BRANZ Appraised
Appraisal No. 1055 [2020]

CEMINTEL RIGID AIR BARRIER™ SYSTEM

Appraisal No. 1055 (2020)

BRANZ Appraisals

Technical Assessments of products for building and construction.

CSR Building Products Limited
376 Victoria Street,
Wetherill Park
NSW 2164
Australia
Tel: +61 2 9235 8000
Web: www.cemintel.com.au

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 Cemintel Rigid Air Barrier™ is a sealed fibre cement sheet designed for use as a rigid wall underlay behind wall cladding systems and as a bracing system to resist wind and earthquake loads on timber and steel framed buildings.

Scope

Timber Framing

2.1 Cemintel Rigid Air Barrier™ is appraised for use as a rigid wall underlay 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; and,
- with absorbent wall claddings directly fixed to framing; and,
- with absorbent and non-absorbent wall claddings installed over a drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High

2.2 Cemintel Rigid Air Barrier™ has also been appraised for use as wall bracing systems for timber framed buildings within the scope of NZS 3604.

Steel Framing

2.2 Cemintel Rigid Air Barrier™ is appraised for use as a rigid wall underlay and temporary weather-protecting sheathing on steel framed buildings within the following scope:

- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel framed buildings; and,
- with absorbent wall claddings directly fixed to framing; and,
- with absorbent and non-absorbent wall claddings installed over a drained cavity; and,
- with masonry veneer in accordance with NASH Building Envelope Solutions; and,
- situated in NASH Standard Part Two, Wind Zones up to, and including Extra High

Specific Design

2.3 Cemintel Rigid Air Barrier™ is also appraised for use as a rigid wall underlay and temporary weather-protecting sheathing for buildings within the following scope:

- constructed with timber or steel framing subject to specific engineering design; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5kPa.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ Cemintel Rigid Air Barrier™ 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. Cemintel Rigid Air Barrier™ meets the requirements for loads arising from wind and earthquake. [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. Cemintel Rigid Air Barrier™ meets these requirements. See Paragraphs 9.1 - 9.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Cemintel Rigid Air Barrier™ will contribute to meeting this requirement. See Paragraphs 12.1 - 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Cemintel Rigid Air Barrier™ meets this requirement.

3.2 Cemintel Rigid Air Barrier™ can be used to satisfy the bracing demand requirements of Section 5 of NZS 3604 which is an Acceptable Solution for compliance with NZBC Clause B1.

Technical Specification

4.1 System components and accessories for Cemintel Rigid Air Barrier™ which are supplied by CSR Building Products Ltd are:

Cemintel Rigid Air Barrier™

- Cemintel Rigid Air Barrier™ is a 6 mm fibre cement sheet manufactured from a cellulose fibre cement formulation. It is produced in sheet material form, cut to length then cured by high pressure autoclaving. The sheet is coated on the front face and four edges with an orange tinted water repellent sealer.
- Cemintel Rigid Air Barrier™ sheets are available in a 1200 x 3000 mm size, or can be supplied in custom sizes. It is manufactured to conform to the requirements of AS/NZS 2908.2.

Accessories

4.2 System components and accessories for Cemintel Rigid Air Barrier™ System, which are supplied by the building contractor are:

- **Sheet fixings (timber):** 40 x 2.8 mm hot-dipped galvanised fibre cement nails, or 40 x 2.8 mm stainless-steel ring-shanked fibre cement nails.
- **Sheet fixings (steel):** 40 x 10 g button head screws, AS3566 Corrosion Class 4 or 304 stainless steel.

  (Note: Hot-dip galvanising must comply with AS/NZS 4680).
- **Flexible flashing or joint sealing tape:** 3M All Weather Flashing Tape 8067, SUPER-STICK Flexible Flashing Tape or Aluband XTREME Flashing Tape.
- **Horizontal Z-flashing:** uPVC galvanised steel or aluminium.
- **GIB® HandiBrac®:** a one-piece, 2 mm thick, galvanised-steel angle bracket approximately 95 mm high, 65 mm long and 54 mm wide. The bracket is supplied with 5 Type 17 screws 14 g x 35 mm.
- **Concrete floor end-stud hold down anchor:** Proprietary anchor with a minimum characteristic pull-out strength of 15 kN.
- **Timber floor end-stud hold down anchor:** Hot-dipped galvanised 12 mm x 150 mm coach screw and 50 x 50 x 3 mm washer.
- **Edge sealer:** Supplied by others to seal cut edges of the Cemintel Rigid Air Barrier™.
- **Thermal Break (steel framing):** in accordance with NASH Building Envelope Solutions (E2/SA4), Paragraph 11.4.3.2.

Handling and Storage

5.1 Handling and storage of all materials supplied by CSR Building Products Limited or the building contractor, whether on or off site, is under the control of the building contractor. Cemintel Rigid Air Barrier™ sheets 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 water proof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. The sheets must always be carried on edge. uPVC flashings 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 Technical Literature for the Cemintel Rigid Air Barrier™. 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

Framing

Timber Treatment

7.1 Timber wall framing behind Cemintel Rigid Air Barrier™ must be treated as required by NZBC Acceptable Solution B2/AS1.

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 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 all NZS 3604 defined Wind Zones and up to a design differential ultimate limit state (ULS) wind pressure of 2.5 kPa. 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 Cemintel Rigid Air Barrier™ sheets are 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 Cemintel Rigid Air Barrier™ application. *(Note: If Cemintel Rigid Air Barrier™ is fixed to framing with a moisture content of greater than 20% problems may occur at a later date due to excessive timber shrinkage.)*

Steel Framing

7.5 Steel framing must be in accordance with NASH Standard Part 2 or to a specific engineering design for buildings outside the scope of NASH Standard Part 2.

7.6 The minimum specification is 'C' section studs and nogs of overall section size of 92 mm web and 38 mm flange. Steel thickness must be minimum 0.75 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.

Cemintel Rigid Air Barrier™ Set Out.

7.7 Cemintel Rigid Air Barrier™ sheets must be installed vertically and must be jointed on stud only.

7.8 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

7.9 Cemintel Rigid Air Barrier™ is intended for use as a rigid wall underlay fixed over timber and steel framed walls in order to support the wind pressures, and to act as a secondary barrier to wind-driven rain.

7.10 Commencing from installation, Cemintel Rigid Air Barrier™ must not be exposed to the weather for more than 180 days.

7.11 Cemintel Rigid Air Barrier™ 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 Cemintel Rigid Air Barrier™ 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.

7.12 When used in accordance with this Appraisal and the Technical Literature, Cemintel Rigid Air Barrier™ can be used to meet the wall bracing requirements of NZS 3604, for timber framed buildings not requiring specific design. The Technical Literature 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 2.

7.13 Cemintel Rigid Air Barrier™ is suitable for use under wall claddings as a rigid wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings and NASH Building Envelope Solutions (E2/AS4), Table 23 for steel framing. Non-absorbent claddings must not be installed directly over the Cemintel Rigid Air Barrier™. Refer to Table 1.

Table 1: Material Properties

NZS 2295 Property	Property Performance Requirement	Cemintel Rigid Air Barrier™ System Actual Property Performance
Surface Absorbency	≥ 100 g/m^2	Pass
Vapour Resistance	≤ 7 MN s/g	4 MN s/g
Water Resistance	≥ 20 mm	Pass

Structure

Mass

8.1 The mass of Cemintel Air Barrier™ is approximately 9.4 kg/m^2 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 and NASH Standard Part 2.

Wind Zones

8.2 Cemintel Rigid Air Barrier™ System is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2, up to, and including, Extra High. Cemintel Rigid Air Barrier™ System can also be used on timber and steel framed buildings, subject to specific design up to a design differential ultimate limit state (ULS) wind pressure of 2.5 kPa. The sheets must be fixed at maximum 200 mm centres. 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 flush with the sheet surface.

8.3 The length of the selected wall cladding fixing must be increased by minimum 6 mm to maintain the face load strength of the wall cladding system.

8.4 Cemintel Rigid Air Barrier™ can be used as an alternative to metal straps or wire dog connectors to achieve a top plate connection capacity of 4.7 kN in accordance with Fixing Type B of NZS 3604, Table 8.18. To achieve the connection strength, the fixings must be positioned a minimum of 20 mm from the sheet edge at maximum 100 mm centres. The fastener heads must finish flush with the sheet surface.

Bracing

8.5 The bracing units achieved (wind and earthquake) when using Cemintel Rigid Air Barrier™ on timber framing are given in Table 2. Sheet fixings must be maximum 200 mm centres to all framing. The Technical Literature gives details of edge and end fixing distances. GIB® HandiBracs® are to be used at each end of a bracing element, installed with the supplied fixings.

Table 2. Cemintel Rigid Air Barrier™ System Bracing Ratings

Minimum Wall Length (m)	Hold Downs Required	NZS 3604 Bracing Rating	
		Wind Rating per Length (BU/m)	Earthquake Rating per Length (BU/m)
0.4	GIB® HandiBrac®	98	95
0.6	GIB® HandiBrac®	114	98
1.2	GIB® HandiBrac®	118	96
2.4	GIB® HandiBrac®	121	98

8.6 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.

Durability

Serviceable Life

9.1 Provided it is not exposed to the weather or ultra-violet light for a total of more than 6 months and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Cemintel Rigid Air Barrier™ is expected to have a serviceable life of at least 50 years. The maximum exposure period may be limited by the maximum exposure period of the flashing tape.

9.2 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604 Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve a 50 year serviceable life in Zone D, Cemintel Rigid Air Barrier™ sheets must be fixed with stainless steel or protected hot-dip galvanised steel fasteners. Fasteners outside Zone D may be hot-dip galvanised steel.

9.3 Micro-climatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of Cemintel Rigid Air Barrier™ sheets in areas subject to micro-climatic conditions requires specific design in accordance with NZS 3604 Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

10.1 Cemintel Rigid Air Barrier™ will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the Cemintel Rigid Air Barrier™ or to the Cemintel Rigid Air Barrier™ itself, the repairs or replacement must be carried out to ensure the integrity of the rigid wall underlay or wall bracing system.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Cemintel Rigid Air Barrier™ from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Cemintel Rigid Air Barrier™ must be used behind claddings that meet the performance requirements of NZBC Clause E2.

12.2 Cemintel Rigid Air Barrier™, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

13.1 All design and building work must be carried out in accordance with the Cemintel Rigid Air Barrier™ Technical Literature and this Appraisal by competent and experienced tradespersons conversant with rigid wall underlay applications. 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.

System Installation

Cemintel Rigid Air Barrier™ Installation

14.1 Cemintel Rigid Air Barrier™ 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 Cemintel Rigid Air Barrier™ sheets must be dry prior to installation. Cut sheet edges that are left exposed must be sealed prior to installation.

14.3 Prior to fixing Cemintel Rigid Air Barrier™, a check must be made to ensure all sheet edges will be supported by framing.

14.4 Cemintel Rigid Air Barrier™ must be fixed to the timber and steel framing with fixings as specified in the Cemintel Rigid Air Barrier™ Technical Literature. Steel Framing must have a thermal break installed on all framing members prior to installation of the Cemintel Rigid Air Barrier™.

14.5 Cemintel Rigid Air Barrier™ sheets must be installed vertically with a maximum 3 mm gap between the sheet edges. Sheets at horizontal joints between floor levels must be installed with a minimum 12 mm gap between the sheet edges and must be supported over horizontal framing. Sheets at inter-storey floor levels must have a minimum 15 mm gap between the sheet edges at this point to allow for shrinkage of the framing. All horizontal joints must be flashed with a Z-flashing.

14.6 Any damaged areas of Cemintel Rigid Air Barrier™, such as holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with joint sealing tape or proprietary penetration seals.

Joint Sealing Tape Installation

14.7 All vertical sheet joints, internal and external corners must be covered with SUPER-STICK or 3M 8067 or Aluband XTREME joint sealing tape. The manufacturer's instructions regarding the application temperatures for the joint sealing tapes.

14.8 Cemintel Rigid Air Barrier™ must be cleaned of dust and other surface contaminants prior to 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 Cemintel Rigid Air Barrier™ 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 Technical Literature must be referred to during the inspection of Cemintel Rigid Air Barrier™ installations.

Health and Safety

15.1 Cutting of Cemintel Rigid Air Barrier™ sheets 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 Technical Literature must be undertaken because of the amount of dust generated.

15.3 Safe use and handling procedures for Cemintel Rigid Air Barrier™ by the supplier.

Basis of Appraisal

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

Tests

16.1 Racking tests on timber framing 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.

16.2 Testing has been carried out by BRANZ to determine the face load pressure resistance of Cemintel Rigid Air Barrier™ on timber and steel framing.

16.3 Testing to determine the suitability of Cemintel Rigid Air Barrier™ as an alternative to the top plate connection specified in NZS 3604 has been completed by BRANZ.

16.4 The resistance of Cemintel Rigid Air Barrier™ 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, fire and durability opinions were given by BRANZ technical experts.

17.2 BRANZ expert opinion on NZBC E2 code compliance for Cemintel Rigid Air Barrier™ was based on evaluation of all details within the scope and as stated within this Appraisal. The details contained within the Technical Literature 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 and NASH Building Envelope Solutions (E2/AS4) for rigid sheathings.

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

17.4 The Technical Literature for Cemintel Rigid Air Barrier™ has been examined by BRANZ and found to be satisfactory.

Quality

18.1 The manufacture of Cemintel Rigid Air Barrier™ 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 CSR Building Products Ltd is the responsibility of CSR Building Products Ltd.

18.3 Quality of installation on site of components and accessories supplied by CSR Building Products 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, flashings, joint seal tapes and flexible sill and jamb tape systems in accordance with the instructions of CSR Building Products Limited.

Sources of Information

- AS/NZS 1170: 2002 Structural design action – General principles.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheets.
- AS/NZS 4200.1: 2017 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- NASH Building Envelope Solutions: 2019
- NASH Standard Part 2: May 2019 Light Steel Framed Buildings
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, Cemintel Rigid Air Barrier™ 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 CSR Building Products 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. CSR Building Products 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;
   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 CSR Building Products Ltd.
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 CSR Building Products Ltd or any third party.

For BRANZ

Chelydra Percy
Chief Executive

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28 February 2020