



Technical Sheet and Installation Guide

Hebel® Vertical Load-Bearing Wall Panels Autoclaved Aerated Concrete

 German
Technology

 **hebel**®



About Hebel®

Hebel® is a registered trademark of Xella Group, a German technology. In the USA, we are now part of Bexel International Group, manufacturing Autoclaved Aerated Concrete products, following the highest quality standards of the industry. Hebel® offers the most efficient solution in construction systems, more than 80 years in the market support us. We have been present in America since 1994.

Hebel® is distinguish by being a high-quality, innovative option that combines various properties in a single material. The benefits are reflected from the construction phase, it is up to 5 times lighter than traditional concrete, and has a significant impact on reducing construction time, as well as generating great savings in steel, concrete and labor.

We promote sustainability with high energy efficiency in all types of buildings.

Our systems provide high thermal performance, maximum fire resistance, acoustic insulation and resistance to humidity.

Hebel® is committed to providing to the United States with environmentally responsible building solutions that conserve material an energy usage. We are members of the Green Building Council.

Hebel® Autoclaved Aerated Concrete offers to 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.

Our building systems offer low insurance and maintenance cost to the building owner. A wide range of projects can benefit from Hebel® blocks and reinforced panels, including those in the commercial, educational, hospitality, industrial, institutional, governmental and residential segments.

Due to the AAC qualities, Hebel® has national and international recognized certifications, their manufacturing process is carefully monitored at all

stages, in order to guarantee the best quality for our customers.

Its properties take any project to a higher category, managing to build a better quality life, comfort and savings for a lifetime. At Hebel® we care to offer a full experience with a 360 service for each project specification.

The Hebel® Plant is located in Nuevo León, México and its USA offices are located in San Antonio, TX., from where we serve the USA market.

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

Resists wind pressures. High impact resistance.



Fire Resistant

We are **certified by** Underwriters Laboratories (UL) with the maximum fire-rating classification. Our systems withstand fire exposure up to 4 hours, maintaining their structural integrity and **DO NOT** emit toxic fumes even under intense heat.



Acoustic Insulation

Provides exceptional acoustic insulation. Its porous structure and high surface mass, coupled with its ability to dampen mechanical vibration energy, **greatly reduces sound transmission from exterior - interior and room-to-room.**



Resistance to humidity

Protects against moisture. It allows the passage of water vapor, reducing condensation.



Green Building

- Recyclable, inert & non-toxic
- Energy saving
- Durable
- LEED credits



Easy treatment

Can be **easily cut, drilled and grooved** with manual or power tools.



Lightweight

Its lightweight nature allows a **faster and more efficient construction.**



Pest resistance

Not a food source for termites or vermin and no cavity construction. **Eliminates the chance of harbouring pests.**

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 cannot 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® Vertical Load-Bearing Wall Panels Autoclaved Aerated Concrete

Uses and applications

Hebel AAC Hebel® Vertical Load Bearing exterior and interior walls for residential, hotels, commercial and modular buildings.

The thickness and panel length (height) vary depending on the design requirements and constraints of the project.

Construction Advantages

- 4 Hour Fire Rating
- Moisture Resistant
- Mold Resistant
- Lightweight
- Pest and Rot Resistance
- Non-Toxic

Application:

- Commercial
- Residential
- Industrial

Certifications:

UL, IAPMO, TDI.



This product is friendly to the environment, ecological, non-toxic and sustainable; And also grants LEED points.



Hebel® Vertical Load-Bearing Wall Panels
Autoclaved Aerated Concrete

German Technology

 **hebel**

1 Technical Sheet

1.1 Vertical Load Bearing Wall Panel

General Features

Hebel® AAC (Autoclaved Aerated Concrete) Wall Panels are lightweight, fire resistant, fast and easy to install. Hebel® AAC Vertical Load-Bearing Wall Panel is a reinforced (Grade 70 steel) element spanning with full story height. The Hebel® Load Bearing Panel system is based on a standard two feet wide module. The thickness and panel length (height) vary depending on the design requirements and constraints of the project.

Uses

Hebel® AAC load bearing Wall Panels are used to build load-bearing and non load-bearing exterior and interior walls for hotels, commercial and any modular buildings.

Dimensions

Length:⁽¹⁾ Up to 20 ft.

Thickness:⁽²⁾⁽³⁾ 6, 7, 8, 10 and 12 in.

Width:⁽⁴⁾ 24 in.

⁽¹⁾Tolerance \pm 3/16", ⁽²⁾⁽⁴⁾Tolerance \pm 1/8", ⁽³⁾Nominal. Manufactured according to ASTM C1693 / ASTM C1452.



Fig. 1: Hebel® wall panels packaging.

| Characteristic | Unit | ACC-4 Class | ACC-6 Class |
|-------------------------------|---------------------------------|-----------------------|-----------------------|
| Compressive Strength (f'aac) | psi | 580 | 870 |
| Nominal Density | pcf | 31 | 37 |
| Design Weight | pcf | 37 | 45 |
| Drying Shrinkage | % | <0.02 | <0.02 |
| Thermal Expansion Coefficient | 1/°F | 4.4 X10 ⁻⁶ | 4.4 X10 ⁻⁶ |
| Modulus of Elasticity | psi | 295,800 | 377,000 |
| Thermal Conductivity | BTU-in/ ft ² ·h°F | 0.9124 | 0.9811 |
| Allowable Bearing Stress | psi | 348 | 523 |

Table 1: Physical and design properties.

| Design Weight | | | | | | |
|--------------------------|--------|---------------|-------|-------|-------------|----|
| Thickness ⁽¹⁾ | | Design Weight | | | Groove Diam | |
| in | in* | AAC-4 | AAC-6 | AAC-4 | AAC-6 | in |
| 6 | 5.906 | 18.41 | 22.15 | 36.82 | 44.29 | 3 |
| 7 | 6.889 | 21.48 | 25.84 | 42.96 | 51.67 | 3 |
| 8 | 7.874 | 24.56 | 29.53 | 49.12 | 59.06 | 3 |
| 10 | 9.843 | 30.70 | 36.91 | 61.40 | 73.82 | 4 |
| 12 | 11.811 | 36.84 | 44.29 | 73.68 | 88.58 | 4 |

⁽¹⁾Nominal dimension, *Exact dimension, **Considering a 24 in panel width.

Table 2: Hebel® wall panel design weight.

| Thermal Properties | | | | | |
|--------------------|----------------------------|-------|-------------|----------------------------|-------|
| Thickness * | R-Value | | Thickness * | R-Value | |
| | AAC-4 | AAC-6 | | AAC-4 | AAC-6 |
| in | ft ² h °F / BTU | | in | ft ² h °F / BTU | |
| 6 | 6.02 | 6.47 | 10 | 10.03 | 10.79 |
| 7 | 7.02 | 7.55 | 12 | 12.03 | 12.95 |
| 8 | 8.02 | 8.63 | - | - | - |

Note: ⁽¹⁾Nominal dimension, Units: R= Thermal resistance, hi= hour, in= inches, F= Fahrenheit degrees ft²= square feet, BTU= British thermal unit.

Table 3: Hebel® wall panel R-Value.

| Fire Performance | | | |
|---------------------------|-----------|-------------|--------------------------------------|
| Material | Thickness | Fire Rating | UL Design Number |
| | in | Hour | UL Fire Resistance Directory 1998 |
| Hebel® Bearing Wall Panel | ≥ 6 | 4 | U920 |

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

Table 4: Hebel® wall panel, fire rating.

| Acoustic Performance | | |
|-----------------------------|-----|---------------|
| Hebel® Wall Panel | STC | Report Number |
| Hebel® 6" AAC-4 Unfinished | 44 | AS-TL958AX |
| Hebel® 8" AAC-6 Unfinished | 50 | AS-TL1026AX |
| Hebel® 10" AAC-4 Unfinished | 50 | AS-TL978AX |

Note: Testing performed at Acoustic System, Inc., Austin, TX in accordance with ASTM E (90) Standard Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

Table 5: Hebel® wall panel acoustic performance.

2 Design Considerations

2.1 General Considerations

- The Hebel® AAC Vertical Load-Bearing Wall Panel system includes the following components: Full height load-bearing wall panels (2 ft. wide), Jamb Panels (adjacent to a window, door or mechanical opening which supports a lintel panel), Lintels Panels (load bearing or nonload bearing panel over window or door openings) and Sill Panels (located below a window or mechanical opening) see Fig.2.
- Hebel® Wall Panels can be used as structural load-bearing and shear walls and shall be designed in compliance with safety and specified by ACI 318-11 and guidelines of ACI 523.4/R-09 and ACI 530-13.
- The design of Hebel® AAC Load Bearing wall panel should consider wind loads according to Local Building Codes.
- Slenderness ratio must be revised as follows: Hebel® wall in vertical arrangement: Panel slenderness ratio: $l/t \leq 30$ where l = Panel length and t = Panel thickness.
- Vertical grooved joints between panels require reinforcement according to structural design #5 in rebars minimum.
- Fitting panels should not be less than 16 in. wide. If more than one fitting panel is required on a wall, at least two normal (non-fitting) panels shall be installed between them.

The components listed herein represent a typical panel installation. However, other items might be needed during a Hebel® Vertical Load-Bearing Wall Panel Installation. Due to design or installation requirements, lintel panels may be

used in conjunction with or substituted by steel headers, precast concrete lintels or cast-in-place concrete. In situations where small in-fill is required, Hebel® AAC Block may be specified.

All Hebel® components are identified on shop drawings for every project.

Clear the unloading and provisional storage area

- Unload panels using forklift, nylon straps, slings or pallet fork on a crane cable. Consult your OSHA safety manual for "rigging" or other safety considerations.

- Insure adherence to OSHA Guidelines - Leading Edge Subpart M (Fall Protection).

- Panels should always be stored away from other construction activities, and on a flat-grade area that is not susceptible to standing water, erosion or settling.

- Place panels over wood blocks (panels must not be in contact with ground) and keep the material covered and banded until ready for installation.

Check material and installation logistics

- Verify dimensions, positions and quantity of the panels according to shop drawings. Define sequence of panel installation.

- Define type of installation equipment (crane or similar).

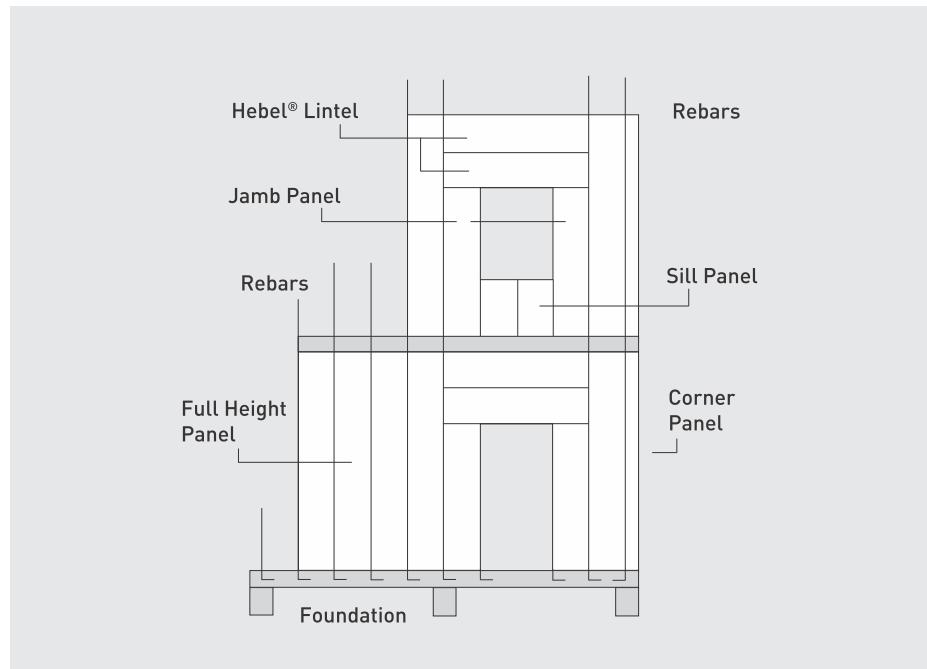


Fig.2: Hebel® wall panels system elements.



Fig. 3: Hebel® Load Bearing Wall panels.

- Evaluate quantity of personnel required.
- Set delivery schedule to match the erection sequence. Excessive handling of Hebel® AAC panels may damage the element.
- Chips and spalls can be repaired. If any panel reinforcing is visible, contact an authorized Hebel® AAC representative.
- All damaged surface areas may be repaired using a compatible Hebel® AAC patching compound.
- Hebel® AAC panels that have surface or minor cracks are usable. Contact an authorized Hebel® AAC representative when cracks extend completely through the panel.

Check for material, tools and equipment Available for purchase from Litecrete, Inc.

- Hebel® Thin-bed Mortar
- Hebel® Repair Mortar
- Corrugated Nails
- Hebel® Nails (4" or 6")
- WKV Lifting Clamp[For Rent]
- Helifix Anchors (8mm)
- Mortar Trowel

Provided by the Contractor/Owner

- Temporary Bracing
- Crane and Accessories
- Fine Grout Mortar.
- Nails, threaded rod, nut, couples, washers, etc.
- 6 ft. Carpenter's Level
- 1/2"Ø A370 Thru-bolts
- Choker & Shackle
- Mixing Tub / Paddles
- Wood Guide Templates
- Reinforcing Bars

| Specifications | | |
|----------------------------|-----------------------------------|-------------------------|
| Concept | Clamp ⁽¹⁾ | |
| Clamp Type | WKV 15-20 | WKV 20-25 |
| Fixed Internal Height | 260 in | |
| Clamp Length | 200 in | |
| Clamp Range | 6" to 8" (15-20 cm) | 8" to 10" (20-25 cm) |
| Max. Load Bearing Capacity | 1,540 lb (700 kg) | 1,650 lb (750 kg) |
| Weight | 220 lb (100 kg) | |
| Pressure (2) | 110 < bar Clamp Pressure <140 bar | |

⁽¹⁾Supplied stan with manometer to check clamp pressure.

⁽²⁾Clamp pressure must be within the acceptable range.

Table 6: WKV lifting clamp specifications.

- Rebar Bender
- Tape measure, chalk-line
- Trubolt wedge anchors
- Wakai Hit Nails [6x 110 mm]

3.2 Preparation

Shop Drawings

Shop Drawings include the following information: Wall panel layout, wall elevations, sections and details, general notes, revision date and number, panel schedule indicating panel number (see Fig. 4), quantity of panels and dimensional information (length, width and thickness).

Review shop drawings and ensure that everyone is using the latest version (see revision number). Drawings must be approved for construction in order to begin panel installation.

Panel Identification

Every panel can be easily identified by a reference number

(project number) and panel information printed on one end-side of the panel. See panel schedule and drawings to corroborate dimensions and to determine its final position.

Lifting Equipment Hebel® Lifting Clamp Type WKV

(Manufactured by Van de Blij B.V.)

The WKV clamp is designed specifically for vertical and horizontal (lintels) installation of Hebel® wall panels. The clamp has a constant clamp force lock (torque wrench principle).

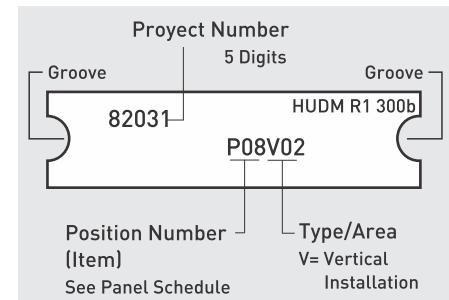


Fig. 4: Hebel® wall panels identification.



Fig. 5: WKV Lifting Clamp and Manometer.



Every day, before using the clamp, check the clamp pressure using the pressure cylinder (manometer) and record the reading in the log. Important: Each manometer is dedicated to a specific lifting clamp type. Verify the lifting and manometer shipped has the same identification numbers. Test the lifting clamp pressure at least twice every day prior to start of panel installation (start of the day and at the mid-day). The clamp pressure should be as follows:

$$110 \text{ bar} < \text{Clamp Pressure} < 140 \text{ bar}$$

If the pressure is either lower or higher than the values in the range, the clamp must be checked by an authorized service representative.

If the manometer shows the correct pressure, you may use the clamp. Record the details in the log and keep the log with the manometer and the clamp. The pressure must be recorded in the log daily.

Template Layout

The purpose of the template is to establish a true and square plan within the building perimeter and to determine control points around the building in order to assess the accuracy of panel placement as installation progresses.

Suggested Material and Equipment (Included but not limited)

- 2" x 4" high grade lumber for use as a panel template guide.
- Level or Transit-Level.
- Masonry screws (Hilti KWIK-CON II or ITW Tapcon)
- 2" x 4" wood cleats.
- Chalk-line, tape measure, etc.
- Metal square.

Note: All slabs which are intended to remain exposed at the completion of the project must be protected with felt paper (30# min) to prevent staining from mortar droppings.

Template Installation



Fig. 6: Check the levelness of the slab prior to installing the template.



Fig. 7: Trace building wall lines. Check alignment and square. Snap chalk-line on slab along the inside face of the wall panels.



Fig. 8: Place cleats every 4 ft. and perpendicular to wall lines. (secure cleats with masonry screws Hilti, ITW Tapcon or similar).



Fig. 9: Place template (elevated) on cleats to allow uniform distribution of mortar bed. Align template to building wall lines.



Fig. 10: Identify openings on template.



Fig. 11: Indicate panel number, door & windows openings, mechanical opening, etc.

| Schedule "A" | Schedule "B" |
|--|--|
| Wind Speed: 40 mph | Wind Speed: 50 mph |
| Wind Load (w) ⁽¹⁾ = 0.00256 V^2 | Wind Load (w) ⁽¹⁾ = 0.00256 V^2 |
| Wind Pressure (w): 4.1 psf | Wind Pressure (w): 6.4 psf |

⁽¹⁾The wind load criteria is in accordance with the iStandard Practice for Bracing Masonry Walls under Construction.

Table 7: Bracing specifications (wind load).

| Element | Wall Height \leq 12'-0" | |
|---------|---|---|
| | Schedule "A" | Schedule "B" |
| E1 | 2"x4" - "T-Brace" with 10d common nails @ 12 in OC and installed @ 6 ft OC (walls & openings $<$ 6 ft wide). For openings $>$ 6 ft wide, provide bracing @ each side. | 2"x4" - "T-Brace" with 10d common nails @ 12 in OC and installed @ 4 ft OC (walls & openings $<$ 4 ft wide). For openings $>$ 4 ft wide, provide bracing @ each side. |
| E2 | 2"x4"x12" Cleat fasten to concrete slab with (2) 1/4" Ø x 3 1/4" tapcons. | Fasten to Hebel® wall/floor panels with (3) 6x1 10Wakai Hit nails or (2) Hebel® AAC nails (4" or 6" long.) (Note: Pre-drill 1/4" holes through wood cleats for Wakai Hit nails or Hebel® AAC Nails) |
| E3 | Fasten "T-Brace" to cleat with (3) 16d common nails. | 2"x 4" lumber continuous with 12d common nails @ 5 in. or Hebel® AAC nails @ 10 in. |

Note: All bracing material shall be Southern Pine (construction grade). Temporary bracing shall remain in place until shear key grouting (vertical joints), floor or roof system and concrete bond beams have been completed and at least 24 hours old.

Table 8: Bracing type specification for wall height \leq 12 ft.

| Element | Wall Height $>$ 12'-0" | |
|---------|---|--|
| | Schedule "A" | Schedule "B" |
| E4 | Fasten top of Pipe-Bracing @ 6 ft OC with (1) 1/2" Ø A307 Thru-Bolt Use a 1/4"x5"x 5" plate washer on the outside wall surface. | |
| E5 | Fasten bottom of Pipe-Bracing to concrete slab with (1) 1/2" Ø ITW Trubolt wedge anchor w/ (1) 2 1/4" embed. Fasten to Hebel® floor panels w/ (1) 1/2" Ø A307 Thru-Bolt Use a 1/4"x5"x 5" plate washer on the bottom floor surface. | |
| E3 | 2"x4" lumber continuous with Hebel® AAC nails @ 8 in. | |
| | Design Pipe-Bracing for a Maximum Load = 700 lb (Tension/Compression) | Design Pipe-Bracing for a Maximum Load = 1000 lb (Tension/Compression) |

Temporary bracing shall remain in place until shear key grouting (vertical joints), floor or roof system and concrete bond beams have been completed and at least 24 hours old.

Table 9: Bracing type specification for wall height $>$ 12 ft.

Temporary Bracing
The temporary bracing used for the installation of Hebel® Vertical Load Bearing Wall Panels may be accomplished in accordance with the following schedules:

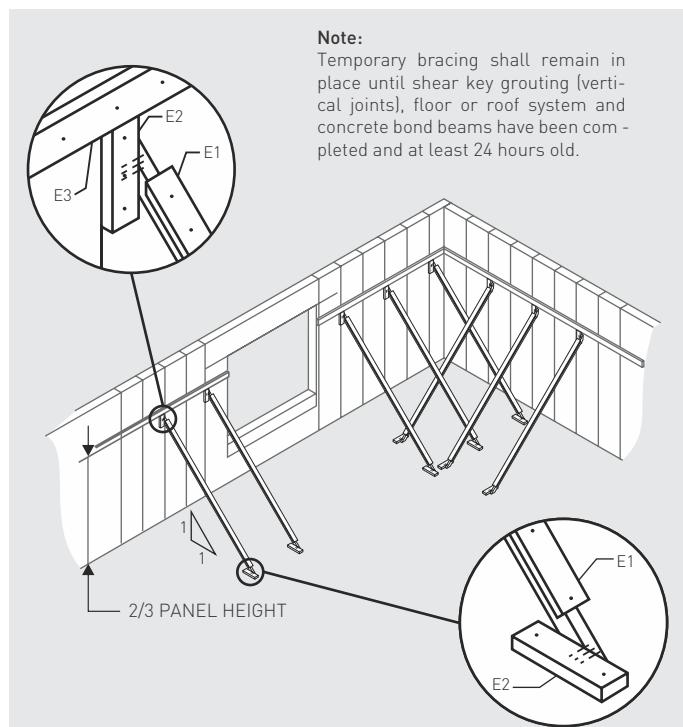


Fig. 12: Bracing type specification for wall height \leq 12 ft.

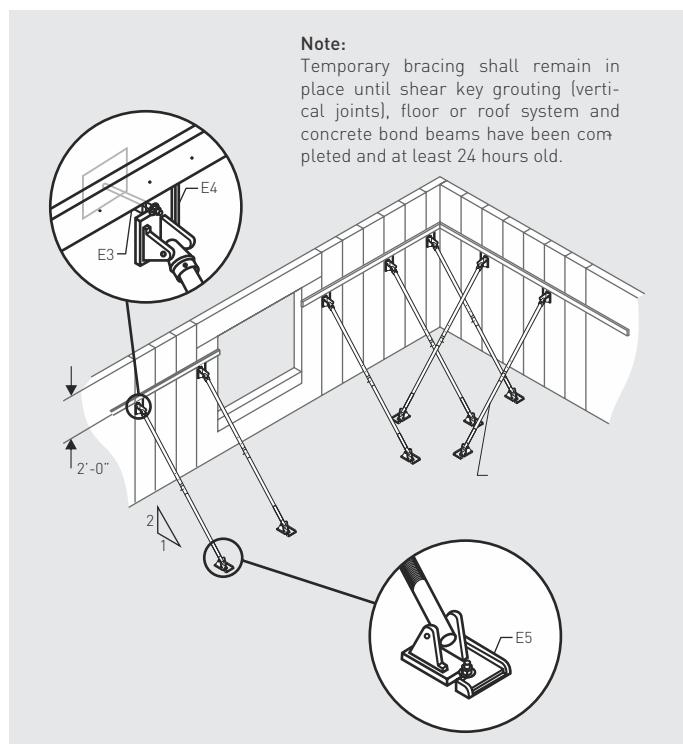


Fig. 13: Bracing type specification for wall height $>$ 12 ft.



Fig. 14



Fig. 15



Fig. 16

3.3 Wall Panel Installation

Vertical Lifting and Installation

1. Identify the panel that will be laid according to previous logistics and template layout (see section 3.2).

2. Unpack panels. Verify panels are in a stable position prior to cutting the banding (see Fig. 14).

3. Check spacing of vertical reinforcement between panels.

4. Prepare thin bed mortar to be used on setting the first row of panels and on joints between panels.

5. Attach clamp to crane hook.

6. Move the clamp to the end of the wall panel to be lifted.

7. Open the clamp sufficiently, depending on the thickness of the wall panel, by turning the hand wheel counterclockwise.

8. Rotate the clamp 90° on the handle so that the jaws of the clamp point toward the wall panel. The jaws of the clamp must be placed in the center of the wall panel.

9. Set the clamp with the inner side of the clamp fully against the wall panel (see Fig. 15).

10. Apply pressure to the clamp by turning the hand wheel of the clamp clockwise until you feel a “click” and the green windows (on clamp wheel face) are visible (do not turn it any further after this).

11. First panel: Prior to lifting a vertical panel with the clamp, apply Hebel® thin bed mortar on slab for installing the first row of panels and 10 minutes (maximum) from final setting of panel (see Fig. 16). Subsequent panels: Apply Hebel® thin bed mortar on slab for installing the first row of panels and on vertical joint between panels (width of panels) 10 minutes (max) from final setting of panel (see Fig. 16 & 17).

Use Hebel® mortar trowel to ensure an even and consistent application of thin bed mortar (see Fig. 17).

12. Carefully hoist the wall panel up and maneuver it into position. Panel rotates to vertical position for panel installation (see Fig. 18).

13. The panel is lowered at its final position, stabilized and guided into place by installer. Always plumb the panel with a 6 ft level prior to being “nailed off” with (2) corrugated nails on top of flat joints between panels and bracing installation (see Fig. 19 to 22). Use shim plates if necessary.

14. Install temporary bracing according to section 3.2. Temporary bracing shall remain in place until concrete bond beam and shear key grouting is complete and floor slabs or roof panels are already installed (see Fig. 12 & 13).



Fig. 17



Fig. 18



Fig. 19



Fig. 20

15. When the wall panel has been positioned correctly, the clamp can be removed from the panel by opening the clamp sufficiently. Do this by turning the hand wheel counterclockwise (see Fig. 22).

16. Clamp is released and returning to lift next panel from staging area (steps 6 to 15 -subsequent panels-).

17. Proceed to pour fine grout mortar into cells (joints between panels) to complete instalation. Allow the escape of trapped air by drilling a hole (½") at the bottom of cells (6" above slab).

18. Approximately 30 minutes after panels are set in place, scrap the excess mortar from all the joints. Clean up the excess mortar and dispose of properly or use it for patching.

19. Patching of minor chips and spalls should occur inmediately following scrapping of the excess mortar from the walls. All interior wall joints should be skim coated with Hebel® thin-bed mortar as part of the surface preparation for the interior finishes.

20. Remove all wall templates from the slab the day after the panels have been installed and bond beams completed. Scrap away and remove all excess mortar at bed joints.

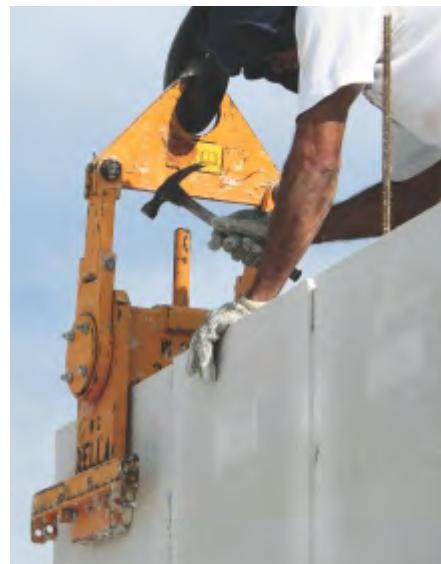


Fig. 21



Fig. 22



Fig. 23

Horizontal Lifting and Installation

21. Mark the center of the wall panel (lintel) to be lifted.

22. Open the clamp, lower it completely on the panel at the marked centerline and apply pressure to close the clamp.

23. Now carefully hoist the wall panel up and maneuver it into its final position. Apply thin bed mortar to adjacent panels (joints) before lintel setting.

24. When the wall panel (lintel) has been positioned correctly, the clamp can be removed from the panel by opening the clamp sufficiently. Do this by turning the hand wheel counterclockwise.

3.4 Panels Cutting

According to shop drawings, identify Hebel® Load-bearing Wall Panels to be cut. Hebel® panels can be cut to length to fit openings (jamb panels, sill panels, etc.) or frame heights.

Permissible cutting lengths are a function of the project dimension. Along its length, Hebel® wall panels can be cut 1/3 the width:

Cutting equipment options:

- Power Cutter (gasoline-powered) 14", 16" diamond blade or greater (see Fig. 25).

Cutting procedures:

Important: Wear work gloves, protective helmet & visor, goggles, hearing and respiratory protection. Do not smoke or work near open fires. Read equipment instruction manual.

- Prepare a flat surface for cutting site.
- Check dimension of cuts to be made.
- For transversal cuts, wood pieces must be placed along the sides of the cut and at the edges of the panel.
- For longitudinal cuts, wood pieces must be placed at every 9 ft. minimum for 6 to 12 in thick panels and at every 6 ft. for panels 4 to 5 in thick.
- Check for full contact between wood pieces and panel. Wedge if necessary.
- Place a ruler as a guide and trace the cut dimensions.
- Proceed with panel cutting, verifying that cutting dimensions comply with specifications. Transversal cuts can be performed with panel in vertical position using groove edge as support. Longitudinal cuts must be made with panel in horizontal position; if full thickness is to be cut, perform cut from both sides.
- Apply anticorrosive paint to the exposed rebar tips.



Fig. 24: Lintel installation.

4 Renders and Finishes

4.1 Products

Most finish systems for exterior AAC (Autoclaved Aerated Concrete) load bearing walls panels consist of three main components: base coat, reinforcing mesh, and a finish coat.



Fig. 25: Cut panels using a gasoline-powered circular saw.

IMPORTANT

- Check the clamp pressure with the special test-cylinder every day before using.
- Tampering with the clamp is not permitted. The clamp has been calibrated in the factory.
- It is strictly forbidden at any time for people to be under the load during lifting.
- The maximum load-bearing capacity of the clamp may never be exceeded.
- Never put hands, arms, feet, head or legs under the load, or between the jaws of the clamp.
- The load must always be hoisted; it may not be dragged along the ground.
- Avoid sudden movement to prevent accidental release of the load.
- In freezing weather, do not attempt to lift panels on which ice has formed.

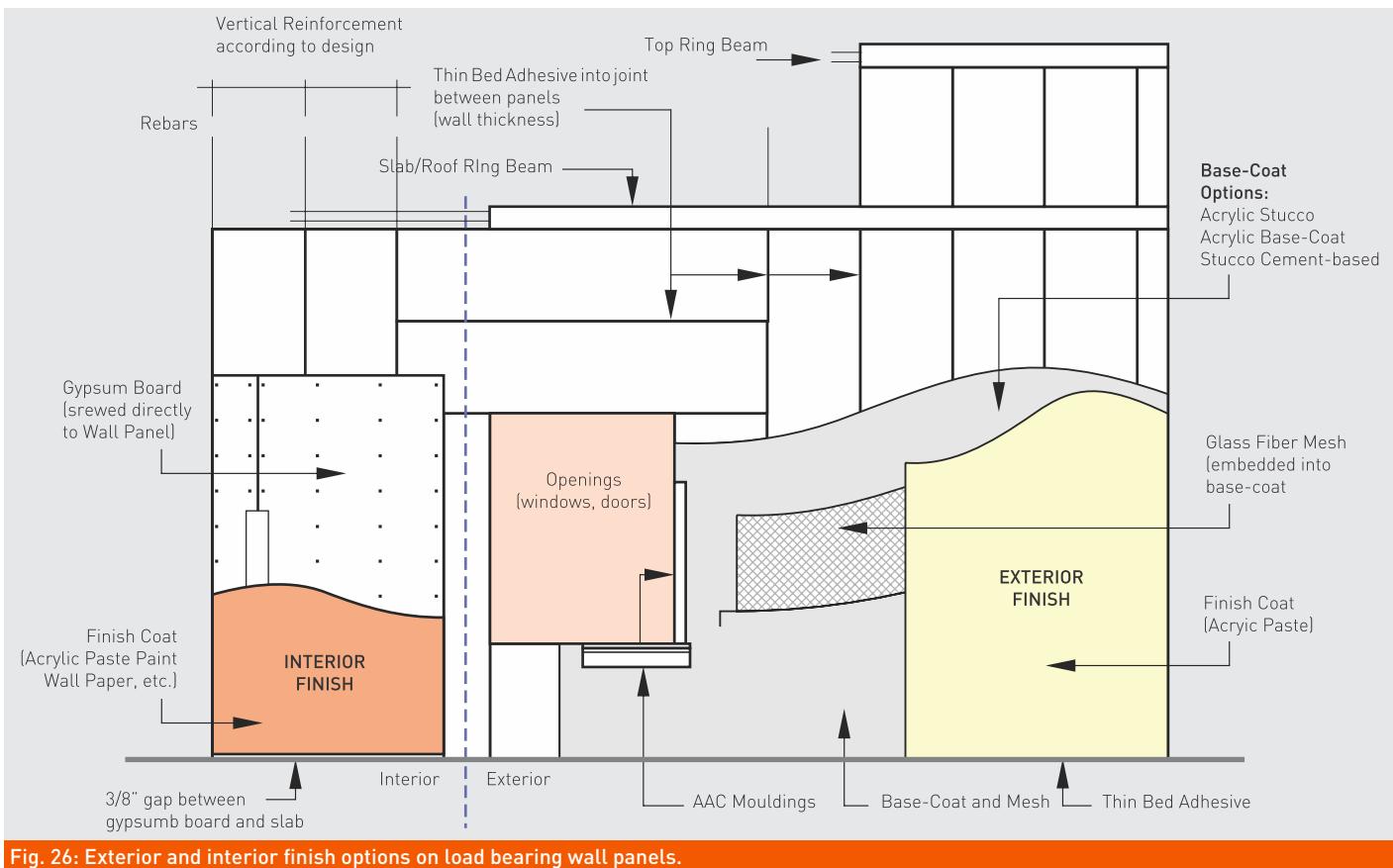


Fig. 26: Exterior and interior finish options on load bearing wall panels.

Surface preparation: Rasp joints and other areas where the Hebel® 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.

Hebel® Base-Coat: Apply a layer (1/4" thickness minimum) of Hebel® Base Coat (cement-based or acrylic) or acrylic base-coats (Hebel®, products or similar), according to manufacturer instructions. Reinforce base-coat using Fiberglass mesh embedded in 100% of the surface area (see Fig. 26).

Finish Coat: Apply ready-mix acrylic based products or elastomeric paints as decorative and protective finish coat -top-coat- (Sto AAC products 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. 26).



Fig. 27: Five-story hotel built with Hebel® AAC load bearing Wall Panels.

5 Fasteners

Fasteners

Anchors used with AAC shall be made of plastic or nylon. Wood, fiber, lead, metal or expansion anchors are not recommended. Use power drills to make holes for fasteners and masonry drill-bits recommended (diameter) on table 10 (drill-bit diameter may differ from recommended by fastener manufacturer; specifications have been adapted for AAC). Percusion drilling or inverting the rotation direction when drilling shall be avoided. The anchor shall penetrate tightly in the hole to avoid rotation when placing the screw. When using Fischer anchors, the external finish layer surrounding the hole should be removed to allow the anchor to fully penetrate into the AAC element.

Hebel® AAC Nail

Hebel® galvanized AAC nails are designed specifically to provide a definitive anchorage in the AAC. Hebel® AAC nails are directly hammered-into the AAC element – no drilling is required.

Screws

Always use screws of the diameter recommended on table 10. Minimum length of screw is defined by the anchor length plus the thickness of the finish layer and the thickness of the element to be fixed.

Precautions

Load values (pull-out strength) shown in chart shall be used only as a reference guide; field testing is suggested according to project requirements. The load values (lb) shown in chart are for direct pull-out and a safety factor of 5 is included in them. Full penetration of screws into the anchor is assumed to obtain such load values.



Fig. 29: Minimum screw length.

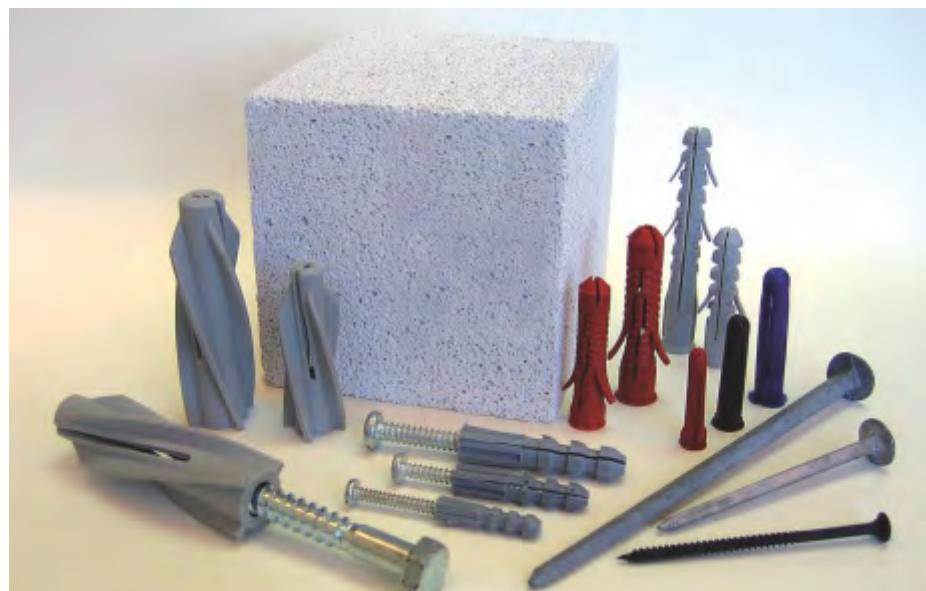


Fig. 28: Recommended nails & anchors.



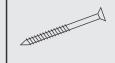
| Fasteners & Nails Autoclaved Aerated Concrete Technical Sheet | Anchor / Nail | | Drill Bit for Masonry | Screw | Load Value* (pull-out strength) | |
|--|---|---------|---|---|--|----------------|
| | Length | Ø Diam |  |  | AAC-4 Block | AAC-6 Panel |
| | in | in | Ø in | Ø in | Lb | Lb |
|  | Hebel AAC Nails® | | | | | |
| | Hebel AAC Nail 4 in. ⁽³⁾ | 4" | 1/4" | Fixed directly with hammer | Not Required | 51 |
|  | Min. Penetration: 3 in. | | | | Not Required | 88 |
| | Hebel AAC Nail 6 in. ⁽³⁾ | 6" | 5/16" | | Not Required | 137 |
|  | Dry Wall Screw | | | | | |
| | 8 x 3" | 3" | - | Not pre-drilling is required | Not Required | 35 |
|  | 8 x 2½" | 2½" | - | | Not Required | 57 |
| | Universal Plastic Anchor | | | | | |
|  | Anchor TP 14 - 1/4" | 1 1/8" | 1/4" | 1/4" | #10 | 22 |
| | Anchor TP 56 - 5/16" | 1 1/2" | 5/16" | 5/16" | #12 | 26 |
|  | Anchor TP 38 - 3/8" | 2" | 3/8" | 5/16" | 1/4" | 44 |
| | TOX VLF® | | | | | |
|  | Available at www.demandproducts.com | | | | | |
| | Anchor 6/70 ⁽⁵⁾ | 2 3/4" | 1/4" | 1/4" | Anchor with screws included (pre- assembled) | 66 |
|  | Anchor 8/80 - 8/135 ⁽⁵⁾ | 3 1/8"+ | 5/16" | 5/16" | | 102 |
| | Anchor 10/100 - 10/160 ⁽⁵⁾ | 4"+ | 3/8" | 3/8" | | 120 |
|  | HILTI® Plastic Anchors | | | | | |
| | Anchor HUD-1 (10x50)⁽⁴⁾ | 2" | 3/8" | 3/8" | 5/16" | 71 |
|  | Anchor HUD-1 (12x60)⁽⁴⁾ | 2 5/8" | 1/2" | 7/16" | 3/8" | 128 |
| | More Products: www.us.hilti.com | | | | | |
|  | FISCHER® | | | | | |
| | Anchor GB 10 ⁽³⁾ | 2" | 3/8" | 3/8" | 1/4" | 126 |
| | | | 1/2" | 1/4" | --- | |
| | Anchor GB 14 ⁽³⁾ | 3" | 5/8" | 5/8" | 3/8" | 165 |
| | Anchor S10H80R ⁽³⁾ | 3 5/8" | 3/8" | 3/8" | 5/16" | 123 |
| Notes: ⁽¹⁾ Anchors without screws, except TOX VLF anchors. ⁽²⁾ Drill bit diameter change between AAC-4 y AAC-6 classes. | | | | | | |
| Notes: ⁽³⁾ Available at Litecrete, Inc. ⁽⁴⁾ Available at Hilti Shops, Home Depot, Lowe's, etc. ⁽⁵⁾ Available at www.demandproducts.com ⁽⁶⁾ For AAC-6 [Block & Panel] use 1/4" drill bit. ⁽⁷⁾ For AAC-6 [Block & Panel] use 1/2" drill bit. *Safety Factor [SF]=5. Use masonry drill bits. Anchors do not include screws (except TOX anchors). | | | | | | |
| IMPORTANT: Information has been adapted considering Autoclaved Aerated Concrete (AAC) material and may differ from original fastener manufacturer. | | | | | | |

Table 7: Anchoring into Hebel® Vertical Load-Bearing Wall Panels.

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