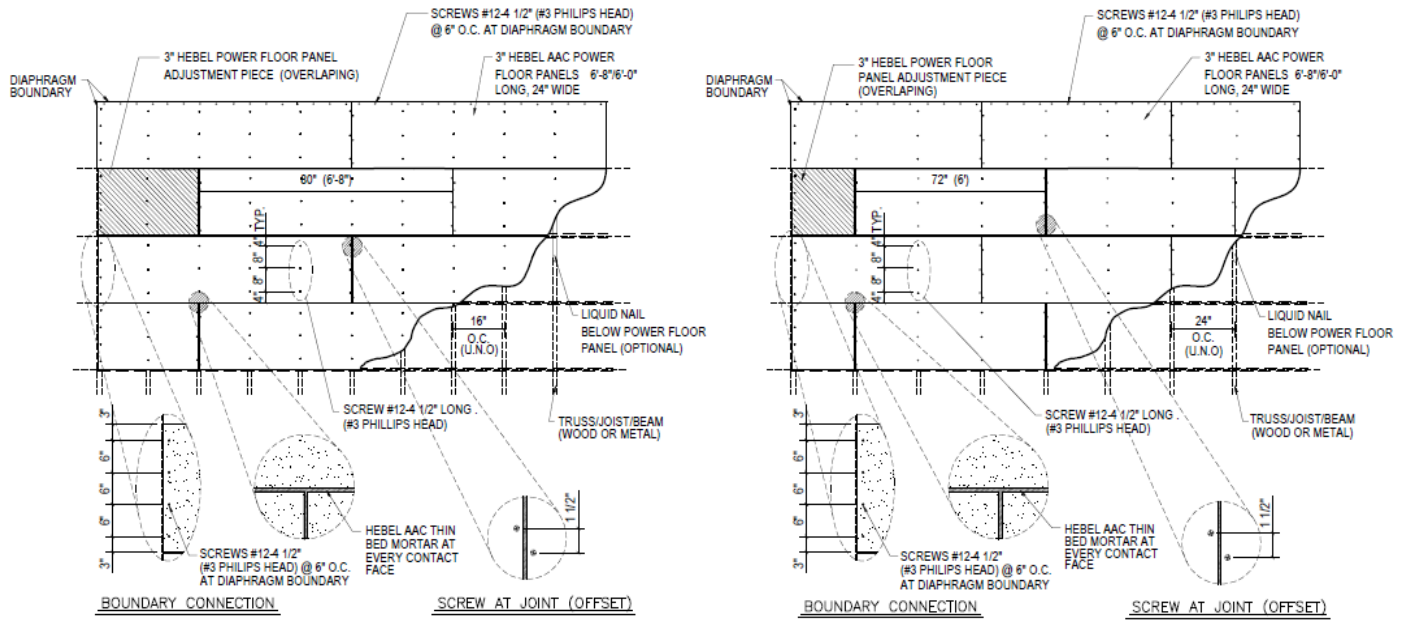
6.3 Reports of testing for compliance with the *Standard Specification for Thin-bed Mortar for Autoclaved Aerated Concrete (AAC) Masonry* in accordance with ASTM C1660.

6.4 Report of testing for noncombustible materials in accordance with ASTM E136.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on Hebel Power Floor Panels and thin-bed mortar used as structural flooring supported by wood or steel structural joists or trusses to assess conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification.

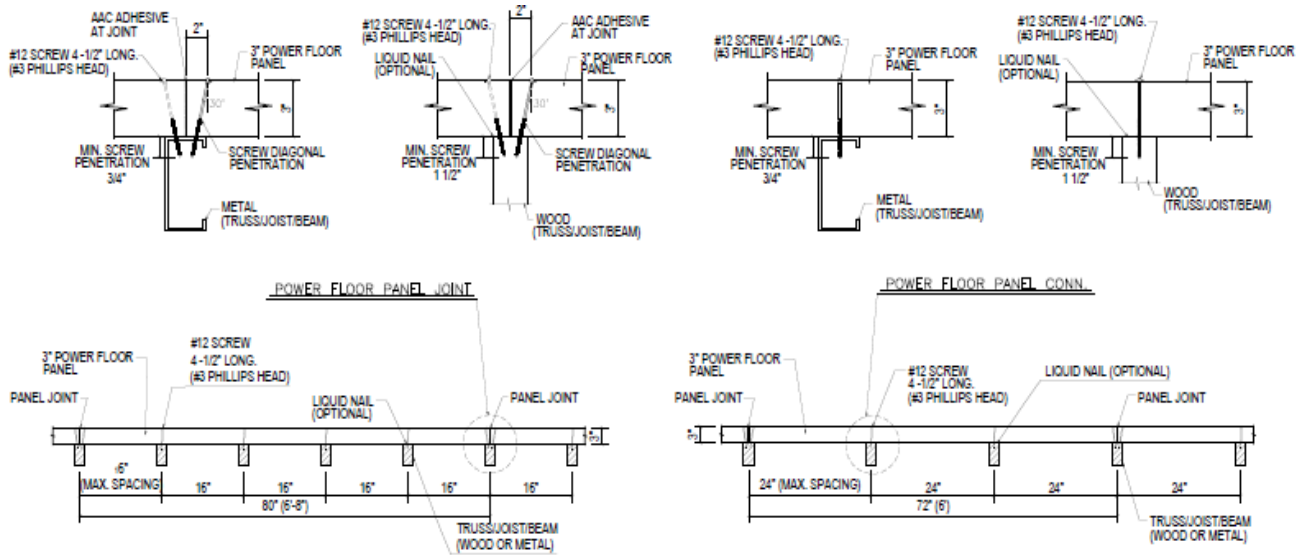
For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



(6'-8" LONG. PANELS - SUPPORTS @ 16" O.C.)

(6' LONG. PANELS - SUPPORTS @ 24" O.C.)

FIGURE 1. HEBEL POWER FLOOR SYSTEM LAYOUT



(6'-8" LONG. PANELS - SUPPORTS @ 16" O.C.)

(6' LONG. PANELS - SUPPORTS @ 24" O.C.)

FIGURE 2. HEBEL POWER FLOOR SYSTEM CONNECTIONS

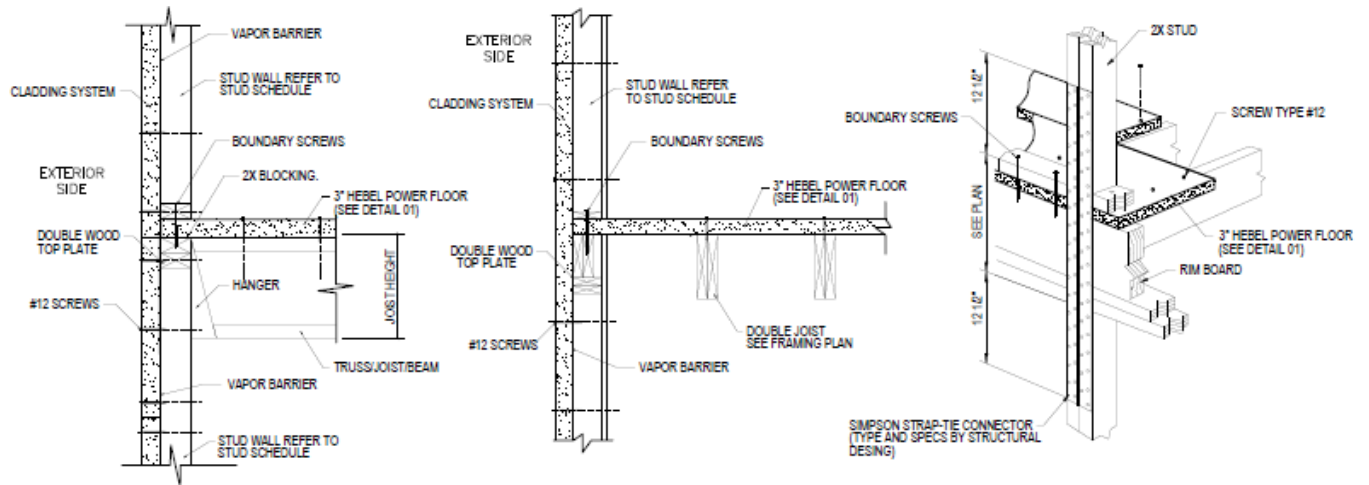


FIGURE 3. HEBEL POWER FLOOR SYSTEM BORDER CONNECTIONS (WOOD FRAMING)

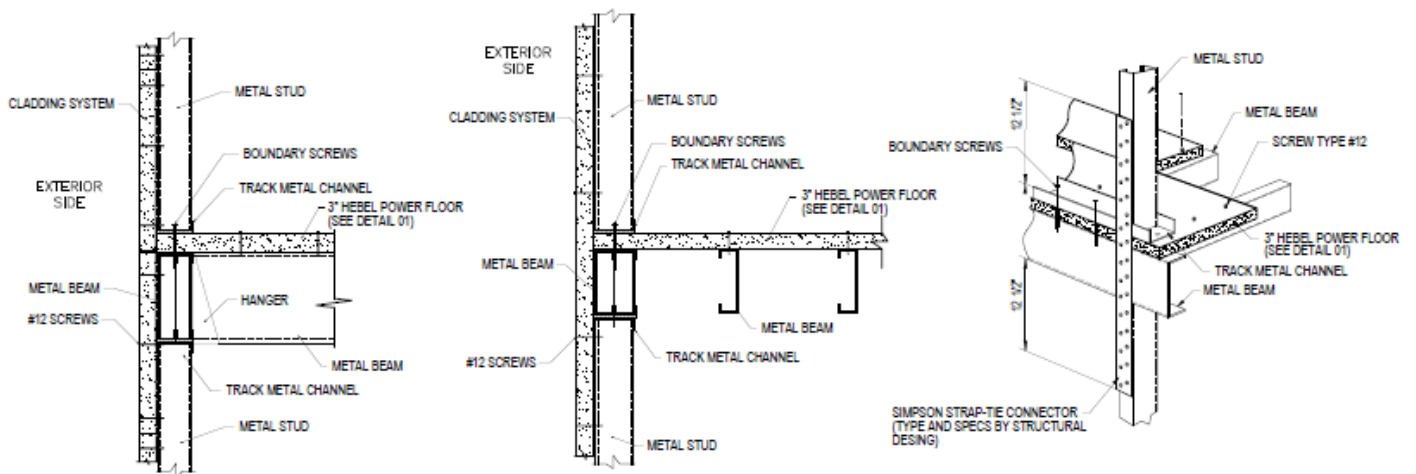


FIGURE 4. HEBEL POWER FLOOR SYSTEM BORDER CONNECTIONS (METAL FRAMING)

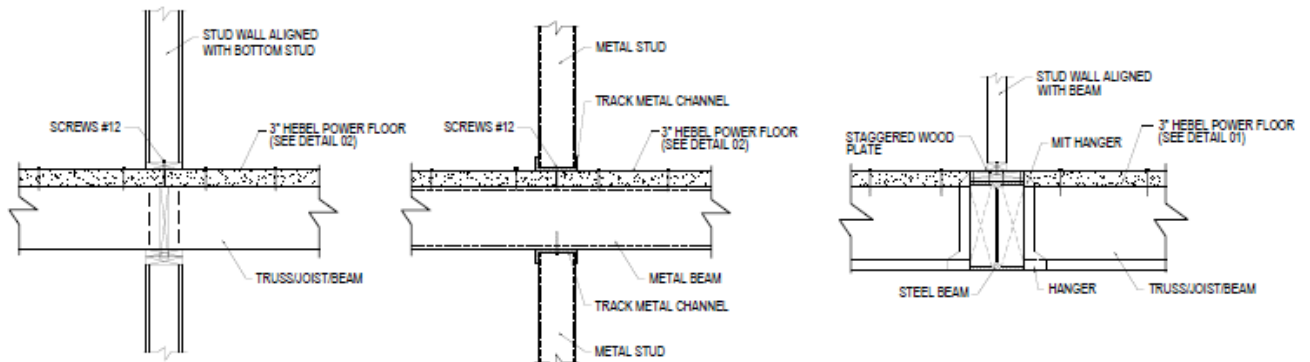


FIGURE 5. HEBEL POWER FLOOR SYSTEM INTERIOR CONNECTIONS (WOOD & METAL FRAMING)