



BRANZ Appraised

Appraisal No.611 [2008]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 611 (2008)**

**HOMERAB™
PRECLAD™ LINING**

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Product

1.1 HomeRAB™ PreClad™ Lining is a sealed fibre cement sheet designed for use as a rigid sheathing behind wall cladding systems and as a bracing system to resist wind and earthquake loads on timber framed buildings. It is manufactured using Ceramic Low Density (CLD) fibre cement technology.



Scope

2.1 HomeRAB™ PreClad™ Lining has been appraised for use as a rigid sheathing and temporary weather-protecting sheathing on timber framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with absorbent wall claddings directly fixed to framing; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZS 3604; and,
- situated in NZS 3604 Building Wind Zones up to, and including 'Very High'.

2.2 HomeRAB™ PreClad™ Lining has also been appraised for use as wall bracing systems for timber framed buildings within the scope of NZS 3604.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, HomeRAB™ PreClad™ Lining, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. HomeRAB™ PreClad™ Lining meets the requirements for loads arising from earthquake and wind [i.e. B1.3.3 (f) and (h)]. See Paragraphs 8.1 - 8.6.

Clause B2 DURABILITY: Performance B2.3.1(a), not less than 50 years, B2.3.1(b), 15 years and B2.3.2. HomeRAB™ PreClad™ Lining meets these requirements. See Paragraphs 9.1 - 9.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, HomeRAB™ PreClad™ Lining will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. HomeRAB™ PreClad™ Lining meets this requirement and will not present a health hazard to people.

3.2 HomeRAB™ PreClad™ Lining is an **Acceptable Solution** rigid sheathing material in terms of compliance with NZBC Acceptable Solution E2/AS1, Table 23. This is an Appraisal of an **Alternative Solution** in terms of the New Zealand Building Code compliance.

3.3 HomeRAB™ PreClad™ Lining is used to satisfy the bracing demand requirements of Section 5 of NZS 3604 which is an NZBC Compliance Document.

Technical Specification

4.1 System components and accessories for HomeRAB™ PreClad™ Lining, which are supplied by James Hardie New Zealand Ltd are:

HomeRAB™ PreClad™ Lining

- HomeRAB™ PreClad™ Lining is a 3.5 mm thick fibre cement sheet, manufactured from a CLD cellulose fibre cement formulation. It is produced in sheet material form with an embedded chequered pattern with 'HomeRAB™ PreClad™' embossed on the front face. The sheets are formed, cut to length, and then cured by high pressure autoclaving. The sheet is coated on the front face and four edges with a green tinted water repellent sealer.
- HomeRAB™ PreClad™ Lining is available in sizes of 1200 mm wide and 2460 and 2760 mm long. It is manufactured to conform to the requirements of AS/NZS 2908.2.

Accessories

- HomeRAB™ PreClad™ Lining horizontal flashing - uPVC, available in 3000 mm lengths.
- HomeRAB™ PreClad™ Lining vertical jointer - uPVC, available in 2760 mm lengths.
- Inseal® 3259 joint sealing tape - black, compressible, medium density PVC (Polyvinyl Chloride) closed cell foam. The foam is coated on one side with pressure sensitive acrylic adhesive and the other face is covered by a silicone release paper. The tape is 1.5 mm thick and is supplied in rolls 50 and 80 mm wide and 50 m long.

4.2 System components and accessories for HomeRAB™ PreClad™ Lining, which are supplied by the building contractor are:

- Flexible sill and jamb flashing tape system - AluBand (Thermakraft Industries (N.Z.) Ltd) and Protecto Sill (Marshall Waterproofing NZ/AUS Ltd).
- Joint sealing tape - 75 mm wide AluBand and 75 mm wide Protecto Sill.
- HomeRAB™ PreClad™ Lining sheet fixing - Paslode 32 x 3.06 mm ring shank stainless steel collation type gun nails with a 9 mm diameter head, Paslode 32 x 3.06 mm hot-dip galvanised collation type gun nails with a 9 mm diameter head, or Sifco 32 x 3.05 mm stainless steel collation type gun nails with a 9 mm diameter head.
- Bracing panel end straps - 25 x 1.0 mm hot-dip galvanised or stainless steel strap.
- End strap fixings - 30 x 2.5 mm hot-dip galvanised flat head nails.
- Timber floor end stud hold down - M12 x 150 mm hot-dip galvanised coach screw with 50 x 50 x 3 mm hot-dip galvanised washer.
- Concrete floor end stud hold down - M12 x 150 mm minimum hot-dip galvanised bolts with 50 x 50 x 3 mm hot-dip galvanised washer or proprietary anchors with a minimum characteristic pull-out strength of 10 kN.

Handling and Storage

5.1 Handling and storage of all materials supplied by James Hardie New Zealand Ltd or the building contractor, whether on site or off site, is under the control of the building contractor. HomeRAB™ PreClad™ Linings must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. The lining must always be carried on edge. uPVC flashings and jointers must be protected from direct sunlight and physical damage, and should be stored flat and under cover.

5.2 Other accessories must be stored so they are kept clean, dry and undamaged.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Installation Manual for HomeRAB™ PreClad™ Lining. The Installation Manual must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Installation Manual and within the scope of this Appraisal must be followed.

Design Information

Framing

Timber Treatment

7.1 Timber wall framing behind HomeRAB™ PreClad™ Lining must be treated as required by NZS 3602.

Timber Framing

7.2 Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and NZS 4203 (AS/NZS 1170). Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. In all cases studs must be at maximum 600 mm centres for buildings situated in NZS 3604 defined Low, Medium and High Building Wind Zones, and at maximum 400 mm centres for buildings situated in NZS 3604 defined Very High Building Wind Zone. Dwangs must be fitted flush between the studs at maximum 1200 mm centres. (*Note: The timber framing must also be suitable for the selected wall cladding. Refer to the selected cladding system's Technical Literature for specific framing requirements.*)

7.3 Timber wall framing where HomeRAB™ PreClad™ Lining is joined must be nominal 50 mm width (i.e. 45 mm minimum finished width).

7.4 Timber framing must have a maximum moisture content of 20% at the time of the HomeRAB™ PreClad™ Lining application. (*Note: If HomeRAB™ PreClad™ Lining is fixed to framing with a moisture content of greater than 20% problems may occur at a later date due to excessive timber shrinkage.*)

HomeRAB™ PreClad™ Lining Set Out

7.5 HomeRAB™ PreClad™ Lining must be installed vertically.

7.6 When HomeRAB™ PreClad™ Lining is used as rigid sheathing only, the lining can be jointed on or off-stud. When HomeRAB™ PreClad™ Linings are used to achieve wall bracing, the lining must be jointed on-stud only. At the base of the wall, the lining must hang below the bottom plate a minimum of 15 mm, up to a maximum of 40 mm.

General

7.7 HomeRAB™ PreClad™ Lining is intended for use as a rigid sheathing fixed over timber framed walls in order to support the wind pressures, and to act as a secondary barrier to wind-driven rain.

7.8 Commencing from installation, HomeRAB™ PreClad™ Lining must not be exposed to the weather for more than 90 days.

7.9 HomeRAB™ PreClad™ Lining may be used as a temporary weather protecting sheathing to allow the internal lining of the building to proceed before the wall cladding is installed. To achieve temporary weathertightness, all joints, internal and external corners of the HomeRAB™ PreClad™ Lining must be sealed, the roof cladding and soffit linings must be installed, the flexible sill and jamb flashing tape system must be installed around the window and door openings, and the window and door joinery must be installed complete with head flashings and airseals. The timber wall framing must have a maximum moisture content as specified by the internal lining system supplier at the time of the insulation installation and internal lining application.

7.10 When used in accordance with this Appraisal and the Installation Manual, HomeRAB™ PreClad™ Lining can be used to meet the wall bracing element requirements of NZS 3604, for timber framed buildings not requiring specific design. The Installation Manual contains details of the construction of the various bracing systems and the bracing unit ratings achieved for each system. The bracing types and ratings are also given within Table 3.

7.11 HomeRAB™ PreClad™ Lining is suitable for use under wall claddings as a rigid sheathing as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, except that non-absorbent claddings must not be installed directly over the HomeRAB™ PreClad™ Lining. Refer to Table 1.

Table 1: NZBC E2/AS1 Table 23 Requirements

NZBC E2/AS1 Table 23 Rigid Sheathing Properties	Property Performance Requirement	HomeRAB™ PreClad™ Lining Actual Property Performance
Vapour Resistance	< 7 MN s/g	0.6 MN s/g
Water Resistance	> 20 mm	Pass

Structure

Mass

8.1 The mass of HomeRAB™ PreClad™ Lining is approximately 4.5 kg/m² at equilibrium moisture content. This mass must be added to the selected wall cladding system mass when determining the overall wall cladding mass in terms of NZS 3604.

Wind Zones

8.2 HomeRAB™ PreClad™ Lining is suitable for use in all Building Wind Zones of NZS 3604, up to, and including, 'Very High'. The sheets must be fixed at centres as specified in Table 2. The fixings must be positioned a minimum of 12 mm from all sheet edges, and a minimum of 50 mm horizontally and 75 mm vertically from sheet corners. The fastener heads must finish flush with the sheet surface.

Table 2: HomeRAB™ PreClad™ Lining Fixing Centres

NZS 3604 Building Wind Zone	Framing Set Out	HomeRAB™ PreClad™ Lining Nailing Centres to Studs, Plates and Dwangs
Very High	Studs at 400 mm centres and dwangs at 1200 mm	150 mm
	Studs at 400 mm centres and dwangs at 800 mm	200 mm
High, Medium and Low	All framing options as per NZS 3604	200 mm

8.3 The length of the selected wall cladding fixing must be increased by minimum 5 mm to maintain the face load strength of the wall cladding system.

Bracing

8.4 The bracing units achieved (wind and earthquake) when using HomeRAB™ PreClad™ Lining are given in Table 3. The HomeRAB™ PreClad™ Lining Installation Manual provides comprehensive construction and panel hold-down details.

8.5 The bracing units are derived from the BRANZ P21 test method based on a wall height of 2.4 m. For any other wall height, the bracing rating can be calculated by multiplying the appropriate value by 2.4 and dividing by the wall height in metres, except that panels less than 1.8 m high must be rated as if they were 1.8 m high.

Table 3: Bracing Ratings for HomeRAB™ PreClad™ Lining

System Number	Minimum Bracing Element Length (mm)	End Straps Required	Flooring Construction		BU Per Metre	
			Timber	Concrete	Wind	Earthquake
HR1	1200	Yes		✓	98	76
HR2	1200	Yes	✓		98	76
HR3	2400	Yes		✓	98	76
HR4	2400	Yes	✓		98	76

Note: Bracing ratings are applicable for HomeRAB™ PreClad™ Lining fixed at 150 or 200 mm centres as detailed in Table 2.

Penetrations for Services

8.6 Holes up to 100 x 100 mm positioned no closer than 200 mm to the edge of a sheet or to another hole, may be allowed for services in HomeRAB™ PreClad™ Lining without affecting the bracing rating of the panel.

Durability

9.1 HomeRAB™ PreClad™ Lining meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years when used for bracing or where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, HomeRAB™ PreClad™ Lining is expected to have a serviceable life of at least 50 years.

9.3 Areas of geothermal activity and coastal locations can be very corrosive to fasteners, especially coastal locations within distances of up to 500 metres of the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets in some instances. These coastal locations are defined in NZS 3604 as Sea Spray Zone and Zone 1. For the HomeRAB™ PreClad™ Lining when used as a rigid sheathing to achieve a 50 year serviceable life in the Sea Spray Zone and Zone 1 where increased corrosion resistance is required, it must be fixed with stainless steel fasteners. Fasteners outside the Sea Spray Zone and Zone 1 may be hot dipped galvanised steel. In all corrosion zones where HomeRAB™ PreClad™ Lining is used to achieve wall bracing, it must be fixed with stainless steel fasteners.

Maintenance

10.1 HomeRAB™ PreClad™ Lining will not normally require maintenance. However, if damage occurs to the cladding or lining protecting HomeRAB™ PreClad™ Lining or to the HomeRAB™ PreClad™ Lining itself, the repairs or replacement must be carried out to ensure the integrity of the rigid sheathing or wall bracing system.

Outbreak of Fire

11.1 The HomeRAB™ PreClad™ Lining system must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

External Moisture

12.1 HomeRAB™ PreClad™ Lining must be used behind claddings that meet the performance requirements of NZBC Clause E2.

12.2 HomeRAB™ PreClad™ Lining, when installed in accordance with the Installation Manual and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

13.1 Installation must always be carried out in accordance with the HomeRAB™ PreClad™ Lining Installation Manual and this Appraisal, by competent tradespersons with an understanding of rigid sheathing and wall bracing system installation.

System Installation

HomeRAB™ PreClad™ Lining Installation

14.1 HomeRAB™ PreClad™ Lining may be cut by scoring and snapping, hand guillotine, hand or power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.

14.2 Lining sheets must be dry prior to installation. Cut lining edges that are left exposed must be sealed prior to installation.

14.3 Prior to fixing HomeRAB™ PreClad™ Lining as wall bracing, a check must be made to ensure all sheet edges will be supported by framing. HomeRAB™ PreClad™ Lining when used as a rigid sheathing only, can be jointed on-stud using a joint sealing tape or off-stud using a uPVC jointer.

14.4 HomeRAB™ PreClad™ Lining must be fixed to the timber framing with Paslode 32 x 3.06 mm ring shank stainless steel collation type gun nails with a 9 mm diameter head, Paslode 32 x 3.06 mm hot-dip galvanised collation type gun nails with a 9 mm diameter head, or Sifco 32 x 3.05 mm stainless steel collation type gun nails with a 9 mm diameter head. Refer to Table 2 for fixing centres and Paragraph 9.3 for material selection.

14.5 Lining at vertical joints must be installed with a 1-2 mm gap between the lining edges. Linings at horizontal joints between floor levels must be installed with a minimum 10 mm gap between the lining edges and must be supported over horizontal framing. Linings at inter-storey floor levels must not be fixed to inter-storey joists or blocking and must have a minimum 15 mm gap between the lining edges at this point to allow for shrinkage of the framing. All horizontal joints must be flashed with a uPVC flashing.

14.6 Any damaged areas of HomeRAB™ PreClad™ Lining, such as holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with joint sealing tape.

Joint Sealing Tape Installation

14.7 When HomeRAB™ PreClad™ Lining is used as wall bracing or as a rigid sheathing without uPVC vertical jointers, all vertical sheet joints, internal and external corners must be covered with Aluband or Protecto Sill joint sealing tape. Inseal® 3259 tape can also be used, however it must be covered with cavity battens as soon as it is installed. The manufacturer's instructions regarding the application temperatures for the joint sealing tapes, and the requirements for the use of adhesive primer must be followed.

14.8 The HomeRAB™ PreClad™ Lining must be cleaned of dust and other surface contaminants prior the application of the joint sealing tape to ensure adequate adhesion is achieved.

Flexible Sill and Jamb Tape Installation

14.9 The selected flexible sill and jamb tape flashing system must be installed in accordance with the tape manufacturer's instructions, except where varied by the HomeRAB™ PreClad™ Lining Installation Manual. Particular attention must be paid to the installation of the sill and jamb tapes around window and door joinery openings to ensure all exposed timber wall framing in the opening is protected.

Inspections

14.10 The Installation Manual must be referred to during the inspection of HomeRAB™ PreClad™ Lining installations.

Health and Safety

15.1 Cutting of HomeRAB™ PreClad™ Lining must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.

15.2 When power tools are used for cutting, grinding or forming holes, health and safety measures as set out in the

Installation Manual must be undertaken because of the amount of dust generated.

15.3 Safe use and handling procedures for HomeRAB™ PreClad™ Lining and the components that make up the cladding system are provided in the relevant manufacturer's Installation Manual.

Basis of Appraisal

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

Tests

16.1 Racking tests were carried out by BRANZ in accordance with BRANZ Technical Paper P21. The earthquake and wind bracing ratings were determined using the evaluation procedures outlined in BRANZ Technical Recommendation No. 10. Nail slip tests were completed to determine the suitability of alternative nail fixings.

16.2 Testing has been carried out by James Hardie Building Products to determine the face load pressure resistance of HomeRAB™ PreClad™ Lining. The testing was completed in a NATA Accredited laboratory and was observed by BRANZ. The test method and results have been reviewed by BRANZ and found to be satisfactory.

16.3 The resistance of HomeRAB™ PreClad™ Lining to water vapour transmission in accordance with AS/NZS 4200.1 and resistance to water penetration in accordance with AS/NZS 4201.4 has been completed by BRANZ.

Other Investigations

17.1 Structural and durability opinions were given by BRANZ technical experts.

17.2 BRANZ expert opinion on NZBC E2 code compliance for HomeRAB™ PreClad™ Lining was based on evaluation of all details within the scope and as stated within this Appraisal. The details contained within the Installation Manual have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of Acceptable Solution E2/AS1 for rigid sheathings.

17.3 Site inspections were carried out by BRANZ to assess the practicability of installation.

17.4 The Installation Manual for HomeRAB™ PreClad™ Lining has been examined by BRANZ and found to be satisfactory.

Quality

18.1 The manufacture of HomeRAB™ PreClad™ Lining has been examined by BRANZ, including methods adopted for quality control. Details regarding the composition of the materials used were obtained by BRANZ and found to be satisfactory.

18.2 The quality of materials, components and accessories supplied by James Hardie New Zealand Ltd is the responsibility of James Hardie New Zealand Ltd. The quality control system of James Hardie New Zealand Ltd has been assessed and registered as meeting the requirements of ISO 9001: 2000 by Telarc Limited, Registration Number 409.

18.3 Quality of installation on site of components and accessories supplied by James Hardie New Zealand Ltd and the building contractor is the responsibility of the installer.

18.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing systems, uPVC flashings, joint seal tapes and flexible sill and jamb tape systems in accordance with the instructions of James Hardie New Zealand Ltd.

Sources of Information

- AS/NZS 1170: 2002 Structural design action – General principles.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4203: 1992 General structural design and design loadings for buildings.
- Compliance Document for the New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- New Zealand Building Code Handbook, Department of Building and Housing, Third Edition May 2007.
- The Building Regulations 1992 up to, and including, July 2007 amendment.



BRANZ

In the opinion of BRANZ, **HomeRAB™ PreClad™ Lining** 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 **James Hardie New Zealand Ltd**, 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. **James Hardie New Zealand Ltd**:
 - 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 **James Hardie New Zealand Ltd**.
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 **James Hardie New Zealand Ltd** or any third party.

For BRANZ

C Preston
Chief Executive

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