



BRANZ Appraised

Appraisal No. 814 [2013]

MITTEN CAMBRIDGE AND CEDARLINE VINYL CLADDINGS

Appraisal No. 814 (2013)

Amended 22 December 2014



BRANZ Appraisals

Technical Assessments
of products for building
and construction.



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Product

- 1.1 Mitten Cambridge and Cedarline Vinyl Claddings are cavity-based external wall claddings for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 The cladding systems consist of colour finished vinyl (PVC) weatherboards with an extruded polystyrene backing, vinyl finishing profiles, flashings and accessories. The weatherboards are installed horizontally with concealed fixings over timber structural battens.
- 1.3 The claddings incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the claddings from the external wall frame with a nominal 20 mm drained cavity.

Scope

- 2.1 Mitten Cambridge and Cedarline Vinyl Claddings have been appraised as external horizontally fixed wall claddings for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - constructed with timber framing complying with the NZBC; and,
 - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
 - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.2 Mitten Cambridge and Cedarline Vinyl Claddings have also been appraised as external horizontally fixed wall claddings for specifically designed 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,
 - constructed with timber framing complying with the NZBC; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.
- 2.3 Mitten Cambridge and Cedarline Vinyl Claddings are appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[The Appraisal of Mitten Cambridge and Cedarline Vinyl Claddings relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.]*
- 2.4 Mitten Cambridge and Cedarline Vinyl Claddings must be installed by trained installers licensed by Mitten Vinyl Australia.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Mitten Cambridge and Cedarline Vinyl Claddings, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Mitten Cambridge and Cedarline Vinyl Claddings meet the requirement for loads arising from self-weight, wind, impact and creep [i.e. B1.3.3 (a), (h), (j) and (q)]. See Paragraphs 9.1 to 9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Mitten Cambridge and Cedarline Vinyl Claddings meet these requirements. See Paragraphs 10.1 to 10.5.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Mitten Cambridge and Cedarline Vinyl Claddings meet this requirement. See Paragraphs 15.1 to 15.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mitten Cambridge and Cedarline Vinyl Claddings meet this requirement and will not present a health hazard to people.

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

Technical Specification

4.1 Components and accessories supplied by Mitten Vinyl Australia are as follows:

Mitten Vinyl Cladding Weatherboards

- Mitten Cambridge and Cedarline Weatherboards are manufactured from extruded PVC and are formed into a profile that allows the boards to lock with each other. On the back face of the weatherboards is an expanded polystyrene (EPS) foam backing that adds rigidity and impact resistance once installed. The weatherboards including the EPS backing are 21 mm thick and supplied in 5.8 m lengths.
- Cambridge weatherboards are produced to replicate a pair of conventional rusticated weatherboards and are 265 mm wide, giving an effective vertical coverage of 230 mm per weatherboard course.
- Cedarline weatherboards are produced to replicate a pair of conventional bevel-back weatherboards and are 290 mm wide, giving an effective coverage of 255 mm per weatherboard course.
- The weatherboards are factory supplied in white (Frost) and a variety of nine other pastel colours as a finished product that does not require any subsequent coating or painting. The ten colours that are covered by the scope of this Appraisal are:

Frost	Bone	Ivory	Lite Maple	Sandlewood
Ash	Brownstone*	Satin Grey	Mist Green	Golden Sand

* Note: Cedarline is not available in Brownstone colour.

Accessories

- **Starter strip** is a PVC extruded profile used to secure the bottom of the first course of weatherboards.
- **J-Trim** is an extruded PVC channel profile used as a general purpose trim and flashing around penetrations.
- **Corner Posts** are extruded PVC profile for use on external corners.
- **Mitten weatherboard fixings** – 34 mm long x 4.15 mm diameter screws with coarse thread at 1.7 mm pitch and 10 mm button-head AS 3566 galvanised Class 4 for NZS 3604 Exposure Zones B and C and Grade 304 Stainless Steel for NZS 3604 Exposure Zone D.
- **Cyclone Washers** – 50 x 12 x 2 mm with a 4.5 mm diameter central hole, hot dip galvanised or stainless steel.

4.2 Accessories used with Mitten Cambridge and Cedarline Vinyl Claddings which are supplied by the building contractor are:

- **Structural cavity battens** – 45 mm wide by maximum 20 mm thick MSG 8 Radiata pine treated to Hazard Class H3.1.
- **Structural cavity batten fixings** – 60 x 2.8 mm flat-head hot-dip galvanised or 60 x 3.15 mm flat-head annular grooved stainless steel hand-driven nails, or 65 x 2.87 mm round-head or D-head, hot-dip galvanised or stainless-steel ring-shanked power-driven nails.

[Note: Hot-dip galvanising must comply with AS/NZS 4680 and stainless steel fixings must be Grade 316.]

- **Flashings** – external corner flashing, internal corner flashing, horizontal inter-storey joint flashing, and parapet cap flashings. The flashings are available in galvanised steel, aluminium or stainless steel. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Cavity vent strip** – PVC, aluminium or stainless steel, punched with 3 – 5 mm diameter holes or slots complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3.
- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1, Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
- **Flexible wall underlay support** – polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: mesh and wire galvanising must comply with AS/NZS 4534.]*
- **Rigid wall underlay** – Plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- **Flexible sill and jamb flashing tape** – flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Window and door trim cavity air seal** – air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Aluminium joinery head flashings** – as supplied by the joinery manufacturer or contractor.
- **Flexible sealant** – sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Mitten Vinyl Australia or the Mitten Vinyl licensed installer, on site or off-site, is under the control of the licensed installer.
- 5.2 Mitten Cambridge and Cedarline weatherboards and PVC accessories must be stacked flat, clear of the ground and supported on timber bearers along their entire length. They must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. If left in direct sunlight, wrapping should be cut open at the ends to allow for air movement. Do not store the cladding material in a location where the temperature may exceed 54°C, e.g. stacked on hot tarmac or wrapped in plastic in the sun.
- 5.3 Care must be taken to avoid damage to edges and ends and the material must be stored away from areas where construction activity may cause damage.
- 5.4 All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Mitten Cambridge and Cedarline Vinyl Claddings. 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 Mitten Cambridge and Cedarline Vinyl Cladding 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. Studs must be at maximum 600 mm centres for buildings situated in NZS 3604 Wind Zones up to and including Very High. Studs must be at maximum 400 mm centres for buildings situated in NZS 3604 Wind Zone Extra High and specific design wind pressures up to and including design differential 2.5 kPa ULS. Dwargs must be fitted flush between the studs at maximum 800 mm centres. Refer to Paragraphs 18.1 to 18.13 for information relating to the installation of the Mitten Cambridge and Cedarline Vinyl Claddings.
- 7.3 Additional framing may be required at soffits, internal and external corners and window and door openings for the support and fixing of structural cavity battens and the Mitten Cambridge and Cedarline Vinyl Claddings.
- 7.4 Timber wall framing behind where weatherboards are joined over a cavity batten must be nominal 50 mm thickness [i.e. 45 mm minimum finished thickness].
- 7.5 Structural cavity battens must have a maximum moisture content of 20% at the time of the cladding application.

General

- 8.1 Punching of the cavity vent strip must provide a minimum ventilation opening area of 1000 mm² per lineal metre of wall in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 [b].
- 8.2 The ground clearance to finished floor levels as set out in NZS 3604 must be adhered to at all times. At ground level, paved surfaces, such as footpaths, must be kept clear of the bottom edge of the cladding by a minimum of 100 mm, and unpaved surfaces by 175 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Table 18.
- 8.3 At balcony, deck or roof/wall junctions, the bottom edge of Mitten Cambridge and Cedarline Vinyl Claddings must be kept above the top surface of any adjacent roof flashing by a minimum of 35 mm in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.6.
- 8.4 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High, and rigid underlays for buildings in the Extra High Wind Zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.

- 8.5 Where cladding penetrations are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities by leaving a minimum gap of 10 mm between the bottom of the cavity and the flashing to the opening.
- 8.6 Where Mitten Cambridge and Cedarline Vinyl Claddings abut other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Some guidance is given within the Technical Literature. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Inter-storey Junctions

- 8.7 Inter-storey junctions must be constructed in accordance with the Technical Literature. Inter-storey joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 [b].

Structure

Mass

- 9.1 The mass of Mitten Cambridge and Cedarline Vinyl Claddings is approximately 8 kg/m², and they are therefore considered lightweight claddings in terms of NZS 3604.

Impact Resistance

- 9.2 Mitten Cambridge and Cedarline Vinyl Claddings have adequate resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to the cladding system when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.

Wind Zones

- 9.3 Mitten Cambridge and Cedarline Vinyl Claddings are suitable for use in all Wind Zones of NZS 3604, up to and including Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 or up to 2.5 kPa design differential ULS wind pressure where buildings are specifically designed. See Paragraph 7.2.

Durability

- 10.1 Mitten Cambridge and Cedarline Vinyl Claddings meet the performance requirements of NZBC Clause B2.3.1 [b], 15 years for the cladding components.

Serviceable Life

- 10.2 Mitten Cambridge and Cedarline Vinyl Cladding installations are expected to have a serviceable life of at least 30 years for white (Frost), and at least 20 years for the remaining colours provided the cladding is maintained in accordance with the Technical Literature and this Appraisal.
- 10.3 On exposure to the environment, Mitten Cambridge and Cedarline Vinyl weatherboards will gradually lose gloss and coloured weatherboards will gradually fade.
- 10.4 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 Exposure Zone D. To achieve a maximum serviceable life in Exposure Zone D, Mitten Cambridge and Cedarline Vinyl Cladding weatherboards and the structural battens supporting them must be fixed with stainless steel fasteners.
- 10.5 Microclimatic 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 Mitten Cambridge and Cedarline Vinyl Claddings in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

- 11.1 Regular cleaning of the surface of the cladding [at least annually] is required to remove grime, dirt and any organic growth and to maximise the life and appearance of the material. Grime may be removed by brushing with a soft brush, warm water and a mild detergent. Avoid the use of stiff brushes or abrasive detergents as these will affect the gloss finish of the product. A water-blaster must not be used on this cladding.
- 11.2 Annual inspections must be made to ensure that all aspects of the cladding, including flashings and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately.
- 11.3 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the cladding.

Prevention of Fire Occurring

- 12.1 Mitten Cambridge and Cedarline Vinyl Claddings must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS1 to C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

Control of Internal Fire and Smoke Spread

- 13.1 Mitten Cambridge and Cedarline Vinyl Claddings meet the flame propagation criteria of AS 1366.3 as specified in NZBC Acceptable Solution C/AS1, Paragraph 4.2.2 and NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.2. The completed wall system, including the surface lining product enclosing the Mitten Cambridge and Cedarline Vinyl Claddings from the adjacent occupied space, must achieve the Group Number for internal surface finish requirements as specified in the relevant NZBC Acceptable Solutions C/AS1 to C/AS6.

Control of External Fire Spread

- 14.1 Mitten Cambridge and Cedarline Vinyl Claddings do not have a peak heat release or total heat released rating. The system is suitable for use on buildings with a SH Risk Group classification, a maximum building height of 10 m and a distance of 1.0 m or more to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.
- 14.2 Buildings in all Risk Groups, apart from SH and VP, and three storeys or more, require horizontal fire stop barriers to be installed to external wall claddings incorporating an externally applied combustible insulant in accordance with NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 5.7.17. Design of the barrier joint must be specifically detailed by the designer to meet the NZBC. NZBC Acceptable Solution C/AS2 – C/AS6, Figure 5.8 gives an acceptable detail for barriers. These joints are not covered by the Technical Literature, and therefore are outside the scope of this Appraisal.

External Moisture

- 15.1 Mitten Cambridge and Cedarline Vinyl Claddings, when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.
- 15.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with NZBC Clause E2.3.5.
- 15.3 Mitten Cambridge and Cedarline Vinyl Claddings allow excess moisture present at the completion of construction to be dissipated without permanent damage to building elements, and meets code compliance with Clause E2.3.6.
- 15.4 The details given in the Technical Literature for weather sealing are based on the principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

- 15.5 Mitten Cambridge and Cedarline Vinyl Claddings, where there is a designed cavity drainage path for moisture that penetrates the cladding, do not reduce the requirements for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

- 16.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

- 16.2 Mitten Cambridge and Cedarline Vinyl Claddings are not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal will not create a risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirements

- 17.1 Installation of Mitten Cambridge and Cedarline Vinyl Claddings must be completed by competent licensed installers with suitable training from Mitten Vinyl Australia and with an understanding of cavity construction, in accordance with instructions given within the Technical Literature and this Appraisal.

Mitten Vinyl Cladding Installation

Wall Underlay and Flexible Sill and Jamb Tape Installation

- 18.1 The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the cladding system.
- 18.2 Flexible wall underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Generic rigid underlay materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems must be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Structural Cavity Batten Installation

- 18.3 Structural cavity battens must be installed over the building underlay to the wall framing at maximum 600 mm centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres. The cavity battens must be fixed in place with flat head nails at 300 mm centres. The nail fixings must be staggered 12 mm either side of the batten centre line. Refer to Paragraph 4.2 for batten fixing options and refer to BRANZ Bulletin Number 475 for further information.
- 18.4 Where studs are at greater than 450 mm centres and a flexible wall underlay is being used, a building underlay support must be installed over the underlay at maximum 300 mm centres horizontally.

Aluminium Joinery Installation

- 18.5 Aluminium joinery and associated head flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5 – 10 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

Mitten Vinyl Weatherboard Installation

- 18.6 Mitten Cambridge and Cedarline Vinyl Cladding weatherboards may be cut on site by power or hand saw. Holes and cut-outs may be formed by using a hole saw. Specific guidance on the cutting of the vinyl and polystyrene materials is given in the Mitten Cambridge and Cedarline Vinyl Claddings Technical Literature.
- 18.7 Mitten Vinyl weatherboards must be kept dry prior to installation.
- 18.8 Mitten Cambridge and Cedarline Vinyl Claddings must be installed starting at the bottom of the wall. The Mitten starter strip must first be fixed behind the bottom course of weatherboards to ensure that this first course is set out level. The starter strip is designed to establish a level bottom course and to overhang the bottom plate by the required minimum of 50 mm.
- 18.9 Before the vinyl weatherboards are installed, the corner details must be decided and plumbed vertical, e.g. corner-post profile for external corners and J-trims used to create internal corners. The necessary flashings must be installed before commencing weatherboard fixing and a cavity closure must be installed continuously around the bottom of all cavities.
- 18.10 Mitten Vinyl weatherboard vertical joints must be overlapped by the depth of the factory cut notch. The EPS backing of the cladding profile is designed to be butted tight.
- 18.11 Mitten Vinyl weatherboards are located in place by sliding the bottom of the new board up and into the lock profile on the top of the previously fixed weatherboard. Once the new weatherboard is located, it must be fixed with a screw and washer through the centre of each fixing slot at each stud. Screws and washers must be placed in the centre of the slots to allow for thermal expansion and contraction movement. Screws and washers must not be driven home tight but left so that there is at least 1 mm of free-play between the washer and the vinyl profile. Failure to correctly place screws at the centre of fixing slots or their over-tightening will cause weatherboards to buckle or distort with heat.
- 18.12 Mitten Vinyl Weatherboards should be used in full lengths wherever possible. Where weatherboard end joints are required, the joint must be formed on a stud. Subsequent end joints in Mitten Vinyl Weatherboards must be staggered by at least 600 mm. No more than two joints are permitted in any vertical line and there must be no less than 3 rows of weatherboards between joints before repeating the joint position.

Finishing

- 18.13 Mitten Cambridge and Cedarline Vinyl weatherboards are pre-coloured at manufacture and factory finished with a gloss surface and require no on site finishing.

Inspection

- 18.14 The Technical Literature must be referred to during inspection of Mitten Cambridge and Cedarline Vinyl Cladding installations.

Health and Safety

- 19.1 Cutting of Mitten Vinyl weatherboards must be carried out in well ventilated areas and eye and hearing protection should be worn.
- 19.2 Safe use and handling procedures for the components that make up Mitten Cambridge and Cedarline Vinyl Cladding are provided in the manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

20.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for Mitten Cambridge and Cedarline Vinyl Claddings is based on testing and evaluation of all details within the scope and as stated within this Appraisal. Mitten Cambridge Vinyl Cladding details were tested to E2/VM1. The testing assessed the performance of the foundation detail, window head, jamb and sill details, vertical and horizontal weatherboard joints, internal and external corners. The results of the test were used in the evaluation of the Mitten Cambridge and Cedarline Vinyl Claddings. In addition to the weathertightness test, 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 for cavity-based weatherboard claddings.
- Wind face load and fastener pull through testing for Mitten Cambridge and Cedarline Vinyl Claddings determined design wind suction pressures, and by comparing these pressures with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber framed walls.

Other Investigations

- 21.1 Structural and durability opinions have been provided by BRANZ technical experts.
- 21.2 The performance and history of use of vinyl weatherboard wall cladding products in New Zealand and Australia has been considered, including their structural and weathertightness performance, durability and non-hazardous nature.
- 21.3 Test results for flame propagation testing to AS 2122.1 of the EPS component of Mitten Cambridge and Cedarline Vinyl Claddings were obtained and reviewed by BRANZ technical experts. The review was satisfactory.
- 21.4 Site visits have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.
- 21.5 The Technical Literature for Mitten Cambridge and Cedarline Vinyl Claddings has been examined by BRANZ and found to be satisfactory.

Quality

- 22.1 The manufacture of Mitten Cambridge and Cedarline Vinyl Claddings has not been examined by BRANZ, however the methods adopted for quality control and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 22.2 Mitten Cambridge and Cedarline Vinyl Claddings manufactured at Mitten Inc. are subject to an annual manufacturing quality audit as part of the Vinyl Siding Institute Product Certification Program. The annual quality audit in turn supports ICC Evaluation and CCMC Acceptance which are recognised by BRANZ.
- 22.3 The quality control system and manufacture of the polystyrene insert material used as a component of Mitten Cambridge and Cedarline Vinyl Claddings has been assessed as meeting the requirements of AS 1366.3 and is also covered by quality certification to ISO 9001: 2008 by QAS International.
- 22.4 The quality of materials, components and accessories supplied to the market is the responsibility of Mitten Vinyl Australia.
- 22.5 Quality of installation on site of components and accessories supplied by Mitten Vinyl Australia is the responsibility of the Mitten Vinyl Australia licensed installer.
- 22.6 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing and joinery, wall underlays, flashing tapes and airseals.
- 22.7 Building owners are responsible for the maintenance of Mitten Cambridge and Cedarline Vinyl Claddings in accordance with the instructions of Mitten Inc.



Sources of Information

- AS 1366.3:1992 Rigid cellular polystyrene – Moulded [RC/PS-M].
- AS/NZS 1170:2002 Structural design actions.
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber Structures Standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4211:2008 Specification for performance of windows.
- BRANZ Bulletin Number 475, August 2006, Structurally Fixed Cavity Battens.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Building, Innovation and Employment, Third Edition July 2005 [Amendment 6, 14 February 2014].
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 22 December 2014.

This Appraisal has been amended to add the Mitten Cedarline profile as a cladding option. The Appraisal has also been amended to update Mitten Vinyl Australia's address and to update fixing options for structural cavity battens.



In the opinion of BRANZ, **Mitten Cambridge and Cedarline Vinyl Claddings** 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 **Mitten Inc.**, 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. **Mitten Inc.:**
 - 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 **Mitten Inc.**
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 **Mitten Inc.** or any third party.

For BRANZ



Pieter Burghout
Chief Executive
Date of Issue:
20 March 2013