



**BRANZ Appraised**  
Appraisal No. 1072 [2019]

## HYDRA WALL UNDERLAY

Appraisal No. 1072 [2019]



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



#### Marshall Innovations Limited

PO Box 9411  
Greerton  
Tauranga  
Tel: 07 543 0948  
Web: [www.mwnz.com](http://www.mwnz.com)



#### BRANZ

BRANZ  
1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



## Product

- 1.1 HYDRA Wall Underlay is a synthetic building underlay for use under wall claddings. The product consists of a plain non woven scrim and a woven bottom scrim with a polymeric laminated face. HYDRA Wall Underlay is coloured white and printed with the HYDRA logo on the top and bottom faces.

## Scope

- 2.1 HYDRA Wall Underlay has been appraised for use as a flexible wall underlay on timber and steel framed buildings with in the following scope:
  - the scope limitations of E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
  - with direct fixed absorbent and non-absorbent wall claddings; or,
  - with absorbent and non-absorbent wall wall claddings installed over an 18 mm minimum drained cavity; or,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or to specific design for steel framed buildings; and,
  - situated in NZS 3604 Wind Zones up to and including Very High
- 2.2 HYDRA Wall Underlay has also been appraised for use as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solutions E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
  - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or to a specific design for steel framed buildings; and,
  - situated in NZS 3604 Wind Zones up to and including Extra High
- 2.3 HYDRA Wall Underlay has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of HYDRA Wall Underlay into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.

## Building Regulations

### New Zealand Building Code

- 3.1 In the opinion of BRANZ, HYDRA Wall Underlay, if designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:

**Clause B2 DURABILITY:** Performance B2.3.1 [a], not less than 50 years, B2.3.1 b), 15 years and B2.3.2 HYDRA Wall Underlay meets these requirements. See Paragraphs 9.1 and 9.2

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the cladding system, HYDRA Wall Underlay will contribute to meeting this requirement. See Paragraphs 12.1- 12.3.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. HYDRA Wall Underlay meets this requirement and will not present a hazard to people.

## Technical Specification

- 4.1 HYDRA Wall Underlay is a synthetic building underlay for use under wall claddings. The product consists of a plain non woven top scrim and a woven bottom scrim with a polymeric laminated facer. HYDRA Wall Underlay is coloured white on the top and bottom faces.
- 4.2 The product is supplied in rolls 1.37 m wide x 36.5 m long or 2.74 m wide x 37.0 m long.
- 4.3 Accessories used with HYDRA Wall underlay which are supplied by the installer are:
- Fixings - Stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.
  - Wall underlay support - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall wrap in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

## Handling and Storage

- 5.1 Handling and storage of the HYDRA Wall Underlay, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for HYDRA Wall Underlay. 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

### Timber and Steel Framing

- 7.1 Studs must be provided at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 1200 mm centres.

### General

- 7.2 HYDRA Wall Underlay is intended for use as an alternative to conventional building papers which are fixed over timber and steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.
- 7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.
- 7.4 HYDRA Wall Underlay must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.

- 7.5 HYDRA Wall Underlay is suitable for use under wall claddings as an absorbent wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23. HYDRA Wall Underlay is suitable for use under cavity based wall claddings as called up in NZS 2295, Table 2.4 on steel framed buildings. Refer to Table 1.
- 7.6 HYDRA Wall Underlay is also suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 [c]. Refer to Table 1.

**Table 1: NZBC E2/AS1 Table 23 Requirements**

<b>NZBC E2/AS1 Table 23 Wall Wrap Properties</b>	<b>Property Performance Requirement</b>	<b>Actual Property Performance</b>
Absorbency	$\geq 100 \text{ g/m}^2$	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 20 \text{ mm}$	Pass
pH of Extract	$\geq 5.5$ and $\leq 8$	Pass
Shrinkage	$\leq 0.5\%$	Pass
Edge Tear	Edge Tear Machine Direction $\geq 100$ Cross Direction $\geq 55$	<b>Edge Tear:</b> Machine Direction = 191.3 N Cross Direction = 145.6 N
Tensile	<b>Tensile Strength</b> Machine Direction $\geq 2$ Cross Direction $\geq 1$	<b>Tensile Strength:</b> Machine Direction = 4.53 kN/m Cross Direction = 3.32 kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^3$	Pass

- 7.7 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- 7.8 HYDRA Wall Underlay is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations. HYDRA Wall Underlay is suitable for use under cavity based wall claddings as an absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings.

#### **Stucco Plaster**

- 7.9 HYDRA Wall Underlay is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1. The wall underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.
- 7.10 HYDRA Wall Underlay may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 [b].

#### **Structure**

- 8.1 HYDRA Wall Underlay is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid building underlays.

### Durability

- 9.1 HYDRA Wall Underlay meets code compliance with NZBC Clause B2.3.1 [a], not less than 50 years for building wraps used where the cladding durability requirement or expected serviceable life is not less than 50 years, and code compliance with NZBC Clause B2.3.1 [b], 15 years for building wraps used where the cladding durability requirement is 15 years.

### Serviceable Life

- 9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, HYDRA Wall Underlay is expected to have a serviceable life equal to that of the cladding.

### Control of Internal Fire and Smoke Spread

- 10.1 HYDRA Wall Underlay has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to HYDRA Wall Underlay 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

- 12.1 HYDRA Wall Underlay must be used behind claddings that meet the requirements of the NZBC, e.g. such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.
- 12.2 HYDRA Wall Underlay, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding systems compliance with NZBC Clause E2.
- 12.3 When used as an air barrier, particular care must be taken to ensure an air tight barrier is achieved, and weather sealing at all openings and penetrations through the cladding meets the requirements of the NZBC.

## Installation Information

### Installation Skill Level Requirements

- 13.1 All design and building work must be carried out in accordance with the HYDRA Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work [RBW] this must be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License class.

### Wrap Installation

- 14.1 HYDRA Wall Underlay must be fixed to all framing members at maximum 300 mm centres with hot-dip galvanised, large-head clouts 20 mm long, zinc plated 6-8 mm staples, self-drilling screws, or proprietary wrap fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 HYDRA Wall Underlay must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

- 14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess wall underlay may be cut off flush with the internal face of the wall frame.
- 14.4 HYDRA Wall Underlay can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3.
- 14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.
- 14.6 Any damaged areas of HYDRA Wall Underlay, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

#### **Inspections**

- 14.7 The Technical Literature must be referred to during the inspection of HYDRA Wall Underlay installations.

### **Basis of Appraisal**

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

#### **Tests**

- 15.1 The following tests have been carried out on HYDRA Wall Underlay by BRANZ: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.
- 15.2 The following tests have been carried out on HYDRA Wall Underlay by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421. A range of these tests were completed before and after Marshall Hydra Underlay was exposed to ultra-violet light.
- 15.3 The Flammability Index of HYDRA Wall Underlay has been evaluated in accordance with AS 1530.2.

#### **Other Investigations**

- 16.1 A durability opinion was given by BRANZ technical experts.
- 16.2 Site inspections were carried out by BRANZ to assess methods used for the installation of HYDRA Wall Underlay, and to examine completed installations.
- 16.3 The marketer's Technical Literature, including installation instructions, have been examined by BRANZ and found to be satisfactory.

#### **Quality**

- 17.1 The manufacture of HYDRA Wall Underlay has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 17.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall wrap into their design in accordance with the instructions of Marshall Innovations Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.



### Sources of Information

- AS 1530.2 – 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp – cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays – materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays – Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays – Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- 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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18 November 2019

HYDRA WALL UNDERLAY



In the opinion of BRANZ, **HYDRA Wall Underlay** 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 **Marshall Innovations 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. **Marshall Innovations 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 **Marshall Innovations 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 **Marshall Innovations Limited** or any third party.

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**For BRANZ**

**Chelydra Percy**

Chief Executive

Date of Issue:

18 November 2019