



## BRANZ Appraised

Appraisal No. 788 [2019]

## WET-SEAL DS411 EXTERIOR WATERPROOFING MEMBRANE

Appraisal No. 788 [2019]

This Appraisal replaces BRANZ  
Appraisal No. 788 [2012]



### BRANZ Appraisals

Technical Assessments of products for  
building and construction.



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## Product

- 1.1 Wet-seal DS411 Exterior Waterproofing Membrane is a single part waterproofing membrane for use under ceramic or stone tile finishes on external decks and balconies.

## Scope

- 2.1 Wet-seal DS411 Exterior Waterproofing Membrane has been appraised as a waterproofing membrane on buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan areas; and,
  - with building structures designed and constructed to meet the requirements of the NZBC; and,
  - with deck and balcony supporting structures of timber framing with substrates of plywood and fibre cement compressed sheet; and,
  - with substrates of suspended concrete slabs; and,
  - situated in all Wind Zones of NZS 3604, up to and including 'Extra High'.
- 2.2 Wet-seal DS411 Exterior Waterproofing Membrane has also been appraised for use as a waterproofing membrane on specifically designed buildings within the following scope:
  - with building structures designed and constructed to comply with the NZBC; and,
  - with deck and balcony supporting structures of timber framing with substrates of plywood and fibre cement compressed sheet; and,
  - with substrates of suspended concrete slab; and,
  - subjected to maximum wind pressures [Refer Paragraph 7.7]; and,
  - with the weathertightness design of all junctions being the subject of specific design by the designer.

*Note: The design of these junctions has not been appraised by BRANZ and is outside the scope of this Appraisal.*
- 2.3 Decks and balconies waterproofed with Wet-seal DS411 Exterior Waterproofing Membrane must be designed and constructed in accordance with the following limitations:
  - constructed to suitable falls [Refer Paragraphs 12.3 - 12.6]; and,
  - with the membranes continually protected from exposure to UV (ultra violet) light and from physical damage by ceramic or stone tile finishes; and,
  - with decks and balconies designed and constructed such that deflections do not exceed 1/360<sup>th</sup> of the span; and,
  - with no steps within the deck level, no integral roof gardens and no down pipes discharging directly onto the deck.



- 2.4 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.
- 2.5 Ceramic or stone tile finishes are outside the scope of this Appraisal.
- 2.6 The membranes must be installed by trained applicators, approved by Wet-seal New Zealand Ltd.

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Wet-seal DS411 Exterior Waterproofing Membrane, 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 B2 DURABILITY:** Performance B2.3.1 (b) 15 years B2.3.2. Wet-seal DS411 Exterior Waterproofing Membrane will meet this requirement. See Paragraph 9.1.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1 and E2.3.2. Decks and balconies incorporating Wet-seal DS411 Exterior Waterproofing Membrane will meet these requirements. See Paragraphs 12.1 – 12.3.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Wet-seal DS411 Exterior Waterproofing Membrane will meet this requirement and will not present a health hazard to people.

## Technical Specification

- 4.1 Materials supplied by Wet-seal New Zealand Ltd are as follows:

### Wet-seal Exterior DS411

- Is a one component, latex modified polyurethane waterproofing membrane for exterior applications. It is supplied as terracotta coloured liquid in 17 litre pails.

### Polyspun Enviro Fabric

- A high strength, spunbond polyester reinforcement for reinforcing the entire body of the membrane. It is supplied as a 1.0 m wide or 142 mm wide strips x 15 m long roll and is coloured white.

## Handling and Storage

- 5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The materials in the original unopened packaging have a shelf life of 12 months from date of manufacture. Once opened, the materials must be used within 3 months.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Wet-seal DS411 Exterior Waterproofing Membrane. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.



## Design Information

### General

- 7.1 Wet-seal DS411 Exterior Waterproofing Membrane is for use on decks and balconies where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 The membrane must be protected from exposure to UV light and from physical damage by ceramic or stone tile finishes.
- 7.3 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to the BRANZ Good Practice Guide – Membrane Roofing.
- 7.4 Movement and control joints may be required depending on the shape and size of the deck, and the finish specified. Design guidelines for control joints for tiles can be found in the BRANZ Good Practice Guide – Tiling.
- 7.5 Timber framing must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and that all sheet edges are fully supported.
- 7.6 Timber framing supporting the substrates must be constructed such that deflections do not exceed 1/360<sup>th</sup> of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.
- 7.7 Wet-seal DS411 Exterior Waterproofing Membrane is suitable for use in areas subject to maximum wind pressures of 6 kPa Ultimate Limit State.

### Substrates

#### Plywood

- 8.1 Plywood must be treated to H3 [CCA treated]. LOSP treated plywood must not be used. Plywood must comply with NZBC Acceptable Solution E2/AS1 Paragraph 8.5.3 and 8.5.5.

#### Fibre Cement Compressed Sheet

- 8.2 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS 2908.2 and must be specified by the manufacturer as being suitable for use as an external decking substrate. The fibre cement sheet must be of a thickness to meet specific structural design requirements and must be secured to the structure to resist wind uplift and all other forces acting on the deck or balcony, such as deflection from gravity and live loads. Installation must be in accordance with instructions of the manufacturer.

#### Concrete

- 8.3 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101.

### Durability

#### Serviceable Life

- 9.1 Wet-seal DS411 Exterior Waterproofing Membrane, when subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tiling finishes with a design service life of 15-25 years.



### Maintenance

- 10.1 No maintenance of the membrane will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiling to ensure it is sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiling and any grout or sealant.
- 10.2 In the event of damage to the membrane, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.
- 10.3 Drainage outlets must be maintained to operate effectively, and tile finishes must be kept clean. Cleaning materials that may affect polymer based membranes must not be used.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to the Wet-seal DS411 Exterior Waterproofing Membrane from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 12.1 Decks and balconies must be designed and constructed to shed precipitated moisture. They must also take account of snowfalls in snow prone areas. A means of meeting code compliance with NZBC Clause E2.3.1 is given by the Technical Literature which gives details aligned with NZBC Acceptable Solution E2/AS1.
- 12.2 When installed in accordance with this Appraisal and the Technical Literature, Wet-seal DS411 Exterior Waterproofing Membrane will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membrane is impervious to water and will give a weathertight deck or balcony.
- 12.3 The minimum fall to decks and balconies is 1 in 40 and gutters are 1 in 60 and all falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane and tiling finish.
- 12.4 Wet-seal DS411 Exterior Waterproofing Membrane is impermeable; therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with NZBC Clause E2.3.6.
- 12.5 Deck and balcony falls must be built into the substrate and not created with mortar screeds applied over the membrane.
- 12.6 Allowance for deflection and settlement of the substrate must be made in the design of the deck or balcony to ensure falls are maintained and no ponding of water can occur.
- 12.7 Drainage flanges must be used for any outlet and must be fitted with a grate or cage to reduce potential sources of blockages. An overflow must be provided where the deck or balcony does not drain to an external gutter or spouting.
- 12.8 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of deck and balcony drainage.
- 12.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

## Installation Information

### Installation Skill Level Requirement

- 12.2 All design and building work must be carried out in accordance with the Wet-seal DS411 Exterior Waterproofing Membrane Technical Literature and this Appraisal. All building work must be undertaken by Wet-seal New Zealand Ltd Approved Applicators. Where the work involves Restricted Building Work this must also be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License class.

### Preparation of Substrates

- 13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents. All surface defects must be filled to achieve an even and uniform surface.
- 13.2 The relative humidity of concrete substrates must be 75% or less before membrane application. The concrete can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 424.
- 13.3 The moisture content of the timber substructure and plywood must be a maximum of 20% and fibre cement and plywood sheets must be dry at time of membrane application. This will generally require plywood and fibre cement sheets to be covered until just before the membrane is laid, to prevent rain wetting.
- 13.4 Substrates must be primed with the recommended primer for the substrate and allowed to dry fully before the membrane is installed.

### Membrane Installation

- 14.1 Installation must not be undertaken where the substrate surface temperature is below 5°C or above 35°C.
- 14.2 Wet-seal DS411 Exterior Waterproofing Membrane must be thoroughly stirred before application.
- 14.3 The membrane must be applied in a minimum three steps method set out in the Technical Literature. Subsequent coats must be applied in an opposite direction to the previous coat. The total finished system thickness of the membrane must be a minimum of 1 mm.
- 14.4 Application can be made by roller, textured roller for the first step and a medium nap roller for the final coats. A brush is used for all detailing work.
- 14.5 In all situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.
- 14.6 It is strongly recommended that the membrane is protected with temporary covers until it is fully cured in case of mechanical damage or rain wetting.
- 14.7 Clean up may be undertaken with water.

### Tiling

- 15.1 The membrane must be fully cured before tiling. The cured membrane must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.
- 15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide - Tiling. The compatibility of tile adhesive must be confirmed with the adhesive manufacturer or Wet-seal New Zealand Ltd.



## Inspections

- 16.1 Critical areas of inspection for waterproofing systems are:
- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
  - Moisture content of the substrate prior to the application of the membrane.
  - Acceptance of the substrate by the membrane installer prior to application of the membrane.
  - Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
  - Membrane curing and integrity prior to the installation of tiles, including protection from moisture, frost and mechanical damage during curing.

## Health and Safety

- 17.1 Safe use and handling procedures for the membrane system are provided in the Technical Literature. The product must be used in conjunction with the relevant Materials Safety Data Sheet for the membrane.

## Basis of Appraisal

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

### Tests

- 18.1 The following testing of Wet-seal DS411 Exterior Waterproofing Membrane has been undertaken:
- AS/NZS 4858 Appendix A including effect of heat ageing, bleach, detergent and water on tensile and elongation, water vapour transmission, cyclic movement resistance requirements of AS/NZS 4858 Appendix B, water absorption, peel adhesion, dry pull-off / tensile adhesive test on plywood, dry pull-off / tensile adhesive test on fibre cement, puncture resistance and low temperature flexibility.
- 18.2 The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

### Other Investigations

- 19.1 An assessment was made of the durability of Wet-seal DS411 Exterior Waterproofing Membrane by BRANZ technical experts.
- 19.2 Site inspections were carried out by BRANZ to examine the practicability of installation.
- 19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

### Quality

- 20.1 The manufacture of the membrane 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.
- 20.2 The quality management system of the membrane manufacturer has been assessed by BRANZ and found to be satisfactory.
- 20.3 The quality of supply to the market is the responsibility of Wet-seal New Zealand Ltd.
- 20.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing system and the substrates.
- 20.5 Quality on site is the responsibility of the Wet-seal New Zealand Ltd Approved and Trained Applicators.
- 20.6 Building owners are responsible for the maintenance of the ceramic tiles in accordance with the instructions of Wet-seal New Zealand Ltd.



### Sources of Information

- AS 2908.2: 2000 Cellulose-cement products – Flat sheet.
- AS 3958.1: 2007 Guide to the installation of ceramic tiles.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2269: 2012 Plywood – Structural.
- AS/NZS 4858: 2004 Wet area membranes.
- Good Practice Guide – Tiling (3rd Edition), BRANZ, 2015.
- Good Practice Guide – Membrane Roofing (2nd Edition), BRANZ, 2015.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3604: 2011 Timber framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments – Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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15 October 2019

WET-SEAL DS411 EXTERIOR  
WATERPROOFING MEMBRANE



In the opinion of BRANZ, the **Wet-seal DS411 Exterior Waterproofing Membrane** 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 **Wet-seal New Zealand Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the Technical Literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **Wet-seal New Zealand Ltd:**
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions;
  - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by **Wet-seal New Zealand Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Wet-seal New Zealand Ltd** or any third party.

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For BRANZ

**Chelydra Percy**

Chief Executive

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15 October 2019