



BRANZ Appraised

Appraisal No. 491 [2015]

PALLISIDE CELLULAR uPVC WEATHERBOARD CAVITY CLADDING SYSTEM

Appraisal No. 491 [2015]

The Appraisal replaces BRANZ
Appraisal No. 491 [2005].

Amended 30 October 2017



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 The Palliside Cavity Cladding System is a cavity-based protective and decorative wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 The system consists of horizontally fixed, inter-locking Palliside weatherboards (Traditional and Rusticated profiles) installed over timber battens to form the cavity, rigid uPVC flashings and trims, and accessories.
- 1.3 The system 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 framing with a nominal 20 mm drained cavity.

Scope

- 2.1 The Palliside Cavity Cladding System has been appraised as an external wall cladding for buildings within the following scope:
 - constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
 - constructed with steel framing subject to specific engineering design with building height and floor plan area scope limitations in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 1.1; 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 The Palliside Cavity Cladding System has also been appraised as an external wall cladding for buildings within the following scope:
 - The scope limitations of NZBC Acceptable Solution E2/AS1, with regards to building height and floor plan area; and,
 - constructed with timber and 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 2.5 kPa.
- 2.3 The Palliside Cavity Cladding System must only be installed horizontally on vertical surfaces.
- 2.4 The Palliside Cavity Cladding System is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[The Appraisal of the Palliside Cavity Cladding System 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, the Palliside Cavity Cladding System 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. The Palliside Cavity Cladding System meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 9.1 - 9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. The Palliside Cavity Cladding System meets these requirements. See Paragraphs 10.1 - 10.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Palliside Cavity Cladding System meets this requirement. See Paragraphs 14.1 - 14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Palliside Cavity Cladding System meets 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 System components and accessories for the Palliside Cavity Cladding System, which are supplied by Dynex Extrusions Ltd are:

Palliside Weatherboards

- Palliside weatherboards are manufactured with a uPVC cellular foam core and a co-extruded uPVC outer layer. They are produced in double bevel-back [Traditional] or double rusticated [Rusticated] weatherboard profiles with an inter-locking weather seal between boards. Traditional weatherboards are available with a smooth face and Rusticated weatherboards are available with either a smooth or woodgrain face.
- The Traditional and Rusticated weatherboards are nominally 6 mm thick, with an effective overall profile thickness of 21 mm for the Traditional profile and 18 mm for the Rusticated profile. The weatherboards have an effective cover of 260 mm and are supplied in 6.3 m lengths.
- Palliside weatherboards are available in White, Tea, Riverstone, Calico, Sandstone and Slate colours.

Accessories

- **Starting trims** - starter strip, one-part channel trim, 2-part channel trim. The starting trims are manufactured from uPVC and are available in colours to match the selected Palliside weatherboard where appropriate. Starting trims are supplied in 3.6 m lengths.
- **Weatherboard jointers** - moulded flat soaker and 2-part jointer. The weatherboard jointers are manufactured from uPVC and are available in colours to match the selected Palliside weatherboard. Moulded flat soakers come in double weatherboard profile, and 2-part jointers are supplied in 2.7 m lengths.
- **External and internal corner mouldings** - external 90° corner soaker base, moulded corner soaker, boxed 2-part 90° internal corner, boxed 2-part 90° external corner, and 2-part boxed 135° corner. The mouldings are available in uPVC to match the selected Palliside weatherboard where appropriate. The external 90° corner soaker base and 2-part boxed 135° corner are supplied in 2.7 m lengths, the moulded corner soakers come in double weatherboard profile, the boxed 2-part 90° internal corner is supplied in 3.0 m lengths and the boxed 2-part 90° external corner is supplied in 3.6 m lengths.
- **Window flashings** - jamb flashing base, scribe cap with end plugs, 2-part head flashing, window head closer and window base scribe. The window flashings are manufactured from uPVC with an aluminium Head Flashing Cap also available. Window flashings are available in colours to match the selected Palliside weatherboard where appropriate and are supplied in 3.8 m lengths. The jamb flashing base are supplied in 3.6 m lengths.

- **Moulded end plugs** - manufactured from uPVC in both Traditional and Rusticated profiles. The end plugs are available in colours to match the selected Palliside weatherboard.
 - **Foam soffit mould** - a 40 x 18 mm cornice moulding manufactured from foamed uPVC. The soffit mould is available in colours to match the selected Palliside weatherboard and is supplied in 3.6 m lengths.
 - **Fastfix fasteners** - PVC fasteners used to secure the Palliside weatherboard in place above head flashings. The fasteners are available in colours to match the selected Palliside weatherboard and are supplied in bags of 50.
 - **Solvent cement** - used to secure in place moulded end plugs and moulded flat soakers. Solvent cement is available in colours to match the selected Palliside weatherboard and is supplied in 180 g tubes.
 - **Sealant** - Silaflex MS available in colours to match the selected Palliside weatherboard. The sealant is supplied in 375 ml canisters.
- 4.2 Accessories used with the Traditional Palliside weatherboard profile, which are supplied by Dynex Extrusions Ltd are:
- **Pre-cut scribes** - pre-finished and pre-cut solid window scribe to replace scribe cap and injection moulded end plugs with the traditional profile. The scribes are supplied in 4.2 m lengths and require a 1-part head flashing with a minimum depth of 66 mm, and are available in colours to match the selected Palliside traditional weatherboard.
 - **1-part internal corner** - 1-part W-flashing style internal corner to replace 2-part internal corner and injection moulded end plugs with the traditional profile. The corners are supplied in 3 m lengths and are available in colours to match the selected Palliside traditional weatherboard.
 - **Under window base clip** - face fixed under windows to provide a base for under window finishing options. The base clip is supplied in 3.6 m lengths and available in white only.
 - **Under window low profile bead** - the standard under window finishing option for the traditional profile that fixes to the under window base clip, between the scribes. The low profile bead is supplied in 3.6 m lengths and is available in colours to match the selected Palliside traditional weatherboard.
 - **Under window full planted sill** - an alternative under window finishing option for the traditional profile that fixes to the under window base clip, extending each side of the window with the scribes trimmed to this. The full planted sill is supplied in 4.2 m lengths and is available in colours to match the selected Palliside traditional weatherboard with colour matched left and right hand end caps to fit sill ends.
- 4.3 Accessories used with the Palliside Cavity Cladding System which are supplied by the building contractor are:
- **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 tapes** - 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.
 - **Cavity battens [non-structural]** - nominal 50 mm wide by 25 mm thick [minimum finished size of 45 mm wide by 18 mm thick] timber treated to Hazard Class H3.1.
 - **Cavity battens [structural over timber and steel frame]** - nominal 50 mm wide by 25 mm thick [minimum finished size of 45 mm wide by 18 mm thick] SG6 grade timber treated to Hazard Class H3.1.
 - **Thermal break** - 10 mm thick expanded polystyrene.

- **Window and door trim cavity airseal** - 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** - as supplied by the joinery manufacturer or contractor.
- **Planted sill, facings, box corners and scribes** - timber treated to Hazard Class H3.1, pre-primed before installation. [Where dark contrasting colours to Palliside weatherboards are required.]
- **Parapet cap flashing** - folded from aluminium or galvanised steel. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Cavity batten fixings (non-structural battens over timber frame)** - 40 x 2.5 mm hot-dip galvanised flat head nails.
- **Cavity batten and thermal break fixings (non-structural battens over steel frame)** - Self-drilling 6-gauge galvanised Class 4 screws. The screw length must allow a 10 mm minimum penetration through the steel framing.
- **Cavity batten fixings (structural battens over timber frame)** - 60 x 2.8 mm hot-dip galvanised flat head nails.
- **Cavity batten fixings (structural battens through thermal break to the steel frame)** - self-drilling 10-gauge galvanised Class 4 screws with a minimum head width of 7 mm. The screw length must allow a 10 mm minimum penetration through the steel framing.
- **Palliside nails (with structural cavity battens over timber frame)** - 40 x 2.5 mm hot-dip galvanised flat head nails.
- **Palliside weatherboard nail fixings (with non-structural cavity battens over timber frame)** - 60 x 3.15 mm annular groove hot-dip galvanised flat head nails.

[Note: Hot-dip galvanising must comply with AS/NZS 4680.]

- **Palliside weatherboard screw fixings (with structural cavity battens)** - 8-gauge x 32 mm long, galvanised Class 4 wood screws with a minimum head width of 5.5 mm.
- **Palliside weatherboard screw fixings (with non-structural cavity battens over timber frame)** - 8-gauge x 50 mm long [NZS 3604 Wind Zones up to and including Very High] or 8-gauge x 65 mm long [NZS 3604 Wind Zones up to and including Extra High and specific design wind pressures up to design differential 2.5 kPa ULS], galvanised Class 4 wood screws with a minimum head width of 5.5 mm.
- **Palliside weatherboard screw fixings (with non-structural cavity battens and thermal break over steel frame)** - self-drilling 6-gauge galvanised Class 4 screws with a minimum head width of 5.5 mm. The screw length must allow a 10 mm minimum penetration through the steel framing.
- **Palliside weatherboard brad fixings (with structural cavity battens over timber frame)** - Paslode ND50 Grade 304 stainless steel brads [2 per stud skewed].
- **Palliside weatherboard brad fixings (with non-structural cavity battens over timber frame)** - Paslode ND60 Grade 304 stainless steel brads [2 per stud skewed].

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Dynex Extrusions Ltd or the building contractor, whether on site or off site, is under the control of the building contractor. Palliside weatherboards and accessories are delivered to site in packs wrapped in plastic sleeves. The packs must be stacked flat, off the ground on bearers at maximum 600 mm centres and be restrained from collapse. Other materials must not be stacked on Palliside weatherboards and accessories. Long term storage must be dry and under cover. Palliside weatherboards should always be carried on edge and care must be taken to avoid damage to edges, ends and surfaces of the weatherboards.
- 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 the Palliside Cellular uPVC Weatherboard Cavity Cladding System. 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 the Palliside Cavity Cladding System 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 in Low, Medium, High and Very High Wind Zones, and maximum 400 mm centres in the Extra High Wind Zone and specific design wind pressures up to and including design differential 2.5 kPa ULS. In all cases, dwangs must be fitted flush between the studs at maximum 800 mm centres.
- 7.3 Timber framing must have a maximum moisture content of 18% at the time of the cladding application.

Steel Framing

- 7.4 Steel framing must be to a specific design meeting the requirements of the NZBC.
- 7.5 The minimum framing specification is 'C' section studs and nogs of overall section size of 75 mm web and 32 mm flange. Steel thickness must be minimum 0.55 mm.
- 7.6 Studs must be at maximum 600 mm centres in Low, Medium, High and Very High Wind Zones, and maximum 400 mm centres in the Extra High Wind Zone and specific design wind pressures up to and including design differential 2.5 kPa ULS. In all cases, dwangs must be fitted flush between the studs at maximum 800 mm centres.

General

- 8.1 Palliside weatherboards are suitable for fixing to timber and steel framing. When fixing to steel frames there are two options: fixing the Palliside weatherboard through the cavity batten and thermal break with self-drilling 6-gauge galvanised Class 4 screws with a minimum head width of 5.5 mm; or, fixing a structural cavity batten through the thermal break at 300 mm centres with self-drilling 10-gauge galvanised Class 4 screws with a minimum head width of 7 mm, with the Palliside weatherboard fixed to the cavity batten with self-drilling 8-gauge x 32 mm long, galvanised Class 4 wood screws with a minimum head width of 5.5 mm.
- 8.2 Standard window and internal corner moulding and flashings are used with both Rusticated and Traditional profiles. Alternative options for window and internal corner detailing are available for Traditional profiles. These are pre-cut scribes, 1-part internal corner, low profile under window bead and planted sill.
- 8.3 Punchings in the cavity vermin tray 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].
- 8.4 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.

- 8.5 At balcony, deck or roof/wall junctions, except where varied by the Technical Literature, the bottom edge of the Palliside Cavity Cladding System must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.
- 8.6 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. 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 fixing lengths must be increased by a minimum of the thickness of the underlay.
- 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. The Technical Literature provides some guidance. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.
- 8.8 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained 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 nominal mass of the Palliside Cavity Cladding System is 4.9 kg/m² and therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

- 9.2 The Palliside Cavity Cladding System will resist impacts likely to be encountered in normal residential use. The likelihood of impact damage to the cladding when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers provided for vulnerable areas.

Wind Zones

- 9.3 The Palliside Cavity Cladding System is suitable for use on buildings situated 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 design differential 2.5 kPa ULS wind pressure when the buildings are specifically designed.

Durability

Serviceable Life

- 10.1 Palliside Cavity Cladding System installations are expected to have a serviceable life equal to that of other weatherboard cladding systems when they are correctly maintained in accordance with this Appraisal and the Technical Literature.
- 10.2 On exposure to the environment, Palliside weatherboards will gradually lose gloss and coloured Palliside weatherboards will gradually fade.
- 10.3 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 Palliside weatherboards and accessories 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 for the Palliside Cavity Cladding System to continue to meet the NZBC durability performance provision and to maximise its serviceable life.

- 11.2 Annual inspections must be made to ensure that all aspects of the cladding system, including the flashings, moulded end plugs, solvent welds 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 Regular cleaning [at least annually] of the Palliside Cavity Cladding System surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the surface finish. Build-up of residue, mould or dirt can be removed by brushing with a soft brush, warm water and detergent. Abrasive cleaners, thinners, solvents or petrol must not be used to clean the Palliside Cavity Cladding System.
- 11.4 Painting may be considered necessary when the appearance of the Palliside weatherboards loses gloss or coloured weatherboards start to fade. Painting must be carried out in strict accordance with the instructions of Dynex Extrusions Ltd.
- 11.5 Minimum ground clearances as set out in this Appraisal must be maintained at all times during the life of the cladding.

Control of External Fire Spread

- 12.1 The Palliside Cavity Cladding System is suitable for use on buildings with an SH Risk Group classification, a building height of ≤ 10 m and at a distance of ≥ 1.0 m 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.

[Note: The scope of this Appraisal limits building heights to 10 m in accordance with the limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 (a). The building heights referenced in Paragraph 12.1 above are as defined in the Definitions Sections of NZBC Clauses C1 - C6 Protection from Fire.]

Prevention of Fire Occurring

- 13.1 Separation or protection must be provided to the Palliside Cavity Cladding System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 - C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 14.1 The Palliside Cavity Cladding System, when installed in accordance with this Appraisal and the Technical Literature, prevents 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 Clause E2.3.5.
- 14.3 The Palliside Cavity Cladding System allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with Clause E2.3.6.
- 14.4 The details given in the Technical Literature for weather sealing are based on the design 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 The use of the Palliside Cavity Cladding System where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

Water Vapour

- 15.1 The Palliside Cavity Cladding System is not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal and the Technical Literature will not create or increase the risk of moisture damage resulting from condensation. Refer to Paragraphs 15.2 and 15.3 for specific requirements for steel framed buildings.
- 15.2 Where the Palliside Cavity Cladding System is installed over a steel frame, an expanded polystyrene thermal break must be installed over the over each steel member under the wall underlay to provide a thermal break in accordance with the requirements of NZBC Acceptable Solution E3/AS1, Paragraph 1.1.4 [d].
- 15.3 The cavity battens and the rest of the Palliside Cavity Cladding System is then installed over the top of the wall underlay in accordance with the Technical Literature and this Appraisal.

Installation Information

Installation Skill Level Requirements

- 16.1 Installation of Palliside weatherboards and accessories supplied by Dynex Extrusions Ltd and the building contractor must be completed by tradespersons with an understanding of Palliside weatherboard installation in accordance with the instructions given within the Palliside Cladding System Technical Literature and this Appraisal.

System 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 manufacturer's instructions prior to the installation of the rest of the Palliside Cavity Cladding 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 sheathing 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 Battens

- 17.2 Cavity battens must be installed over the wall 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. Non-structural battens must be fixed in place with 40 x 2.5 mm hot-dip galvanised flat-head nails [timber frame] or self-drilling 6-gauge galvanised Class 4 screws [steel frame] at maximum 800 mm centres. Structural battens must be fixed in place with 60 x 2.8 mm hot-dip galvanised flat head nails [timber frame] or self-drilling 10-gauge galvanised Class 4 screws with a minimum head width of 7 mm [steel frame] at 300 mm centres.
- 17.3 Where studs are at greater than 450 mm centres and a flexible wall underlay is being used, a wall underlay support must be installed over the underlay at maximum 300 mm centres horizontally.

Aluminium Joinery Installation

- 17.4 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.

Palliside Cladding System Installation

- 17.5 Palliside weatherboards may be cut on site by hand saw, power saw with a fine toothed blade (minimum 20 teeth), jigsaw or router. Holes and cut-outs may be formed by using a hole saw or router.
- 17.6 Palliside weatherboards must be installed starting at the bottom of the wall. The bottom course of weatherboards must overhang the bottom plate by a minimum of 50 mm.
- 17.7 Before the weatherboards and aluminium joinery are installed, all base accessories, including the starter strip, corner soaker base and 2-part jointer base (if 2-part jointer is being used) must be fixed in place. Base accessories must be fixed to the wall frame at maximum 300 mm centres. The starter strip must be fixed level and must be left short of the selected corner option base piece and vertical trims.
- 17.8 The first course of weatherboards must be located on the starter strip and fixed in place. To ensure the boards remain flat they must be fixed progressively either from the centre of each board working out or away from one end only. A 3 mm thermal movement gap must be left where the boards join, and at each end of the board where they fit into trims.
- 17.9 The boards must be fixed at every vertical support through the fixing guide strip at the top of the board in accordance with Table 1. The nail or screw head must hold the board firmly, but must not be over-driven as damage can result. Subsequent boards clip over the nailing guide strip and conceal the nail or screw heads.

- 17.10 Window and door joinery head, sill and jamb flashings must be installed in accordance with the Technical Literature.
- 17.11 Internal corners must be finished with an internal corner mould. External corners must be finished with either moulded corner soakers fixed to a full length corner soaker base or by the boxed external corner. Corner moulds and board jointers must be jointed using Solvent Cement. Moulded end plugs must also be secured in place with Solvent Cement.

Inspections

- 17.12 The Technical Literature must be referred to during the inspection of Palliside Cavity Cladding System installations.

Finishing

- 17.13 The Palliside Cavity Cladding System is pre-finished and does not require painting at the completion of installation. Touch up of scratches and the like must be completed in accordance with the instructions of Dynex Extrusions Ltd.

Table 1: Fixing Selection

Fixing Type	NZS 3604 Wind Zones up to and including Very High (studs at 600 mm centres maximum)	NZS 3604 Wind Zone Extra High and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa (studs at 400 mm centres maximum)
40 x 2.5 mm hot-dip galvanised flat head Palliside nails (with structural cavity battens over timber frame).	✓	
60 x 3.15 mm annular groove hot-dip galvanised flat head nails (with non-structural cavity battens over timber frame).	✓	✓
8-gauge x 32 mm long galvanised Class 4 wood screws with a minimum head width of 5.5 mm (with structural cavity battens over timber and steel frame).	✓	✓
8-gauge x 50 mm long galvanised Class 4 wood screws with a minimum head width of 5.5 mm (with non-structural cavity battens over timber frame).	✓	
8-gauge x 65 mm long galvanised Class 4 wood screws with a minimum head width of 5.5 mm (with non-structural cavity battens over timber frame).	✓	✓
Paslode ND50 Grade 304 stainless steel brads (two skewed per stud crossing with structural cavity battens over timber frame).	✓	
Paslode ND60 Grade 304 stainless steel brads (two skewed per stud crossing with non-structural cavity battens over timber frame).	✓	
Self-drilling 6-gauge galvanised Class 4 screws with a minimum head width of 5.5 mm for steel framed buildings. The screw length must allow a 10 mm minimum penetration through the steel framing.	✓	✓

Health and Safety

18.1 Hearing and eye protection must be worn while cutting Palliside weatherboards and accessories.

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 the Palliside Cavity Cladding System was based on testing and evaluation of all details within the scope and as stated within this Appraisal. The Palliside Cavity Cladding System was tested to NZBC E2/VM1. The testing assessed the performance of the foundation detail, window head, jamb and sill details, meter box head, jamb and sill details, weatherboard lap, weatherboard jointers, internal and external corners and balustrade to wall junction. In addition to the E2/VM1 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 NZBC Acceptable Solution E2/AS1 for cavity-based weatherboard claddings.
- Uniform wind face load and fixing pull-out tests to simulate wind pressures on Palliside weatherboards were carried out by BRANZ, and the results were used in assessing the Palliside Cavity Cladding System.
- White Palliside weatherboards have been exposed in a weatherometer for 5000 hours. Samples of the weatherboard material were also exposed to ultraviolet (UV) light and were then microscopically examined and Gardner impact-tested in accordance with Appendices E and F of AS 2376 Part 1 - 1980. The results were used in assessing the durability of the Palliside Cavity Cladding System.

Other Investigations

- 20.1 Structural and durability opinions have been provided by BRANZ technical experts.
- 20.2 Experience with single skin, double skin (twin wall), and cellular uPVC wall claddings and other fully exposed uPVC exterior building products in New Zealand and overseas for many years has been noted, including structural and weathertightness performance, durability, and non-hazardous nature.
- 20.3 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 20.4 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 21.1 The manufacture of Palliside weatherboards and trim has been examined by BRANZ, and 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 Dynex Extrusions Ltd is the responsibility of Dynex Extrusions Ltd. The quality control system of Dynex Extrusions Ltd has been assessed and registered as meeting the requirements of ISO 9001: 2008.
- 21.3 The environmental management system of Dynex Extrusions Ltd has been assessed and registered as meeting the requirements of ISO 14001: 2004.
- 21.4 Quality of installation on site of components and accessories supplied by Dynex Extrusions Ltd 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 systems and joinery, wall underlays, flashing tapes and airseals in accordance with the instructions of Dynex Extrusions Ltd.
- 21.6 Building owners are responsible for the maintenance of the Palliside Cavity Cladding System in accordance with the instructions of Dynex Extrusions Ltd.



Sources of Information

- AS 2376.1 - 1980 Plastic Building Sheets - Extruded PVC.
- 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.
- Acceptable Solution 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).
- BRANZ Bulletin Number 582. Structurally fixed cavity battens, April 2015.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 19 October 2016.

This Appraisal has been amended to update the available length of Palliside Weatherboards.

Amendment No. 2, dated 30 October 2017.

This Appraisal has been amended to include alternative window and internal corner detailing for the Traditional Palliside weatherboard profile, and an alternative Palliside weatherboard, cavity batten, thermal break and steel frame fixing.



In the opinion of BRANZ, **Palliside Cellular uPVC Weatherboard 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 **Dynex Extrusions 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. **Dynex Extrusions 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 **Dynex Extrusions 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 **Dynex Extrusions Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

30 April 2015