

Technical Sheet and Installation Guide
Hebel® Power Floor™
Autoclaved Aerated Concrete



The Xella logo consists of the word "Xella" in a white, sans-serif font, positioned on a solid 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 Floor™ Autoclaved Aerated Concrete



Uses and applications

Hebel® PowerFloor™ is a lightweight autoclaved aerated concrete (Hebel AAC) panel that can be fixed to timber or steel joists. It provides the feel of a rigid concrete floor but with the advantage of providing an instant working surface, along with acoustic and thermal benefits.

Construction Advantages

- No topping required.
- Rapid installation.
- Fire resistant.
- Superior Acoustic insulation.
- Accuracy of manufactured panels.
- No pre-drilling.
- Excellent load carrying capacity.
- Smooth finish surface.
- Lightweight panels.
- Non Toxic.
- Pest and rot resistant.

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

Application:

- Hospitality
- Assisted Living
- Multifamily

Certifications:

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

More benefits of Hebel® Power Floor™

- Fire resistance.
- Strength and security.
- Acoustic performance.
- Thermal performance.
- Not Mildew.
- Low maintenance.
- Friendly to the environment and Sustainable.
- Grants LEED points.
- Solid concrete floor.



Hebel® Power Floor™
Autoclaved Aerated Concrete

German
Technology 

 hebel®

xella®



Fig. 1: Hebel® Power Floor™ packaging.

1 Technical Sheet

1.1 Hebel® Power Floor™

General Features

Hebel® Power Floor™ 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 Floor™ can be cut and drilled with conventional tools.

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

Uses

Hebel® Power Floor™ can be used as flooring for metal or wood frame construction. Appropriate for residential, hotels, commercial and industrial buildings.

*Under ASTM E119/**ASTME514

Dimensions	
Thickness ⁽¹⁾⁽³⁾	3 in.
Length ⁽²⁾	6, 6.67 and 8 ft.
Width	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	in/ft	<0.02
Thermal Expansion Coefficient	1/°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⁾	ft	lb/ft ²	lb/piece	ft ²
3	2.953	6	9.22	110.6	12
3	2.953	6.67	9.22	122.7	13.3
3	2.953	8	9.22	147.7	16

* Exact dimension.

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

Table 2: Hebel® Power Floor™ design weight.

Thermal Properties	
Hebel® Power Floor™	
Thermal Conductivity	
0.9124 BTU-in/ft ² h ⁰ F	

Units:

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

Table 3: Hebel® Power Panel™ Thermal Conductivity.

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

Table 4: Hebel® Power Floor™ Acoustic Properties.

Note: Testing performed at stork Twin City Testing Corporation in accordance with ASTM (E90) Standard Method for Laboratory Measurement of Airborne Sound Transmission Loss Building Partitions.

2 Design Considerations.

2.1 General Considerations.

- Hebel® Power Floor™ shall be designed in order to comply with safety and serviceability requirements as specified by ACI 523.4R-09.
- Supporting joists shall be designed in accordance with the code to support design loads, including the self-weight of the floor panels.
- Hebel® Power Floor™ Panels shall be installed over wood or steel joists or trusses spaced a maximum of 24 inches on-center (610mm).

Joists and trusses shall be designed in accordance with the code to support the loads, including the self-weight of the floor panels. The nominally 3-inch thick panels weight approximately 9 psf. The maximum allowable uniform load shall not exceed 305 psf when supported a maximum of 24-inches (610 mm) on-center. See Table 5 of this report for maximum allowable diaphragm shear loads.

- Control joints are placed to prevent random cracking due to thermal expansion, contraction and structural movements.
- The width of the control joint should be 5/8" for metal frame or 1" for wood frame, and should be sealed with backer rod and caulking.

Shear Values		
	Maximum Diaphragm Shear (plf)	Joist Requirements, minimum
Wood systems - parallel to joists	392	2x6 nominal DF lumber spaced 24" o.c., minimum specific gravity of 0.50
Wood systems - perpendicular to joists	258	
Steel systems - parallel to joists	430	1.5" x 5.5" steel joists, minimum 22 gage (0.028-inch), spaced 24" o.c.
Steel systems - perpendicular to joists	343	

SI conversions: 1 inch = 25.4 mm; 1 plf = 1.488 kg/m

Table 5. Hebel® Power Floor™ allowable Diaphragm Shear Values.



Fig. 2

3 Installation Guide.

3.1 General Installation Guidelines

Previous Installing Hebel® Power Floor™

1. Check the Structure:

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

2. Check Hebel® Power Floor™ Pallets:

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

3. Hebel® Power Floor™:

- Shall be installed in accordance with this guide and the approved construction plans. A copy of the plans and this guide shall be available at the jobsite at all times during installation.
- Typical installation details are illustrated in figures 3 of this guide. These typical details are intended for general guidance only and must be substantiated for approval by the code official.

- Hebel® Power Floor™ Panels shall be protected from moisture and abrasion by application of an approved topping.

4. Fasteners:

- Fasteners shall be SFSintec’s #12 DEKFAST metal screws or similar. For installation to wood joists screws shall be minimum 4½-inch (114 mm) long with minimum 3½-inch (88.9 mm) long threaded ends. Fasteners shall penetrate a minimum of 1½-inch (38 mm) into wood framing. Wood framing shall be of a species with a minimum SG of 0.50 or greater. For use with steel joists screws shall penetrate a minimum of ¾-inch (19 mm) through steel framing. See Table 7 of this report for allowable shear load per fastener.

- Fasteners shall be spaced nominally 8-inches (203 mm) on-center along each joist line with edge distances as shown in Figures 3 and 4 of this report.

5. Miscellaneous:

- Hebel® Power Floor™ Panels shall be installed over wood or steel floor joists or trusses spaced a maximum of 24-inches (610 mm) on-center. Panels shall be installed in a running bond pattern with joints staggered at least 24-inches (610 mm) as shown in Figure 3 of this report.

- Construction adhesive shall be installed onto each joist prior to placement of the AAC panel, and panels shall be fastened to the joists or trusses with fasteners as described in Section 4.3 of this report. Joints between AAC panels shall be filled with Hebel® Thin Bed mortar prior to placement of adjacent panels.

- Bond construction adhesive (liquid nail or similar) below power floor in wood joist is optional and helps to prevent squeezing.

Fastener			
Material Stud	Shear (lb)	Pull-through (lb)	Pull-out (lb)
Wood	150	108	154
Steel	151	108	171

SI conversions: 1 lbs = 4.448 N, Screw #12-4½ Long.
Table 7. Allowable load per Fastener.

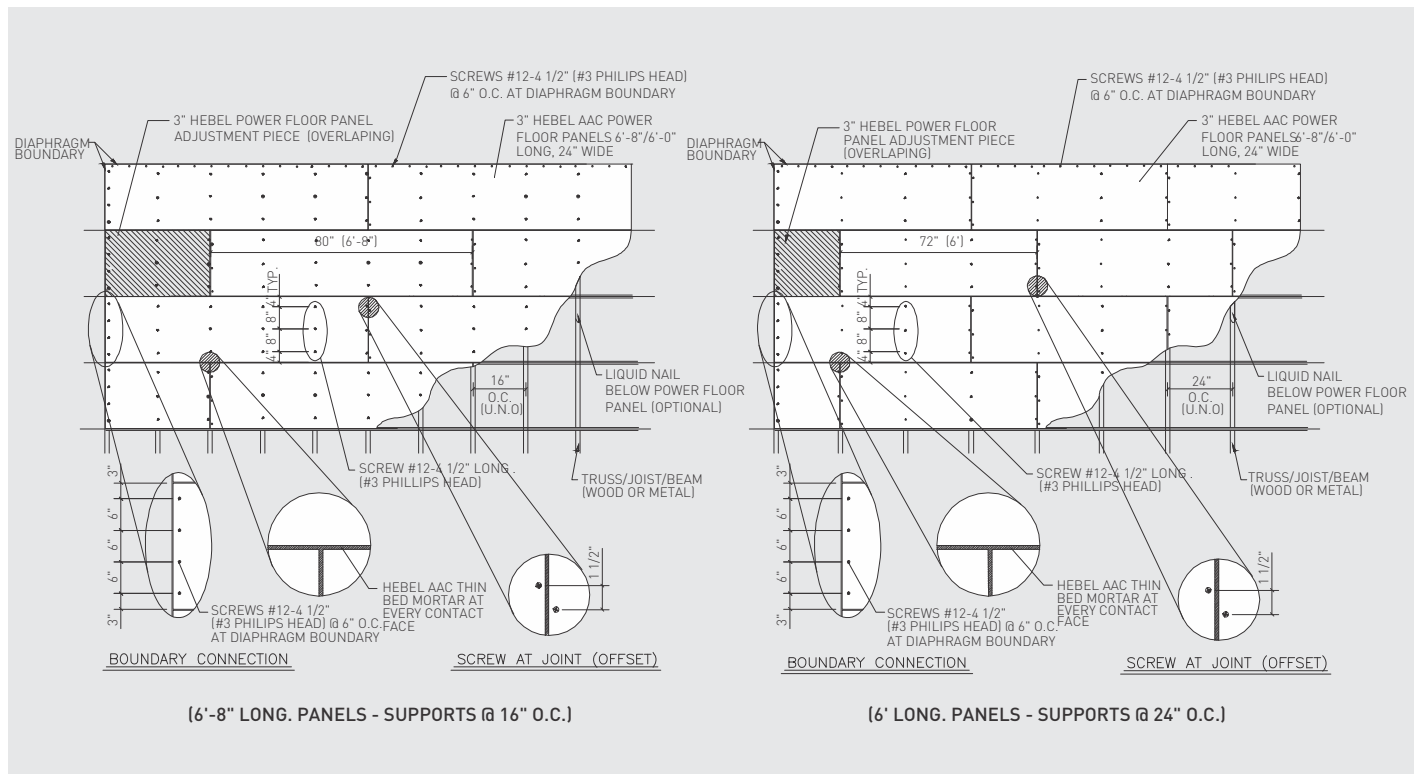


Fig. 3: Hebel® Power Floor™ System Layout

7. 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

Equipment:

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

Additional Material:

- Screws #12 (see Table 7 for specifications).
- Hebel® Thin Bed Mortar and Hebel® Repair Mortar.
- Anticorrosive Paint.

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



Fig. 5: Place Hebel® Power Floor™ pallets close to job site.

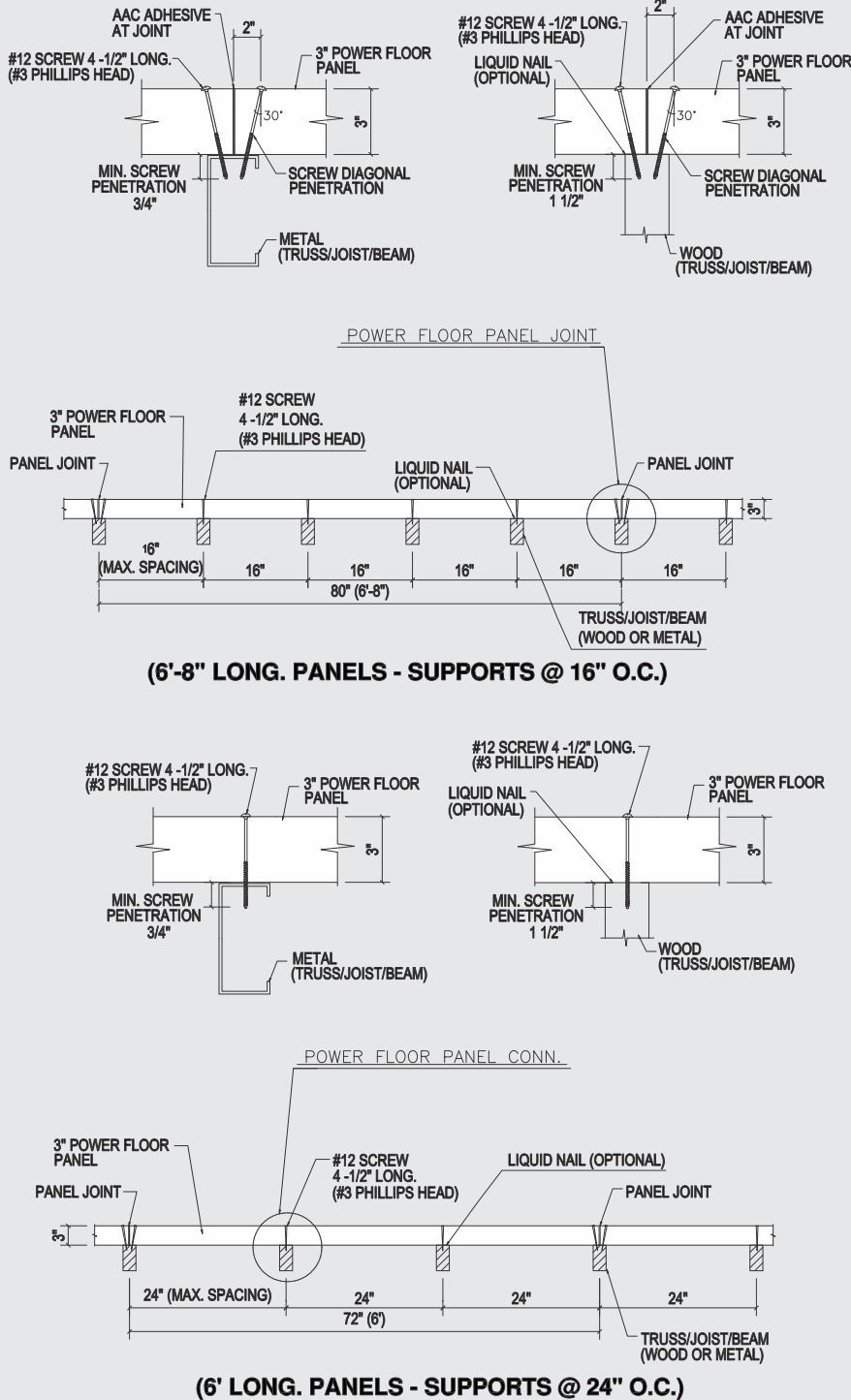


Fig. 4: Typical Hebel® Power Floor™ connections.

6. Check the Utilities:

- Make sure that water pipes have been installed properly below the floor level and not on the external face of the floor frame.
- Check for electrical conduits, phone lines, TV antenna, cable, dryer ventilation, etc.

3.2 Hebel® Power Floor™ Installation Sequence

1. Preparation of framing for Hebel® Power Floor™ panel installation.

Floor framing must be complete and within level tolerances, provide set-out chalk lines as required, a temporary installation platform can be used where necessary, ensure floor framing has adequate strength to support Hebel® Power Floor™ bundles and position them.

2. Hebel® Power Floor™ Panel Installation

Border panels are to be installed first in a stretcher bond pattern with a minimum overlap of 1 joist space and not less than 16". Use lifting handles or trolley to move the panels to installation area, apply a 3/16" min. bead of bond construction adhesive (or equivalent) to top of joists in accordance with manufacturer's instructions, and apply Hebel adhesive to panel edges.

Panels must be installed with a minimal horizontal sliding on the joints to ensure a good bond. Ensure all joints are tight and that adhesive makes full contact along all joints.

Screw fix panel to the joists as required. Repeat process, removing excess Hebel® Adhesive. Screws into joists are driven without drilling of panels and excessive adhesive should be removed immediately. Screw holes are filled with AAC Adhesive and any chips on panel edges should be filled with AAC adhesive or AAC Patching Mortar.

3. Penetrating Detailing

Install blocking to support Hebel® Power Floor™ Panel at chases or holes.

Penetrations and Notches in floor panels Hebel® PowerFloor™ can accommodate a maximum circular penetration of 4" diameter without compromising the panel strength. Where multiple holes are required, these should all be in a straight line parallel to the long panel edge. The maximum width of notching in a panel

is a quarter of the panel width and no notching is allowed in panels less than 16" wide. All holes in floors for pipes/services, etc. should have full blocking to support panels around openings and movement joints should be installed around all services.

Fitted Flooring is placed between the framed walls, after the walls are erected. Fitted floors are required where the bearing stress on the floor panels would exceed 340 psi, either on top of the joists or blocking under the panels, or under the bottom plates of partitions. Fitted floor panels should finish with a 3/8" minimum gap between the panel and the wall framing.

Platform flooring is where the floor is laid before the wall partitions are erected, and all wall frames sit on top of the Hebel® PowerFloor™. It can only be used where bearing stresses are less than 340 psi. To give the equivalent holding down capacity required by structural specifications, bottom plates should be fastened

With #12-4½" Philips head screws at maximum 8" centers. All bracing walls on platform floors require bottom plates to be fastened with bolts through the Hebel® PowerFloor™ to blocking on the under-side as shown in Fig. 7, 12 and 13.

4. Finishes

Sweep the floor surface to remove debris and loose particles, fill joints and screw holes with Hebel® Adhesive as required and make sure the perimeter is not chipped.

Install floor covering for Hebel® Power Floor™ System in accordance with manufacturer's specifications.

Wet Areas

All wet areas require the water-proof membrane over the Hebel® PowerFloor™. This includes exterior decks, tiled areas in bathrooms, laundries etc.

Note: Ensure panel moisture content is within limits outlined by the floor covering manufacturer.



Fig. 5A: Cutting Hebel® Power Floor™ using a circular saw.

"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 Floor™.

5. Surface Patching

Use Hebel® Repair Mortar to patch chips, breaks and other imperfections on the external surface of the Hebel® Power Floor™

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.

6. Control Joints

Control joints should divide the floor panels into separate floor diaphragms of a maximum of 20 ft long in either direction. See Figures 6 and 8 for typical control joint details. Control joint locations should be as follows:

- At changes in panel and joist orientation.
- At load bearing bracing walls to ensure that the floor diaphragm is continuous between bracing walls.
- Over support walls or beams.
- At 20 ft maximum spacing.

3.3 Cutting Hebel® Power Floor™

All Hebel® Power Floor™ can be cut to fit required spaces. The width of the Hebel® Power Floor™ can be cut to a minimum of 12" along its length (except the bottom panel, to avoid breaks and waste (see Fig. 5A).

Where cutting of panels lengthwise is required, the minimum width of cut panel allowable is 10" to ensure sufficient reinforcing is located in each panel. If a narrower piece is required against a floor edge, the last two panels should be reduced in width so that both exceed 10" in width. All reinforcing exposed on cut panels should be coated with anti-corrosion agent.

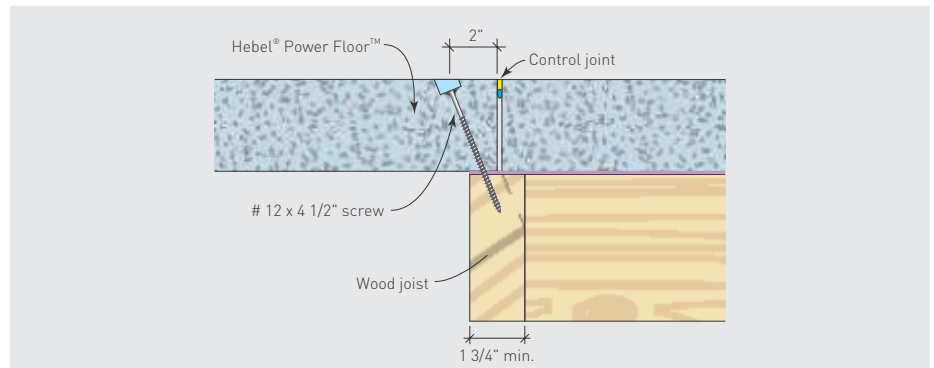


Fig. 6: Fixing to Timber Joists at change in Joist Orientation.

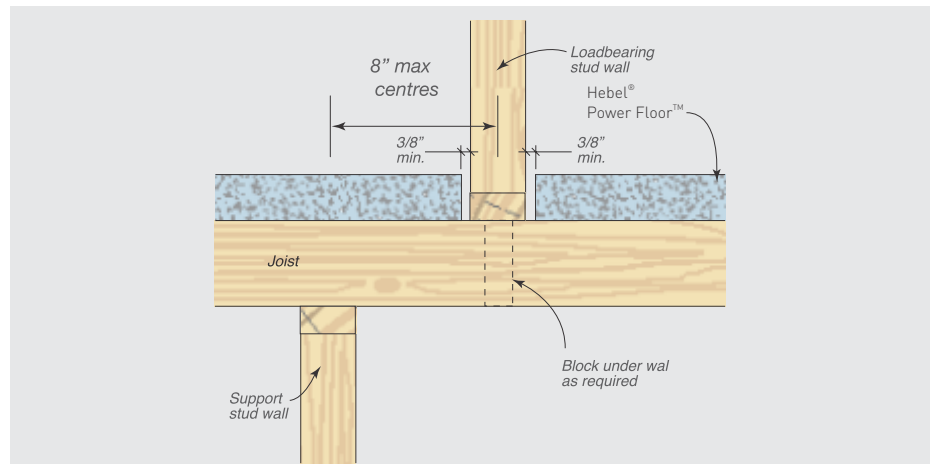


Fig. 7: Fitted Flooring with Internal Loadbearing Wall.



Cutting Procedures:

- a) Prepare a flat surface for cutting site.
- b) To support Hebel® Power Floor™, 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 Floor™.

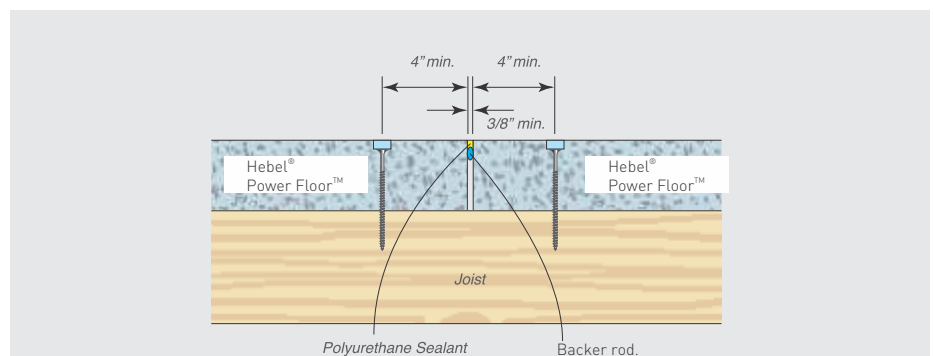


Fig. 8: Movement Control Joint Detail.

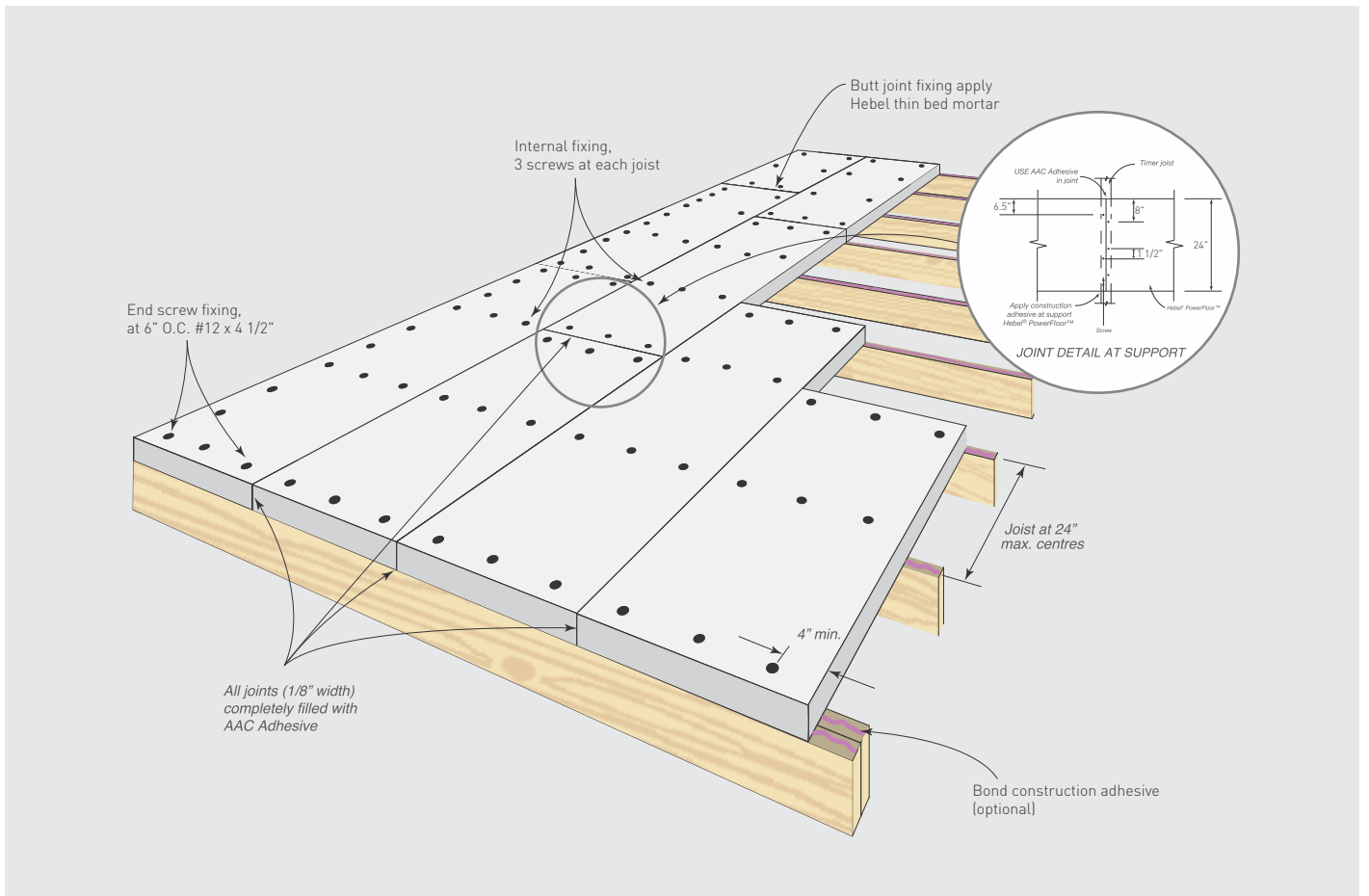


Fig. 9: Hebel® PowerFloor™ Panel Fixing Details.



Fig. 10a : Hebel Power Floor at ground level.

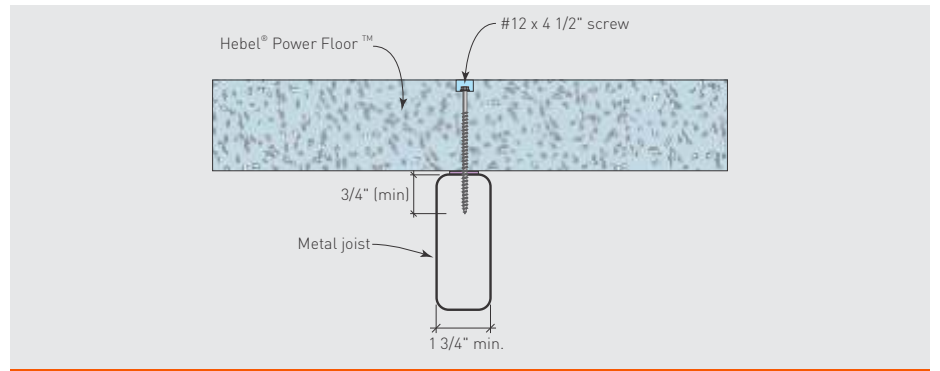


Fig. 11: Fixing to Steel Joists

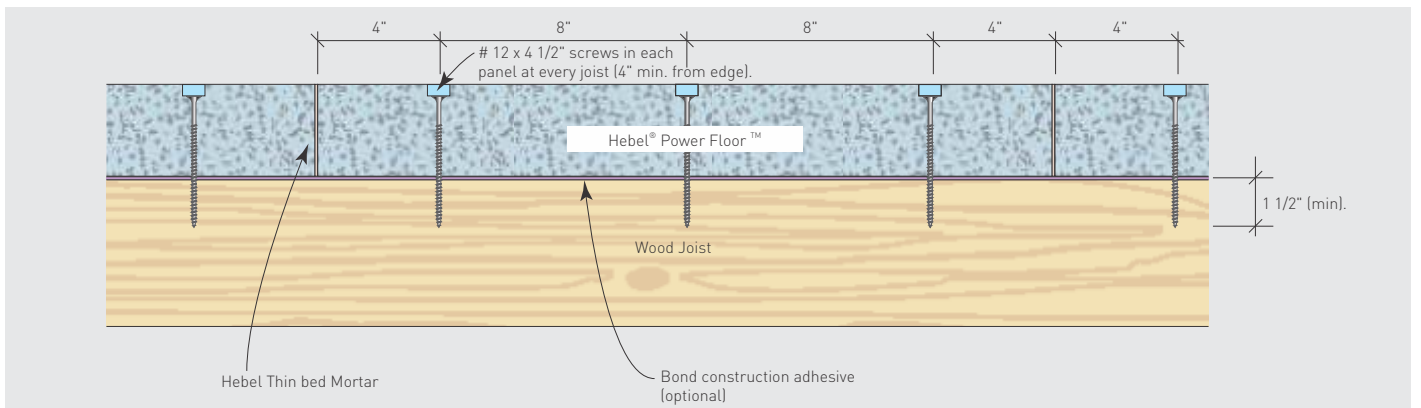


Fig. 10b: Cross-section of Hebel® PowerFloor™ Installation on Timber Joists.

Wedge if necessary.

d) Trace the cut dimension and place a ruler as a guide.

e) Cut the Hebel® Power Floor™ using a circular saw with a metal cut blade (see application requirements).

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

4 Floor Covering Installation

4.1 Carpet Installation

Panel Surface Preparation

Sweep the floor surface to remove debris and loose particles. Expose all surface blemishes such as chips, cracks, gaps, ridges or the like. Fill all unacceptable locations with an appropriate and compatible patching compound such as Hebel Patch or levelling compound as required. Ensure panels are then dry.



Fig. 14.

Installation of carpet gripper prior to laying carpet requires the use of specifically selected nails or course threaded screws. Standard fixings supplied with the carpet gripper are not suitable for fixing to Hebel PowerFloor panels.

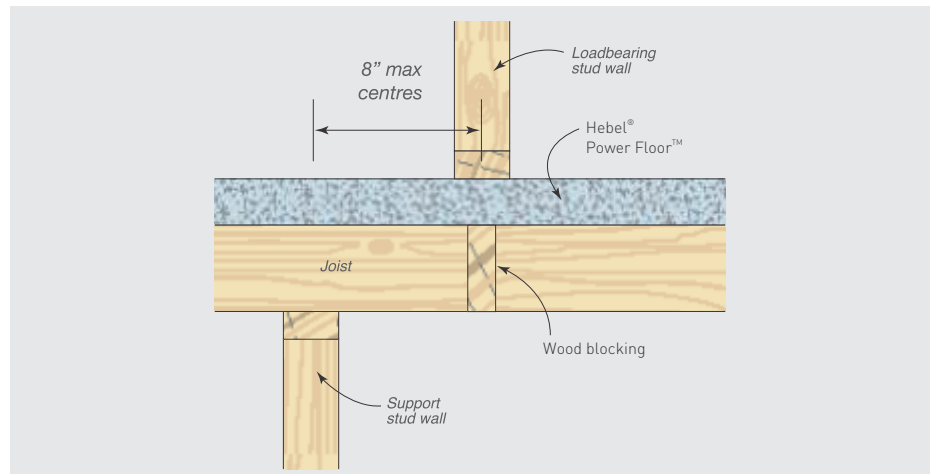


Fig. 12: Platform Flooring with Internal Loadbearing Wall.

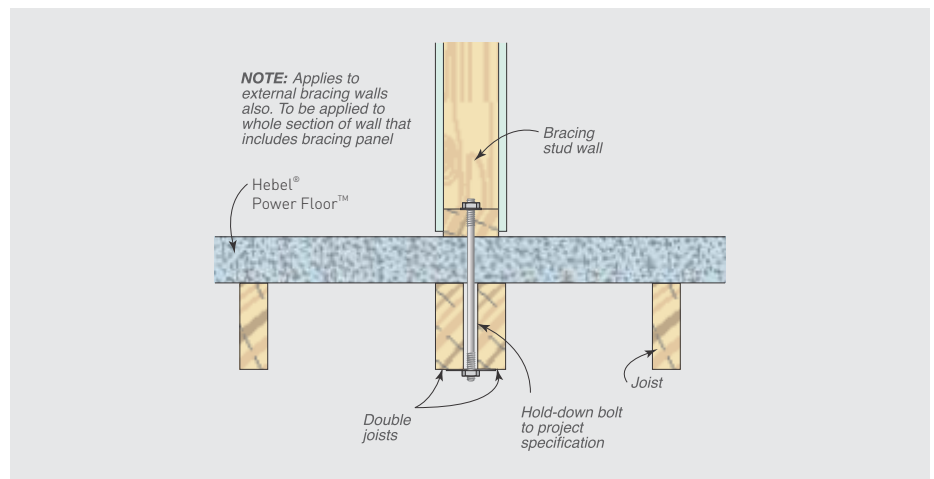


Fig. 13: Hold-down of Internal Bracing Wall Parallel to Joists on Platform Floor.

Carpet gripper strips are available without factory supplied nails. For carpet gripper installation near the panel edge, only glue is recommended. If relying on glue only, the carpet cannot be stretched until the glue is set after approximately 24 hours. (See figures 15, 16 and 17)

Underlay Installation

Minimum medium duty underlay is to be used. No other special requirements.

Carpet Installation

As per carpet manufacturer's guidelines. No other special requirements.



Fig. 15.



Fig. 16.

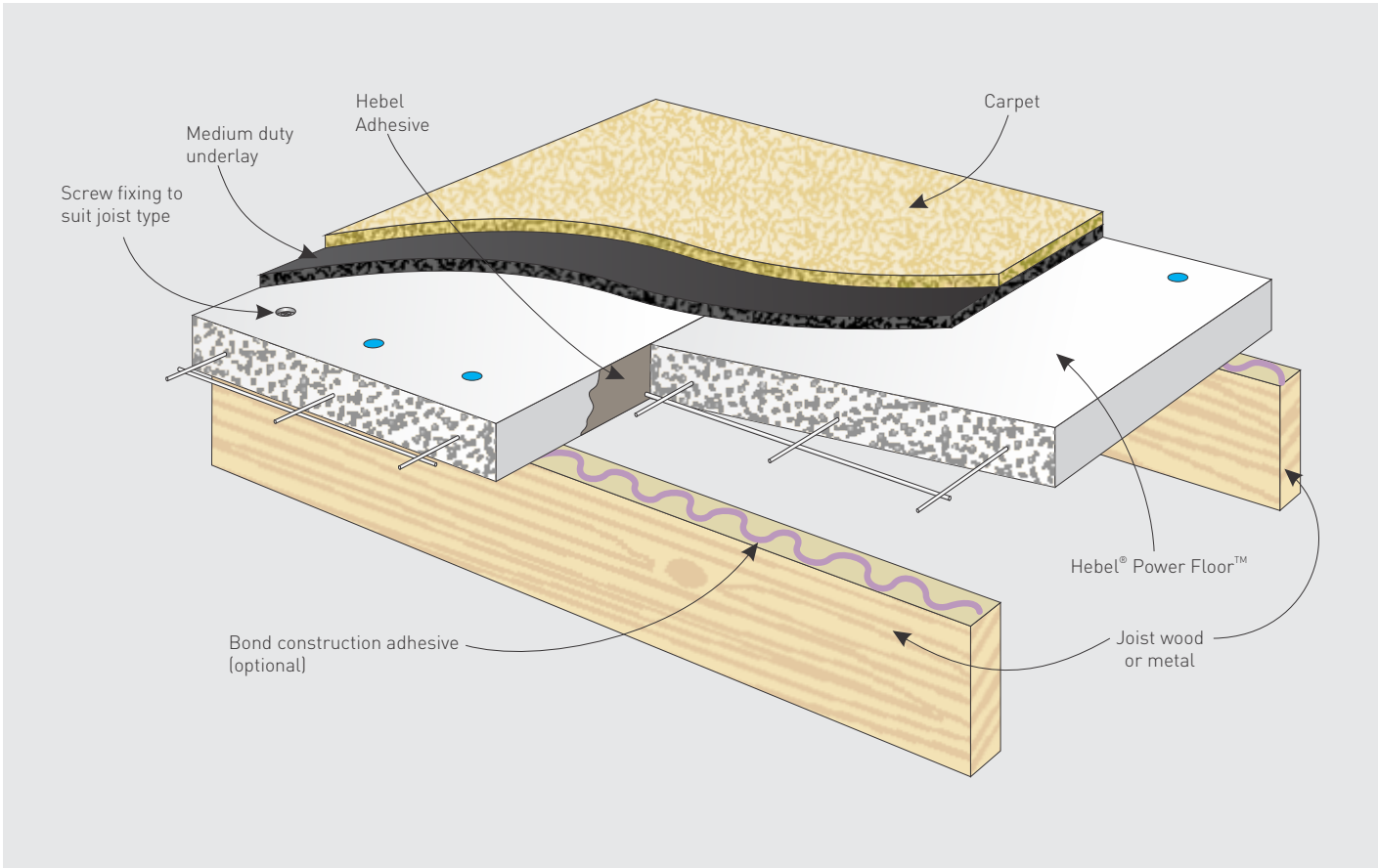


Fig. 17: Hebel® Power Floor™ System Carpet.

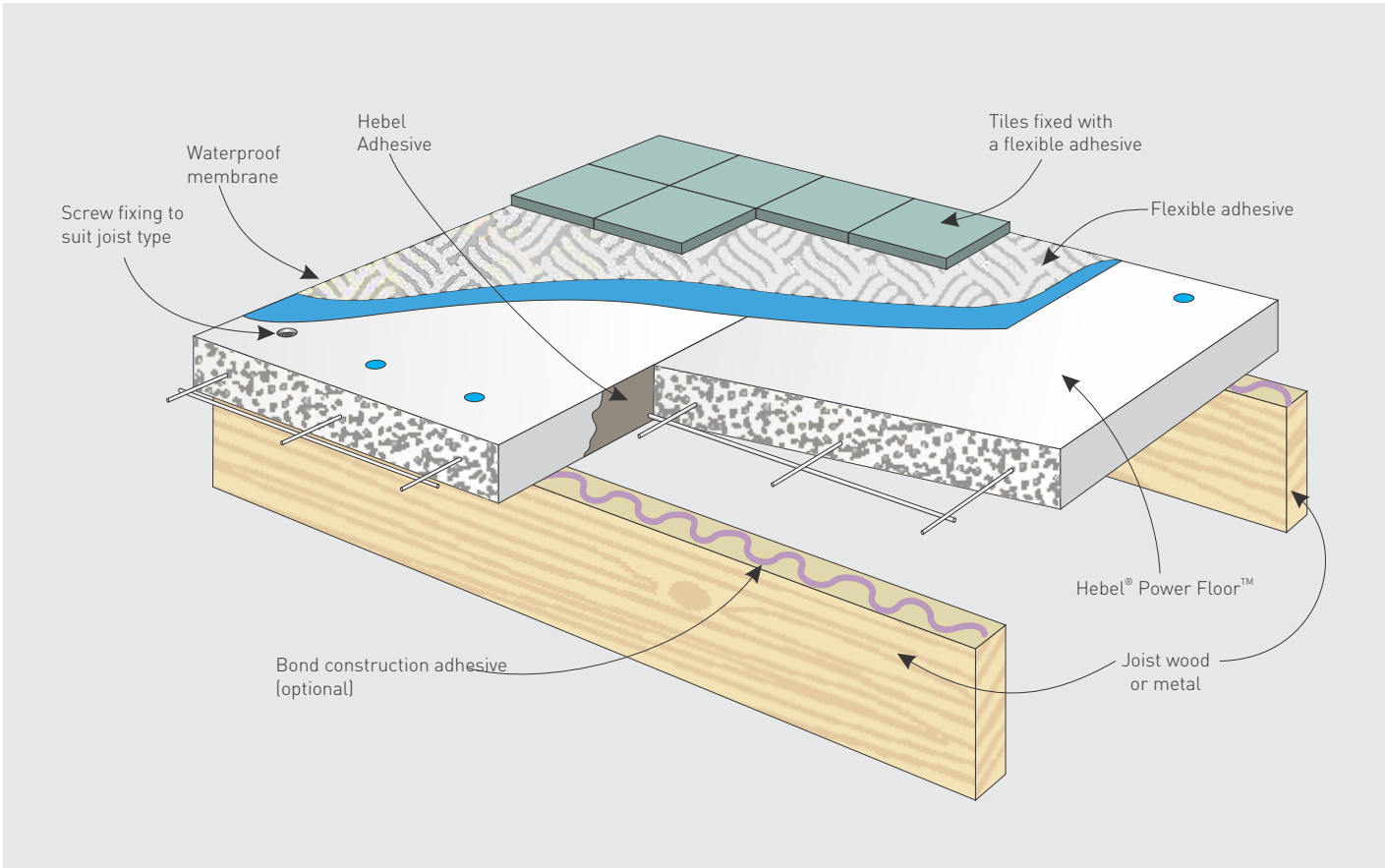


Fig. 18: Hebel® Power Floor™ System 8mm Ceramic Tiles.

4.2 Tile Installation Panel Surface Preparation

Sweep the floor surface to remove debris and loose particles. Expose all surface blemishes such as chips, cracks, gaps, ridges or the like. Fill all unacceptable locations with an appropriate and compatible patching compound such as Hebel Patch or levelling compound as required. Ensure panels are then dry.

As per manufacturer's guidelines. Apply tiles to screed or adhesive as per normal floor (See figure 18 and 19).

Direct Stick Adhesive

Sealer as per manufacturer's recommendations. Waterproof membrane as required, for balconies and wet areas.

Notes: Control Joints - ensure Control Joints are installed in tiles at the appropriate location of floor Control Joints. Penetration - seal penetrations through waterproof membrane.



Fig. 19.

4.3 Vinyl Installation

Panel surface preparation sweep the floor surface to remove debris and loose particles. Expose all surface blemishes such as chips, cracks, gaps, ridges or the like. Fill all unacceptable locations with an appropriate and compatible patching compound such as Hebel Patch or levelling compound as required. Ensure panels are then dry. (See figure 22).

Notes:

1. Ensure panel preparation is completed properly and thoroughly to avoid crunching.

2. When screed is used, ensure that the additional load is taken into account in the sub floor design.

4.4 Timber Installation

Panel surface preparation sweep the floor surface to remove debris and loose particles. Expose all surface blemishes such as chips, cracks, gaps, ridges or the like. Fill all unacceptable locations with an appropriate and compatible patching compound such as Hebel Patch or levelling compound as required. Ensure panels are then dry (See figure 20 and 21).

Moisture

Timber is affected by changes in environmental conditions and it is good practice to allow the flooring to acclimatise to the environment before installation.

If there is significant moisture in the Hebel PowerFloor (>6%) a membrane, such as min. 200 micron polyethylene sheeting, should be placed over the top surface of the Hebel PowerFloor.

Timber Strip Flooring

Batten fix - ensuring flatness is not as critical as direct mechanical fix. Anchor battens at the required centres using anchors suitable for AAC, eg. Mungo MBSP1080.

Direct mechanical fix - install min. 12mm plywood sheets to Hebel PowerFloor using construction Maxbond or equivalent and 65-75mm coarse thread countersunk screws at max 600mm centres.

Floating Timber Floor

Underlay / backing installed as per normal for a concrete slab.

No special requirements for floating timber flooring installation.



Fig. 21.

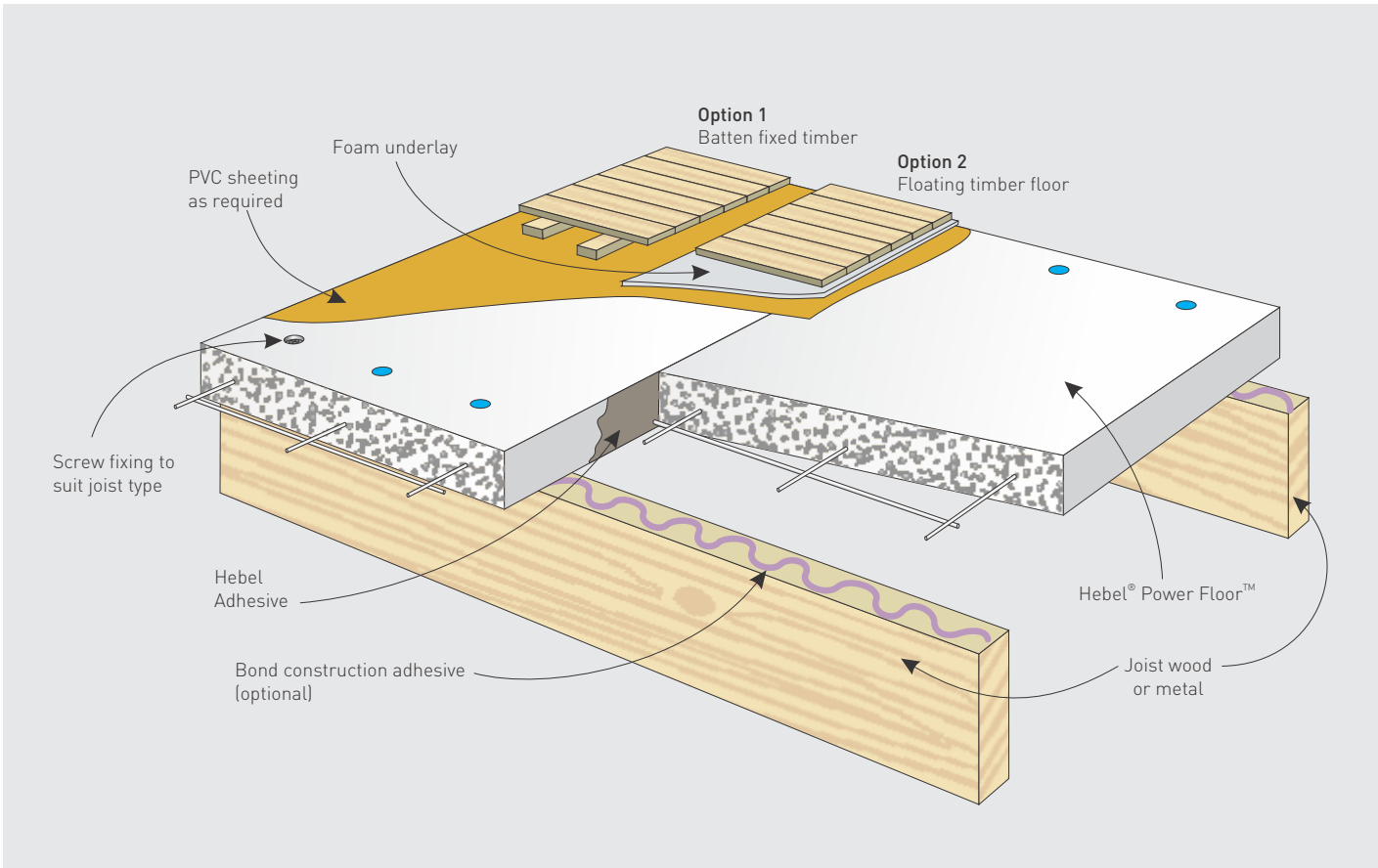


Fig. 21: Hebel® Power Floor™ System Timber Floors.

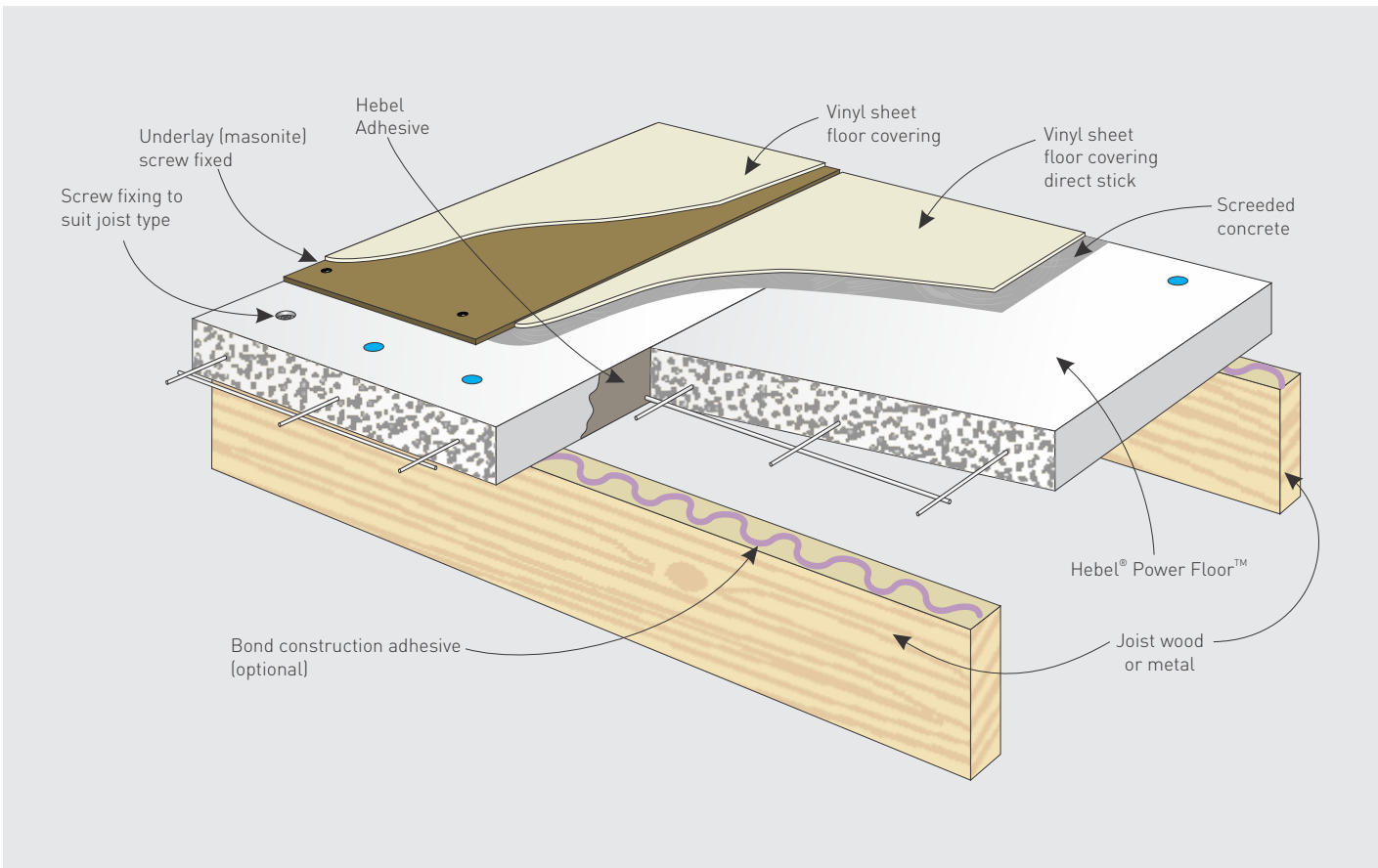


Fig. 22: Hebel® Power Floor™ System Vinyl Sheet with Masonite.

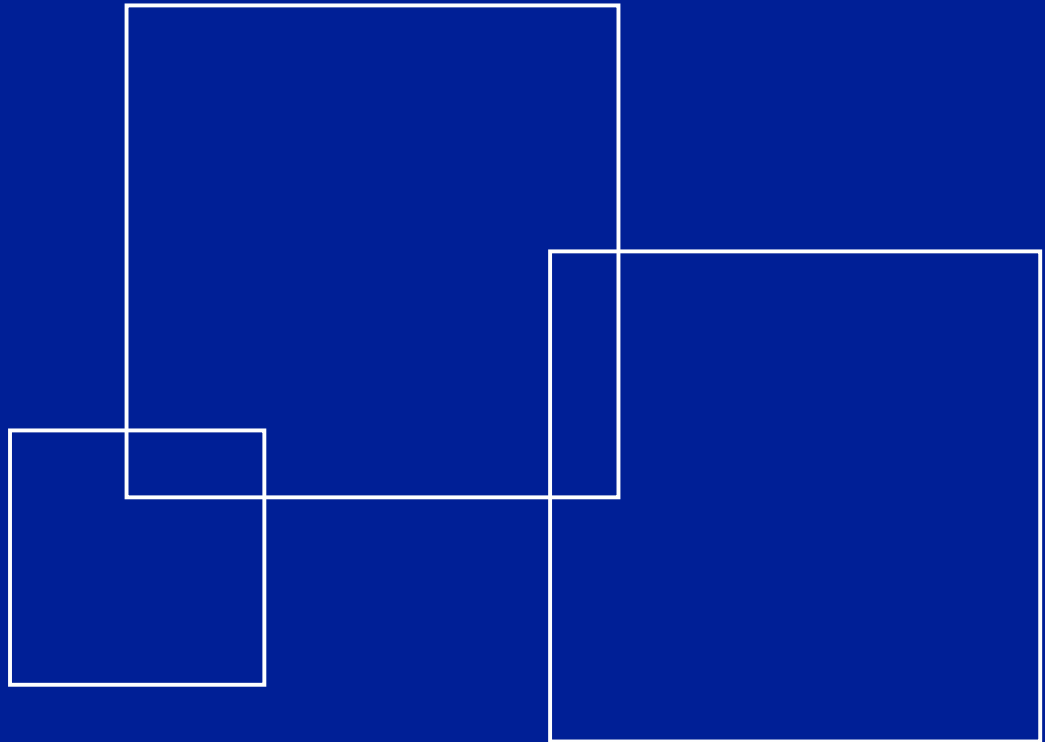
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