



CELCRETE

FLOOR SYSTEM TECHNICAL MANUAL

**Product Description and
Building System Details**

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CELCRETE FLOOR SYSTEM

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CELCRETE FLOOR SYSTEM

General Description

CELCRETE FLOOR SYSTEM comprises autoclaved aerated concrete panels 75mm thick and reinforced with corrosion protected steel wires fixed to a light timber framed or light steel framed flooring system. It is suitable for residential and light commercial buildings.

CELCRETE FLOOR SYSTEM is the innovative marriage of this well proven lightweight concrete material with New Zealand lightweight timber framing construction.

The panels are fixed to the floor framing of the building using galvanized bugle headed screws. The panels are 600mm wide, with a dry density of 520kg/m³, about 1/5th that of concrete.

CELCRETE 75mm floor panels are available in standard lengths of 1800mm and 2200mm.

Material Properties – 75mm Panel

CELCRETE FLOOR PANELS have the following material properties:

Dry Density:	520kg/m ³
In service Density:	600kg/m ³
Compressive strength, f'c:	4.0 MPa
Modulus of Elasticity, E:	1800 MPa
Water absorption (by volume):	up to 30 – 36%
Thermal Conductivity:	0.174 W/(mK)
Thermal Resistivity, R:	0.56 m ² K/W
Sound Transmission Loss:	35dB for 1000Hz

(75mm bare panel)

CELCRETE FLOOR SYSTEM

Performance

CELCRETE FLOOR SYSTEM constructed in accordance with the details and instructions in this Technical Manual will meet the relevant sections of the New Zealand Building Code (NZBC) including:

B1 – Structure

Structure:

CELCRETE FLOOR SYSTEM constructed in accordance with this manual can support a maximum uniformly distributed load of 2.5kPa, or a concentrated live load of 2.7kN with joists at 600mm maximum centres.

This manual has been prepared in conjunction with Celcrete International's design consultants, Redco NZ Ltd, Chartered Professional Engineers, 470 Otumoetai Road, Tauranga. Designers should contact Redco directly to arrange for specific designs which are outside the scope of this manual. Email red@redco.co.nz

Hazardous Building Materials:

CELCRETE FLOOR SYSTEM is non-hazardous in terms of Clause F2 of the NZBC providing the safety precautions included in this literature are adhered to.

Mass:

The dry mass of 75mm **CELCRETE FLOOR PANELS** is 39 kg/m². The panels are available in two sizes; 1800mm x 600 (Dry weight per panel is 42kg) and 2200mm x 600 (Dry weight per panel is 51kg). The in service mass of 75mm **CELCRETE FLOOR PANELS** is 45 kg/m². The designer should use the in service mass for the design of the support system.

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Design Considerations

General:

CELCRETE FLOOR PANELS shall be laid generally in full panels wherever possible. The panels shall be laid in half stretcher bond. **CELCRETE FLOOR PANELS** can be readily cut to size to suit floor layout requirements and openings.

Framing:

CELCRETE FLOOR PANELS may be supported on either a light timber framed system or a light steel framed system. The light timber framed system may comprise timber joists, ply webbed joists, trussed joists, laminated timber joists, timber and steel beams or any combination of the above. The floor framing system should be designed for the appropriate live load plus the in service mass of the **CELCRETE FLOOR PANELS**. For framing designed to NZS3604 “Timber Framed Buildings” compensation needs to be made for the extra weight of the **CELCRETE FLOOR PANELS**. Framing sizes should be selected from the appropriate table for a live load of the Design Live Load plus 0.5kPa for the Celcrete Floor Panel. For example, for normal domestic loading the floor joists should be chosen from the 2.0kPa live load tables (1.5kPa + 0.5kPa). Similarly for normal domestic decks the deck joists should be chosen from the 3.0kPa (2.0kPa + 0.5kPa) live load tables

Concentrated Loads:

CELCRETE 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. The bearing stress in the **CELCRETE FLOOR PANELS** shall be limited to 1.0MPa.

Penetrations:

Isolated penetrations up to 80mm diameter may be made in **CELCRETE FLOOR PANELS** without reducing their 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 **CELCRETE FLOOR PANELS** 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 **CELCRETE FLOOR PANELS** in all wet areas.

CELCRETE FLOOR SYSTEM

Components

NOTE: Only components specified by **CELCRETE** are to be used in the **CELCRETE FLOOR SYSTEM** and all references to components in the CAD details are for these products. All components are supplied to trained installers by Licensed Celcrete Distributors.

Panels:

600x1800x75mm and 600x2200x75mm autoclaved aerated concrete panels that are reinforced with corrosion protected steel wires.

Screws:

14-10x100mm bugle head galvanised steel screws are used for fixing the 75mm panels to the timber flooring system.

Mortar Glue:

CELCRETE Mortar Glue is supplied by **CELCRETE** for use in the jointing and stopping of **CELCRETE PANELS**. This mortar is mixed on site and applied with the aid of a trowel.

Sealants:

Low expandable polyurethane foam that complies with AAMA 812-04 and moisture compatible flexible sealant for use in penetrations of **CELCRETE FLOOR PANELS**.

Zinc Primer:

Zinc primer complying with AS/NZS 2311:2000, Part 2.3 is applied to all exposed reinforcing steel.

Adhesive:

CELCRETE FLOOR PANELS shall be laid on a continuous 5mm bed of a solvent based construction adhesive applied to the floor joist before laying the **CELCRETE FLOOR PANEL**.

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Installation

General:

CELCRETE FLOOR SYSTEM must be constructed or supervised by trained and certified installers to ensure quality of workmanship. Please contact Celcrete International for details of Licenced Celcrete Distributors on **0508 CELCRETE (0508 2352 7383)**

Handling & storage:

CELCRETE 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.

Safety precautions:

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

All aspects of cutting, grinding or drilling must comply with the latest regulations of the Occupational Safety & Health (OSH) division of the Labour Department.

Tools:

Tools that will be required to install **CELCRETE FLOOR PANELS** include:

- Power drill with square drive
- Power saw with metal or diamond blade.
- Power planer
- Safety glasses & dust mask
- Mortar mixer & bucket
- 50mm spreader trowel
- Stopping blade & sanding float

Construction Method:

1. Ensure builder has completed items set out in pre-flooring checklist (**see Appendix 1**).
2. Check with a straight edge to ensure floor framing is straight and level.
3. Measure 600mm in from boundary joist at both ends of the floor, then mark a line parallel to the boundary joist. Repeat this method at 600mm intervals across the building.
4. Spread a continuous 5mm bead of construction adhesive along the joists under the first panel and starting from a corner, place the first **CELCRETE FLOOR PANEL** onto the construction adhesive. Ensure the panel is parallel with the boundary joist. Screw fix the **CELCRETE FLOOR PANEL** a minimum of 100mm in from the long edge of the panel and 50mm from the end of the panel. Two screws are required in each panel at each joist. Screws in the end edge of the panel may be skewed to achieve the 50mm end distance requirement. The screws must be wound into the panel until the head is 2mm – 3mm below the panel surface. Panels must be supported on a minimum of two joists. The interior end connection of the panel **does not** have to be supported by a joist ie **CELCRETE FLOOR PANELS** may be joined between joists **provided** the panel is continuous over at least two joists. **CAD REFS 100-1, 100-2, 100-3, 100-4, 100-5**
5. Spread Celcrete mortar glue 2-3mm thick along the vertical edge of the panel and then repeat step 4 abutting the next panel hard against the fixed panel. Ensure this panel is parallel with the boundary joist and screw to floor joists as before. This procedure is repeated along one side of the building.
6. Spread Celcrete mortar glue, approx 2-3mm thick along the rebated vertical edge of the first panel for the second row of panels. Spread a continuous 5mm bead of construction adhesive along the joists under the first panel. Lay the next row of panels with a half stretcher bond, then screw panels to the floor joists as before.
7. 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 exposed it must be treated with zinc primer.

Penetrations:

Typical penetrations are shown in **CAD REFS 102-1 & 102-2**.

Non Loadbearing Walls:

Typical support for non loadbearing walls are shown in **CAD REFS 100-2**.

Loadbearing Walls:

Typical support for loadbearing walls are shown in **CAD REFS 101-1 & 101-3**.

Bracing Walls:

Typical support for bracing walls are shown in **CAD REFS 101-4 & 101-6**.

CELCRETE FLOOR SYSTEM

The following construction details describe the most commonly used applications of the **CELCRETE FLOOR SYSTEM**. If designers / specifiers require additional or modified details please contact Celcrete International immediately on:

0508 CELCRETE (0508 2352 7383).

100-1	Typical Panel Fixing Arrangement
100-2	Typical Floor Joist Detail - 2
100-3	Typical Steel Floor Joist Fixing - Detail 3
100-4	Section through floor panels - Detail 4
100-5	Typical Panel Installation - Detail 5
100-6	Typical Floor Joist Detail at Change of Joist Direction
101-1	Typical Wall Fixing Detail
101-2	Non Loadbearing Wall Detail
101-3	Loadbearing Wall Detail
101-4	Bracing Wall Fixing Detail
101-5	Alternative Bracing Wall Fixing Detail
102-1	Typical Penetration Detail
102-2	Typical Large Penetration with Blocking Detail
Appendix 1	Builders Checklist