

Technical Sheet and Installation Guide
Hebel® Power Panel
Autoclaved Aerated Concrete



The Xella logo consists of the word "Xella" in a white, sans-serif font, positioned on a dark blue square background.

About us

Xella Aircrete North America, the leading manufacturer of **Hebel® Autoclaved Aerated Concrete (AAC)** is an amazingly innovative building material that has been used in Europe for more than 80 years and in the US for more than 15 years. Products and systems have been developed for all types of the construction industry: Industrial, commercial, high-rise buildings, schools, hospital and more.

Hebel® AAC is a lightweight concrete that is formed into blocks and reinforced panels for a wide range of loadbearing and non-loadbearing construction applications. It is manufactured from sand, cement, recycled material, lime, gypsum, aluminium paste and water. It is moulded, cut and steam pressure cured in an autoclave before being packed, ready for transport.

Hebel® AAC delivers more benefits than the traditional materials such as strength, acoustics, fire and pest resistance and is installed faster, saving valuable construction time.

It has a unique combination of thermal mass and insulation providing a more comfortable living environment.

Why Hebel

One of the worlds leading manufacturer of Hebel autoclaved aerated concrete (AAC), Xella Aircrete North America is transforming the building industry with Hebel, its ultra-lightweight concrete.

Committed to providing the United States with environmentally responsible building products that conserve material and energy usage, Xella's Hebel Aerated Concrete is recognized as the largest producer in Europe by capacity based on management estimates based on different sources and member of the Green Building Council. In addition, it has a high UL rating for fire resistance.

Xella Aircrete North America is a division of Germany-based Xella International.

More than 6.000 employees for Xella's total 91 plants and offices throughout 30 countries worldwide, including North America, Europe and Asia.

Hebel Aerated Concrete provides contractors with strong, easy-to-install blocks and reinforced panels that are one-third the weight of traditional concrete and replace traditional multi-step construction processes. In addition, Hebel is energy efficient, fire resistant and long lasting, which, over time, will reduce energy, insurance and maintenance costs to building owners. A wide range of industries can benefit from Hebel's custom blocks and reinforced panels, including those in the commercial, educational, hospitality, industrial, institutional, governmental and residential markets.



Aerated Concrete Hebel® :

Unique properties in a single material.

Benefits



Thermal Insulation

Buildings constructed of HEBEL AAC provide substantial energy savings in both hot and cold climates. The unique closed cellular structure and the thermal mass contribute to a high R-value and air-tightness which reduce heating and cooling costs and improve indoor air quality. Buildings have seen savings on air conditioning up to 35% by using HEBEL AAC.



Structural Performance

Strength can resist wind pressures without reinforcement. Shear wall strength can resist lateral loads. High impact resistance.



Fire Resistant

HEBEL AAC has proven to remain fully intact and withstand the stress of fire for up to 4 hours without any impairment to its stability. Even under intense heat, HEBEL AAC remains tightly sealed against smoke and gas, emitting no toxic fumes.



Acoustic Insulation

The solid wall construction of a building made of Hebel AAC provides exceptional acoustic insulation. Its porous structure and high surface mass, coupled with its ability to dampen mechanical vibration energy, greatly reduces outside environmental.



Resistance to humidity

Your works are always protected against moisture. It allows the passage of water vapor, reducing condensation. It is an inert material.



Green Building

Hebel and green building attributes

- Recyclable, inert & non-toxic.
- Energy saving, manufacturing through occupancy.
- Excellent life-cycle cost.
- Durable, natural finish options.
- Supports LEED credits.

Add up USGBC LEED Credits with Hebel

Physical Properties

The physical properties of HEBEL Autoclaved Aerated Concrete are unique to any other building material. Properties such as thermal insulation and fire resistance can not be met by another product alone.

- Speed of Construction
- Thermal Insulation & Energy Savings
- Superior Fire Resistance

- Sustainable
- Relatively high strength for a low density
- Workability
- Acoustic Performance
- Precision

This product meets Standards and Evaluation issued by:



ACI
530-13
ACI
523.4-R09



ASTM
C 1693-11
ASTM
C 1660-09



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Hebel® Power Panel Autoclaved Aerated Concrete

Uses and applications

Hebel® Power Panel can be applied directly to wood or metal studs, eliminating the need for additional structural sheathing such as plywood. The Hebel Power Panels are reinforced internally with a steel mesh protected with anti-corrosive coating. In addition, the lightweight nature of Hebel AAC allows a faster and more efficient construction.

Construction Advantages

- Steel Reinforced.
- Structural Performance.
- Fire Resistant.
- Light-weight.
- Long life.
- Efficient construction.
- Cost competitive.
- Fast and easy to install.
- Water penetration resistant.
- Termite and Pest-resistant.
- Workability.
- Environmentally friendly.

Application:

- Commercial
- Residential
- Industrial



Certifications:

NOM, ONNCCE, ASTM, UL, IAPMO, ACI, USGBC, TDI.

Wall solid-smooth and easy to install, weather resistant.

Hebel® Power Panel panels for light façades are installed directly on metal (or wooden) frames, which, because of their size and ease of installation, can be quickly assembled leaving a wall with a perfectly monolithic and uniform surface, achieving a better performance before loads of wind and at the same time to avoid the penetration of the humidity.

More benefits of Hebel® Power Panel

- Solid cellular concrete material, without deterioration of its properties over time.
- Monolithic surface: smooth walls with the capacity to receive all kinds of finishes or stonework.
- Greater thermal and acoustic insulation.
- Resistant to climate changes: rain, heat and humidity.
- As versatile as cutting, sanding, grooving.



Hebel® Power Panel
Autoclaved Aerated Concrete

German
Technology 

 hebel®

 yella®



Fig. 1 Hebel® Power Panel Package.

1 Technical Sheet

1.1 Hebel® Power Panel

General Features

Hebel® Power Panel is an Autoclaved Aerated Concrete (AAC) and steel reinforced element. The steel wire reinforcement is Grade 70 and it's covered with an anti-corrosive coating. Hebel® Power Panel can be cut and drilled with conventional tools.

Hebel® Power Panel is lightweight, fire resistant*, water penetration resistant**, pest resistant, fast and easy to install, versatile and affordable.

Uses

Hebel® Power Panel can be used as cladding for internal and external load-bearing and non-load-bearing walls in metal or wood frame construction. Appropriate for residential, hotels, commercial and industrial buildings.

* Under ASTM E119/ ** ASTM E514

Dimensions
Thickness: ⁽¹⁾⁽³⁾ 2 and 3 in.
Length: ⁽²⁾ 8 and 10 ft.
Width: ⁽²⁾ 24 in.

⁽¹⁾Tolerance ±1/8", ⁽²⁾ Tolerance 3/16", ⁽³⁾Nominal. Manufactured according to ASTM C1452, ASTM C1693.

Characteristic	Unit	AAC-4 Class
Minimum Compressive Strength (f' aac)	lb/in ²	580
Design Weight ⁽¹⁾	lb/ft ³	37
Nominal Density	lb/ft ³	31
Module of Elasticity	lb/in ²	295,000
Drying Shrinkage	%	< 0.02
Thermal Expansion Coefficient	1/ ⁽³⁾ K	8 x 10 ⁻⁶

⁽¹⁾Values consider material's moisture content.

Table 1: Physical and design properties.

Design Weight					
Thickness ⁽¹⁾		Length	Design Weight ⁽²⁾		Area per Piece
in	in ⁽¹⁾		AAC-4	lb/piece	
		ft	lb/ft ²	lb/piece	ft ²
2	1.969	8	6.14	98.4	16
3	2.953	8	9.22	147.7	16
3	2.953	10	9.22	184.6	20

* Exact dimension.

(1) Nominal dimension. (2) Values consider material's moisture content. (3) Standard width 24 in

Table 2: Hebel® Power Panel design weight.

Thermal Properties
Thermal Conductivity
0.9124 BTU-in/ft ² h ⁰ F

Units:

BTU=brish thermal unit, in=inches, ft²=square feet, h=hour, 0 F=Fahrenheit

Table 3: Hebel® Power Panel Thermal Conductivity.

Fire Performance		
Hebel® Power Panel	Fire Rating Hrs	UL Design Number
Panel 3" Metal / Wood Frame Assembly	1	U358
	2	V420
	3	U208
Panel 2" Metal/Wood Frame Assembly	2-4	U212, U205
	2	U213, U214

Note:

Testing performed at Underwriters Laboratories, Inc. under ASTM E119 (ANSI/UL 263) "Fire Test Building Constructions and Materials"

Table 4: Hebel® Power Panel fire rating.

Acoustic Performance		
Hebel® Power Panel	STC	Report Number
Hebel® Power Panel 3" (without finishes)	36	STORK 23816

Note: Testing performed at Stork Twin City Testing Corporation, Saint Paul, MN, in accordance with ASTM E (90) Standard Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

Table 5: Hebel® Power Panel acoustic performance.

2 Design Considerations.

2.1 General Considerations.

- Hebel® Power Panel shall be designed in order to comply with safety and serviceability requirements as specified by ACI 523.4R-09.
- Hebel® Power Panel should be installed in horizontal position in a “running bond” pattern.
- The wind loads, according to the region and Local Building Codes, will determine the number of screws required in each Hebel® Power Panel.
- Foundation should be constructed with a brick ledge (see Fig. 3a) or by installing a galvanized steel angle (see Fig. 3b).

- A water-resistance barrier should be installed on all wall areas before Hebel® Power Panel, windows and doors installation.
- Control joints may be vertical and horizontal and are placed to prevent random cracking due to thermal expansion, contraction and structural movements.
- Vertical control joints should be spaced at 20 ft. maximum from each other. The width of the vertical control joints should be 3/8” and should be sealed with backer rod and caulking.
- Horizontal control joints should be placed for multi-story construction at floor level and 20 ft maximum.
- The width of the horizontal control joint should be 5/8” for metal frame or 1” for wood frame, and should be sealed with backer rod and caulking.

3 Installation Guide.

3.1 General Installation Guidelines

Previous Installing Hebel® Power Panel

1. Check the Foundation:

- Make sure the slab foundation has a brick ledge of:
 - 2” deep (min) and 2” wide (max) for 2” Hebel® Power Panel (see Fig. 3a).
 - 2” deep (min) and 3” wide (max) for 3” Hebel® Power Panel (see Fig. 3a).
- In case the foundation doesn't have a brick ledge, install a continues galvanized steel angle 2” x 2” x 1/4” to support Hebel® Power Panel (see Fig. 3b).
- Check level of the brick ledge.

2. Check the Structure:

- Verify the complete and proper installation of all studs, trusses, lintels, bracing, reinforcing elements and connectors.
- Check plumb and alignment of studs of external walls.
- Studs (wood or metal) should not be spaced at more than 24 inches o.c. (please contact Xella's technical department otherwise).

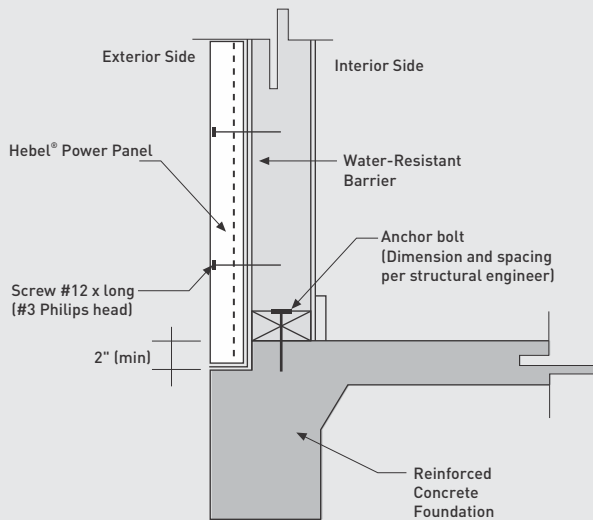
3. Check Hebel® Power Panel Pallets:

- Carefully unload the Hebel pallets using an all terrain fork-lift. Flat surfaces are required for unloading and storage areas.
- Place Hebel® Power Panel pallets close to their final position around the building and over wood blocks (panels must not be in contact with ground).
- Check Hebel® Power Panel quantity.



Fig. 2: Verify structure before Hebel® Power Panel installation.

a)



b)

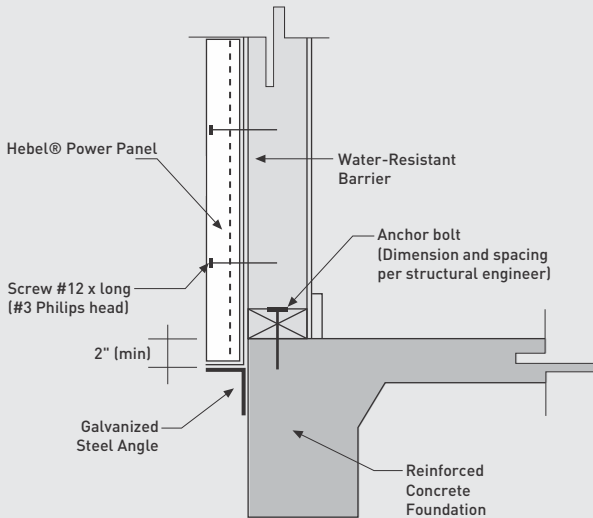


Fig. 3: Typical cross section for Hebel® Power Panel.

Equipment:

- Circular Saw (7¼" min) with metal cutting blade for 2" Hebel® Power Panel.
- Circular Saw (10¼" min) with metal cutting blade for 3" Hebel® Power Panel.
- D-Handle Drill ½" for fastening Hebel® Power Panel.
- Power Drill ½" (Low RPM) for Stirrer.
- Screwdriving Bits (Phillips).
- Clamps.
- Safety Gear (goggles, dust mask, gloves, apron, hard hat, etc.).

Additional Material:

- Cement-Sand Mortar.
- Screws #12 (see Table 6 for specifications).
- Hebel® Thin Bed Mortar and Hebel® Repair Mortar.
- Fiber Glass Mesh.
- Water-resistant barrier and cramp-irons.
- Anticorrosive Paint.
- Base-coat, Stucco, and Finish Coat.

Note: Technical support is available for builders and architects. Contact Xella Aircrete North America, Inc., for more information.



Fig. 4: Place Hebel® Power Panel pallets close to job site.

4. Check the Utilities:

- Make sure that water pipes have been installed properly with all vertical runs located between the studs and not on the external face of the frame.
- Ensure hermetic water and gas pipes.
- Check for electrical conduits, phone lines, TV antenna, cable, dryer ventilation, etc.

5. Application Requirements:

Tools:

- Plastic Bucket
- Masonry Level
- Rubber Mallet (24 oz min)
- Stirrer for Power Drill
- Spatula
- Chalk Line
- Finishing Trowel
- Sanding Float
- Masonry Scrub Brush
- Tape Measure

3.2 Hebel® Power Panel Installation

a. Water-Resistant Barrier

Before Hebel® Power Panel installation wrapping the frame is extremely important in preventing the build-up of moisture within the wall. Install the vapor barrier as a flashing under the Hebel® Power Panel before windows and doors are installed, extending it from the bottom to the top of the entire height of the wall and around corners. Overlap the roll following manufacturer instructions (see Fig.5).

Attach the water-resistant barrier with cramp-irons over wood or with self-drilling screws over metal studs.

b. Corner Installation

The first and most important step in Hebel® Power Panel installation is placing the corner boards. The corner Hebel® Power Panel should be installed in horizontal position with a 2" or 3" overhang (depending on panel thickness), so it may remain flush with the other corner board (see Fig. 6).

It is important to check the level and alignment using a masonry level. In case of uneven brick ledge, use a 1/2" of cement-sand mortar bed to ensure the level of the first Hebel® Power Panel (maximum bed thickness 1 1/2"). Correct small alignment differences, using a rubber mallet.

For fastening Hebel® Power Panel use #12 screws (0.21in) as specified in Tables 5 and 6. Pre-drilling of holes is not required. Use a minimum of 3 fasteners (screws) per stud/ board (see Fig. 7 and 8). Excessive tightening can cause damage to Hebel® Power Panel, resulting an improper placement.

Hebel® Power Panel Thickness	#12 ⁽¹⁾ Screw Length	Penetration Length (Minimum)
2"	3-3/4"	1-1/2"(wood)-3/4"(metal)
3"	4-1/2"	1-1/2"(wood)-3/4"(metal)

(1) Screw #12 - #3 Philips Head.

Table 6: Screws specifications.



Fig. 5: Interior side of the water-resistant barrier.



Fig. 6: Overlap Hebel® Power Panel at corners.



Fig. 7: Use minimum 3 fasteners per stud / board.

c. Subsequent Hebel® Power Panel

The subsequent Hebel® Power Panel should be mortared and fastened with the appropriate screws to ensure the best results. The Hebel® Power Panels are placed in a running bond pattern using Hebel thin bed mortar to join all board edges and then screw boards firmly into place (see Fig. 8 and 9, 9A).

Hebel thin bed mortar is mixed in a plastic bucket, adding water [see instructions on the bag] using a stirrer on a power drill. Remix before application.

Use a brush to clean the joint surface before mortar application. Thin bed mortar is applied using a notched trowel or spatula over the horizontal and vertical joints before the next panel installation.

The number of screws per panel shall be specified by the structural engineer but a minimum of 3 screws per stud must be used (see Tables 6 and 7).



Fig. 9: Hebel® Power Panel in a running bond pattern.

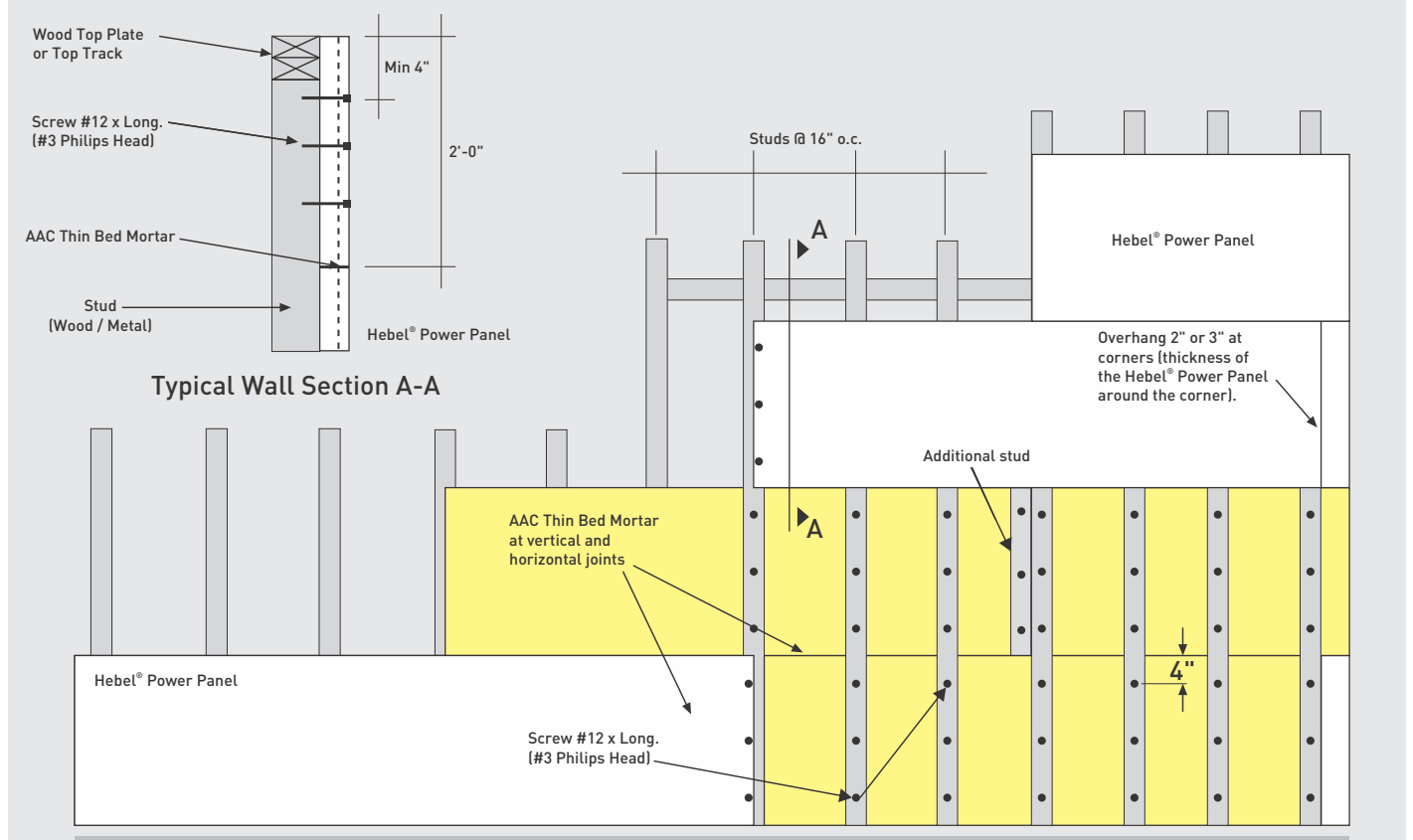


Fig. 8: Typical Hebel® Power Panel System.

Allowable shear wall and out-of-plane loads				
	Maximum Shear (plf)	Positive (psf)	Negative (psf)	Joist Requirements and screw minimum
Wood System	127	41	41	2 x 6 nominal of lumber spaced 24" O.C. screw #12, 3.5" long at 8" (3 per panel).
Steel System	127	64	41	1.625"x 5.5" steel studs minimum 18 gage (0.051 in), spaced 24" O.C.

Table 7: Allowable load capacity.

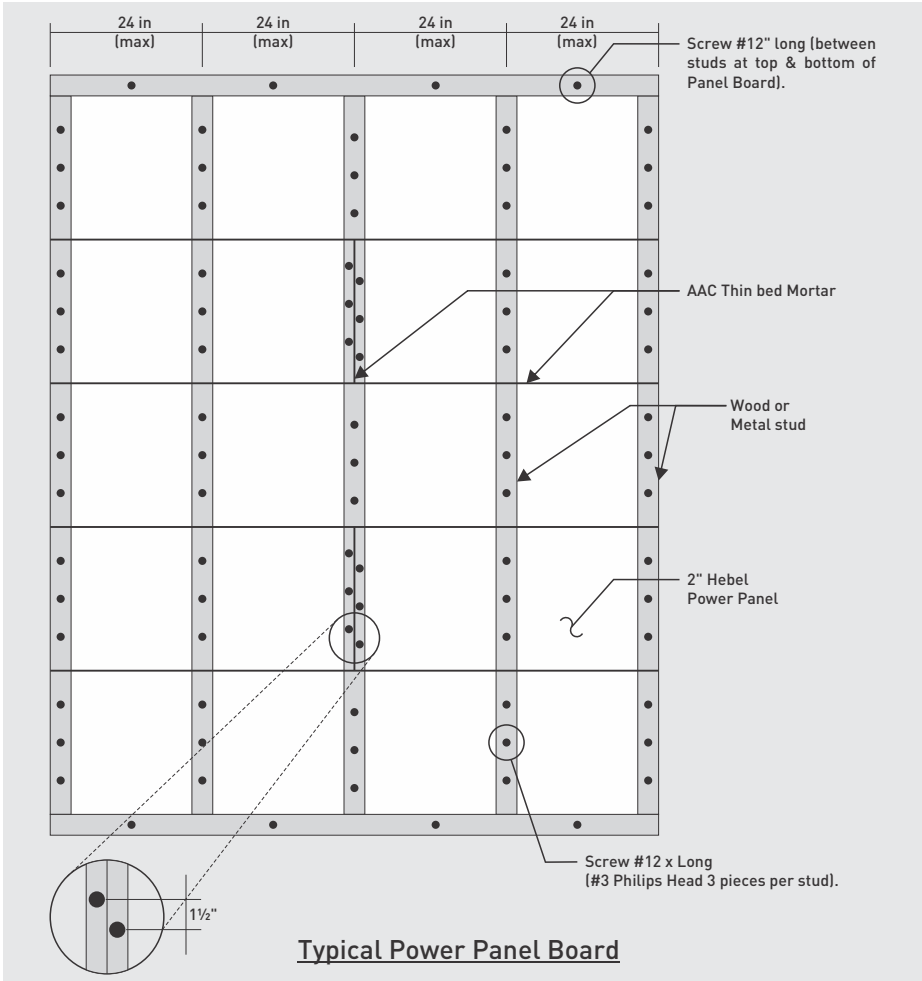


Fig. 9 A: Typical Power Panel Board.



Fig. 10: Patch chips, screws heads and any other imperfections.

d. Two Story Building

In metal and wood frame construction, the upper Hebel® Power Panel can rest on the lower Panel as high as ten rows (20 ft) maximum.

e. Surface Patching

Use Hebel® Repair Mortar to patch chips, breaks and other imperfections on the external surface of the Hebel® Power Panel (see Fig. 10).

Hebel® Repair Mortar is mixed in a plastic bucket, adding water (see instructions on the bag) using a stirrer and a power drill or by manual means (depending of quantity to be used). It is applied using a spatula.

f. Windows

The Hebel® Power Panel installed below the window should have a sloping sill site cut in the Panel. The sill should have a slope of at least 15°.



Fig. 11: Door or window openings.



Fig. 12: Completed installation of an external wall using Hebel® Power Panel.

3.3 Cutting Hebel® Power Panel

All Hebel® Power Panel can be cut to fit window openings or frame heights. The width of the Hebel® Power Panel can be cut to a minimum of 12" along its length (except the bottom panel, to avoid breaks and waste (see Fig. 13 to 15).

Cutting Procedures:

- a) Prepare a flat surface for cutting site.
- b) To support Hebel® Power Panel, wood pieces must be placed at the edges of the Panel. For transversal cuts, add wood pieces along the side of the cuts. For longitudinal cuts, add wood pieces to avoid cracking in the panel at every 30" (maximum).
- c) Check for full contact between wood pieces and Hebel® Power Panel. Wedge if necessary.
- d) Trace the cut dimension and place a ruler as a guide.
- e) Cut the Hebel® Power Panel using a circular saw with a diamond blade (see application requirements).

Note: Hebel® Power Panel reinforcement exposed during the cutting process must be coated with any anticorrosive paint.



Fig. 14: Cutting Hebel® Power Panel using a circular saw.



Fig. 15: Hebel® Power Panel on exterior walls.



Fig. 13: Hebel® Power Panel circular wall.

"Please refer to our SDS for further information":



Caution: Use safety gear: Hard hat, gloves, dust mask and goggles to avoid excessive inhalation of dust and protection of the eyes when handling Hebel® Power Panel.



Fig. 16: Base-coat application.

Reinforce base-coat or Hebel® stucco using fiberglass mesh embedded in 100% of the surface area (see Fig. 16 and 17).

Finish Coat:

Apply ready-mix acrylic based products as decorative and protective finish coat -top-coat- (Acrylic textures or similar). Apply finish directly over the primed wall surface. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified (see Fig. 18 to 20).

4 Renders and Finishes.

4.1 Products.

Most finish systems for exterior AAC (Autoclaved Aerated Concrete) Hebel® Power Panel consist of three main components: base-coat or stucco, reinforcing mesh, and a finish coat. Additionally, Hebel® Power Panel exterior walls can be finished with laminated stones, ceramic or clay tiles, concrete pieces and ornamentals.

Surface Preparation:

Rasp joints and other areas where the AAC surface is out of plane to a smooth in-plane surface. Surface must be clean, free of dirt, oil and any other foreign matter. Loose or damaged material must be removed. Apply a tinted primer (acrylic based) in case of acrylic base-coats.

Base-Coat:

Apply a layer (1/4" thickness min) of Hebel® stucco (cement-based or acrylic) or 1/8" min. of an acrylic base-coat (Sto AAC products or similar), according to manufacturer instructions.



Fig. 17: Fiberglass mesh installation.



Fig. 18: Finished wall (base-coat and texture).

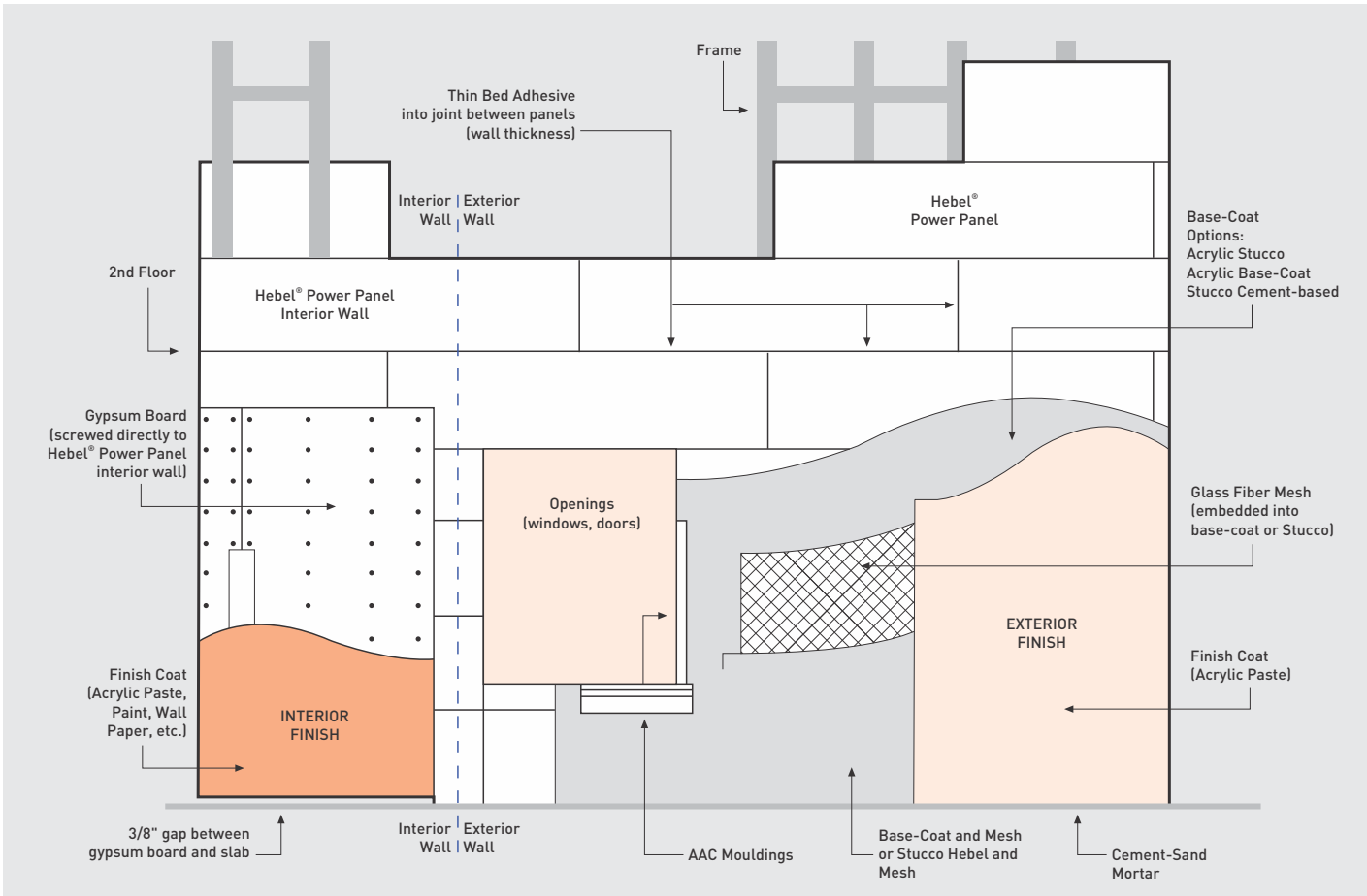


Fig. 19: Exterior and interior finish options on Hebel® Power Panel.



Fig. 20: Hebel® Power Panel residential projects.

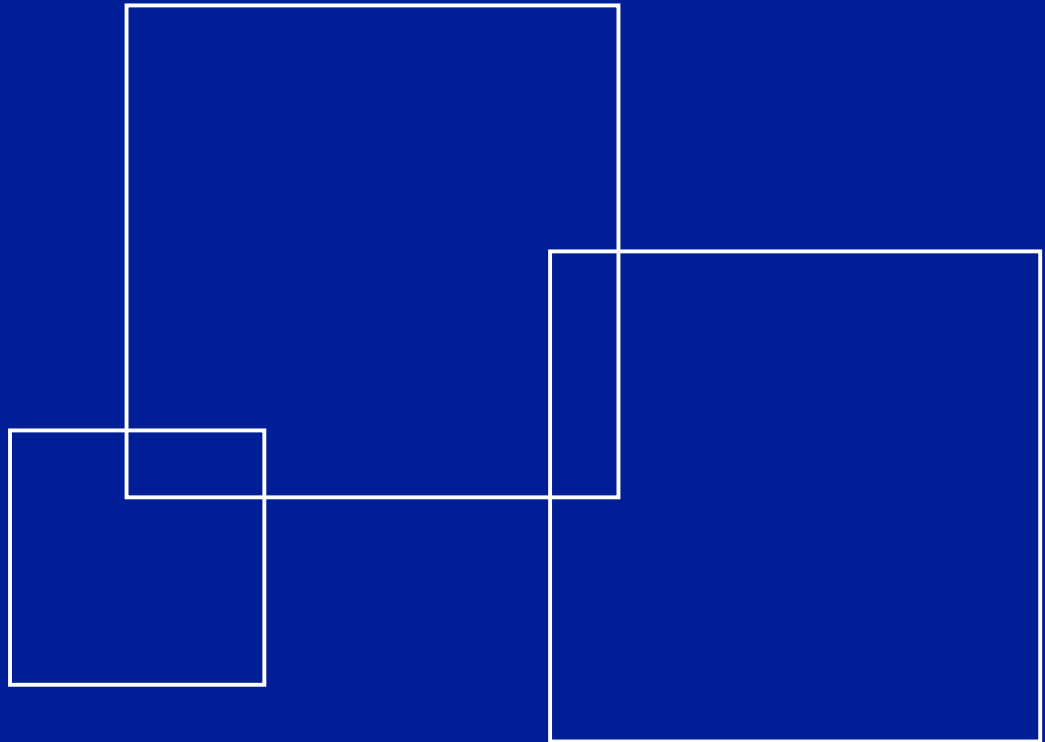
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