Section 5C: Vertical Load Bearing Wall Panel Installation Guide

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5C.1 Introduction

This Installation Guide was prepared by Xella Aircrete North America, Inc., to help owners, design professionals, construction managers and installers install vertical load bearing panels. It is especially for the installer who may not be familiar with all areas of AAC load bearing wall construction.

We have attempted to provide some general information regarding areas of construction and details. However, since we cannot cover all areas or possibilities, we encourage and trust that you will ask for additional information regarding specific areas or possibilities, or when you have questions or need additional information.

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5C.2 General Installation Guidelines

- Unload panels using pallet forks (forklift, nylon straps, slings or pallet fork on a crane cable). Consult an appropriate safety consultant or knowledgeable OSHA trainer for “rigging” or other safety considerations.

- Insure adherence to Leading Edge Support MOSHA Guidelines.

- Storage areas should be accessible to delivery trucks and convenient to material staging areas. If possible, drop-deliver the material right to the material staging areas.

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

- Keep the material covered and banded until ready for installation.

- Excessive handling may cause damage. Set delivery schedule to match the erection sequence.

- Chips and spalls can be repaired. If any reinforcing is visible, contact an authorized AAC representative.

- All damaged surface areas may be repaired using a compatible AAC patching compound.

- AAC panels that have surface or minor cracks are usable. Contact an authorized AAC representative when cracks extend completely through the panel.

- Stored or staged materials should always be set on flat, stable grade on pallets or dunnage.

- Observe and provide all necessary temporary support and bracing in addition to following all laws and safety requirements.

- **Caution:** Use safety gear, including hard hat, dust mask, and goggles to avoid inhalation of dust and protection of the eyes when handling Hebel AAC Vertical Load Bearing Wall Panels.
5C.3 Hebel AAC Vertical Load Bearing Wall Panels

Hebel AAC Vertical Load Bearing Wall Panels are reinforced panels spanning a full story height. Available nominal thicknesses are 8 in (200 mm), 10 in (250 mm) and 12 in (300 mm). The Hebel system is based on a standard two foot wide module. The thickness and story height vary depending on the design requirements and constraints of the project.

The Hebel AAC Vertical Load Bearing Wall Panel system includes the following components: full height panels, jamb panels, lintel panels and sill panels.

See Illustration below:

1. Full Height Panel.
2. Jamb Panel, adjacent to a window, door or mechanical opening which supports a lintel panel.
3. Lintel Panel, load bearing or non-load bearing panel over window or door openings.
4. Sill Panel, located below a window or mechanical opening.

The components listed represent a typical panel installation. However, other items should be considered 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 the Hebel shop drawings for every project, as developed in cooperation with the customer’s design professionals.
The installation of Hebel AAC Vertical Load Bearing Wall Panels typically requires the following equipment, tools and materials.

The following items are available for purchase from Xella if the Contractor does not have an appropriate quantity:

**Table 5C.1: Tools and Equipment for Purchase from Xella**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hebel Thin-bed Mortar</td>
<td>Thin-bed Mortar Trowel</td>
</tr>
<tr>
<td>Repair Mortar 30</td>
<td>Tube Nails</td>
</tr>
<tr>
<td>Corrugated Nails</td>
<td>Helifix Anchors (8mm x 20in)</td>
</tr>
<tr>
<td>Hebel Lifting Clamp w/ manometer</td>
<td>Commercial Router &amp; bits</td>
</tr>
</tbody>
</table>

**Table 5C.2: Tools and Equipment Typically Provided by the Contractor / Owner:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixing Paddles</td>
<td>Mixing Tub (white)</td>
</tr>
<tr>
<td>Temporary Bracing</td>
<td>Wood Guide Template</td>
</tr>
<tr>
<td>6 ft Carpenter’s Level</td>
<td>Commercial Router &amp; bits</td>
</tr>
<tr>
<td>Fine Grout</td>
<td>Reinforcing Bars</td>
</tr>
<tr>
<td>Threaded Rod, couplers, nuts, washers, etc.</td>
<td>Choker &amp; shackle</td>
</tr>
<tr>
<td>Crane</td>
<td>Rebar bender</td>
</tr>
</tbody>
</table>

*Note:* Major equipment / tools are listed but not limited to items noted above to complete the installation.
Figure 5C.2: Thin-bed Mortar Trowel (Width to match panel thickness)

Figure 5C.3: WKV Lifting Clamp

Figure 5C.4: Corrugated Nails

Figure 5C.5: Manometer for WKV Lifting Clamp (Manufactured by Van der Blij B.V.)

Figure 5C.6: Tube Nails

Figure 5C.7: Helifix Anchors
5C.4 Preparation

Introduction to Hebel Shop Drawings

Hebel Shop Drawings include the following:

- General Notes
- Wall Panel Layout
- Wall Elevations
- Sections and Details
- Panel Schedule indicating the following:
  - Panel mark numbers
  - Quantity of panels
  - Panel Profiles
  - Dimensional information
  - Weight of individual panels

Hebel Shop Drawings are developed and issued to the customer for his design professional's approval, based on the requirements established by the customer’s professional design team and originating from the final construction documents. Once approved, the Shop Drawings are used as a source to develop the panel schedule and to design the panels according to the specific loadings and the required reinforcement and strength class.

Template Layout

Purpose: 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
- Masonry screws (HILTI KWIK-CON II ¼"dia. x 3 ¼“)
- 2 x 4 wood cleats
- Chalk lines
**Note:** All surfaces 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.

- Check the levelness of the slab prior to installing the template.
- Layout building wall lines. Snap chalk-line on slab along the inside face of the wall panels.
- Check range & elevation with string lines
- Plumb elevated template true to chalk lines
- Template elevated on cleat (secure with ITW Tapcon) to allow uniform distribution of mortar bed
- Verify building wall lines.
- Layout of wall panels – Panel marks, door & window openings, mechanical openings, etc.
- Identify extent of openings on template
- Indicate panel marks above opening
5C.5 Erection Equipment

Lifting Clamp & Manometer

(Manufactured by Van der Blij B.V.)

Important Note: Each manometer is dedicated to a specific lifting clamp. Verify the lifting clamp and manometer shipped has the same identification numbers.

Test lifting clamp pressure twice a day.

Clamp pressure must be within the acceptable range (See operating manual for pressure range)

Note: Test the lifting clamp pressure twice every day prior to start of panel installation. The clamp pressure should be checked at the start of the day and at the mid-day. Record clamp pressure and date into the daily log.
Operating Manual for Wall Panel Clamp:

Read operating manual before using this clamp!

TYPE WKV 15-20-US FL
TYPE WKV 20-25-US FL
TYPE WKV 24-30-US FL

These clamps are used to install vertical and horizontal Hebel wall panels:

- 6” to 8” thick (150-200 mm)
- 8” to 10” thick (200-250 mm)
- 9 1/2” to 12” thick (240-300 mm)

Table 5C.3: Clamp Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>129952A*</th>
<th>129960*</th>
<th>129980*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed internal height</td>
<td>260 mm</td>
<td>260 mm</td>
<td>260 mm</td>
</tr>
<tr>
<td>Clamp length</td>
<td>200 mm</td>
<td>200 mm</td>
<td>200 mm</td>
</tr>
<tr>
<td>Clamp range</td>
<td>6” - 8” (150-200 mm)</td>
<td>8” - 10” (200-250 mm)</td>
<td>9 1/2” - 12” (240-300 mm)</td>
</tr>
<tr>
<td>Max. Load bearing capacity</td>
<td>1,540 lbs (700 kg)</td>
<td>1,650 lbs (750 kg)</td>
<td>1,980 lbs (900 kg)</td>
</tr>
<tr>
<td>Weight</td>
<td>220 lbs (100 kg)</td>
<td>220 lbs (100 kg)</td>
<td>260 lbs (120 kg)</td>
</tr>
</tbody>
</table>

*Supplied as standard with manometer for checking clamp pressure

Instructions for Use

Hebel wall panels are shipped horizontally on their edges, and installed vertically or horizontally.

The clamp has a constant clamp force lock (torque wrench principle).
Every day before using the clamp, check the clamp pressure with the aid of the pressure cylinder and record the reading on the log sheet (Appendix 1). Pressure should be as follows:

110 < Pressure < 140 bar (WKV 15-20 US FL & WKV 20-25 US FL)

130 < Pressure < 160 bar (WKV 24-30)

**Vertical lifting and installation**

1. Attach clamp to crane hook.
2. Move the clamp to the end of the wall panel to be lifted.
3. Open the clamp sufficiently, depending on the thickness of the wall panel, by turning the hand wheel counterclockwise.
4. 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.
5. Set the clamp with the inner side of the clamp fully against the wall panel. (See drawing below).

![Figure 5C.10: Clamp set with the inner side of clamp fully against wall panel](image)

6. Apply pressure to the clamp by turning the hand wheel of the clamp clockwise until you feel a click and the green windows are visible (do not turn it any further after this).
7. Now carefully hoist the wall panel up and maneuver it into position.
8. 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.
**Horizontal lifting and installation**

1. Attach clamp to crane hook.

2. Four safety strap suspension points are located on the (2) plates mounted to the clamp jaws.

3. Attach the straps with hooks to one side of the clamp and with triangles to the other side.

4. Mark the center of the wall panel to be lifted.

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

6. Lower the clamp completely on the panel at the marked centerline.

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

8. Lift clamp and panel ± 12” (300mm) above the ground and attach the safety straps under the panel. Connect both safety hooks to the opposite triangles.

9. Now carefully hoist the wall panel up and maneuver it into position, disconnecting the safety hooks from the triangles just prior to setting.

10. 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.

**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 persons to be under the load during lifting!**
- Handle the clamp with care.
- 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.
- No alterations may be made to the clamp without the manufacturer's written permission. Any breach of this condition automatically invalidates all warranties.
- If the lifting eye on the clamp is attached directly to the crane hook, the crane hook must be able to move freely in the lifting eye. If not, use an extension.
- In freezing weather, do not attempt to lift panels on which ice has formed.
Daily

- Check the clamp pressure with the special test-cylinder every day before using.
- Check the clamp to insure it is in good condition and working properly.
- Any parts showing defects or wear must be replaced by an authorized service representative.

The clamp must be serviced and checked by an authorized service representative every six (6) months.

Transport/Storage

Keep the clamp, with the jaws closed, in a dry storage area (stress-free) to prevent damage and to keep dirt out. Keep the wall panel clamp clean. The pressure cylinder must be stored in the box provided and kept with the specified clamp at all times.
Instructions for Checking Clamp Pressure

Clamp type 12.99.52A - 12.99.60 – 12.99.80

This type of clamp is designed specifically for the vertical and horizontal installation of Hebel wall panels. Every day before using the clamp, check the clamp pressure with the aid of the pressure cylinder and fill record the reading in the log.

Method

1. Place the clamp on a solid surface and open it at least 8”(200mm).
2. The lifting eye must be at the top of the clamp (see figure 5C.11).
3. Place the cylinder between the clamp rubbers and carefully place the manometer on the surface.
4. Apply pressure to the clamp until you feel the click and the green windows are visible.
5. Check the working pressure using the manometer. Pressure should be as follows:

   110 < Pressure < 140 bar (WKV 15-20 US FL & WKV 20-25 US FL)
   130 < Pressure < 160 bar (WKV 24-30)

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. Enter the data on the enclosed log.
### Table 5C.4: Clamp Types and Codes

<table>
<thead>
<tr>
<th>Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>WKV 12.99.52A</td>
<td>WKV 15-20 US-FL</td>
</tr>
<tr>
<td>WKV 12.99.60</td>
<td>WKV 20-25 US FL</td>
</tr>
<tr>
<td>WKV 12.99.80</td>
<td>WKV 24-30 US FL</td>
</tr>
</tbody>
</table>

### Table 5C.5: Log Sheet

<table>
<thead>
<tr>
<th>Serial #</th>
<th>Date of Check</th>
<th>Checked By</th>
<th>Manometer Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

*Store the manometer in the box with the lid closed.*
HEBEL THINBED MORTAR

Polymer Modified AAC Adhesive Cement

HEBEL THINBED MORTAR is a polymer modified, white portland cement adhesive specifically designed to bond autoclaved aerated concrete units for interior and exterior wall construction.

Surface Preparation: All bases to receive HEBEL THINBED MORTAR must be clean, dry, and free of grease, oil, dirt, paint, and any foreign residues.

Mixing: Mix one 55 pound bag with approximately 1 3/4 gallons of clean water for 5 minutes and remix prior to use. The desired consistency is that which allows the mortar to flow easily through a notched trowel.

Application: Apply to autoclaved aerated concrete using an appropriately sized notched trowel. Deposit the proper amount of HEBEL THINBED MORTAR along the center of the horizontal surface to evenly distribute the mortar over the surface. Use the trowel to directly apply mortar to the vertical surface, drawing it from the bottom to the top of the block. Once set, the joint thickness should be approximately 1/16 to 3/32 inch. The mortar allows approximately 5 minutes for straightening and adjustment of the unit before it begins to set.

Precautions: Ambient and surface temperatures must be higher than 40°F and not expected to fall below 40°F within 24 hours. Protect from rain until completely hard.

Drying Time: Total cure obtained in 24 hours.

Package Size: 55 pound bag

Cleaning: Clean tools with water. Protect glass, metal, stone, brick and other area from contact with plaster.

Coverage: One 55 pound bag covers one pallet of autoclaved aerated concrete.

Storage: Product storage life is one year from date of manufacture.

Technical Data:
- Compressive Strength: 1800 psi
- Dry Density: 89 lbs/ft³
- Wet Density: 108 lbs/ft³
- Shear Bond Strength ASTM C1072: 85psi* block failure
REPAIR MORTAR 30

Patching Mortar for use on AAC Panels

REPAIR MORTAR 30 is a crack resistant, non-shrinking patching mortar for use on autoclaved aerated concrete panels. REPAIR MORTAR 30 sets in 15 - 30 minutes to form a permanent bond to existing surfaces. REPAIR MORTAR 30 is both color and texture matched to autoclaved aerated concrete so that repairs to surface damages blend in with the surrounding substrate.

REPAIR MORTAR 10 is also available in a formulation designed to set in only 5 - 10 minutes.

Surface Preparation: All bases to receive REPAIR MORTAR 30 must be clean and free of grease, oil, dirt, paint, and other foreign residues. The surfaces must always be wetted before application of mortar.

Mixing: One bag of REPAIR MORTAR 30 is mechanically mixed with 4 gallons of water. Do not re-temper mortar.

Application: Fill patches with mortar to extend over the edges of the damaged area. After initial setting, level surface flush with the plane of substrate using a rasp or angle plane. After the patch hardens, decorative coatings may be applied.

Precautions: Do not apply if temperature is expected to drop below 40°F within 24 hours of application.

Drying Time: Depending on temperature and humidity, mortar cures in 2 to 5 days.

Cleaning: Immediately after use, rinse with water.

Coloring: Approximates autoclaved aerated concrete color.

Package Size: 55 pound bag

Coverage: One cubic foot per bag.

Storage: Product storage is one year from manufacture. Protect from moisture.

Technical Data:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Density</td>
<td>82 lbs./ft.³</td>
</tr>
<tr>
<td>Dry Density</td>
<td>50 lbs./ft.³</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>600 psi</td>
</tr>
<tr>
<td></td>
<td>285,000 psi</td>
</tr>
</tbody>
</table>

ELITE CEMENT PRODUCTS, INC. • 4235 Buford Highway • Duluth, Georgia 30096 • (678) 206-0242 • fax (678) 206-0254
Product Data Sheet

BLOCKPATCH

Lightweight Patching Mortar

BLOCKPATCH is a premixed fast setting cement mortar that is applied to autoclaved aerated concrete block to repair broken, chipped, or gouged areas prior to application of exterior or interior plasters.

Surface Preparation: All bases to receive BLOCKPATCH must be clean, dry, and free of grease, oil, dirt, paint, and any foreign residues.

Mixing: Mix one 50 pound bag with approximately 2 gallons of clean water for a few minutes and be careful not to mix more than can be used within 15 minutes.

Application: Apply BLOCKPATCH to repair area and smooth trowel to bring even with aerated concrete. Cold water and material will slow set. Warm water and material will accelerate set.

Precautions: Ambient and surface temperatures must be higher than 40°F within 24 hours. Protect from rain until completely hard.

Drying Time: Initial set is in 30 minutes. Higher strengths obtained in 24 hours.

Cleaning: Clean tools with water. Protect glass, metal, stone, brick, and other area from contact with plaster.

Coverage: One 50 pound bag will cover 32 sq/ft at 1/4 inch thickness.

Storage: Product storage life is one year from date of manufacture.

Technical Data:
Compressive Strength 700 psi
Dry Density 68 lbs/cf
Wet Density 92 lbs/cf
5C.7 Execution
The following section outlines the basic steps required to properly install Hebel-Vertical Load Bearing Wall Panels:

1. Building Plan/Detail Orientation & Material staging
2. Wall Layout
   - Square and true building (See Template Layout in Preparation section)
   - Verify field dimensions with Hebel shop drawing dimensions
3. Template Installation (See Template Layout in Preparation section)
4. Clamp Testing / Rigging
5. Mortar Mixing (See Hebel Mortar)
   - Bed Mortar (Large Aggregate Thin Bed Mortar)
   - Joint Mortar (Thin Bed-Mortar)
6. Panel Preparation for Lifting
   - Panel Banding
   - Panel Separation on Pallets
   - Lifting Clamp hook-up
   - Mortar Application
7. Panel Placement
   - Plumbing
   - Truing
   - Corrugated Nails
8. Temporary Bracing
   - Schedule A for 40 mph Wind Speed
   - Schedule B for 50 mph Wind Speed
9. Site clean-up
   - Stripping template
   - Mortar scraping
   - Patching

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Straight Reach</th>
<th>Reach over 20' Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 Ton</td>
<td>90'</td>
<td>70’</td>
</tr>
<tr>
<td>35 Ton</td>
<td>120’</td>
<td>90’</td>
</tr>
<tr>
<td>50 Ton</td>
<td>120’</td>
<td>120’</td>
</tr>
</tbody>
</table>
Prior to lifting a vertical panel with the clamp hook-up, apply the thin-bed mortar 10 minutes (maximum) from final setting of panel. Lifting Clamp Hook-up of rigging is simple and quick (one man operation)

**Note:** Remove panel tag after securing the lifting clamp to the panel.

*Figure 5C.12: Lifting Clamp*

Always plumb the panel with a 6' level prior to being “Nailed Off” with (2) corrugated nails to secure panel in plumb true final position

*Figure 5C.13: Plumb Panel with 6” level*
5C.8 Temporary Bracing

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

Table 5C.7: Recommended Schedules

<table>
<thead>
<tr>
<th>Schedule A</th>
<th>Schedule B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Speed: 40 mph</td>
<td>Wind Speed: 50 mph</td>
</tr>
<tr>
<td>Wind Load ( (w) = 0.00256V^2 )</td>
<td>Wind Load ( (w) = 0.00256V^2 )</td>
</tr>
<tr>
<td>Design Pressure ( (w) : 4.1 ) psf</td>
<td>Design Pressure ( (w) : 6.4 ) psf</td>
</tr>
</tbody>
</table>

* The Wind Load Criteria is in accordance with the “Standard Practice for Bracing Masonry Walls under Construction”

Figure 5C.14: Temporary Bracing
**Stripping Template**

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

**Mortar Scraping**

Approximately (30) thirty minutes after panels are set in place, scrap the excess mortar from all the joints. Clean up the excess mortar and dispose of properly.

**Patching**

Patching of minor chips and spalls should occur immediately 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.
**DISCLAIMER.** This document is not intended to replace the knowledge, experience and judgment of design professionals. Xella Aircrete North America, Inc. is **not** responsible for ensuring weather-tightness, overall functionality or fitness for use of the panels, nor compliance with federal, state, or local laws, ordinances or regulations, including building, environmental and other codes.

**WARNING.** Property damage, personal injury or death may result from improper design, use, or installation. Licensed design and construction professionals, who maintain good standing with the governing authority and have the necessary knowledge, experience and judgment of the specific building system and its components, should be retained to ensure a proper design, use, and installation.

**MODIFICATIONS.** Xella Aircrete North America, Inc. reserves the right to change its Technical Manual, Design Guide, safe working loads, panel dimensions or installation techniques at any time without prior notice. Last modified: 1/7/2010.

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