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HEBEL POWER PANEL WALL SYSTEM AND HEBEL THIN-BED MORTAR

CSI Section:
03 41 00 Precast Structural Concrete

1.0 RECOGNITION

Hebel Power Panel wall system and Hebel Thin-Bed Mortar described in this report have been evaluated for use as wall panels. The strength, durability and noncombustibility were evaluated for compliance with the following codes and regulations:

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

2.0 LIMITATIONS

Use of Hebel Power Panel wall system and Hebel Thin-bed Mortar recognized in this report are subject to the following limitations:

2.1 Hebel Power 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 Panel wall system 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 studs and framing shall be designed in accordance with the applicable code to support design loads.

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

2.5 Hebel Power Panels and Hebel Thin-bed Mortar are manufactured in Pesquería, Nuevo Leon, Mexico, under a quality control program with inspections by an accredited inspection agency.

3.0 PRODUCT USE

3.1 General: Hebel Power Panels recognized in this report are used as structural wall panels supported by wood or steel structural supports.

3.2 Design: Hebel Power Panels shall be installed over wood or steel studs spaced a maximum of 24 inches on-center (610 mm). Supporting studs shall be designed in accordance with the applicable code to support the loads. The nominally 2-inch thick panels weigh approximately 6 psf (295 Pa). Table 1 of this report provides maximum allowable out-of-plane (wind) loads. The maximum allowable shear load is 127 plf (183 kN/m) when using #12 DEKFAST, or similar, fasteners.

Table 1. Allowable Out-of-Plane (Wind) Loads[1]

	Positive (psf)	**Negative** (psf)
Wood Studs[2]	41	41
Steel Framing[3]	64	41

SI conversions: 1 inch = 25.4 mm; 1 psf = 0.04788 kPa
[1] Supports at maximum 24 inches on-center
[2] Minimum nominal 2x6, DF No. 2 or better
[3] Minimum 5.50" x 1.625", No.18 gage (0.051 inch), 51 ksi

3.3 Installation:

3.3.1 General: Hebel Power 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 4 of this report. These typical details are intended for general guidance only and shall be substantiated for approval by the building official.

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

3.4 Fasteners: Fasteners shall be SFSintec's #12 DEKFAST metal screws or #12 DEKFAST wood screw or similar. For installation to wood studs, screws shall be minimum 3¼-inches (83 mm) long with minimum 3-inch (76.2 mm) long threaded ends. Fasteners shall penetrate a minimum of 1½-inch (38 mm) into wood studs. 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. See Table 2 of this report for allowable shear load per fastener.

Table 2. Allowable Load per Fastener (lbs)			
	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 stud line with edge distances as shown in Figure 1 of this report.

3.5 Miscellaneous: Hebel Power Panels shall be installed over wood or steel studs 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) when stud spacing is 24 inches (610 mm), or at least 16 inches (406 mm) when stud spacing is 16 inches (406 mm), as shown in Figure 1 of this report. Panels shall be fastened to the studs with fasteners as described in Section 3.4 of this report. Joints between Hebel Power Panels shall be filled with Hebel Thin-Bed Mortar prior to placement of adjacent panels.

4.0 PRODUCT DESCRIPTION

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

Table 3. Physical 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/ft^3 = 16.02 kg/m^3

The wall panels are 24 inches (610 mm) wide by 2 inches (51 mm) thick by 48 inches to 96 inches (1,220 to 2,440 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 $9^1/_2$ inches (241 mm) on-center running in the long direction and cross bar reinforcement is spaced 15 inches (380 mm) in the 48 inch (1220 mm) long panel and $13^1/_4$ inches (340 mm) in the 96 inch (2440 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 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 Hebel Thin-Bed Mortar: The Hebel Thin-bed Mortar complies with ASTM C1660 and Sections 2103.2.1 of the 2015 IBC (Section 2103.12 of the 2012 IBC, Section 2103.11 of the 2009 IBC). The Hebel Thin-bed Mortar is dry-mixed and pre-bagged from the factory with each bag weighing 48.5 pounds (22 kg). The Hebel thin-bed Mortar shall be used with Hebel Power 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 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 and the Evaluation Report Number (ER-381). 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:

or

IAPMO UES ER-381

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 *Behavior of Materials in a Vertical Tube Furnace at 750*° C[1].

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on Hebel Power Panel wall system and Hebel Thin-bed Mortar used as structural wall panels supported by wood or steel structural supports to assess conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification. Products are manufactured at locations noted in Section 2.5 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

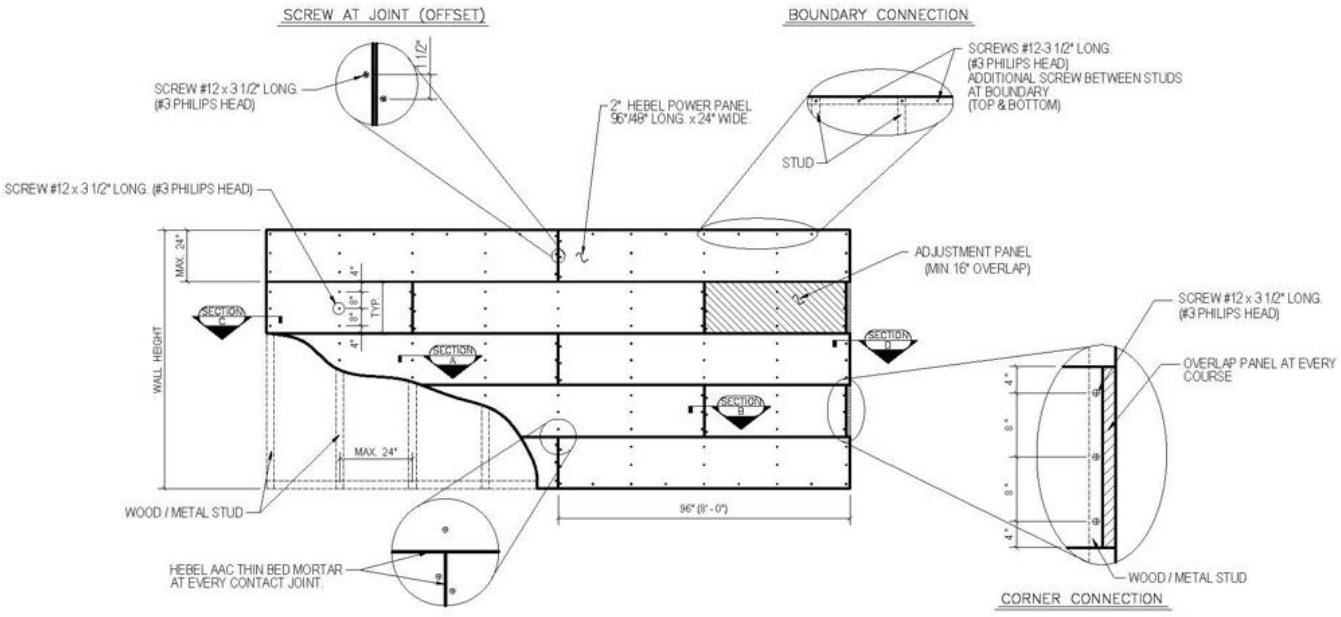

FIGURE 1. HEBEL POWER PANEL WALL SYSTEM LAYOUT

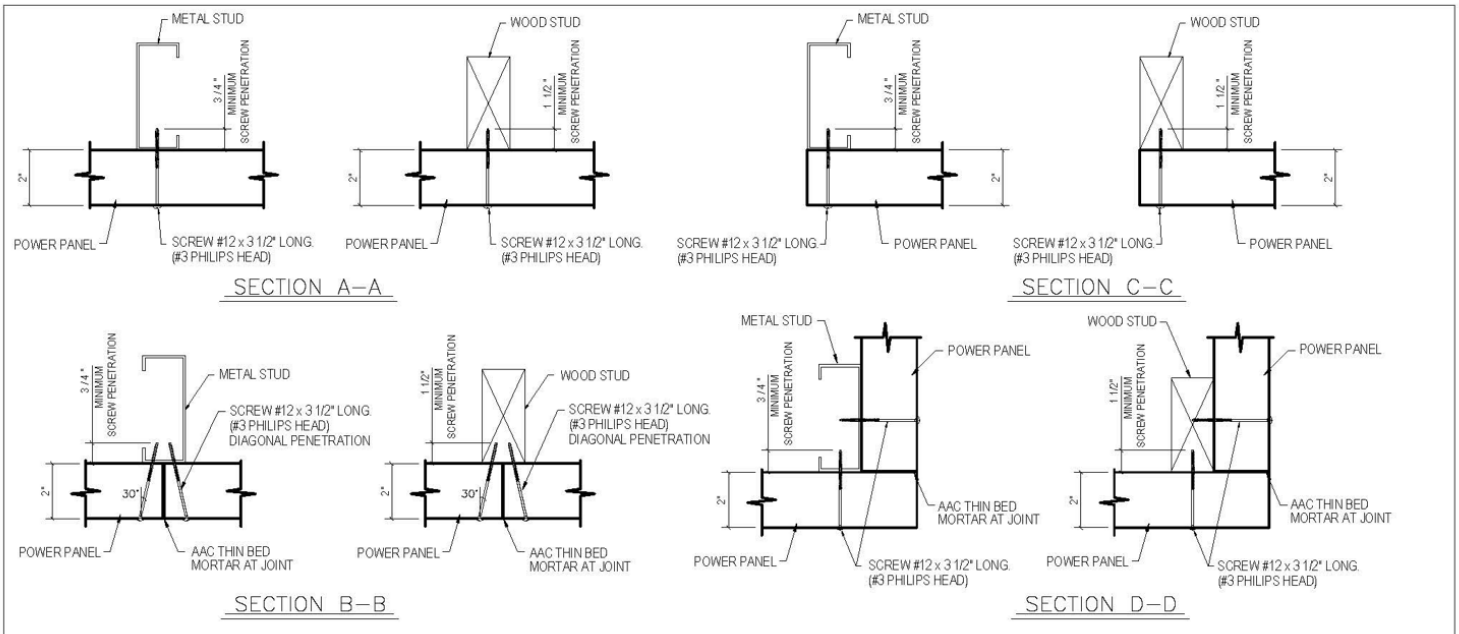

FIGURE 2. HEBEL POWER PANEL SYSTEM CONNECTIONS

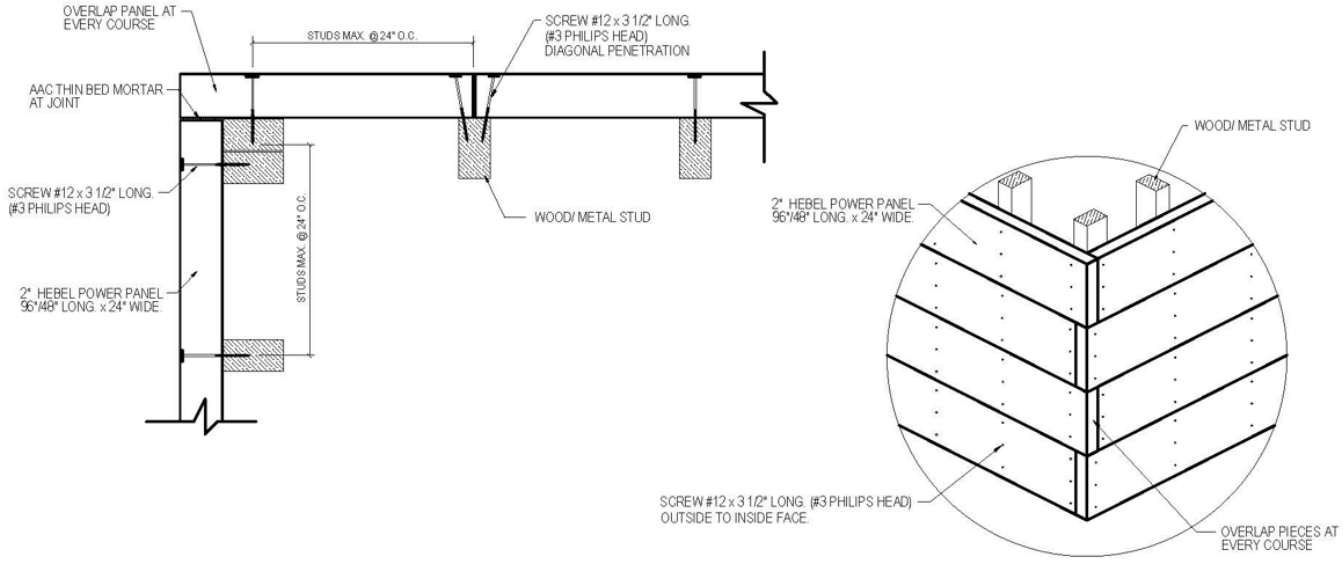

FIGURE 3. HEBEL POWER PANEL SYSTEM - CORNER CONNECTION

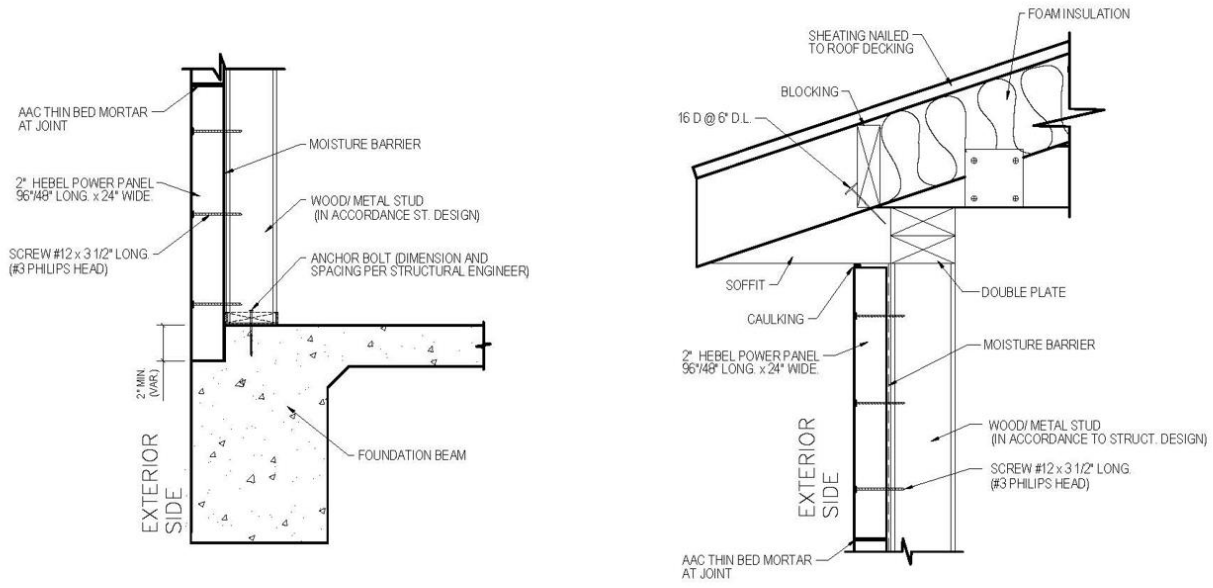

FIGURE 4. HEBEL POWER PANEL SYSTEM - EXTERIOR WALL SECTIONS