



DESIGN & CONSTRUCTION MANUAL



METRA – Take a closer look.

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Foreword

The Metra System of engineered wood panel construction is the prime construction method used by Metrapanel Limited.

Panel based building systems have been developed in the New Zealand market for the past twenty years and the basic principles are similar to that of concrete "Tilt Slab". Whereas, "Tilt Slab" is generally used for industrial construction, engineered wood panels are ideally suited to residential and light commercial activities.

The engineered wood panel products that form the system are:

- Metra wall panel – 36mm thick, fine surface, moisture resistant particleboard.
- Metra ceiling panel – 25mm thick, fine surface, moisture resistant particleboard.
- Metra flooring panel – 25mm thick, fine surface, moisture resistant particleboard.



Metra wall panels

The standard sheet size that wall panels and ceiling panels are cut from is 7350mm x 2440mm

Wall panels are pre-cut to size, with grooves and rebates for ease of assembly, window and door openings marked or cut and pre-primed/sealed at the factory. These panels are then supplied in kitset form, complete with assembly hardware.

Metra panels have been used in the construction of residential houses, school buildings, retirement villages, apartment complexes, detention centres and industrial fit outs. The BRANZ Appraisal covers residential houses.

The Metra System allows for construction to proceed at an exceptionally rapid pace and a typical single storey structure can be easily assembled in one day.

All Metra construction must only be carried out by selected builders or construction companies that have been fully trained in panel construction by Metrapanel Limited.

This manual has been designed to align with NZS 3604:2011 (the current acceptable solution for Structure/Timber of the New Zealand Building Code). A similar index and numbering system has been used and this document should be read in conjunction with that standard.

Compliance

The Metra Panel Construction System has a BRANZ Appraisal, Certificate No. 364, for use under the NZBC.

In the opinion of BRANZ, the Metra Panel Construction System will meet or contribute to meeting the following provisions of the New Zealand Building Code:

- **B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4 for the relevant physical conditions of B1.3.3.
- **B2 DURABILITY:** Performance B2.3.1 (a), the Metra panel wall and ceiling system, not less than 50 years.
- **C1 OUTBREAK OF FIRE:** Performance C1.3.2.
NZBC Acceptable Solutions C/AS1 requires that foam plastics such as Expanded Polystyrene (EPS), which is an insulating material in the Metra Wall System, must be protected from direct exposure to fire. Metra wall panels, when joined with screw/nail fixed back blocking or metal strips, in accordance with the details in this manual, will satisfy the NZBC Acceptable Solution C/AS1 requirements as a flame barrier.
- **E2 EXTERNAL MOISTURE:** The system requires the addition of a building envelope to meet performance E2.3.2 and E2.3.6.
- **E3 INTERNAL MOISTURE:** Performance E3.3.1, E3.3.4. and E3.3.5.
- **F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1.
The System will not present a health hazard to people.
- **H1 ENERGY EFFICIENCY:** Performance H1.3.1 and H1.3.2.
- **STRUCTURAL AND DURABILITY TESTING**
The Metra System and its components have been extensively tested by a range of independent agencies.

Durability

BRANZ Opinion

As a result of the latest edition of NZS 3602:2003 being adopted as the Acceptable Solution for Durability under the New Zealand Building Code, BRANZ have updated their durability opinion for the Metra wall panels.

“The update addresses the robustness required for exterior and other framing by NZS 3602 for exposure to moisture due to cladding leaks which will allow time for detection and repair. NZS 3602 has been adopted in the amendment to NZBC B2/AS1.

The opinion states that Metra external walls meet the robustness intent of NZS 3602:2003.

Materials

- The board is manufactured from reconstituted (recycled) New Zealand plantation pine wood fibre, bonded together with moisture resistant (MR) resins and waxes.
- The blended fibres are compressed under heat to form a structurally strong and moisture-resistant medium-density particleboard called “Superfine LB”.
- Boards are then passed through a series of high-speed drum sanders that finish the surfaces to its Superfine finish on each face. Our re-manufacturing plant then applies a paint application to seal the panel further.

Table 2.1 Metra Wall & Ceiling Panels – Physical Properties

Board	36mm Wall Panels	25mm Ceiling Panels	25mm FloorPanels
Board Size	7350 x 2440mm	7350 x 2440mm	7350 x 2440mm
Weight per Board	422 kg	293 kg	293 kg
Weight per m2	23kg	15.9 kg	15.9 kg

WALLS

Metra wall panels are manufactured with a nominal density of 658 kg/m³.

- Full sheets are 7350mm long x 2440mm wide x 36mm thick..
- The standard wall height is 2440mm (h).
- A Factory joined sheet is available for a wall height of 2700mm (h).
- Higher walls may be built with the sheet stood on end and wall joints at 2440mm max.

Table 2.2 Metra Wall Panels – Physical Properties

Property	Unit	Average	95%
Density	Kg/m ²	658	623
MOR	MPa	20000	15600
MOE	MPa	2700	2300
IB	kPa	1000	920

CEILING

25mm Metra ceiling panels are manufactured with a nominal density of 635 kg/m³.

- Full sheets are 7350mm long x 2440mm wide x 25mm thick.
- Floor & Ceiling sheets are generally supplied full size and cut to fit on site.
- Floor & Ceiling sheets may be supplied with tongue and groove edges and plastering chamfer for jointing.

PAINT

The primer paint applied to the panel faces and edges will resist water entering the board during the construction period. Any disturbance of this coating, i.e. cuts, nail or screw penetrations, or damaged areas must be re-primed.

NOTE: Primer for sealing edges of cut panel is supplied with the Panel kitset.