



BRANZ Appraised

Appraisal No. 738 [2011]

PRIMAaqua™ / PRIMALiner™ WALL AND CEILING LININGS

Appraisal No. 738 [2011]



BRANZ Appraisals

Technical Assessments of products for building and construction.

Manufactured by



Hume Cemboard Industries Sdn Bhd

Lot 127220
Kawasan Perusahaan Kanthan
31200 Chemor
Perak, Malaysia

Marketed by



Hume Doors & Timber Pty Ltd

Web: www.humedoors.com.au

and



VTW Australia

Web: www.vtw.com.au



BRANZ

BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz



Product

- 1.1 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings are fibre cement sheets for use as internal and external ceiling linings, eave linings and internal wall linings in dry or wet areas that are not subjected to direct sunlight, rain or snow.
- 1.2 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings are suitable for use as a base for tiles, wallpaper, paint, and other interior finishes.

Scope

- 2.1 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings have been appraised for use as interior wall and ceiling linings in timber and steel framed buildings.
- 2.2 PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings have also been appraised as an external ceiling / eave lining for buildings within the following scope:
 - situated in non-cyclonic wind zones up to, and including N3.

Building Regulations

National Construction Code Series [NCC 2011] Building Code of Australia [BCA]

- 3.1 **In the opinion of BRANZ, PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the BCA:**

BCA Volume One - Class 2 to Class 9 Buildings

Part B1 - Structural Provisions: Performance Requirement BP1.1. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings meet the requirements for actions arising from the following imposed actions: wind action, creep and shrinkage [i.e. BP1.1 [b] [iii] and [xi]]. See Paragraphs 11.1 to 11.4.

Part C1 - Fire Resistance: Performance Requirement CP4. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings meet this requirement. See Paragraphs 15.1 – 15.4.

Part F1 - Damp and Weatherproofing: Performance Requirement FP1.4. PRIMAaqua™ / PRIMALiner™ Wall and Ceiling Linings when used as external external ceiling / eave linings meet this requirement. See Paragraph 16.1.

BCA Volume Two - Class 1 and Class 10 Buildings

Part 2.1 Structure: Performance Requirement P2.1. PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings meet the requirements for actions arising from the following imposed actions: wind action, creep and shrinkage [i.e. BP1.1 [b] (iii) and (xi)]. See Paragraphs 11.1 to 11.4.

Part 2.2 Damp and Weatherproofing: Performance Requirement P2.2.2. PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings when used as external ceiling / eave linings meet this requirement. See Paragraph 16.1.

Part 2.3 Fire Safety: Performance Requirement P2.3.1. PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings meet this requirement. See Paragraphs 15.1 - 15.4.

3.2 This is an Appraisal of an **Alternative Solution** in terms of Building Code of Australia compliance

Technical Specification

4.1 System components and accessories for PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings, which are supplied by Hume Doors & Timber Pty Ltd or VTW Australia are:

PRIMAaqua™ / PRIMAliner™ Sheets

- PRIMAaqua™ / PRIMAliner™ sheets are manufactured by Hume Cemboard Industries Sdn Bhd from Portland cement, cellulose fibre, finely ground sand and water. The sheets are formed, cut to length and then cured by high-pressure autoclaving. They are produced in flat, smooth surfaced sheet material form, and are pink in colour.
- PRIMAaqua™ / PRIMAliner™ sheets are manufactured to conform to the requirements of AS/NZS 2908.2. The sheets have square rebated edges to the two long edges for jointing and square edges at the top and bottom of the sheet. They are available in sizes and thicknesses as given in Table 1 and Table 2.

Table 1: PRIMAaqua™ Sheet Size and Thickness

Length [mm]	Width [mm]	Thickness [mm]	
		6.0	9.0
1800	1200	✓	
2400	900	✓	
	1200	✓	✓
2700	1200	✓	✓
3000	900	✓	
	1200	✓	✓
3600	900	✓	
	1200	✓	
4200	1200	✓	

Table 2: PRIMAliner™ Sheet Size and Thickness

Length [mm]	Width [mm]	Thickness [mm]		
		6.0	7.5	9.0
2400	900	✓		
2400	1200	✓	✓	✓

4.2 Accessories used with PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings which are supplied by the building contractor are:

- PRIMAaqua™ / PRIMAliner™ fixings (external ceiling / eave linings on timber frame) – 40 x 2.8 mm hot-dip galvanised flat head nails (for 6.0, 7.5 and 9.0 mm thick sheets). *[Note: Hot-dip galvanising must comply with AS/NZS 4680.]*
- PRIMAaqua™ / PRIMAliner™ fixings (interior wall and ceiling linings on timber frame) – 30 x 2.8 mm hot-dip galvanised flat head nails (for 6.0 and 7.5 mm thick sheets), and 40 x 2.8 mm hot-dip galvanised flat head nails (for 9.0 mm thick sheets). *[Note: Hot-dip galvanising must comply with AS/NZS 4680.]*
- PRIMAaqua™ / PRIMAliner™ fixings (external ceiling / eave linings on steel frame) – 8-gauge x 20 mm (for 6.0 and 7.5 mm thick sheets) and 8-gauge x 30 mm (for 9.0 mm thick sheets) self-drilling AS 3566 Corrosion Class 3 screws in mild or moderate industrial or marine environments and Corrosion Class 4 wood screws in severe marine environments.
- PRIMAaqua™ / PRIMAliner™ fixings (interior wall and ceiling linings on steel frame) – 8-gauge x 20 mm (for 6.0 and 7.5 mm thick sheets) self drilling self embedding head screws and 8-gauge x 30 mm (for 9.0 mm thick sheets) self-drilling self embedding head screws.

[Note: The screw type specified above is suitable for fixing PRIMAaqua™ / PRIMAliner™ to steel frame with a 0.55 mm to 0.75 mm base metal thickness. For steel frame with 0.8 mm to 1.6 mm base metal thickness, use self drilling self embedding head Wing Tek screws.]

Handling and Storage

5.1 Handling and storage of all materials supplied by Hume Doors & Timber Pty Ltd, VTW Australia or the building contractor, whether on site or off site, is under the control of the building contractor. PRIMAaqua™ / PRIMAliner™ Wall and Ceiling 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 by providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. The sheets must always be carried on edge.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings. 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 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings may be used as wall and ceiling linings in the following areas:

- Wet areas - wall areas enclosing a shower compartment or shower over bath. The sheets are designed to be used in these areas as substrates for wet area membranes and ceramic tiles, and other wet area finishes.
- Semi-wet or dry areas or wall areas adjacent to sanitary fixtures such as baths, tubs and basins. The sheets are designed to be used in these areas as substrates for ceramic tiles, paint, wallpaper or other finishes.

Framing

Timber Framed Buildings

- 8.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings are suitable for use with Class 2 to Class 9 timber framed buildings that have been specifically designed in accordance with AS 1720.1.
- 8.2 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings are suitable for use with Class 1 and Class 10 timber framed buildings that have been specifically designed in accordance with AS 1684.2 and AS 1684.4.
- 8.3 In all cases studs must be at maximum 600 mm centres. Nogs must be fitted flush between the studs at maximum 1200 mm centres and additionally 25 mm above a preformed shower tray, sink, tub or other fixtures, and in any other areas to support baths, towel rails, soap holders and the like.
- 8.4 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings must not be joined off of the framing. Timber framing where sheets are joined must be nominal 50 mm thickness [i.e. 42 mm minimum finished thickness]. In tiled areas, dwangs must be provided directly behind all horizontal sheet joints.
- 8.5 Wall framing around bath enclosures and shower compartments may be checked a maximum of 20 mm to accommodate the bath or shower tray flange. Alternatively, furring's may be fixed to the wall to ensure the face of the PRIMAaqua™ / PRIMAliner™ sheets will finish in front of the upturn on the fixture.
- 8.6 Supporting framing for external ceilings / eaves and ceilings must be at maximum 600 mm centres.
- 8.7 Timber framing must have a maximum moisture content of 16% at the time of the PRIMAaqua™ / PRIMAliner™ sheet application. *[Note: If PRIMAaqua™ or PRIMAliner™ sheets are fixed to framing with a moisture content of greater than 16% problems may occur at a later date due to excessive timber shrinkage.]*

Steel Framing

- 8.8 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings are suitable for use with Class 2 to Class 9 steel framed buildings that have been specifically designed in accordance with AS/NZS 4600.
- 8.9 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings are suitable for use with Class 1 and Class 10 steel framed buildings that have been specifically designed in accordance with AS/NZS 4600 or NASH - Residential and low-rise steel framing – Part 1 Design criteria.
- 8.10 The minimum framing specification is 'C' section studs and nogs of overall section size of 64 mm web and 38 mm flange. Steel thickness must be minimum 0.55 mm. In all cases studs must be at maximum 600 mm centres. Nogs must be fitted flush between the studs at maximum 1200 mm centres and additionally 25 mm above a preformed shower tray, sink, tub or other fixtures, and in any other areas to support baths, towel rails, soap holders and the like. Furrings must be fixed to the wall framing around bath enclosures and shower compartments to accommodate the bath or shower tray flange to ensure the face of the PRIMAaqua™ / PRIMAliner™ sheets will finish in front of the upturn on the fixture.
- 8.11 Supporting framing for external ceilings / eaves must be at maximum 600 mm centres.
- 8.12 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings must not be joined off of the framing. In tiled areas, dwangs must be provided directly behind all horizontal sheet joints.

PRIMAaqua™ / PRIMAliner™ Sheet Set Out

- 8.13 PRIMAaqua™ / PRIMAliner™ sheets may be installed vertically or horizontally.

Control Joints

- 9.1 Control joints must be installed in walls to allow for structural movement. They must be positioned in both directions at 7.2 m maximum centres for non-tiled walls, and at 4.8 m maximum centres for tiled walls. Control joints must be constructed as set out in the Technical Literature.

Finishing

- 10.1 The sheets must be stopped and waterproofed if required. They may then be finished by tiling, painting, wallpapering or applying any other finishing suitable for use over fibre cement sheets.
- 10.2 Wet areas as defined by AS 3740 must be protected with a waterproof membrane system complying with AS/NZS 4858.
- 10.3 Tiling must be carried out in accordance with AS 3958.1, or the BRANZ publication 'Good Tiling Practice'. A flexible adhesive complying with AS 2358 and a compatible flexible waterproof membrane must be used. All tiles must be fixed in accordance with the tile adhesive manufacturer's instructions.
- 10.4 Waterproofing systems and wall finishes have not been assessed and are outside the scope of this Appraisal.

Structure

Impact Resistance

- 11.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings have adequate resistance to impact loads likely to be encountered in normal residential use.
- 11.2 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings 9 mm thick sheets are designed for use in applications where higher than normal residential impacts can be expected, such as may be encountered in non-residential buildings.

Wind Zones

- 11.3 When used as an external external ceiling / eave lining, PRIMAaqua™ / PRIMAliner™ is suitable for use in non-cyclonic wind zones up to, and including N3.

Sheet Fixings [For External Ceilings / Eaves]

- 11.4 PRIMAaqua™ / PRIMAliner™ sheets must be fixed to the eave framing (maximum 600 mm centres) at maximum 150 mm centres along sheet edges and maximum 300 mm centres in the body of the sheet. The fixings must be positioned a minimum of 12 mm from all sheet edges, and a minimum of 50 mm from sheet corners. The fastener heads must finish proud of the sheet surface.

Durability

Serviceable Life

- 12.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Lining installations are expected to have a serviceable life of at least 30 years provided the finish system is maintained in accordance with this Appraisal to ensure the PRIMAaqua™ / PRIMAliner™ sheets and fixings are continuously protected by a water resistant finishing system and remain dry in service.

Maintenance

- 13.1 Regular maintenance is essential to ensure the performance requirements of the BCA are continually met and to ensure the maximum serviceability of the system.
- 13.2 In wet areas, annual inspections must be made to ensure that all aspects of the finishing system remain in a waterproof condition. The sheets must remain dry at all times to ensure the sheet fasteners and framing remain durable. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately as for new work.

Heating Appliances, Fireplaces, Chimneys and Flues

- 14.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings have not been assessed for construction associated with heating appliances.

Fire Resistance

BCA Volume Two – Class 1 and Class 10 Buildings

- 15.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings when used as an external ceiling / eave lining are deemed to be non-combustible in accordance with BCA Volume Two Part 3.7.1, Paragraph 3.7.1.2 [d].

BCA Volume One – Class 2 to Class 9 Buildings

- 15.2 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings have a Group 1 Classification in accordance with BCA Volume One Specifications A2.4 and C1.10 a.

BCA Bush Fire Zones

- 15.3 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling linings are suitable for use as an eave lining in bushfire attack levels [BAL] Low, 12.5, 19, 29 and 40 in accordance with AS 3959.

Damp and Weatherproofing

- 16.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings installed as an external ceiling / eave lining in accordance with this Appraisal and the Technical Literature, prevent the penetration of moisture that could cause undue dampness or damage to building elements.

Internal Moisture

- 17.1 PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings can be installed and finished as wall linings to provide surfaces that are impervious and easily cleaned, and will prevent water from penetrating behind linings or to concealed spaces.

Installation Information

Installation Skill Level Requirements

- 18.1 Installation of PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings must be completed by tradespersons with an understanding of fibre cement sheet installation, in accordance with instructions given within the PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings Technical Literature and this Appraisal.

System Installation

PRIMAaqua™ / PRIMAliner™ Sheet Installation

- 19.1 PRIMAaqua™ / PRIMAliner™ sheets 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.
- 19.2 Site edge recessing of cut sheets may be carried out using a tool designed for that specific purpose. An angle grinder run down the sheet edge to produce a square taper may also be used, but will be less accurate. A dust mask must be worn when using an angle grinder. The recess depth must not exceed 1.5 mm, and should be approximately 30 mm wide.
- 19.3 Prior to fixing sheets, a check must be made to ensure all sheet joints will be supported by framing. The recommended method of installation for sheets is horizontal fixing, with end-joints on studs and staggered a minimum of 600 mm horizontally. Joints over door or window openings must be avoided. If vertical joints are located near the opening, they must be a minimum of 200 mm from opening studs, and must be formed on a stud. For horizontal installation, bottom sheets must be fitted first, and kept clear of the floor by a minimum of 6 mm.
- 19.4 In tiled areas, a silicone sealant-filled expansion gap of 6 mm must be allowed between sheets at all internal comers and around all plumbing penetrations.
- 19.5 When PRIMAaqua™ / PRIMAliner™ sheets are used in shower compartments using preformed shower trays, the sheets must overhang the shower tray upstand. Sheets must be sealed to the preformed shower tray upstand rebate with a 6 mm wide bead of silicone sealant. For straight sided preformed trays, the sheets and flashing must overlap inside the tray by approximately 25 mm, and a sealant bead must be placed behind the sheet to ensure no moisture can pass between the sheet and the shower tray upstand.
- 19.6 All sheet fasteners must be positioned a minimum of 12 mm from the sheet edge, and 50 mm from the sheet comer. Fasteners must be at maximum 200 mm centres in the body of the sheet and at all joints.

- 19.7 Fixing to timber framing of PRIMAaqua™ / PRIMAliner™ external ceilings / eaves is carried out using 40 x 2.8 mm hot-dip galvanised flat head nails [for 6.0, 7.5 and 9.0 mm thick sheets]. Fixing to timber framing of PRIMAaqua™ / PRIMAliner™ interior wall and ceiling linings is carried out using 30 x 2.8 mm hot-dip galvanised flat head nails [for 6.0 and 7.5 mm thick sheets] and 40 x 2.8 mm hot-dip galvanised flat head nails [for 9.0 mm thick sheets]. Fixing to steel framing is carried out with 8-gauge x 20 mm [for 6.0 and 7.5 mm thick sheets] self drilling self embedding head screws and 8-gauge x 30 mm [for 9.0 mm thick sheets] self-drilling self embedding head screws.

Finishing

- 19.8 Joints, corners and fastener head indentations must be stopped using two coats of bedding compound. For flat joints and internal corners, paper-reinforcing tape must be embedded in the first bedding coat. Joints in non-tiled areas may be further finished with a topping and finishing compound. Where sheets are to be a substrate for tiling, joints, fastener heads and comers must be stopped with bedding compound only, finishing compounds must not be used. Stopping compounds must be allowed to dry for at least 24 hours before sanding.
- 19.9 PRIMAaqua™ / PRIMAliner™ sheets may be tiled, painted, wallpapered or finished with other impervious materials such as polyvinylchloride [vinyl] sheet. Application of the selected finish must be carried out in accordance with the relevant manufacturer's instructions.

Inspections

- 19.10 The Technical Literature must be referred to during the inspection of PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings installations.

Health and Safety

- 20.1 Safe use and handling procedures for the components that make up PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings are provided in the relevant manufacturer's Technical Literature.
- 20.2 Cutting of PRIMAaqua™ / PRIMAliner™ sheets must be carried out in well ventilated areas, and a dust mask and eye protection must be worn. When power tools are used for cutting, grinding or forming holes, safety measures as set out in the Technical Literature must be undertaken because of the amount of dust generated.

Basis of Appraisal

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

Tests

- 21.1 Wind suction tests were conducted by BRANZ to demonstrate the required eave fixing and eave lining pull-off strength for both steel and timber framing for Building Wind Zones of NZS 3604.
- 21.2 Cone Calorimeter testing of PRIMAaqua™ / PRIMAliner™ sheets has been completed by CSIRO in accordance with AS/NZS 3837.

Other Investigations

- 22.1 Fire and durability opinions have been given by BRANZ technical experts.
- 22.2 The practicability of installation has been assessed by BRANZ.
- 22.3 The Technical Literature for PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings has been examined by BRANZ and found to be satisfactory.

Quality

- 23.1 The manufacture of PRIMAaqua™ / PRIMAliner™ sheets has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 23.2 The quality management system of the PRIMAaqua™ / PRIMAliner™ sheet manufacturer, Hume Cemboard Industries Sdn Bhd, has been assessed and registered as meeting the requirements of ISO 9001: 2008 by SIRIM QAS International Sdn Bhd, Registration Number AR 0430.
- 23.3 Quality of installation on site of components and accessories supplied by Hume Doors & Timber Pty Ltd or VTW Australia and the building contractor is the responsibility of the installer.
- 23.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and joinery, building wraps, flashing tapes, air seals, joinery head flashings, cavity battens and PRIMAaqua™ / PRIMAliner™ sheets in accordance with the instructions of Hume Cemboard Industries Sdn Bhd.
- 23.5 Building owners are responsible for the maintenance of PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings in accordance with the instructions of Hume Cemboard Industries Sdn Bhd.

Sources of Information

- AS 1684.2 - 2006 Residential timber frame construction - Non-cyclonic areas.
- AS 1684.4 - 2006 Residential timber frame construction - Simplified - Non-cyclonic areas.
- AS 1720.1 - 1997 Timber structures - Design methods.
- AS 3740:2010 Waterproofing of domestic areas.
- AS 3959 - 2009 Construction of buildings in bushfire-prone areas.
- AS/NZS 1170: 2002 Structural design action - General principles.
- AS/NZS 2908.2:2000 Cellulose-cement products - Flat Sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4600: 2005 Cold-formed steel structures.
- AS/NZS 4680: 2006 Hot-dip galvanised (zinc) coatings on fabricated ferrous articles.
- AS/NZS 4858: 2004 Wet area membranes.
- National Construction Code Series, Building Code of Australia 2011, Australian Building Codes Board.



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14 June 2011

PRIMAaqua™ / PRIMAliner™
WALL AND CEILING LININGS



In the opinion of BRANZ, **PRIMAaqua™ / PRIMAliner™ Wall and Ceiling Linings** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Hume Cemboard Industries Sdn Bhd**, 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. **Hume Cemboard Industries Sdn Bhd**:
 - 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 **Hume Cemboard Industries Sdn Bhd**.
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 **Hume Cemboard Industries Sdn Bhd** or any third party.

For BRANZ

Pieter Burghout

Chief Executive

Date of Issue:

14 June 2011