



BRANZ Appraised

Appraisal No. 951 [2022]

METRA CEILING

Appraisal No. 951 [2022]

This Appraisal replaces BRANZ Appraisal No. 951 [2017]

Amended 25 October 2023



BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 Metra Ceiling is a method of ceiling construction based on Metra Ceiling panels. Metra Ceiling is intended for use in timber-framed buildings with timber roof trusses and/or timber rafters. The design and construction of the remainder of the building is conventional.

Scope

- 2.1 Metra Ceiling has been appraised for use as ceilings in buildings covered by the scope of Clause 1.1.2 of NZS 3604 in all Wind Zones up to, and including, Very High.
- 2.2 Metra Ceiling has also been appraised for use as ceilings in timber-framed buildings subject to specific engineering design.
- 2.3 The use of Metra Ceiling in the following situations has not been assessed and is outside the scope of this Appraisal:
 - Sauna rooms and areas of high humidity [greater than 85% relative humidity (RH)].
 - Where temperatures exceed 35°C for prolonged periods [e.g. ceiling heating installations] or exceed 50°C in localised areas [e.g. near fuel burning appliances].

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Metra Ceiling, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Metra Ceiling meets the requirements for loads arising from self-weight, imposed gravity loads, earthquake, and wind [i.e. B1.3.3 (a), (b), (f), and (h)]. See Paragraphs 8.1 and 8.2.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years. Metra Ceiling meets this requirement. See Paragraphs 9.1 and 9.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Metra Ceiling meets this requirement. See Paragraphs 15.1 and 15.2.

Technical Specification

- 4.1 The components and accessories used with Metra Ceiling, which are supplied by Metra Systems Limited are:
- **Metra Ceiling panels** – 7.3 m x 2.45 m x 25 mm thick medium density particleboard panels with a nominal density of 640 kg/m³. The panels are supplied primer-painted and may be supplied with tongue and groove edges and plastering chamfers for jointing.
 - **Ceiling straps [CP1]** – 50 x 1.2 mm thick galvanised steel.
 - **Ceiling clips [CPC40]** – 60 x 40 x 50 x 2 mm thick galvanised steel right angle bracket.
 - **Ceiling U-channels** – 600 x 1.2 mm thick galvanised steel.
 - **Ceiling square plates** – 200 x 200 x 2 mm galvanised steel.
 - Connection and fixing screws, adhesive, sealer/primer paint, as specified in the Technical Literature.
- 4.2 The remaining materials, components and fixings required to construct the ceiling are supplied by the building contractor or installer, in accordance with the requirements of the Technical Literature. All fixing components must comply with the requirements of Section 4 of NZS 3604.

Handling and Storage

- 5.1 Panel lifting procedures are provided by Metra Systems Limited. If it is necessary to store the Metra Ceiling panels on-site, care should be taken to ensure they are stacked flat, kept dry and that proper air circulation can occur around the stack.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- Metra Ceiling on Timber Framing Construction Manual, Version 1.
- 6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Metra Ceiling provides a rigid and flat ceiling surface and replaces conventional ceiling lining and ceiling battens.
- 7.2 Metra Ceiling panel joints can be tapered to allow plastering using conventional materials before the application of internal finishes. The Technical Literature provides guidance on how to incorporate Metra Ceiling into a building design. All other aspects of building design and construction are in accordance with NZS 3604.
- 7.3 Roof trusses are required at 900 mm maximum spaces. The ceiling panels are installed over walls and fixed to top plates. Trusses are laid directly on the ceiling panels without the need for ceiling battens.
- 7.4 Trusses are the subject of specific engineering design following the information in the Technical Literature. Roof trusses and their anchorage must be in accordance with NZS 3604, Paragraph 10.2.2.
- 7.5 Roof space ventilation should be provided when using Metra Ceiling. Contact Metra Systems Limited for specific information.
- 7.6 The thermal insulation of the ceiling is conventional.

Structure

- 8.1 Metra Ceiling panels provide an effective ceiling diaphragm. The length of the diaphragm shall not exceed twice its width. The maximum diaphragm length is 12 m.
- 8.2 The specific fixing requirements for Metra Ceiling diaphragms are provided within the Technical Literature.

Durability

- 9.1 The durability is dependent on the Metra Ceiling, including the connections, remaining dry in service. It is also dependent on the ceiling panels not being exposed to sustained high humidity, liquid water, or high temperatures.
- 9.2 The durability is also dependent on the maximum weather exposure time for Metra Ceiling not exceeding 28 days prior to being enclosed within the building.

Maintenance

- 10.1 The exterior roof cladding system must be maintained to ensure adequate protection is continually provided against water ingress.
- 10.2 The Technical Literature contains details of how Metra Ceiling must be maintained.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Metra Ceiling from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

- 12.1 NZBC Verification Method C/VM2, Table A1 states that particleboards with a density of greater than 600 kg/m³, with or without the coatings defined in Table 1, can be taken as having a Group Number of three. When an applied finish is used over Metra Ceiling, the Group Number must be obtained from the manufacturer or supplier of the finish product or system, for the complete lining system. Metra Ceiling can be used as an internal ceiling surface lining where permitted by NZBC Performance Clause C3.4 [a].
- 12.2 In all Risk Groups where foamed plastic building materials or combustible insulating materials form part of the ceiling system, the completed system, including any applied finish, must achieve a Group Number of not more than three.
- 12.3 In buildings with a SH Risk Group classification, there are no internal surface finish requirements for Metra Ceiling [with or without applied finish] unless foamed plastic building materials or combustible insulating materials form part of the ceiling system.

External Moisture

- 13.1 Metra Ceiling must be protected against the effects of external moisture by the building's external envelope. The external roof cladding system must be compliant with NZBC Clause E2 and be maintained in a weathertight condition.

Internal Moisture

- 14.1 Ventilation of spaces within the building must meet the performance requirements of NZBC Performance Clause G4.3.1.
- 14.2 Ceilings in wet areas must be finished with a protective paint system.
- 14.3 Some permanent ventilation, not reliant on window openings, must be provided in wet areas, such as bathrooms and laundries. Vented windows, wall or ceiling mounted extract fans, or similar fittings are recommended. Extract fans for moisture laden air must be vented externally.

Hazardous Building Materials

- 15.1 Metra Ceiling panels are manufactured using melamine fortified urea formaldehyde adhesive. Vapour emissions are minimal because the panels are encapsulated by a paint coating. Adequate ventilation in accordance with NZBC Performance Clause G4.3.1 must be provided.
- 15.2 The degree of health hazard caused by vapour release will depend on the total amount of vapour released from all sources in the building including flooring and furniture, the ventilation rate, and the degree of encapsulation provided by surface finishes, such as coatings and carpets.

Energy Efficiency

- 16.1 Compliance to NZBC Performance Clauses H1.3.1 and H1.3.2 [E] is achieved by using NZBC Acceptable Solution H1/AS1 and NZBC Verification Method H1/VM1.
- 16.2 Roofs and walls complying with the Schedule Method for Compliance with Clause H1.3.2 [E] will have adequate thermal resistance to comply with NZBC Acceptable Solution E3/AS1.

Installation Information

Installation Skill Level Requirement

- 17.1 All design and building work must be carried out in accordance with the Metra Ceiling Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the Metra Ceiling. Where the work involves Restricted Building Work (RBW), this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License Class.

General

- 18.1 Metra Ceiling must be constructed in accordance with the non-specific design information contained within the Technical Literature.
- 18.2 Metra Ceiling panels must be inspected for water damage before, during and after installation, and damaged panels repaired or replaced.
- 18.3 Particular care must be taken that the foundations and building platform are level and square and that perimeter dimensions are accurate.
- 18.4 All timber framing must have a moisture content of not more than 18% at the time of enclosure.
- 18.5 All exposed pre-cut Metra Ceiling panel edges are protected by a factory paint coating. It is important that any site cut, or site exposed edges are similarly protected, using the sealing paint supplied with the ceiling panels.
- 18.6 Metra Ceiling panels are temporarily supported on purpose built support frames. For non-diaphragm ceilings, ceiling panels are fixed to the top plate of walls with 75 x 3.15 mm nails or 50 mm x 8 g screws at 250 mm centres. For diaphragm ceilings, ceiling panels are fixed to the top plate of walls with 75 x 3.15 mm nails at 150 mm centres. Panel joints are glued with construction adhesive. The panels are fixed together by a continuous screw-fixed 50 x 1.2 mm thick galvanised steel strap centered on the panel joints. The screws are 25 mm x 8 g with one each side of the joint at 200 mm centres. Where the joint is more than 300 mm away from a truss member, it is stiffened at right angles to the joint by 600 mm long galvanised steel channels at 1,200 mm centres.
- 18.7 After the ceiling panels have been installed, the roof trusses are placed in position and fixed to the top of the ceiling panels using galvanised steel brackets and 25 mm x 8 g screws or 30 x 2 mm nails. The ceiling support frames are then removed.
- 18.8 Roof trusses must be restrained against wind uplift. Roof trusses and their anchorage must be in accordance with NZS 3604, Paragraph 10.2.2.
- 18.9 Roof cladding should be installed as soon as practicable. The maximum weather exposure time for Metra Ceiling is 28 days.

Inspections

- 18.10 The Technical Literature must be referred to during the inspection of Metra Ceiling installations.

Health and Safety

- 19.1 Suitable protective masks must be worn to prevent inhalation of dust resulting from cutting or working with the Metra Ceiling panels.

Basis of Appraisal

The following is a summary of the technical investigations carried out.

Tests

20.1 Tests were carried out by BRANZ to establish the durability of Metra Ceiling.

Calculations

21.1 Calculations to justify the structural adequacy of Metra Ceiling has been examined by BRANZ and found to be satisfactory.

Other Investigations

22.1 The satisfactory performance of Metrapanel wall and ceiling panels in New Zealand over a period of 20 years has been recognised by BRANZ.

22.2 Site inspections at various stages of construction, to assess installation methods and to examine completed installations, have been made by BRANZ.

22.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

23.1 Details of materials and components used and methods adopted for quality control have been obtained by BRANZ and found to be satisfactory.

23.2 The manufacture of Metra Ceiling panels by the Laminex Group Limited, Taupo has been assessed by BRANZ.

23.3 The Metra Ceiling panel pre-cut operation by Metra Systems Limited, Huntly has been assessed by BRANZ.

23.4 The quality of materials, components and accessories supplied by Metra Systems Limited is the responsibility of Metra Systems Limited.

23.5 Quality on-site is the responsibility of the building contractor and/or nominated installer.

23.6 The designer is responsible for the building design, and the building contractor and/or nominated installer is responsible for the quality of installation of Metra Ceiling panels.

23.7 The building contractor is responsible for the quality of installation of the roof.

23.8 Building owners are responsible for the maintenance of Metra Ceiling.

Sources of Information

- AS/NZS 1170:2002 Structural design actions.
- NZS 3604:2011 Timber-framed buildings.
- World Health Organisation (WHO) Working Group on the Evaluation of Carcinogenic Risks to Humans, Wood Dust and Formaldehyde, 1995.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 25 October 2023

This Appraisal has been amended to update Appraisal holder name.



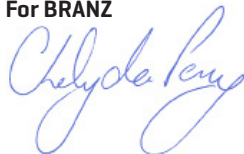
In the opinion of BRANZ, **Metra Ceiling** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Metra Systems Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Metra Systems Limited:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Metra Systems Limited**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Metra Systems Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

19 May 2022