Section 5B: Floor and Roof Panel Installation Guide

5B.1 Introduction

This Installation Guide was prepared by Xella Aircrete North America, Inc., to help owners, design professionals, construction managers and installers install Hebel Autoclaved Aerated Concrete (AAC) Floor and Roof Panels. It is especially for the installer who may not be familiar with AAC floor and roof construction.

We have attempted to provide some general information regarding various 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.

Please contact us with additional questions or supplies:
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5B.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 OSHA Guidelines.
- Stored 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 safety laws and 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 Floor and Roof Panels.**

5B.3 Hebel AAC Floor and Roof Panels

Hebel Floor and Roof Panel is an Autoclaved Aerated Concrete (AAC), steel reinforced element. The steel wire reinforcement is covered with an anti-corrosion coating.

Hebel AAC Floor and Roof Panels are lightweight, fire resistant*, water penetration resistant**, pest resistant, fast and easy to install, versatile and affordable.

*Under ASTM E119-95 UL

**ASTM E514

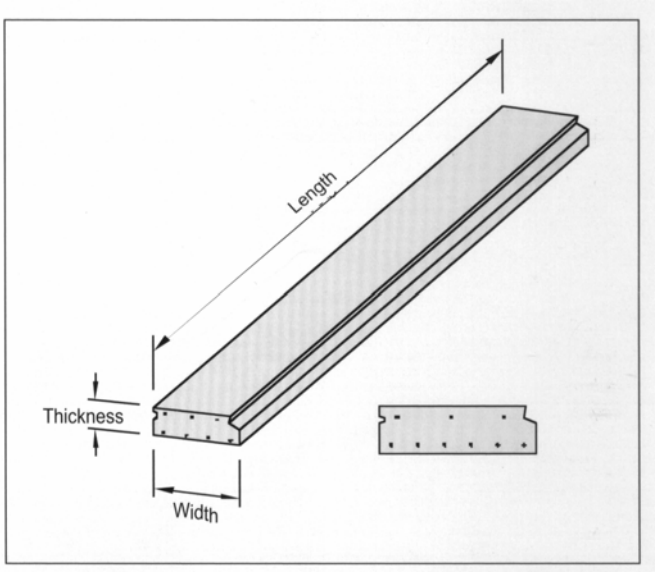


Figure 5B.1: Hebel Floor/Roof Panel (AAC reinforced element)

Uses

Where appropriate, Hebel AAC Floor and Roof Panels can be used in conjunction with Hebel Masonry Components, CMU walls, steel or concrete beams. These panels are used in residential and commercial buildings.

Table 5B.1: Floor and Roof Panel Dimensions

Length	Up to 236 in	5,995 mm
Width	12 – 24 in	300 – 610 mm
Nominal Thickness	6 in	150 mm
	8 in	200 mm
	10 in	250 mm
	12 in	300 mm

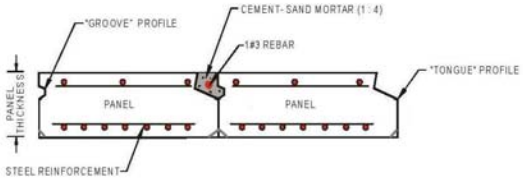


Figure 5B.2: Typical cross section in Hebel Floor/Roof Panel

Design Considerations

- Hebel AAC Floor and Roof Panels generally can be used as floor or roof systems and can be manufactured to meet certain safety and serviceability requirements as specified by ACI 318 and following guidelines of ACI SP226.
- Floor and Roof panels generally can be supported by Hebel Masonry Walls, CMU walls and concrete or steel beams.

5B.4 Preparation

Before Installation of Hebel Floor and Roof Panels:

1. Clear the unloading and provisional storage area

- Flat surfaces are required for unloading pallets, preferably close to final position.
- Place pallets over wood blocks (panels must not be in contact with ground).

2. Check material and installation logistics

- Verify dimensions, positions and quantity of the panels according to Hebel shop drawings.
- Define sequence of panel installation according to Hebel shop drawings. To help speed installation, place the panels with the groove side at the beginning and continue.
- Define type of installation equipment (crane or similar).
- Evaluate quantity of personnel required (see Table 5B.2).

3. Check existing steel accessories

- Steel accessories for holes in floor and roofs.
- Steel accessories for holes in walls.
- Steel accessories for cantilevered panels.
- Fasteners to fix steel accessories.

4. Check support structure

- All support elements (walls, beams, etc.) must be already finished before receiving floor and roof panels.
- Check layout and top of supporting structure. Hebel masonry block adjustments must not be less than 2” in height, or else cement-sand mortar (1:4) must be used.
- Bearing lengths for Hebel Floor and Roof Panels should comply with Table 5B.3.
- Place steel accessories if required (holes in walls, supporting areas, etc.)
- Mark guidelines on top of the supporting elements, according to bearing lengths in Hebel shop drawings.
- For non-load bearing elements, put compressible sheets (polystyrene or similar) on top.

Table 5B.2: Average Efficiency for Hebel Floor and Roof Panel Installation

Hebel Floor and Roof Panels	Average Efficiency (panels/shift)	Personnel Required	Notes
Floor or roof, Length from 10’ to 14’ 9”, Thickness: 6” and 8”	120 – 150	1 skilled, 3 laborers, crane operator, and safety look out.	Depending on job site access
Floor or roof, Length from 10’ to 20’ Thickness: 10” and 12”	110 - 140	1 skilled, 3 laborers, crane operator, and safety look out.	

Table 5B.3: Minimum Bearing Length for Hebel Floor and Roof Panels.

Support Elements	Minimum Bearing Length "a" (in)
Hebel Masonry	2
Concrete or reinforced concrete	2
Steel Beams	1 ½

5B.5 Installation of Hebel Floor and Roof Panels

1. Identify panels to be installed according to previous logistics.
2. Unpack panels using scissors or hammer ax
3. Mark center of panels.
4. Place lifting gear at center of panel (Figure 5B. 5)
5. Using the pulleys, close clamps, clipping the tongue and groove sides of the panel.
6. Lower safety bars prior to lifting panel.
7. Raise the locking lever and indicate to crane operator to lift the panel.
8. Two people will lead the panel to place it on the supports.
9. Clear safety bar from adjacent panel prior to placing panel on supports (Figure 5B.5).
10. Place the panel on the guidelines previously traced.
11. Once the panel is placed, remove the lifting gear.
12. This procedure should be followed for each successive panel.

Caution: Handle panels with care to avoid damage. Make chases needed prior to installation.

Figure 5B. 5: Placing the lifting gear at the center of panel

Figure 5B.5: Floor and Roof Panel Lifting Gear

Figure 5B.5: Before placing the panel on the supports, clear safety bar from adjacent panel

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 Floor and Roof Panels.

5B.6 Cast and Reinforcement of Longitudinal Joints and Ring Beams

After panel installation, place steel reinforcement in longitudinal joints (see Figure 5B.6) and ring beams surrounding panels (see Figure 5B.7, Figure 5B.8, and Figure 5B.9). Forms must be placed in perimeter ring beams.

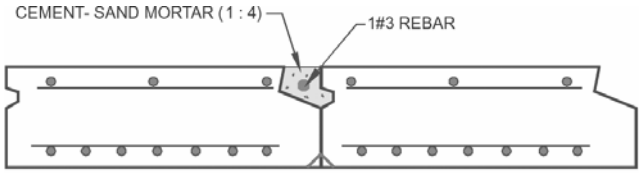


Figure 5B.6: Typical detail of longitudinal joint between Hebel AAC Panels

1#3 rebar (min) is required in longitudinal joints (shear joints), wedged with rebar spacers (1 every 5 ft), and filled with cement-sand mortar (1:4).

Ring beams require min. 2 #4 rebars and a #3 every 16" (diagonal) and filled with regular concrete f'=3ksi. The maximum size of coarse aggregate is 3/8" and 5" to 6" of slump. Form surfaces must be moist before concrete casting. A smooth surface of concrete is required to match the top of the panels using a mason's trowel.

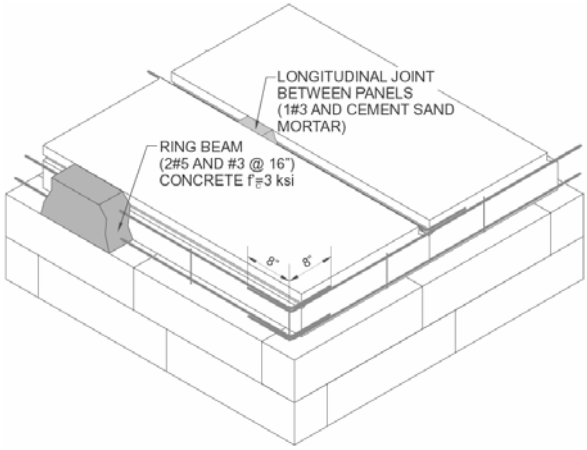


Figure 5B.7: Typical Reinforcement for ring beams and longitudinal joints

When Hebel Panels are installed on a steel structure, steel plates must be welded (every 2 longitudinal joints) to the structure for connection (see Figure 5B.11)

5B.7 Utilities Installation

Openings

Openings in floor and roofs for A/C ducts, staircases, etc. are built using steel supports. For more information call Xella Technical Department.

Electrical Conduits

Electrical conduits with a diameter < 1" can be lodged through longitudinal joints on top or bottom of the panels. For electrical conduits with a diameter> 1", longitudinal joints can be widened to lodge them. It is not recommended to chase on top of panels.

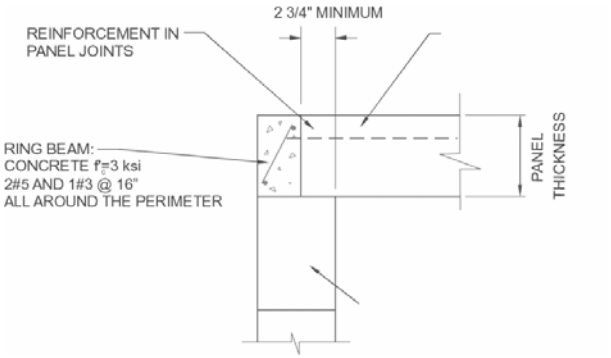


Figure 5B.8: Typical detail of panels supported on Hebel AAC masonry walls.

It is possible to define cut surfaces in panels regarding installations (for more information call Xella Technical Department).

Caution: Concrete dust contains quartz silica, a potential human carcinogen. Inhalation of concrete dust above required or recommended exposure levels may be harmful. Proper dust protection is recommended when cutting AAC

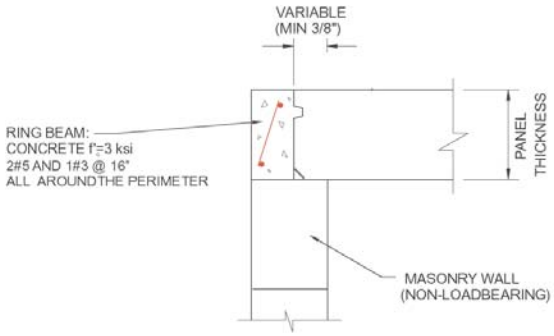


Figure 5B.9: Typical side bearing detail o floor/roof panel.

Piping Lines

When required, PVC and other piping lines can pass through holes in the panels. The maximum hole diameter permitted in panels is 4". If more than one hole is required, they must be aligned along the length of the panel. Only one longitudinal rebar in the bottom reinforcement of the panel can be cut (for more information call Xella Technical Department).

Surface Patching

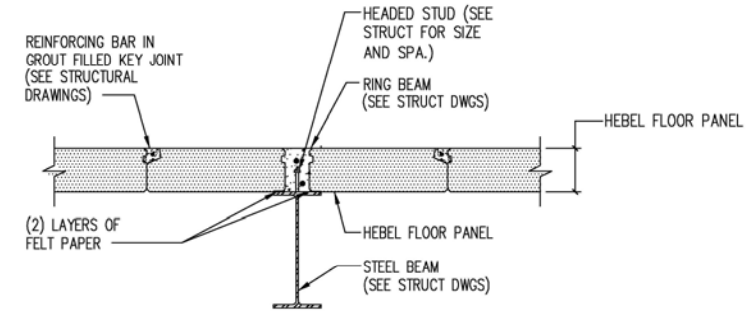
Use Hebel Repair Mortar to patch chips, breaks and other imperfections on surfaces of Hebel Floor and Roof Panels.

Hebel Repair Mortar is prepared in a bucket, adding water and mortar from the bag (see instructions on the bag) and mixed with a stirrer using a power drill or by manual means (depending on quantity to be used).

It is applied using a spatula.

Note: Technical support is available for builders and architects.

Contact your local Xella sales office for more information.



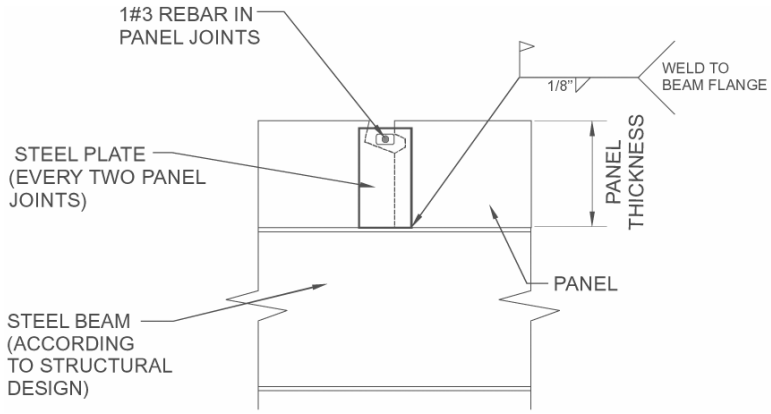


Figure 5B.11: Connection Plate in Ring Beam (N.T.S.)

Caution: Use safety gear: Hard hat, gloves, dust mask and goggles to avoid inhalation of dust and protection of the eyes when handling Hebel Floor and Roof Panels.

5B.8 Equipment / Tools

Below is a list of equipment, tools and materials typically required for the installation of Hebel Floor and Roof Panels. The following items are available from Hebel if the contractor does not have an appropriate quantity:

Table 5B.4: Equipment / Tools Available from Hebel

Description:	
Lifting Clamp	Repair Mortar 30

Table 5B.5: Equipment / Tools Typically Provided by the Contractor / Owner

Description:	
4x4 in. wood blocks, 2 ft long	Rubber mallet
Crane or similar	Anticorrosive Paint
Sanding Float	Brush
Chasing tool	Spatula
Safety gear (goggles, dust mask, gloves, hard hat)	Router
Floor and Roof Lifting Gear	Power drill
Circular saw with 8 1/4” or 9” metal or diamond blade	

Note: Major equipment / tools are listed but not limited to items noted above to complete the installation.

5B.9 Erection Equipment

Read operating manual before using this clamp!

Operating Manual for Floor/ Roof Panel Clamp TYPE 125575A

Use This clamp is used to install Xella floor and roof panels:
8” – 12” (200 – 305 mm) thick,
12” - 24” wide (305 – 610 mm),
Max. length 19’-8” (5,995 mm).

Table 5B.6: Erection Equipment Specifications

Type	**125575A**
Code	**UDPK 15-20 US FL**
Fixed internal height	50 – 62 mm
Clamp length	2,400 mm
Clamp range	12” – 24” (305-610 mm)
Max. Load bearing capacity	2,860 lbs (1,300 kg)
Weight	705 lbs (320 kg)
Supplies as standard with	Safety Bars

Instructions for Use

The floor/roof panel clamp consists of following items:

(1) spreader beam with chain suspension
(2) clamps fitted for 12” to 24”
(1) set of safety bars to be mounted on the clamps
(1) separate lifting eye for using (1) clamp

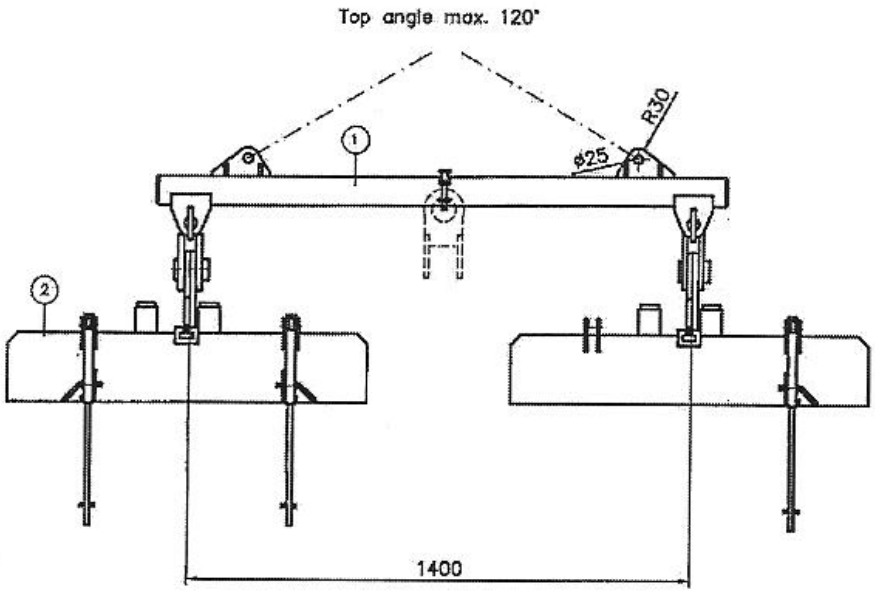


Figure 5B.12: Floor and Roof Panel Clamp Drawing

Floor/roof panels are shipped horizontally and installed in the horizontal position.

Using Two (2) Clamps with Spreader Beam

Lifting floor/roof panels with a length of 6'–6" to 19'-8" (1,980 – 5,995 mm) and max. load of 2,860 LBS**.**

1. Mount both clamps on the spreader beam and lock the suspension bolts with the R pin.
2. Each side of the clamps must be aligned with one another (marked as tongue and groove side).
3. Attach the lifting eye to the crane hook.
4. Measure the width of the floor/roof panel which is going to be lifted.
5. The clamps are provided with an automatic locking system. Each clamp has a locking mechanism
6. The clamps must be in the open position before adjusting the width for the panel. If not, lower the (2) clamps onto a firm and level surface and the clamps will lock in open position automatically. If the grabs are not working synchronous, one of the clamps must be reset by means of turning the cam wheel 1/6 of a turn. The cam wheel is turned by rotating the bushing sticking out through the guard at the locking mechanism.
7. Lift the clamps in open position 20" (± 500mm) above the ground. On the side of each clamp are (2) spring loaded pins at the sides. By pulling the pin out of its locking position, you can slide the jaw over the T-profile in order to adjust the clamp width. When the jaw is in the correct position the spring loaded pin will slide into the hole.
8. All (4) jaws must be placed in the same position (See Table 5B.7). The clamping jaws must be placed in the appropriate position for the panel width being lifted as listed in the table below.

Table 5B.7: Clamping Jaws Position

Position A	Panel width 305 mm
Position B	Panel width 400 mm
Position C	Panel width 500 mm
Position D	Panel width 610 mm

Figure 5B.13: Pulling Pin to Position Clamping Jaw

9. On each clamp are (4) height adjustments to be adjusted by means of rollers. Adjust the height of the rollers based on the thickness of the floor/roof panel. The round bar must always be at the deepest in the tongue and the round bar at the opposite side must be in the centre of the groove (see Figure 5B.14 and 5B.15).
10. All (8) rollers must be in the correct position and locked with the pin.
11. Adjust the (4) safety bars. The safety bars must be adjusted as close under the panel as possible but still being able to rotate under the panel after the panel has been lifted. All (4) bars must be adjusted to the same position and locked with the pins
12. Mark the centre of the floor/roof panel to be lifted. The centre of the spreader beam must be at the marked centreline!
13. Lower the clamps completely on the panel.
14. Now lift the clamps slowly
15. Note: Verify that both clamps start gripping the panel.
16. Lift the panel ± 12 inches above the ground and rotate the (4) safety bars under the panel.
17. Now carefully hoist the floor/roof panel up and maneuver it into position, rotating the (4) safety bars upward just prior to setting.
18. When the panel has been positioned correctly, lower both clamps on the panel so that the (2) locking mechanisms keeps the clamps open.
19. Now you can lift the clamps carefully from the panel.

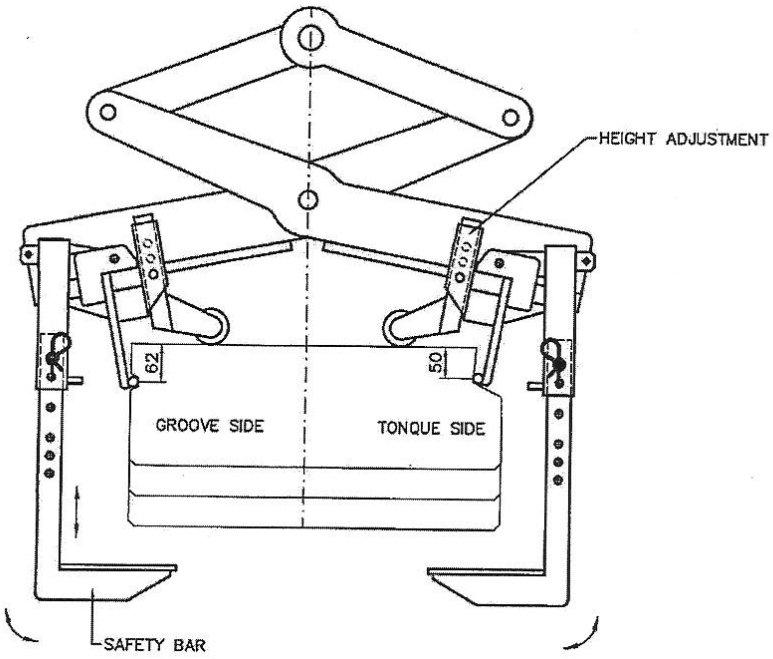


Figure 5B.14: Clamp Roller Height

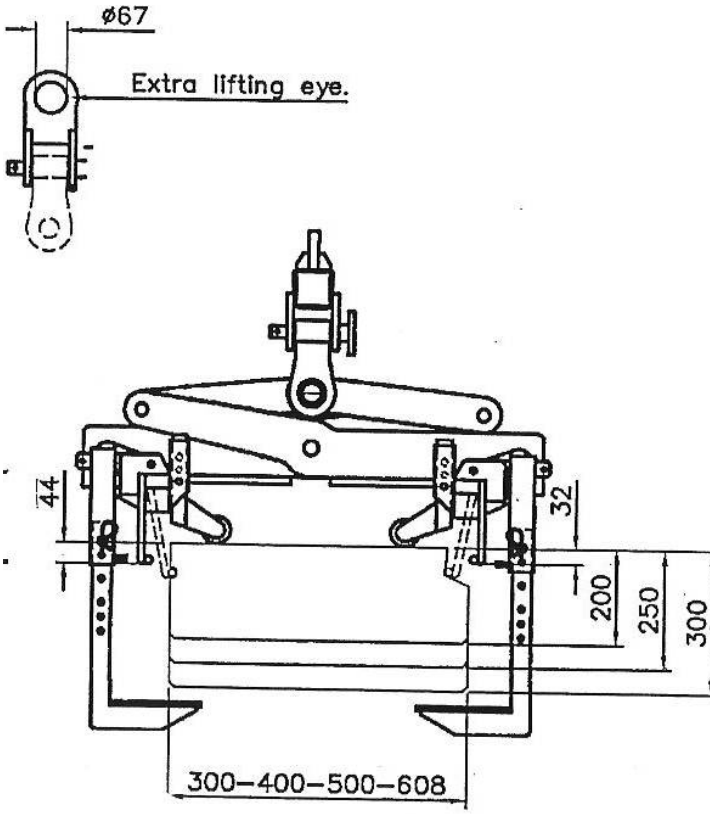


Figure 5B.15: Clamp Roller Height

Using One (1) Clamp

Lifting floor/roof panels with a max. length of 10'–0" (3,000 mm) and max. load of 1,430 LBS.

1. Dismount 1 clamp from the spreader beam.
2. Mount the separate lifting eye on the clamp and lock it with the bolt and R pin.
3. Attach the lifting eye to the crane hook using an appropriate sling or choker (never directly).
4. Measure the width of the floor/roof panel which is going to be lifted.
5. The clamp is provided with an automatic locking system.
6. Use 2 safety bars from the other clamp and mount them on the brackets.
7. Lift the clamp in open position 20" (± 500mm) above the ground. On the side of each clamp are (2) spring loaded pins at the sides. By pulling the pin out of its locking position, you can slide the jaw over the T-profile in order to adjust the clamp width. When the jaw is in the correct position the spring loaded pin will slide into the hole. Both (2) jaws must be placed in the same position. The clamping jaws must be placed in the appropriate position for the panel width being lifted as listed in the Table 5B.8.

Table 5B.8: Clamping Jaw Position

Position A	Panel width 305 mm
Position B	Panel width 400 mm
Position C	Panel width 500 mm
Position D	Panel width 610 mm

8. On the clamp are (4) height adjustments to be adjusted by means of rollers. Adjust the height of the rollers based on the thickness of the floor/roof panel. The round bar must always be at the deepest in the tongue and the round bar at the opposite side must be in the centre of the groove (see drawing below).

   All (4) rollers must be in the correct position and locked with the pin.
9. Adjust the (4) safety bars. The safety bars must be adjusted as close under the panel as possible but still being able to rotate under the panel after the panel has been lifted. All (4) bars must be adjusted to the same position and locked with the pins
10. Mark the centre of the floor/roof panel to be lifted. The centre of the clamp must be at the marked centreline!
11. Lower the clamp completely on the panel.
12. Now lift the clamp slowly **Note: Verify that the clamp starts gripping the panel.**
13. Lift the panel ± 12 inches above the ground and rotate the (4) safety bars under the panel.
14. Now carefully hoist the floor/roof panel up and manoeuvre it into position, rotating the (4) safety bars upward just prior to setting.
15. When the panel has been positioned correctly, lower the clamp on the panel so that the locking mechanism keeps the clamp open.

16. Now you can lift the clamp carefully from the panel.

Important

- Always use the safety bars during lifting a floor/roof panel
- **It is strictly forbidden at any time for persons to be under the load during lifting!**
- Handle the clamps 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 movements 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 hook must be able to move freely in the lifting eye on the clamp. If it cannot, use an extension.
- In freezing weather, do not attempt to lift panels on which ice has formed.
- Do not attempt to lift panels which are greasy or in any other way are dirty or slippery which may cause less friction between the clamp rubbers and the panel.

Daily

- 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.

In the event that the clamp(s) is not operating properly, contact an authorized service representative.

Transport/Storage

Keep the floor/roof panel clamp dry and clean.

Produced by: VT-BSV a/s, Knudevejen 3, 6600 Vejen Denmark, Tel: 0045 7454 1437, Fax: 0045 7536 5093

5B.10 Repair Mortar 30

Product Data Sheet

REPAIR MORTAR 30

elite Cement Products

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 40^0 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:

Wet Density	82 lbs./ft.^{3}
Dry Density	50 lbs./ft.^{3}
Compressive Strength	600 psi
	285,000 psi

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

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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.

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