



**BRANZ Appraised**

Appraisal No.461 [2010]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 461 (2010)**

This Appraisal replaces BRANZ  
Appraisal No. 461 (2005) issued  
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**PROTECTO WRAP  
AFM®-WM WET AREA  
MEMBRANE**

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## Product

1.1 Protecto Wrap AFM®-WM Wet Area Membrane is a self adhesive sheet waterproofing membrane for use under ceramic or stone tile finishes in internal wet areas.



## Scope

2.1 Protecto Wrap AFM®-WM Wet Area Membrane has been appraised for use as a waterproofing membrane for internal wet areas of buildings, within the following scope:

- on floor substrates of concrete, flooring grade particle board, plywood, compressed fibre cement sheet and fibre cement sheet tile underlay, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic or stone tile finishes; and,
- where floors are designed and constructed such that deflections do not exceed 1/360<sup>th</sup> of the span.

2.2 The use of Protecto Wrap AFM®-WM Wet Area Membrane on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.

2.3 Building structural 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 are specific to each building, and therefore the responsibility of the building designer and building contractor and are outside the scope of this Appraisal.

2.4 Ceramic or stone tile finishes are outside the scope of this Appraisal.

2.5 The membrane must be installed by Marshall Waterproofing NZ/AUS Ltd certified installer.

## Building Regulations

### New Zealand Building Code (NZBC)

**3.1** In the opinion of BRANZ, Protecto Wrap AFM®-WM Wet Area 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. Protecto Wrap AFM®-WM Wet Area Membrane meets this requirement. See Paragraph 9.1.

**Clause E3 INTERNAL MOISTURE:** Performance E3.3.6. Interior wet area floors and walls incorporating Protecto Wrap AFM®-WM Wet Area Membrane will meet this requirement. See Paragraphs 11.1- 11.6.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Protecto Wrap AFM®-WM Wet Area Membrane meets this requirement and will not present a health hazard to people.

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

## Technical Specification

4.1 Materials supplied by Marshall Waterproofing NZ/AUS Ltd are as follows:

### Membrane

- Protecto Wrap AFM®-WM membrane is 1 mm thick and consists of a fabric reinforcement laminated to an SBS modified, rubberized, asphalt adhesive membrane with a 50 mm wide peel-and-stick side overlap strip. It is available in rolls 900 mm wide x 23 m long.

### Accessories

- AFM500 Detail Tape is a 1 mm thick unreinforced conformable tape used for detailing internal corners, drains, posts and penetrations. The tape is installed prior to installation of the membrane.
- #6000 Primer is a water-based primer for use on indoor applications. It is used at full strength.
- JS160H Mastic is a rubberized, adhesive, liquid membrane used as a sealant at membrane terminations and at end laps; for seam sealing and for membrane repairs.

### Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight, at temperatures between 10°C and 32°C. Materials must not be removed from the packaging until ready to use. The membrane product has a shelf life of 2 years from date of manufacture in the original unopened packaging. Once opened, the products 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 the Protecto Wrap AFM®-WM Wet Area 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 Protecto Wrap AFM®-WM Wet Area Membrane is for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.

7.2 The membrane must be protected from physical damage by the application of ceramic or stone tile finishes.

7.3 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ "Good Practice Guide Tiling".

7.4 Timber framing systems 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 NZS 4203. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

### Substrates

#### Plywood

8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 (CCA treated). **LOSP treated plywood must not be used.** The Plywood must be supported with dwangs or framing with a maximum span of 400 mm in each direction, fixed with 10g x 50 mm stainless steel countersunk head screws at 150 mm centres on the edges and 200 mm through the body of the sheets.

#### Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

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 a wet area substrate. Installation must be in accordance with the instructions of the manufacturer.

#### Concrete and Concrete Masonry

8.3 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 and NZS 3604 Concrete Slab-On-Ground Floors and Concrete masonry to NZS 4229 and NZS 4230.

#### Wet Area Wall Linings

8.4 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be covered by a valid BRANZ Appraisal for use in internal wet areas.

8.5 Fibre cement 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 a wet area lining. Installation must be in accordance with the instructions of the manufacturer.

## Durability

### Serviceable Life

9.1 Protecto Wrap AFM®-WM Wet Area Membrane, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tile finishes with a design service life of 15-25 years.

### Maintenance

10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grouts and sealants.

10.2 In the event of damage to the membranes, 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 ceramic or stone tile finishes must be kept clean.

### Internal Moisture

11.1 Protecto Wrap AFM®-WM Wet Area Membrane is impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 Protecto Wrap AFM®-WM Wet Area Membrane is suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of Code Compliance for overflow is given in NZBC Acceptable Solution E3/AS1 Paragraph 2.

11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of Code Compliance to NZBC Clause E3.3.3 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1 (b), 3.1.2 (b) and 3.3.1 (b).

11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes must be provided and the floor must fall to the outlet.

11.5 The waterproofing membrane must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, BRANZ "Good Practice Guide Tiling", and flooring and wallboard manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30mm.

## Installation Information

### Installation Skill Level Requirement

12.1 Installation of the membranes must be completed by Marshall Waterproofing NZ/AUS Ltd certified installer.

12.2 Installation of substrates must be completed by tradespersons with an understanding of internal wet area construction, in accordance with instructions given within the Marshall Waterproofing NZ/AUS Ltd Technical Literature and this Appraisal.

## Preparation of Substrates

13.1 Concrete slabs and plywood must be dry and sound before installation proceeds. Concrete slabs can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin Number 424. The relative humidity of the concrete surface must be 75% or less, and the moisture content for plywood must be a maximum of 20% before laying the membrane.

13.2 The ambient and substrate temperatures must be between 7°C and 49°C before laying the membrane.

13.3 Surfaces must be smooth and free from sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents. All surface defects must be filled to achieve a smooth and uniform surface.

13.4 Sheet materials must be installed in accordance with the relevant manufacturers instructions. All sheet edges must be supported by framing.

13.5 Substrates must be primed with #6000 Primer and allowed to cure before the membrane is installed. When fully cured the primer is tacky and will not come off the surface.

13.6 Primed surfaces must be covered with the membrane on the same day that the primer is applied, or they must be reprimed.

### Membrane Installation

14.1 All corners (floor to wall) and areas around pipes, conduits and any other penetrations through the substrate must be primed with #6000 Primer and then taped with AFM500 Detail Tape. The tape must be formed to fit tightly to the penetrations and the substrate.

14.2 Drain openings must be primed with #6000 Primer and then taped with AFM500 Detail Tape. The tape must extend at least 150 mm beyond the perimeter of the drain.

14.3 The membrane is cut to the length necessary for it to extend 150 mm in all directions beyond the area to be covered. The first edge of the release paper is carefully removed and the membrane is then aligned and pressed into place. The release paper is continuously removed, exposing the adhesive underside, while the membrane is smoothed onto the primed surface. Continuing to smooth the membrane as it comes into contact with the primer is essential to achieving adhesion and preventing the trapping of air.

14.4 Adjoining Protecto Wrap AFM®-WM membrane sheets are aligned with the overlap strip of the installed sheet, giving a 50 mm overlap. The lap joint must be firmly rolled to create a cohesive bond between the two membrane sheets.

14.5 End joints must be lapped a minimum of 150 mm and sealed using JS160H Mastic, in accordance with the Technical Literature.

14.6 After application, the membrane must be inspected, and any defects repaired. If the membrane is damaged or requires repair, the area must be cleaned and lightly primed with #6000 Primer to 150 mm beyond the damaged area. A patch of Protecto Wrap AFM®-WM membrane is cut and rolled on firmly. A troweled bead of JS160H Mastic must be applied to the edges of the patch.

### Tiling

15.1 Tiling directly to the Protecto Wrap AFM®-WM Deck and Balcony Membrane may be carried out immediately after the membrane has been laid.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and BRANZ "Good Practice Guide Tiling". The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Marshall Waterproofing NZ/AUS Ltd.

## Inspections

16.1 Critical areas of inspection 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 integrity prior to the installation of tiles including protection from damage.

## Health and Safety

17.1 Safe use and handling procedures for the membranes are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

## Basis of Appraisal

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

### Tests

18.1 Tests have been carried out by Ramtech Laboratories Inc. in accordance with ICC Evaluation Services Acceptance Criteria for Waterproof Membranes used under Ceramic Tiles, AC 115 and ANSI 118.10. These tests covered fungus and micro-organism growth, seam strength, breaking strength, dimensional stability, waterproofness and shear strength to ceramic tiles. The test results were reviewed by BRANZ experts and found to be satisfactory.

18.2 Testing covering pliability, water resistance, tensile strength, elongation, nail sealability, peel adhesion, UV sunlamp exposure, bursting strength and peel strength have been undertaken by other organisations.

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 the Protecto Wrap AFM®-WM Wet Area Membrane by BRANZ technical experts.

19.2 Site visits have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

### Quality

20.1 The manufacture of Protecto Wrap AFM®-WM membrane has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory. USA evaluation reports have been taken into consideration.

20.2 The quality of manufacture of Protecto Wrap AFM®-WM membrane is the responsibility of the Protecto Wrap Company.

20.3 The quality of supply of the membrane system materials to the market is the responsibility of Marshall Waterproofing NZ/AUS Ltd.

20.4 Quality on site is the responsibility of the Marshall Waterproofing NZ/AUS Ltd certified installer.

20.5 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Marshall Waterproofing NZ/AUS Ltd and this Appraisal.

20.6 Building owners are responsible for the maintenance of the tiling or stone finishing systems in accordance with the instructions of Marshall Waterproofing NZ/AUS Ltd.

### Sources of Information

- ANSI 118.10: 1999 Load bearing, bonded, waterproof membranes for thin-set ceramic tile and dimension stone installations.
- AC 115 Criteria for Waterproof Membranes for Flooring and Shower Liners.
- AS 2908.2: 2000 Cellulose-cement products - flat sheet.
- AS 3740 – 2004 Waterproofing of wet areas within residential buildings.
- AS 3958.1: 1991 Guide to the installation of ceramic tiles.
- AS/NZS 4858 - 2004 Wet area membranes.
- AS/NZS 2269: 2008 Plywood - Structural.
- NZS 3101: 1995 The design of concrete structures.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4229: 1999 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 1990 Code of practice for the design of masonry structures.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition May 2007.
- The Building Regulations 1992, up to, and including August 2008 Amendment.
- Good Practice Guide Tiling, BRANZ, March 2004.
- Good Practice Guide Membrane Roofing, BRANZ, October 2003.



**BRANZ**

In the opinion of BRANZ, **Protecto Wrap AFM®-WM Wet Area 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 **Marshall Waterproofing NZ/AUS 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. **Marshall Waterproofing NZ/AUS 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 **Marshall Waterproofing NZ/AUS 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 **Marshall Waterproofing NZ/AUS Ltd** or any third party.

For BRANZ

P Burghout  
Chief Executive

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