# ALPHAFLOOR®

*THE SOLID CONCRETE FLOOR PANEL*

# ALPHAFLOOR®

ALPHAFLOOR® is the only cost effective, solid concrete floor system available in the Australian Construction Industry.

- 25MPa Solid Concrete Panel
- Super Light Weight at 35kg/m2
- Highest Performing Acoustic Product Available to Minimise Sound Transfer between levels
- Significant improvement to NatHERS/BASIX Star Rating of Home
- Lower Cost than Fibre Cement Flooring
- Strong, Durable, Impact & Abrasion Resistant
- No need to protect from Water, Rain or Traffic
- Highly suitable for Flood Prone areas
- Real Solid Concrete Feel & Sound
- Non-Combustible
- Compliant with all 6 Bush Fire Attack (BAL) Levels
- Australian Made & Owned
- ISO 9001 Accredited

Quality Management · ISO 9001
Global-Mark.com.au®

# TESTIMONIALS

### Fowler Homes - Christian Romano – Estimating and Procurement Manager & Steve Licastro – Construction Manager

“ALPHAFLOOR is a fantastic product and one that really aligns with our brand of building a quality home with innovative products. We would recommend this product to anyone wanting a solid concrete feel with the added benefit of boosting the BASIX star rating at the same time.”

### Andrew W, Sydney Construction Group

“I recently had the XCEM ALPHAFLOOR system installed in my latest project, and I couldn’t be more impressed. The lightweight, dense concrete panels provide the feel of a real concrete slab while significantly reducing sound transfer from upstairs. The difference in noise levels is remarkable! I can confidently say I will never use another floor system for timber frame construction again. I highly recommend XCEM ALPHAFLOOR for anyone looking to take their project to the next level.”

### Andrew Strachan, Construction Manager

"I am absolutely blown away by how this floor feels, it is rock solid! The floor feels every bit as good as a suspended slab on a double brick home. This product has far exceeded my expectations. I am converted."

### Lance Paneras, General Manager, Wincrest Group

"The team at XCEM really have come up with a great product and project delivery service, which will be a real difference maker in the residential construction market for years to come! I look forward to working with them and the latest innovations they come up with in future, in order to integrate those into many more Wincrest builds for years to come."

### Alex Ilic, Director, Pirossi Developments

We found XCEM ALPHAFLOOR online and were absolutely blown away at this product at first glance. Once we saw the product in person it was a no brainer to utilise this on our high end projects. Very happy with the product, the team at XCEM were great all the way through the journey.
Already using this product on another job and looking forward to many more. ALLHAFLOOR is leagues above AAC or yellow tongue flooring!

# BENEFITS OF ALPHAFLOOR®

**For the first time ever, Homeowners can now have a solid concrete floor at an affordable price point.**

01

## High-Performance Concrete at the Right Price

ALPHAFLOOR® is solid, high-strength (25MPa) concrete, yet is incredible affordable. ALPHAFLOOR® is the ONLY cost effective concrete-slab substitute.

02

## Significant improvement to NatHERS/BASIX Star Rating

There are cost savings available when substituting ALPHAFLOOR® for particle board on the first floor, driven by the high thermal mass of the product and the 7 star NatHERS/BASIX requirements.

03

## Solid Concrete Floor Feel & Sound

ALPHAFLOOR® feels and sounds like a concrete slab. The ALPHAFLOOR® floor system is the highest acoustic performing system available. Even outperforming a 150mm concrete slab.

04

## Durability Provides Peace of Mind

- Unlike alternative flooring materials ALPHAFLOOR® can be left exposed to the elements indefinitely. ALPHAFLOOR® does not need to be kept dry, and does not need to be waterproofed within a set time period.
- Moisture will not cause ALPHAFLOOR® to lift.
- ALPHAFLOOR® is solid concrete - Cut edges do not require coating or sealing as is typically required for substitute FC & AAC products.

05

## Crystalline Silica Free

ALPHAFLOOR® contains NO crystalline silica, eliminating risk of development of silicosis through inhalation of dust.

06

## Fast

A typical floor is installed in approximately one day. Because the product is concrete, it can easily accomodate all floor finishes including, carpet, tiles, hybrid and hardwood flooring.

07

## Australian Made & Owned

ALPHAFLOOR® is 100% Australian Made & Owned. ALPHAFLOOR® is manufactured at XCEM's state-of-the-art manufacturing facility located in the Southern Highlands of New South Wales.

# THE QUIETEST FLOOR SYSTEM

ALPHAFLOOR® has been thouroughly tested and proven to be Australia's highest acoustic performing floor system. Performing even higher than a 150mm suspended concrete slab. The table below presents a comparison of the common floor systems.

| | Airborne Sound Transmission (Rw + Ctr) | Airborne Sound Transmission (DnTw + Ctr) | Impact Insulation (LnTw) |
|---|---|---|---|
| | *Higher = Better* | *Higher = Better* | *Lower = Better* |
| 19mm Particleboard | ~40 dB | ~35 dB | ~85 dB |
| 75mm AAC | 48 dB | 43 dB | 70dB |
| 100mm Concrete Slab | 50 dB | 45 dB | 73 dB |
| 150mm Concrete Slab | 52 dB | 47 dB | 63 dB |
| *35mm ALPHAFLOOR* | *60 dB* | *55 dB* | *54 dB* |
| *NCC Requirement for Class 2 & 3* | *≥ 50 dB* | *≥ 45 dB* | *≤ 62 dB* |

FLOOR SYSTEM DESCRIPTIONS & NOTES

- **19mm Particleboard:** Timber flooring + 19mm Particleboard floor system + R1.5 Glasswool Insulation + 10mm Plasterboard Ceiling (Direct Fixed)
- **75mm AAC:** Timber flooring + Battens + PVC + 75mm AAC + Furring Channel with resilient mounts + R2 Acoustic insulation + 13mm plasterboard ceiling fixed to furring channel.
- **100mm Concrete Slab:** Timber flooring + 100mm Concrete Slab + 10mm Suspended Plasterboard Ceiling
- **150mm Concrete Slab:** Timber flooring + 150mm Concrete Slab + 10mm Suspended Plasterboard Ceiling
- **35mm ALPHAFLOOR®:** Timber flooring + 35mm ALPHAFLOOR® System + R4 Standard Thermal Insulation + 10mm Plasterboard Ceiling (Direct Fixed)
- Lab Results (Rw+ Ctr/Lnw) were assumed to have a ~5 dB difference than infield results (DnTw/LnTw) as per NCC
- R4 Insulation utilised in the ALPHAFLOOR® test was standard thermal insulation, which does not perform as well as acoustic insulation does. If this test had utilised R2 acoustic insulation it is expected that the Rw + Ctr for the floor system would have been marginally higher (~2 dB)

# FLOOR SYSTEM COMPARISON

Presented below is a comparison of 35mm ALPHAFLOOR® with 75mm AAC Panels, FC Sheets & Particle Board.

| | 35mm ALPHAFLOOR® | 75mm AAC Panel | 19/22mm FC Sheet | 19/22mm Particle Board |
|---|---|---|---|---|
| Material | Solid Concrete Panel | Autoclaved Aerated Concrete | Fibre Cement | Particle Board |
| Thickness | 35mm | 75mm | 19/22mm | 19/22mm |
| Compressive Strength | 25 MPa | 3 MPa | N/A | N/A |
| Weight | 35kg/m2 | 52kg/m2 | 35 - 43kg/m2 | 16kg/m2 |
| Contains Crystalline Silica (Severe Health Hazard) | No | Yes | Yes | No |
| Durability - AS/NZS 4456.10 | Yes | No | No | No |
| Requires Protection from Water | No | Yes | Yes | Yes |
| Sound Insulation Floor System (DnTw + Ctr) | 55 | 43 | NA | ~32 |
| High Water Absorption (Porosity) | No | Yes | No | Yes |
| Risk of Corrosion | No | Yes | No | No |
| Low Maintenance | Yes | No | No | No |
| Non-Combustible | Yes | Yes | No | No |

# TECHNICAL SPECIFICATIONS

ALPHAFLOOR® is a solid precast concrete panel made using XCEM® concrete technology. It presents a hard, smooth surface. Table 2.1 contains the material properties of ALPHAFLOOR®. Testing was carried out by a laboratory accredited by NATA for Technical Competence (Accreditation No. 1393, Site No. 1386). The determination of characteristic strength and connection capacity values has been carried out in accordance with AS/NZS1170.0 Appendix B.

## ALPHAFLOOR®

| Product | Panel Width | Available Lengths (mm) | Dry Weight | # panels per pack |
|---|---|---|---|---|
| 35mm ALPHAFLOOR® | 570mm | 2700mm | 35kg/m2 | 14 |

XCEM ALPHAFLOOR is a precast concrete panel. Tolerances on the manufactured product are:

- Panel short edges +- 2mm tolerance
- Panel long edges +- 4mm
- Panel thickness within + 1.5mm tolerance

## LOAD CAPACITY OF ALPHAFLOOR®

| Application | Permanent Actions Included in Application (35mm) | Distributed Imposed Action Q | Concretrated Imposed Action $Q_C$ (area distributed over) | Maximum Joist Spacing for AlphaFloor® |
|---|---|---|---|---|
| Residential Activities - General Areas | $G_{sw}$ = 0.40 kPa<br>$G_f$ = 0.25 kPa<br>$G_s$ = 0.50 kPa | 1.5 kPa | 1.8 kN (350 mm²) | 600 mm |
| Residential Activities - Tiled Wet Areas | $G_{sw}$ = 0.40 kPa<br>$G_f$ = 0.50 kPa<br>$G_s$ = 0.50 kPa | 1.5 kPa | 1.8 kN (350 mm²) | 500 mm |
| Residential Activities - Balconies and Verandahs | $G_{sw}$ = 0.40 kPa<br>$G_f$ = 1.00 kPa<br>$G_s$ = 0.50 kPa | 2.0 kPa | 1.8 kN (350 mm²) | 450 mm |
| Light Commercial Activities | $G_{sw}$ = 0.40 kPa<br>$G_f$ = 1.00 kPa<br>$G_s$ = 0.50 kPa | 3.0 kPa | 2.7 kN (0.01 m²) | 450 mm |

**Notes:**

1. $G_{sw}$ = permanent action due to self-weight of ALPHAFLOOR - 0.40 kPa 35mm
2. $G_f$ = permanent action of applied floor coverings
3. $G_s$ = permanent action allowance for superimposed loading of permanent fixtures
4. Applicable factored load case for strength: 1.2G + 1.5Q

# TECHNICAL SPECIFICATIONS

## FIXING OPTIONS ALPHAFLOOR®

**Timber Joists**

- Bremick Screw Decking Shark Tooth 10x65mm;
- Strong Tie - DSVT212S - 10g x 65mm Quikguard® Coated (Collated for Quik Drive®) or loose
- Macsim: 10g X 65mm Decking Screw Nail Point SS304
- Strong Tie - SSDHSD65TSA 12g x 65mm SS316

- Adhesive: Construction adhesive or Polyurethane based adhesive.

**Steel Joists**

- Quick Drive Screws - Strong-Tie - CBSDHG214SA 10g x 55mm Gal Winged Self Drilling Screw
- Hobson DRiLLX Metal Wings Screw 10G x 60mm Countersunk Square HOBT9PG3RQ1016060

- Recommended Adhesive: HB Floor Bond Fuller XMS

## CUTTING & SANDING ALPHAFLOOR®

**Cutting:** Track Saw / Diamond Holesaw / PCD Circular Saw (Xtorque Brand or equivalent)
**Sanding:** Sand using Floor or Belt sander (Grit 24)

## FIXING FRAMING BOTTOM PLATE TO ALPHAFLOOR®

**Timber Framing:** As per Nominal fixings for timber wall framing to timber joists as specified in AS 1684.2:2021 the fastener shall be embedded min. 40mm into the timber framing member. Equivalent for screw – No. 8 or No. 10 with sufficient length to go through wall bottom plate, ALPHAFLOOR and embed minimum 40mm in the timber framing member – for 35mm bottom plate and 35mm ALPHAFLOOR this is min. 110mm screw length.)

Note, for non-loadbearing partition walls that are also not braced, it is permissible to nail through the 35-38mm thick timber bottom plate to ALPHAFLOOR using 1x dia.2.87 x 65mm framing nails at 300 mm ctrs. Note - 1 x nail at 300mm ctrs. is equivalent to 2x nails at 600mm ctrs. per nominal fixing table, but is preferred.

**Steel Framing:** No. 14-10 Hex head Tek Screw about 55-65mm length for general fixing. Assuming steel bottom plate. NASH standard should be followed for high strength hold down which need plate washers/brackets to studs and possible through bolts. As a guide should have 3 x threads stocking through the steel on the drill point end.

## INSTALLATON OF CARPET

ALPHAFLOOR can be nailed. Use timber/wood smoothedge/carpet gripper with timber nails, which have good connection strength in ALPHAFLOOR.

## WATERPROOFING

ALPHAFLOOR and framing members must be constructed above the DPC, and exposed floor areas on verandahs and balconies must be fully sealed with a waterproof tanking membrane to all exposed ALPHAFLOOR surfaces in accordance with the supplier's specifications prior to installation of tiling or other floor surface finishing. The tanking membrane shall not be penetrated by fixings after application. Waterproofing of verandahs and balconies shall be carried out in accordance with AS 4654.2 using membranes that comply with AS 4654.1. Separate protection of framing members may be necessary – refer to supplier's specifications for verandah and balcony applications. Internal wet areas shall be detailed and waterproofed.

# CONSTRUCTION DETAILS

Figure 1: ALPHAFLOOR Configuration

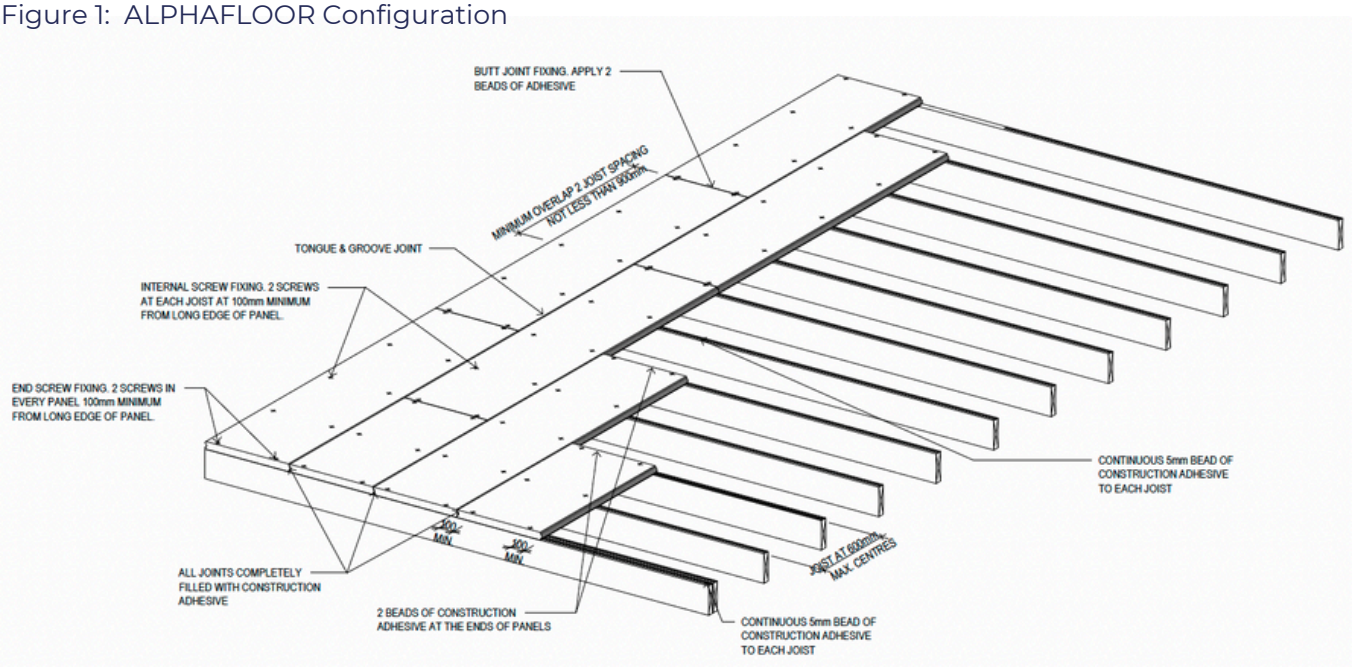



Figure 3: Floor Section - Perpendicular to Joists

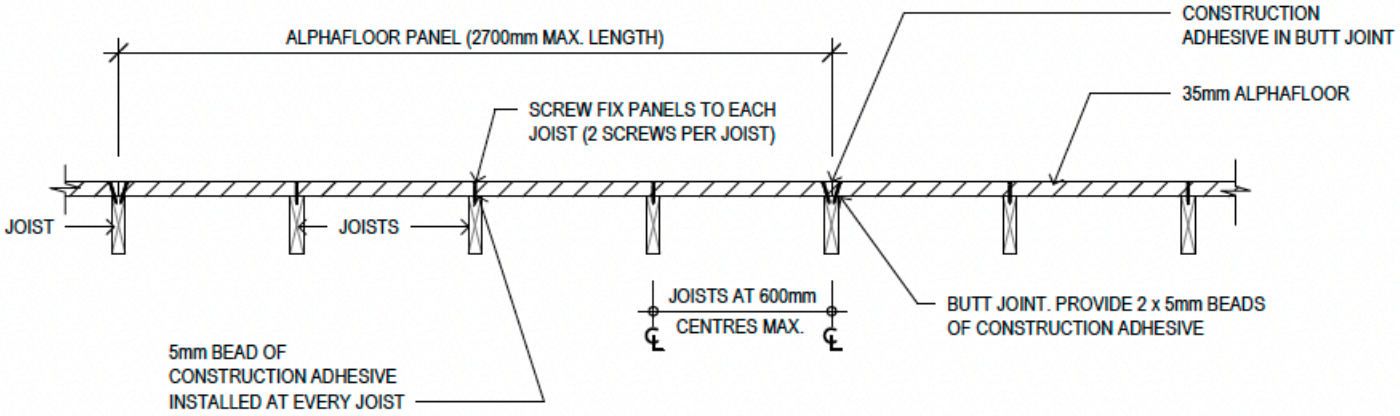



Figure 4: Floor Section - Parallel to Joists

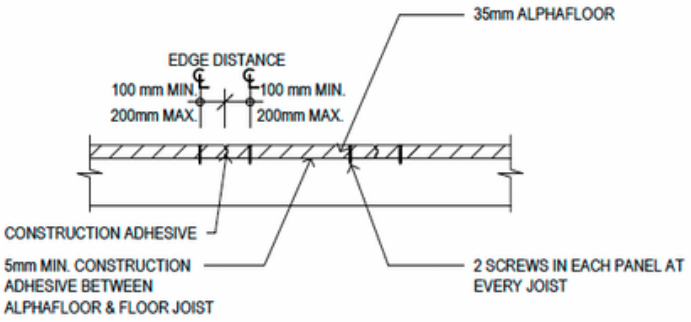



Figure 5: ALPHAFLOOR® Fixing to Timber Joists

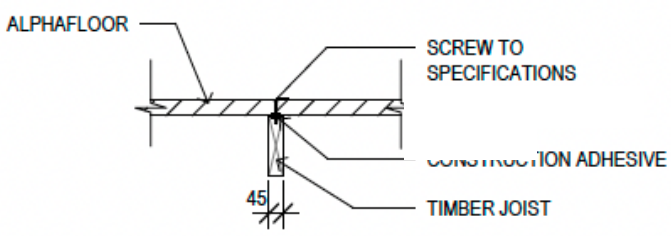


Figure 6: ALPHAFLOOR® Fixing at end of panels to Timber Joists

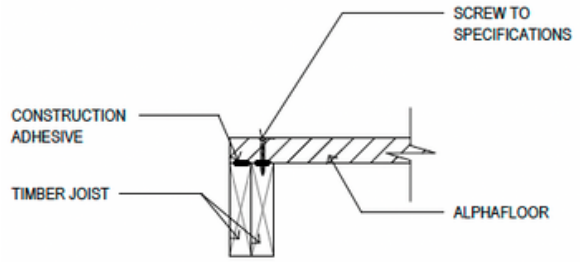



Figure 7: ALPHAFLOOR® Fixing to Steel Joists

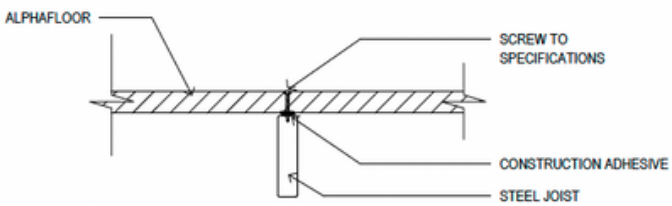



Figure 8: Membrane Termination at Drainage Flange

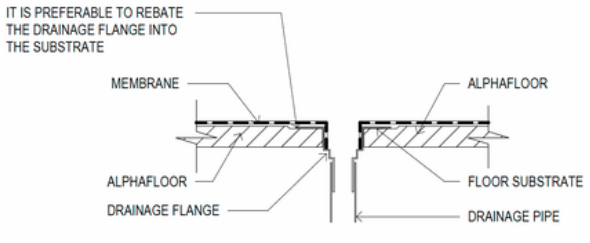



Figure 9: Control Joint at Panel End

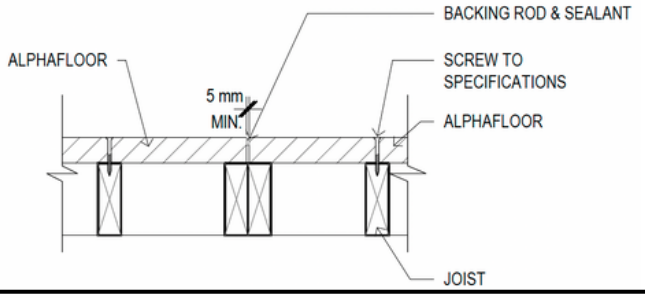



Figure 10: Control Joint at Panel Edge

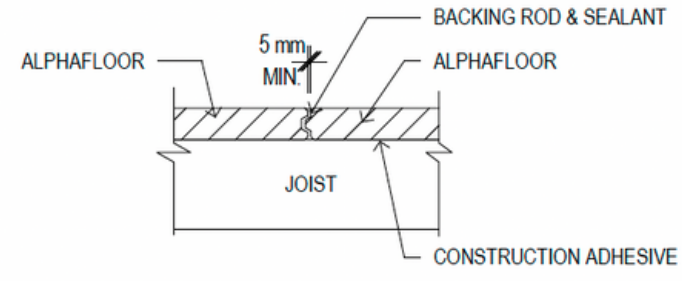



Figure 11: ALPHAFLOOR® Fixing at End of Panels To Timber Joists

**Note that if the joist is a minimum of 63mm wide at the top, then a single joist can be utilised under the control joint, as opposed to a double.*

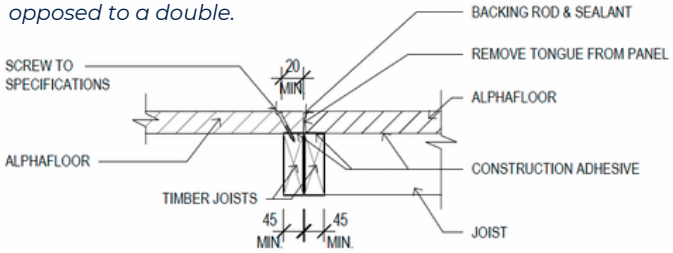



Figure 12: ALPHAFLOOR® Control Joint Location at Change in Joist Orientation

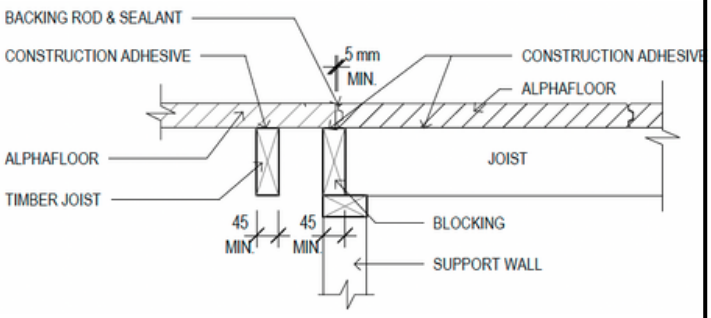



Figure 13: ALPHAFLOOR® Control Joint over Structural Steel Beam

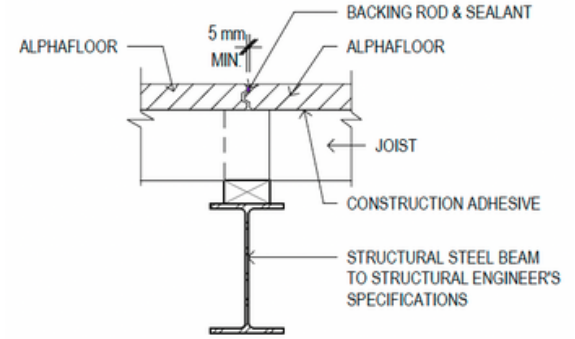



Figure 14: ALPHAFLOOR® Fixing at Alternative End of Panels to Timber Joists

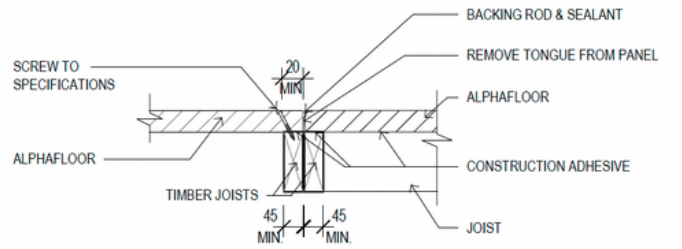
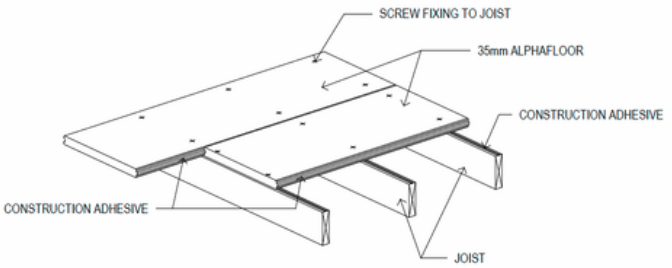



Figure 15: ALPHAFLOOR Components



## CONSTRUCTION NOTES

The Installer shall refer to the project drawings and specifications and shall perform work to the quality standards agreed with the builder. The notes below are important from a structural engineering and compliance perspective.

1. Framing shall be in accordance with the required standards for timber or cold-formed steel as per Load Capacity Table, designed to support the permanent action of ALPHAFLOOR® and other linings or permanent fixtures plus required imposed actions, and any other actions as applicable. Consult the project engineer for appropriate loading requirements.
2. Verandah and balcony framing shall be constructed so as to provide the necessary fall away from the external wall of the building. Structural members shall be protected from moisture by flashings and DPC as required.
3. Timber joists shall be min. 40 mm wide. Steel joists shall be min. 50 mm wide.
4. Line loads and concentrated point loads shall have a structural support pathway directly under ALPHAFLOOR®.
5. All joists shall be level and flat to provide even bearing for support of ALPHAFLOOR®.
6. Panel ends in the field of the floor shall be evenly supported on a joist with 20 mm minimum bearing to each panel end. Ensure construction adhesive bonds both sheets to the joist and fill gap with bonding compound, filler or sealant.
7. Min. panel width when trimmed shall be 200 mm. Trim to maintain T&G edge profiles.
8. ALPHAFLOOR® is to be joined with construction adhesive applied in the tongue and groove edge joints and End Joints.
9. For joints where the tongue and groove joint has been cut away and not reinstated, provide joist section or 90x45 MGP10, or similar, trimmers between the joists to support the joint.
10. Provide control joints (min. 10 mm wide) in ALPHAFLOOR® at the following locations:
    10.1. For Carpet and Timber Floor coverings, max. 12,000 mm grid internal, ensuring any wet areas are isolated. Where movement could affect the floor covering e.g., Tiles - internal control joint spacing in accordance with tile specification or alternatively provide a membrane and flexible tile bed/adhesive solution that can accommodate substrate movement.
    10.2. Max. 4,500 mm grid external.
    10.3. A change in floor thickness.
    10.4. Corresponding to supporting structure steps or control joints.
    10.5. Junctions of different floor system types.
    10.6. Over structural beams supporting the floor framing members.
11. Control joints perpendicular to the ALPHAFLOOR® span direction shall have 2 x joists, one under each sheet, unless the joist is a minimum of 63mm wide at the the top. If the joist is a minimum of 63mm wide then a single joist can be utilised.
12. Seal control joints with backing rod and compatible sealant, 10 mm width x 5 mm depth.
13. Provide a light gauge steel angle trim (min. 30 x 30 x 1.0 mm) to the leading edge of ALPHAFLOOR® at exposed edges, eg. top of stairs.
14. Waterproofing of finished ALPHAFLOOR® floors for wet areas shall be done in accordance with NCC Volume One 3.8.1.2 and AS 3740 using products compatible with ALPHAFLOOR® material. Provide a bond breaker tape over sealant joints in the floor and at wall junctions and corners.
15. Waterproofing of finished ALPHAFLOOR® shall be done using membranes complying with AS 4654 Part 1 that are compatible with ALPHAFLOOR®, and installed in accordance with AS 4654 Part 2. Provide a bond breaker tape over sealant joints in the floor and at wall junctions and corners.
16. Control joints in the floor shall be expressed through floor tile systems.

## WORKERS HEALTH & SAFETY

Please download ALPHAFLOOR® Material safety data sheet (MSDS) from www.xcem.com.au/download

## CUTTING OF ALPHAFLOOR®

ALPHAFLOOR® can be very easily cut on-site using a PCD blade. ALPHAFLOOR® products have been analysed and assessed by HIBBS & Associates (certified occupational hygienists) for traces of crystalline silica. The ALPHAFLOOR® does not contain measurable levels of crystalline silica, therefore worker exposure to that risk when handling and processing is unlikely to occur. Crystalline silica is categorised as a health hazard when it's in a respirable form, such as occurs when cutting, grinding, and drilling. Refer to HIBBS report S11606-L1 for full details and limitations.

## MANUAL & TROLLEY ASSISTED HANDLING

ALPHAFLOOR® are to be handled and worked on-site as per similar generally accepted masonry and panel units, with installation contractors providing relevant safe work method statements.

XCEM recommends using a panel trolley and any other mechanical apparatus to assist with movement of the panels. Physical & manual movement of ALPHAFLOOR® should be kept to a minimum. Contractors must provide adequate support to the panels when lifting off the horizontal or tilting.

## PERSONAL PROTECTION

**Eye/Face:** For dust generating work, wear safety glasses with side shields or dust-proof goggles.
**Hand:** For dry handling/work, use any work-compatible protective gloves.
**Body:** Wear long sleeve shirt and full-length pants, or full coveralls. Where a body part is likely to be in contact with wet product.
**Respiratory:** For dust generating work (e.g. cutting, drilling, crushing, cleaning, etc.), use Class P1 (Particulate) respirator at minimum. Respiratory protective equipment should be selected based on an assessment of the working conditions (conducted by a competent person and should be informed by occupational hygiene exposure assessment results). Refer to AS/NZS 1715.

## INSTALLATION AND PRODUCT NOTES

1. ALPHAFLOOR is a raw precast concrete product, it is not a pre-finished product and is designed for use as a substrate only.
2. The Tonge and Groove are offset from the centre of the panel. The panels are packaged so that the face with the thinner groove edge is face up. Panels are to be installed so that this face is face up.
3. When carrying the panel, ensure it is carried on edge. Carrying it on the flat may cause cracking of the panel. Support the panel in the centre when tilting or rotating.
4. The pre-cast panel as delivered may contain pin holes, or bug holes in the panel surface. These surface defects do not adversely impact the performance of the product in regards to compliance requirements. This does not constitute a product issue that can be claimed under warranty.
5. Because ALPHAFLOOR is a cementitious product, the product may be subject to minor surface cracking, such as craze cracking and minor horizontal cracks. All performance testing of the product was conducted with such cracking evident in the panel, so the appearance of these cracks in no way impacts the product in regards to compliance requirements. The panel is reinforced with Glass Fibre. Surface cracking in the panel does not constitute a product issue that can be claimed under warranty.
6. If required the panel surface can be sanded using a floor sander with 24grit paper. Sanding can be performed locally (150mm max. across the panel) down to not less than 32.5mm thickness.

ALPHAFLOOR®

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