



**BRANZ Appraised**

Appraisal No.593 [2008]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 593 (2008)**

## **TRIBOARD INTER-TENANCY WALL SYSTEM**

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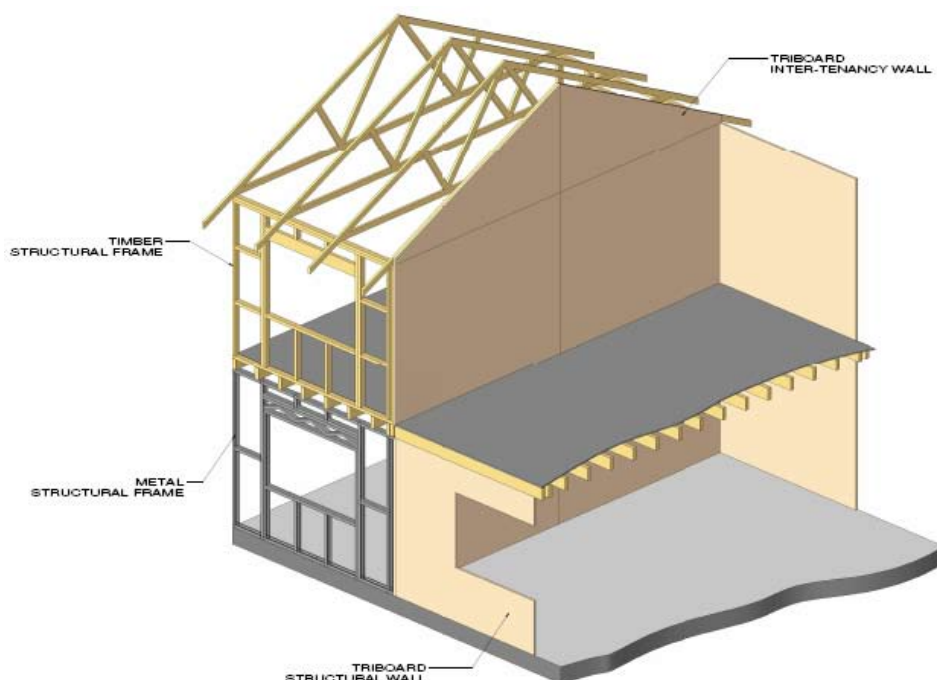
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## Product

1.1 The Triboard Intertency Wall System consists of Triboard wall panels, timber battens and sound insulation for use as fire-rated and sound insulating walls.



## Scope

2.1 The Triboard Intertency Wall System has been Appraised for use as load bearing or non-load bearing, fire-rated and sound insulating internal walls.

2.2 The walls must be straight. The maximum height allowed for any single storey of a Triboard Intertency Wall System is 3.0 m for loaded walls and 4.5 m for unloaded walls. For loaded walls the maximum allowable design load is 20 kN/m of wall length. For loaded wall heights greater than 3.0 m specific design is required. This is outside the scope of this Appraisal.

2.3 The Triboard Intertency Wall System is suitable for use when interfacing with traditional timber frame construction, light gauge steel frame construction, and with the Triboard Construction System. See Paragraph 7.1.

2.4 The Triboard Intertency Wall System is suitable for use as infill panels within buildings having concrete frames designed to NZS 3101.

2.5 The use of Triboard wall panels in the following situations has not been assessed and is outside the scope of this Appraisal:

- sauna rooms and the like where they may be exposed to sustained high humidity (greater than 95% RH) or liquid water.
- where temperatures are in excess of 35°C over large areas for prolonged periods or in excess of 50°C in localised areas (e.g. the area adjacent to a fuel burning appliance).

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Triboard Intertency Wall System if designed, installed, used 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. The Triboard Intertency Wall System meets the requirements for loads arising from self-weight, imposed gravity loads arising from use, earthquake, snow and wind [i.e. B1.3.3 (a), (b), (f), (g) and (h)]. See Paragraphs 8.1 - 8.5.

**Clause B2 DURABILITY:** Performance B2.3.1(a), not less than 50 years. The Triboard Intertency Wall System meets this requirement. See Paragraphs 9.1 and 10.1.

**Clause C3 SPREAD OF FIRE:** Performance C3.3.2. The Triboard Intertenancy Wall System meets this requirement. See Paragraphs 12.1 - 12.3.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. The Triboard Intertenancy Wall System meets this requirement and will not present a health hazard to people. See Paragraphs 14.1 and 14.2.

**Clause G6 AIRBORNE AND IMPACT SOUND:** Performance G6.3.1. The Triboard Intertenancy Wall System meets this requirement. See Paragraph 15.1.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code Compliance.

## Product Information

### Description

#### Triboard Panels

4.1 The Triboard panels used with the Triboard Intertenancy Wall System are supplied by Juken New Zealand Limited. They are a three-layered wood panel product with a medium density fibreboard surface, 3 to 4 mm thick, on both sides of a non-oriented strandboard core. Triboard wall panels are manufactured to be 4.0 m x 2.45 m x 38 mm thick with a nominal density of 695 kg/m<sup>3</sup>. The panels are cut to size for walls and have their vertical edges rebated to form a 10 mm step.

#### Batten Timber

4.2 Timber wall battens are MSG 8, H1.1 treated, kiln dried ex 50 x 50 mm radiata pine (dry dressed 45 x 45 mm) with a moisture content of 18% or less.

#### Insulation

4.3 The insulation used in the Triboard Intertenancy Wall System is Tasman Insulation New Zealand Ltd 75 mm thick Noise Control Blanket, which is a glass-wool material.

#### Other Components

4.4 Other components for the Triboard Intertenancy Wall System, such as fasteners and connectors, are as specified in the Technical Literature.

4.5 Fire and sound rated sealants have not been assessed and are outside the scope of this Appraisal.

### Handling and Storage

5.1 Panels must be handled carefully at all times to avoid physical damage and kept dry under cover until ready for construction.

5.2 For long term storage, Triboard panels must be kept dry under cover and be stacked horizontally with fillets in between sheets at 1200 mm maximum spacing to allow air circulation. Triboard panels must be protected from direct sunlight whilst in storage.

5.3 When exposure to the weather is anticipated during building construction, waterproof covers such as tarpaulins must be provided to keep the panels dry.

5.4 Metal components such as fixings and steel angles must be stored so that they are kept dry and undamaged.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature. The Technical Literature must be read in conjunction with this Appraisal. 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 Triboard Intertenancy Walls only form that part of the structure that is a wall between two tenancies. The rest of the building structure may be:

- timber framed structures designed and constructed in accordance with NZS 3604; or,
- specifically designed light gauge steel frame construction; or,
- Triboard houses as defined by BRANZ Appraisal No. 481 (2005); or,
- specifically designed timber structures designed in accordance with NZS 3603; or,
- specifically designed concrete framed structures designed in accordance with NZS 3101.

7.2 Triboard wall panels must be finished directly with a paint system, or for alternative finishes the panels must be sealed first. Alternative finishes may include wall paper, or walls may be battened out for internal linings, e.g. where impervious linings are required in wet areas or to accommodate services.

7.3 Where the Triboard Intertenancy Walls interface with other construction, the joints must be appropriately designed with fire and sound sealants and materials. The sealants have not been assessed and are outside the scope of this Appraisal.

### Structure

#### Wall Loads

8.1 The maximum height allowed for any single storey of a Triboard Intertenancy Wall System is 3.0 m for loaded walls and 4.5 m for unloaded walls. For loaded walls the maximum allowable design load is 20 kN/m of wall length. For loaded wall heights greater than 3.0 m specific design is required. This is outside the scope of this Appraisal.

8.2 Walls comprising Triboard wall panels and wall battens have been designed as an integral unit. The stiffness and strength of the walls are adequate to resist gravity, wind and earthquake loads to the same level as conventional timber framing with similar deflections.

#### Wall Bracing Resistance

8.3 The in-plane rigidity of a Triboard wall panel is high, and the wind and earthquake bracing resistance it provides is limited by the connections. Sliding is prevented by connections at the floor and ceiling. Overturning is prevented by connections to abutting walls. Connection to other wall panels and the ceiling is by nailing or screwing. Connections to the floor are by galvanised steel angles, nails, screws, and cast-in floor framing anchors. The instructions in the Technical Literature for connection of the Triboard wall panels to the rest of the structure must be carefully followed to ensure that all loads can be safely carried.

#### Impact

8.4 Triboard wall panels are robust and have a high resistance to soft body impacts, and most hard body impacts associated with normal use situations.

## Service Penetrations

8.5 The Triboard Intertenancy Wall System has not been assessed with penetrations. Any penetrations in a Triboard Intertenancy Wall will likely severely impact on both the fire resistance rating and sound insulation properties of the wall. Specific engineering design advice should be sought if it is necessary to include penetrations in a Triboard Intertenancy Wall System. Such penetrations are outside the scope of this Appraisal.

## Durability

9.1 The Triboard Intertenancy Wall System has a serviceable life of at least 50 years. The durability opinion is dependent on the Triboard wall panels and the connections remaining dry in service. It is also dependent on the Triboard wall panels not being exposed to sustained high humidity, liquid water, or high temperatures.

## Maintenance

10.1 The building must be maintained weathertight and all components of the Triboard Intertenancy Wall System protected from internal and external moisture. The internal linings or finishing must be maintained to provide protection from internal moisture. Regular inspections (at least annually) of the external cladding system and the internal linings and finishes must be made, and any damage or deterioration repaired or restored. The Technical Literature contains details of how Triboard wall panels must be maintained.

10.2 Fire and sound rated sealants must be regularly inspected and maintained in accordance with the instructions of the sealant manufacturer.

## Outbreak of Fire

11.1 The Triboard Intertenancy Wall System contains combustible components which must be protected from heat sources such as chimneys, solid fuel heaters and flues. Clearances from such heat sources specified in NZBC Acceptable Solution C/AS1 Part 9 may not be sufficient for some appliances to ensure that the 50°C limit for the Triboard is not exceeded.

## Spread of Fire

12.1 The Triboard Intertenancy Wall System is painted or finished or lined with another suitable internal lining system. The Spread of Flame Index (SFI) and Smoke Developed Index (SDI) will depend on the finish used. Careful attention to internal finishing material may therefore be required to ensure that requirements of Table 6.2 in NZBC Acceptable Solution C/AS1 are met.

12.2 The Triboard Intertenancy Wall System has a fire resistance rating (FRR) of 60/60/60. Building designers should ensure that this is suitable for the structure under consideration in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 6.

12.3 In order to satisfy the requirements of NZBC Clause C4 Structural Stability During Fire, designers must ensure that fire rated elements are supported by building elements having at least the same FRR as the fire rated element that they are supporting.

## Internal Moisture

13.1 Ventilation must meet the performance requirements of NZBC Clause G4.3.1, and thermal insulation of the building external envelope must be provided in accordance with Clause 1.1.1 (a) of NZBC Acceptable Solution E3/AS1.

13.2 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 in all building wet areas. Extract fans for moisture laden air must be vented externally.

13.3 The incorporation of vented windows and other forms of permanent ventilation are recommended in all rooms to ensure adequate air circulation and to prevent the build-up of moisture levels.

13.4 In wet areas (where sanitary fixtures are installed), and in rooms where the walls are likely to be splashed, the surface of Triboard wall panels must be finished with an impervious lining which is easily cleaned. These linings must meet the SFI and SDI requirements mentioned in Paragraph 12.1 above. All joints must be impervious to water, and protection of the walls must be provided by extending impervious floor membranes up the wall in accordance with the coved detail of NZBC Acceptable Solution E3/AS1 Figure 1.

## Hazardous Building Materials

14.1 Although Triboard wall panels are manufactured using melamine fortified urea formaldehyde adhesive, vapour emissions are minimal if the panels are sealed as specified in Paragraph 7.2.

14.2 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. The permanent ventilation required and recommended to control moisture levels (see Internal Moisture) will also minimise any accumulation of formaldehyde gas.

## Airborne and Impact Sound

15.1 When installed in accordance with the Technical Literature the Triboard Intertenancy Wall System is rated to a sound transmission class (STC) of 56 dB.

# Installation Information

## Installation Skill Requirements

16.1 Triboard Intertenancy Wall Systems must be installed by contractors competent in Triboard wall construction and the principles of fire rated and noise control construction.

## Inspection

16.2 For inspection, reference must be made to the Technical Literature especially for confirmation of fixing types and spacings.

## General

17.1 Triboard Intertenancy Wall Systems must be installed in accordance with the Technical Literature.

17.2 Triboard wall panels must be inspected for water damage before, during and after installation and damaged panels repaired or replaced.

17.3 All timber framing including battens must have a moisture content of not more than 18% at the time of enclosure.

17.4 The battens, which extend the full height of the panels, are screw fixed to the back faces of the Triboard panels. They are spaced at 600 mm centres.

17.5 Triboard panels are fixed to the floor and ceiling via steel angles as described in the Technical Literature. These fixings are at 200 mm centres.

17.6 One side of the Triboard Intertenancy Wall System is erected first. The Noise Control Blanket is then installed, and the other leaf of the wall is then erected. Care must be taken to ensure that the timber battens are alternately spaced on the interior side of each leaf of the wall system. This is especially important at panel joints.

17.7 Joints between panels on one leaf of the Triboard Intertenancy Wall System must not occur within 900 mm of a joint on the other leaf, except that horizontal joints in unloaded Triboard Intertenancy Walls may occur adjacent to each other.

17.8 Each vertical joint between Triboard Wall Panels has a 100 mm wide strip of Triboard running full height behind it. This is screw fixed to the sheets on each side of the joint as described in the Technical Literature.

17.9 Horizontal joints have the same 100 mm wide strip of Triboard, but instead of being continuous it spans between the vertical battens.

17.10 Particular attention must be paid to ensure all voids at wall perimeters are sealed with fire/acoustic insulation or sealant as specified in the Technical Literature.

## Health and Safety

18.1 Suitable protective masks must be worn to prevent inhalation of dust resulting from cutting or working with the Triboard panels.

## Basis of Appraisal

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

## Tests

19.1 Cyclic humidity tests were carried out by BRANZ to establish the durability of Triboard wall panels.

19.2 A fire resistance test to AS 1530.4: 1997 was carried out by BRANZ.

19.3 Laboratory measurement of airborne sound insulation of a Triboard wall has been carried out by Auckland UniServices Limited. The results of this testing have been reviewed and found to be satisfactory.

## Other Investigations

20.1 The satisfactory performance of Triboard wall panels in New Zealand since 1987 has been recognised by BRANZ. BRANZ have inspected a number of Triboard panel houses up to 15 years old.

20.2 An inspection of the method of construction was carried out by BRANZ to assess installation methods and to examine the completed installation.

20.3 Results of a formaldehyde monitoring investigation carried out by Paragon Health and Safety Ltd have been obtained. The results show that the air concentration of formaldehyde in a number of finished (closed up) houses is acceptable, being within the generally accepted indoor Air Quality Guidelines of 0.05 – 0.10 ppm.

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

## Quality

21.1 The manufacture of Triboard wall panels by Juken New Zealand Limited has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.2 The quality control systems of Juken New Zealand Limited have been assessed and registered as meeting the requirements of ISO 9001:2000 by SGS International Certification Services Pty Ltd, Certificate number NZ03/052C.

21.3 The quality of the Triboard panels supplied by Juken New Zealand Limited is their responsibility.

21.4 The building designer is responsible for incorporating the Triboard Intertenancy Wall System into their building design.

21.4 Quality on-site is the responsibility of the building contractor.

21.6 The building contractor is responsible for the quality of installation of the Triboard Intertenancy Wall System.

21.7 Building owners are responsible for the maintenance of the Triboard Intertenancy Wall System in accordance with the instructions of Juken New Zealand Limited.

## Sources of Information

- AS 1530.4 Methods for fire tests on building materials, components and structures - Fire-resistance tests of elements of building construction.
- NZS 3101:2006 Concrete structures standard.
- NZS 3602:2003 Timber and wood based products for use in buildings.
- NZS 3603:1993 Timber structures standard.
- NZS 3604:1999 Timber framed buildings.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition, May 2007.
- The Building Regulations 1992, up to, and including June 2007 Amendment.



**BRANZ**

In the opinion of BRANZ, **Triboard Intertenancy Wall System** 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 **Juken New Zealand 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. **Juken New Zealand 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.
3. 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.
4. 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 **Juken New Zealand Limited**.
5. 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.
6. BRANZ provides no certification, guarantee, indemnity or warranty, to **Juken New Zealand Limited** or any third party.

For BRANZ

P Burghout  
Chief Executive

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