ENVIRO™ AAC FLOOR PANEL SYSTEM

DESIGN AND INSTALLATION GUIDE

MASONS
Designed Smart, Built Tough.

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Section

System Description

Masons Enviro Floor System utilises autoclaved aerated concrete panels 75mm thick reinforced with corrosion protected steel mesh fixed to light timber floor framing. It is suitable for residential and light commercial buildings.

Enviro AAC 75mm floor panels are 600mm wide and are 2200mm long and 75mm thick.

The panels are bonded to each other using mortar or adhesive, and fixed to the floor framing of the building using adhesive and galvanised bugle head screws and bonded to themselves, and to the floor framing using the approved adhesives. The panels are 600mm wide, with a dry density of 520 kg/m^3, about 1/5th that of concrete.

The finished floor system is squeak free, and utilises the structural performance, thermal efficiency and sound absorbing properties of AAC panels to create a very solid 'feeling' and a quiet floor system is a significant upgrade of a 20mm thick floor systems.

It may be installed readily by building teams, or plaster and panel contractors at the client's discretion.

ENVIRO FLOOR PANELS HAVE THE FOLLOWING MATERIAL PROPERTIES

Dry Density	525kg/m^3
In Service Density	600kg/m^3
Compressive Strength	4.0 MPA
Bending Strength	780N → 1000N or above
Dry Shrinkage Value	0.8mm/m → 0.03%~0.05% or 0.3~0.5mm/m
Water absorption (by volume)	Up to 30–35%
Thermal conductivity	0.12 w/mk → 0.14 w/mk
Thermal resistivity	0.56m^2 K/W
Sound Transmission Loss	35dB for 1000 Hz

Performance

Enviro Floor Systems when constructed in accordance with the details and instructions in this Design and Installation Guide and will meet the relevant sections of the New Zealand Building Code (NZBC) including:

STRUCTURE

Enviro 75mm Floor Systems are constructed in accordance with this manual and can support a maximum uniformly distributed load of 0.35kPa, or a concentrated live load of 2.7kN with joists at 600mm maximum centered (550, 440 or 366mm centres are recommended to suit the panel length of 2200mm).

MASS

The dry mass of Enviro 75mm Floor Systems is 39kg/m^2. The in-service mass of 75mm Enviro Floor Panel is 45kg/m^2. The designer should use the in-service mass for the design of the support system.

Design Considerations

GENERAL

Enviro Floor Panels should be laid in full panels wherever possible and in a half stretcher or brick bond pattern. Enviro Floor Panels can be readily cut to size and to suit floor layout requirements and openings.

FRAMING

Please refer to 75mm Enviro floor details and span tables.

CONCENTRATED LOADS

Enviro Floor Panels have been designed to support a concentrated live load of 2.7kN applied over a 0.3m x 0.3m area. Concentrated loads from load bearing walls or point loads shall be supported by additional framing such as joists or blocking.

PENETRATIONS

Isolated penetrations up to 80mm diameter may be made in the Enviro Floor Panel without reducing their overall structural performance. Larger penetrations or clusters of penetrations shall be trimmed by framing members. Penetrations should be sealed using an appropriate flexible polyurethane sealant or proprietary collar.

BRACING WALLS

Where bracing walls occur on top of the Enviro Floor Panel, additional framing shall be incorporated in the floor framing as follows:

For bracing walls parallel with the floor joists, the bracing wall shall either be over a joist, or be supported by solid blocking. Blocking shall have a minimum width of 45mm.

WET AREAS

A waterproof membrane installed in accordance with the manufacturer's recommendations shall be applied to Enviro Floor Panels in all wet areas.

ACOUSTICS

Enviro 75mm AAC floors will meet or exceed the minimum IIC and STC requirements of

the NZBC G6 when 12mm carpet over 8mm of chip floam underlay is laid on top, and a minimum of 240 deep joists are used with 75mm acoustic batts and resilient mounts and furring chanels to support a minimum 10mm plasterboard ceiling. Contact Masons for more infomation.

COMPONENTS

NB: Only components specified by Enviro are to be used in the Enviro Floor System and all references to components in the CAD details are for these products.

PANELS

600 x 2200 x 75mm autoclaved aerated concrete panels that are reinforced corrosion protected and welded steel mesh.

SCREWS

14G 100mm type 17 bugle head screws are used for fixing the 75mm panels to the timber flooring system. When fixing at panel ends 125mm x 14G type 17 bugle head screws are used at an angle. 150mm x 14G type 17 Galv bugle head screws are used where required to connect upper floor framing to lower floor frames or floor framing. 175 or 200mm 14G type 17 Galv Bugles may be substituted for 150mm screws at the designers discretion.

Adhesives

JOINTING PANELS EDGE TO EDGE – REPAIRING AND PATCHING ENVIRO PANELS

Enviro Glue Mortar is available through Masons for use in the jointing and stopping of Enviro Panels. This mortar is to be mixed on site and applied with the aid of a trowel. This is cost effective adhesive for edge jointing. There is additional labour in the mixing and trowel application of Enviro Glue.

ALTERNATIVE ADHESIVES FOR JOINTING – BONDING ENVIRO PANELS EDGE TO EDGE –

These adhesives are high performance. They tolerate moisture and expand to fill voids before creating very strong bonds. Sudabond Adhesive Foam is particularly cost effective, fast and efficient to apply.

Soudal Gorilla Grip 2 HR PU adhesive

Soudal Sudabond Adhesive Foam

ADHESIVE FOR BONDING ENVIRO PANELS TO TIMBER FLOOR FRAMING.

Soudal Gorilla Grip 2 HR PU adhesive

Soudal Sudabond Adhesive Foam

SEALANT AND FOAMS FOR CONSTRUCTION – EXPANSION JOINTS AND PENETRATIONS

Low expandable polyurethane foam that complies with AAMA 812-04 and moisture compatible flexible sealant for use in penetrations of Enviro Floor Panels.

Masons recommends Soudal MS Sealant or Soudal Gorilla Pro range of expanding PU foams.

ZINC PRIMER

Zinc primer complying with AS/MZS 2311:2000, is to be applied to all exposed reinforcing steel.

FLOOR TOPPING

A self-leveling floor screed or topping is an optional addition to the Enviro Floor. Masons recommends the designer or installers seek advice from floor screed supplier on the most suitable product for the project.

INSTALLATION

GENERAL

Installation of the Enviro Floor System should be supervised and checked by an LBP such as a carpenter or plasterer.

HANDLING AND STORAGE

Enviro Floor Panels should be stored on site on the pallets provided and kept dry until required. Care is required in handling the product and edges and corners must be protected from damage. Although 75mm Enviro Floor Panels tolerate moisture well, they will absorb water if exposed to water over prolonged periods becoming heavy to lift and handle.

SAFETY PRECAUTIONS

When craning the panels up onto the mid-floor always perform a trial lift and adjust the lift to suit the actual weight of the panel on site for the cranes safe load limits. Each panel has an nominal service weight of circa 66Kg. Panel weight will vary with ambient moisture and how dry it has been stored.

Autoclaved Aerated Concrete (AAC) dust contains crystalline silica in common with the dust from other concrete products including fiber cement products.

This dust is irritating to the eyes, skin and respiratory system and inhalation may cause irreversible damage to health. Avoid breathing the dust and contact with eyes and skin. Wear suitable protective clothing and gloves. When cutting, grinding, or drilling panel, do so in the open air, or in well ventilated spaces and wear approved safety glasses and adust mask. Dust extraction for power cutting is strongly recommended.

All aspects of cutting, grinding or drilling must comply with the latest regulations of Work safe NZ.

TOOLS

Tools that will required to install Enviro Floor Panels include:

- Rattle impact driver gun or power drill and drive to suit bugle head screw
- Power saw with concrete or diamond masonry blade
- Power planer and hand grinder with a masonry wheel
- Safety glasses and dust mask
- Vacuum extraction of AAC panel dust
- Mortar mixer and bucket
- 50mm spreader trowel
- Stopping blade and sanding float
- Cartridge gun to suit cartridges or bags of adhesive or sealant
- Soudal adjustable foam application gun
- String line, laser, rules, pencil or marking crayon and solvent cleaner
- Small garden sprayer or trigger bottle for mist spraying

Construction Details

PREPARATION

- Check that the floor framing has been installed according to the requirements of the Enviro 75mm AAC Flooring System.
- Plan for any additional blocking or support that may needed for large penetrations, bracing walls, or off joist joints or other requirements.
- Check floor framing is level and true and adjust, as necessary.
- Check all fixings adhesives sealants and foams are on site prior to commencing.
- AAC panel are sometimes damaged in transport, upon delivery, open all pallets of Enviro Floor 75mm AAC Panel and check the condition of the panels. Small damage may be repaired using Enviro Glue mortar. Larger damage must be cut down/ off or the panel replaced. Promptly advise the supplier of any panels that require replacement and provide photo evidence. Re-cover the panels until ready to crane up onto the floor framing.
- Panels must be cut to size so that wherever possible, no reinforcing steel is exposed to openings or corners. The last row of panels may be cut lengthwise to fit the floor width. Where steel reinforcing is exposed, it must be treated with zinc primer. Grind off any 'nib' left by cutting so panel ends are flush and true.
- Plan for panels to run at right angles across the joists fixed in a staggered brick bond pattern.
- Expect a small amount of panel edge 'creep' across the centre line of the joists as the panels are laid, and plan for where in the job this can be corrected such as a stair void or other floor cut-outs. Otherwise trim the panel ends to maintain centring on joists as needed.

STEP 1:	Measure 600mm in from the boundary joist (edge of the floor) at both ends of the framing run (ends of the floor), mark a line parallel to the boundary joist. Repeat this method at 600mm intervals across the building.
STEP 2:	Mist spray floor framing with water, then spread a continuous 5mm bead of the approved construction adhesive, or adhesive foam along the joists under the first panel run.
STEP 3:	Starting from a corner, place the first Enviro Floor Panel onto the construction adhesive or foam. Ensure the panel is parallel with the boundary joist.
STEP 4:	Two screws are required in each panel at each joist. Three screws are required in the end of the panel where panels are butt jointed over framing, these may be skewed to achieve the 50mm end distance requirement. The screws must be wound into the panel until the head is 2mm to 3mm below the panel surface. 30mm minimum penetration into the floor framing is required.

STEP 5:	Panels must be supported on a minimum of two joists.
STEP 6:	If the panel is to be jointed edge-to-edge with Enviro Glue Mortar, after mixing with clean water to the right consistency, spread 2-3mm thick along the vertical end of the panel. **Or,** If the panels are to be edge bonded with construction adhesive or foam – mist with clean water, then apply two beads of PU adhesive or foam to the panel edge either side of the tongue and groove line, and at the panel ends.
STEP 7:	Mist with water first – then spread a continuous 5mm bead of the approved construction adhesive, or adhesive foam along the joists under where the second panel will be placed, install it butting the second panel hard against the fixed panel. Ensure the second panel is parallel with the boundary joist and screw to floor joists as before. Repeat this procedure along one side of the floor framing – edge of the building. *NB: The approved construction adhesive or foam may be substituted for Enviro Glue Mortar to joint panels end to end and edge to edge.*
STEP 8:	Lay the next row of panels in a half stretcher bond pattern, apply construction adhesive or foam to the floor framing, and either Enviro Glue Mortar, or the approved construction adhesive or foam to the vertical edges of the panel. Place the panel engaging the tongue and groove with the first row of panels using firm pressure and screw the panels to the floor joists.
STEP 9:	If a floor screed or toping is not to be used, then Enviro Glue may be used to fill fixing holes, panel joints and cavities to create a level floor deck. This is optional step that increases the water resistance of the floor deck during construction, and the chance of holes of joins telegraphing through floor coverings.

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