



BRANZ Appraised
Appraisal No. 764 [2017]

SHADOWCLAD® VENTILATED CAVITY CLADDING SYSTEM

Appraisal No. 764 [2017]

This Appraisal replaces BRANZ
Appraisal No. 764 [2011]

Amended 1 March 2021



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Carter Holt Harvey Plywood Ltd

Private Bag 92-106

Auckland

Tel: 0800 326 759

Fax: 09 633 1582

Web: www.chhply.co.nz



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 Shadowclad® Ventilated Cavity is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 The system consists of Shadowclad® sheets, timber cavity battens, flashings and accessories and is finished with either an acrylic paint system or penetrating, or film forming stain.
- 1.3 Shadowclad® Ventilated Cavity incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with a nominal 20 mm drained cavity.

Scope

- 2.1 Shadowclad® Ventilated Cavity has been appraised as an external wall cladding 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, The use of dark colours with an LRV of less than 50 and failure to adequately maintain them increases the risk of aesthetic related issues such as face checking. For this reason CHH Plywood does not support the use of dark colours on Shadowclad exterior cladding.
 - situated in NZS 3604 Wind Zones up to, and including Extra High; and,
 - with a building height of ≤ 10 m and at a distance of ≥ 1.0 m to the relevant boundary.
- 2.2 Shadowclad® Ventilated Cavity has also been appraised as an external wall cladding for specifically designed 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,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state [ULS] of 2.5 kPa; and,
 - with a building height of ≤ 10 m and at a distance of ≥ 1.0 m to the relevant boundary.
- 2.3 Shadowclad® Ventilated Cavity is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[The Appraisal of Shadowclad® Ventilated Cavity relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.]*

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Shadowclad® Ventilated Cavity, 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. Shadowclad® Ventilated Cavity meets the requirement for loads arising from self-weight, wind, impact and creep [i.e. B1.3.3 (a), (f), (j) and (q)]. See Paragraphs 9.1 – 9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years, and B2.3.2. Shadowclad® Ventilated Cavity meets these requirements. See Paragraphs 10.1 - 10.5.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Shadowclad® Ventilated Cavity meets this requirement. See Paragraphs 14.1 - 14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Shadowclad® Ventilated Cavity meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 System components and accessories supplied by Carter Holt Harvey Plywood Limited are as follows:

Shadowclad® Sheets

- Shadowclad® sheets are nominal 12 mm thick structural plywood sheets manufactured from New Zealand pinus radiata veneers. They are 1216 mm wide and either 2440 mm or 2745 mm long. They have a textured surface finish on the exposed face.
- Shadowclad® sheets are available as either Shadowclad® Natural or Shadowclad® Ultra finish. Shadowclad® Natural is an uncoated panel for use with penetrating stains, film forming stains and paints. Shadowclad® Ultra has a factory applied powder coat exterior primer for use with paints and film forming stain topcoats. Shadowclad® Ultra is not suitable for use with penetrating stains.
- Shadowclad® Natural and Shadowclad® Ultra are both available as Texture and Texture Groove surface finish. Texture Groove has 9 mm wide by 5 mm deep grooves at 150 mm centres running vertically down the outside face of the sheet.
- Shadowclad® Natural sheets are available as Hazard Class H3.1 treated only. Shadowclad® Ultra sheets are available in either H3.1 or H3.2 CCA treated.

Shadowclad® Accessories

- **Shadowclad® flashings:** horizontal 'Z' flashing, inter-storey 'Z' flashing, internal 90° angle, internal 'W' angle, large internal 'W' angle, external box angle, large external box angle and flat flashing for vertical negative detail. Shadowclad® flashings are available in extruded aluminium and folded stainless steel.
 - **Cavity vent strip:** manufactured from aluminium or stainless steel, available in 3600 mm lengths.
- 4.2 Accessories used with Shadowclad® Ventilated Cavity which are supplied by the building contractor are:
- **Shadowclad® sheet fixings:** 60 x 2.8 mm hot-dip galvanised or ring shank stainless steel flat head nails, 8 gauge x 65 mm AS 3566 Corrosion Class 4 mechanically zinc plated wood screws or 8 gauge x 65 mm stainless steel wood screws. [Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680].
 - **Exterior Battens:** 65 mm wide x 18 mm thick timber batten, dressed or bandsawn, treated to Hazard Class H3.1 and with 6 x 6 mm weathergrooves.
 - **Cavity battens:** nominal 45 mm wide x 20 mm thick or 75 mm wide x 20 mm thick merchant grade timber treated to Hazard Class H3.1.
 - **Cavity batten fixings:** 40 x 2.5 mm hot-dip galvanised or stainless steel ring shank flat head nails.



- **Flexible wall underlay:** wall underlay complying with NZBC Acceptable Solution E2/AS1, Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlay.
- **Rigid wall underlay:** 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.
- **Brush on timber preservative:** brush on timber preservatives as listed in the Technical Literature for Shadowclad® Ventilated Cavity.
- **Flexible 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.
- **Joinery head flashings:** folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **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.

Finishing System Specification

- 4.3 Paint and stain systems are not supplied by Carter Holt Harvey Plywood Limited and have not been assessed by BRANZ and are therefore outside the scope of this Appraisal.
- 4.4 All exposed faces, including top edges at sills and all bottom edges of Shadowclad® sheets must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730, or at least two coats of a film forming or penetrating stain to protect the Shadowclad® and give the desired finish colour to the exterior walls.

[Note: Carter Holt Harvey Plywood Limited does not recommend that Shadowclad® is left uncoated when used as an exterior cladding. Using dark colours with an LRV of less than 50%, and failure to adequately maintain the surface coating of the cladding increases the risk of aesthetic related issues such as face checking. For this reason, Carter Holt Harvey Plywood Limited does not support the use of dark colours on Shadowclad® exterior cladding.]

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Carter Holt Harvey Plywood Limited or the building contractor, whether on-site or off-site, is under the control of the building contractor. Shadowclad® sheets must be stacked flat, clear of the ground on at least three evenly spaced timber bearers. They must be kept dry at all times either by storing within an enclosed building or under cover when stored externally. Care must be taken to avoid damage to edges, ends and the primed surfaces.
- 5.2 Accessories must be stored so they are kept clean, dry and undamaged. 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 Shadowclad® Ventilated Cavity. 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 Shadowclad® Ventilated Cavity 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. Dwangs must be fitted flush between the studs at maximum 800 mm centres.
- 7.3 Additional framing may be required at soffits, internal and external corners and window and door openings for the support and fixing of cavity battens and Shadowclad® Ventilated Cavity.
- 7.4 Timber wall framing and cavity battens must have a maximum moisture content of 20% at the time of the cladding application. *[Note: If Shadowclad® is fixed to framing with a moisture content of greater than 20% problems may occur at a later date due to excessive timber shrinkage.]*

General

- 8.1 When Shadowclad® Ventilated Cavity is used for specifically designed buildings up to 2.5 kPa design differential ULS wind pressure, only the weathertightness aspects of the cladding and maximum framing centres are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.
- 8.2 Punchings in the cavity vent strip 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].
- 8.3 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 system 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.
- 8.4 At balcony, deck or roof/wall junctions, the bottom edge of Shadowclad® Ventilated Cavity 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.
- 8.5 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.
- 8.6 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.
- 8.7 Where the system abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. These details have not been assessed and are outside the scope of this Appraisal.

Inter-storey Junctions

- 8.8 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 Shadowclad® Ventilated Cavity is approximately 6.6 kg/m² at equilibrium moisture content. The system is therefore considered a lightweight cladding in terms of NZS 3604.

Impact Resistance

- 9.2 Shadowclad® Ventilated Cavity has good resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to Shadowclad® Ventilated Cavity 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 Shadowclad® Ventilated Cavity is suitable for use in all Building 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.

Durability

- 10.1 Shadowclad® Ventilated Cavity meets the performance requirements of NZBC Clause B2.3.1 (b), 15 years for the Shadowclad® and flashings when used as a non-structural cladding installed in accordance with the Technical Literature.
- 10.2 Shadowclad® is envelope preservative treated. Where sheets are cut, all cuts must be coated with a brush on timber preservative specified in the Technical Literature for Shadowclad® Ventilated Cavity. Failure to correctly apply preservative to these areas may negatively affect the durability of the cut sheets.

Serviceable Life

- 10.3 Shadowclad® Ventilated Cavity installations finished with penetrating stain or non-penetrating film forming stain, are expected to have a serviceable life of at least 15 years provided they are maintained in accordance with this Appraisal. *[Note: This opinion only covers serviceability with regards to structural and weathertightness performance. It does not cover appearance, which may deteriorate significantly, especially when proper and regular maintenance is not carried out. Carter Holt Harvey Plywood Limited does not recommend that Shadowclad be left uncoated when used as an exterior cladding.]*
- 10.4 The use of dark colours with an LRV of less than 50 and failure to adequately maintain the coating increases the risk of aesthetic related issues such as face checking. For this reason Carter Holt Harvey Plywood Limited does not support the use of dark colours on Shadowclad® exterior cladding.
- 10.5 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. It is recommended that Shadowclad® sheets be fixed with stainless steel fasteners in these situations.
- 10.6 When using CCA treated Shadowclad®, aluminium extrusions must be coated in accordance with the requirements of NZBC E2/AS1, Table 20, and are not suitable for use in NZS 3604 Corrosion Zone D. When used with CCA treated Shadowclad®, horizontal Z-flashings must be manufactured from stainless steel in all Corrosion Zones.

- 10.7 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert a mildly corrosive atmosphere into an aggressive environment for fasteners. The fixing of Shadowclad® sheets 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 maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.
- 11.2 Regular cleaning [at least annually] of the paint coating is required to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent. Paint systems must be recoated at approximately 7 – 10 yearly intervals in accordance with the paint manufacturer's instructions. Penetrating and non-penetrating stains must be recoated every 2 – 3 years in accordance with the stain manufacturer's instructions.
- 11.3 Annual inspections must be made to ensure that all aspects of the cladding system, including the selected finishing system, 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. Sealant and paint coatings must be repaired in accordance with the relevant manufacturer's instructions.
- 11.4 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the system. *[Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Shadowclad® Ventilated Cavity installations.]*

Control of External Fire Spread

- 12.1 Shadowclad® Ventilated Cavity has not been assessed for a peak heat release or total heat released rating. Refer to NZBC Acceptable Solutions and Verification Methods C/AS1, C/AS2 and C/VM2 for requirements for fire rating and exterior surface finish requirements of external walls..

Prevention of Fire Occurring

- 13.1 Separation or protection must be provided to Shadowclad® Ventilated Cavity from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1, C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 14.1 Shadowclad® Ventilated Cavity, 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.
- 14.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with NZBC Clause E2.3.5.
- 14.3 Shadowclad® Ventilated Cavity allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC Clause E2.3.6.
- 14.4 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.
- 14.5 Shadowclad® Ventilated Cavity, where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirements for junctions, penetrations, etc to remain weather resistant.



Internal Moisture

- 15.1 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

- 15.2 Shadowclad® Ventilated Cavity is 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

- 16.1 Installation must always be carried out in accordance with the Shadowclad® Ventilated Cavity Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

Shadowclad® Ventilated Cavity Installation

Wall Underlay and Flexible Sill and Jamb Tape Installation

- 17.1 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 manufacturers' instructions prior to the installation of the cavity battens and the rest of the Shadowclad® Ventilated Cavity system. 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 shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the wall 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.

Cavity Batten Installation

- 17.2 The cavity battens must be installed over the wall underlay to the wall framing at maximum 300 mm horizontal centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres.
- 17.3 Cavity battens are fixed in place with 40 x 2.5 mm hot-dip galvanised or stainless steel ring shank flat head nails at 300 mm centres when over studs or plates, and to the top and bottom plates and dwangs when between studs.

Shadowclad® Sheet Installation

- 17.4 Shadowclad® sheets may be cut on site by power or hand saw. Holes and cut-outs may be formed by using a hole saw.
- 17.5 Shadowclad® is envelope preservative treated. Where sheets are cut, all cuts must be coated with a brush on timber preservative specified in the Technical Literature for Shadowclad® Ventilated Cavity. Failure to correctly apply preservative to these areas may negatively affect the durability of the cut sheets.
- 17.6 Shadowclad® sheets must be dry prior to installation. Before the sheets are installed, cut edges must be sealed with a brush-on timber preservative. The bottom edges and back of the Shadowclad® sheets to a height of 150 mm must be primed or stain coated at ground level and where the sheets are installed above apron flashings on roofs.
- 17.7 Shadowclad® sheets must be installed starting at the bottom of the wall. The bottom of the Shadowclad® sheets must overhang the bottom plate by a minimum of 50 mm.
- 17.8 Before the Shadowclad® sheets are installed, the corner detail must be prepared to suit the selected option, e.g. external box angle or boxed corner. The necessary flashings must be installed before commencing sheet fixing.

- 17.9 The Shadowclad® sheets are fixed with 60 x 2.8 mm hot dip galvanised or ring shanked stainless steel flat head nails, or 8 gauge x 65 mm mechanically zinc plated or stainless steel wood screws at 150 mm centres around the edge of the sheets starting at the corners and at 300 mm centres in the body of the sheet. The fasteners must be no closer than 7 mm to the sheet edges, and on the rebated edge the fasteners must be inside the weather groove.

Aluminium Joinery Installation

- 17.10 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.

Finishing

- 17.11 The coating manufacturer's instructions must be followed at all times for application of the paint or stain finish. Shadowclad® Sheets must be painted or stained as soon as practicable following fixing and must be clean and dry before commencing. If Shadowclad® sheets are exposed to the weather for more than 3 months, the surfaces must be washed with a mild detergent solution to remove any dirt, dust, mould or sea spray prior to coating. Allow the recommended drying time between coats and follow the temperature limitations for application. Carter Holt Harvey Plywood Limited does not recommend Shadowclad® be left uncoated when used as an exterior cladding.
- 17.12 The use of dark colours with an LRV of less than 50 and failure to adequately maintain the coating increases the risk of aesthetic related issues such as face checking. For this reason Carter Holt Harvey Plywood Limited does not support the use of dark colours on Shadowclad® exterior cladding.
- 17.13 Coatings should be applied by brush to ensure adequate coating film build is achieved. Application via roller or spray is not recommended.

Inspection

- 17.14 The Technical Literature must be referred to during the inspection of Shadowclad® Ventilated Cavity installations.

Health and Safety

- 18.1 Cutting of Shadowclad® sheets must be carried out in well ventilated areas and eye and hearing protection must be worn.
- 18.2 Safe use and handling procedures for the components that make up Shadowclad® Ventilated Cavity are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

- 19.1 The following testing has been completed by BRANZ:
- BRANZ expert opinion on NZBC E2 code compliance for Shadowclad® Ventilated Cavity was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Shadowclad® Ventilated Cavity details were tested to E2/VM1. The testing assessed the performance of the foundation detail, window head, jamb and sill details, vertical and horizontal Shadowclad® joints, internal and external corners. 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 plywood claddings.
 - Wind face load and fastener slip testing for Shadowclad® Ventilated Cavity. BRANZ 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 given in the Technical Literature were confirmed as suitable for timber framed walls.



Other Investigations

- 20.1 Structural and durability opinions have been provided by BRANZ technical experts.
- 20.2 The performance and testing of plywood wall cladding products in New Zealand and Australia has been considered, including the structural and weathertightness performance, durability and non-hazardous nature.
- 20.3 Site inspections have been carried out by BRANZ to examine the practicability of installation.
- 20.4 The Technical Literature for Shadowclad® Ventilated Cavity has been examined by BRANZ and found to be satisfactory.

Quality

- 21.1 The manufacture of Shadowclad® has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 21.2 The quality of materials, components and accessories supplied by Carter Holt Harvey Plywood Limited is the responsibility of Carter Holt Harvey Plywood Limited. The quality control system for the manufacture of Shadowclad® has been assessed and registered as meeting the requirements of AS/NZS 2269 by the Engineered Wood Products Association of Australasia, and ISO 9001 by Telarc SAI.
- 21.3 The treatment of Shadowclad® to H3.1 and 3.2 has been independently assessed and certified as meeting the requirements of AS/NZS 1604.3.
- 21.4 Quality of installation on site of components and accessories supplied by Carter Holt Harvey Plywood Limited and the building contractor is the responsibility of the installer.
- 21.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing solutions and joinery, wall underlays, flashing tapes, cavity battens, airseals and Shadowclad® sheets in accordance with the instructions of Carter Holt Harvey Plywood Limited.
- 21.6 Building owners are responsible for the maintenance of Shadowclad® Ventilated Cavity in accordance with the instructions of Carter Holt Harvey Plywood Limited.

Sources of Information

- AS 3730: 2006 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 1604.3: 2012 Specification for preservative treatment - Part 3: Plywood.
- AS/NZS 2269: 2012 Plywood - Structural.
- AS/NZS 4680: 2006 Hot-dip galvanized [zinc] coatings on fabricated ferrous articles.
- 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.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



Amendments

Amendment No.1, dated 5 September 2018.

This Appraisal has been amended to include the timber preservative treatment.

Amendment No. 2, dated 1 March 2021

This Appraisal has been amended to clarify coating requirements.



BRANZ Appraised
Appraisal No. 764 [2017]

BRANZ Appraisal
Appraisal No. 764 [2017]
21 September 2017

SHADOWCLAD® VENTILATED
CAVITY CLADDING SYSTEM



In the opinion of BRANZ, the **Shadowclad® Ventilated Cavity Cladding System** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Carter Holt Harvey Plywood Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Carter Holt Harvey Plywood Limited:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - 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 **Carter Holt Harvey Plywood Limited**.
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 **Carter Holt Harvey Plywood Limited** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

21 September 2017