



**BRANZ Appraised**

Appraisal No.449 [2005]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
CERTIFICATE  
No. 449 (2005)**

**PROTECTO WRAP  
AFM®-WM DECK AND  
BALCONY MEMBRANE**

**Marshall Waterproofing  
NZ/Aus Ltd**

P O Box 9411

Greerton

Tauranga

Tel: 07 543 0948

Fax: 07 541 1029



**BRANZ Limited**  
Private Bag 50 908  
Porirua City  
New Zealand  
Tel: +64 4 237 1170  
Fax: +64 4 237 1171  
[www.branz.co.nz](http://www.branz.co.nz)

**BRANZ Pty Ltd**  
P O Box 830  
Brookvale  
NSW 2100  
Australia  
Tel: +61 2 9938 6011  
Fax: +61 2 9938 6911  
[www.branz.com.au](http://www.branz.com.au)



## Product

- 1.1 Protecto Wrap AFM®-WM membrane is manufactured from styrene-butadiene-styrene (SBS) modified asphalt with a laminated fabric top.
- 1.2 Protecto Wrap AFM®-WM membrane is a waterproofing membrane for use under ceramic thin set tiles. It is also used as a flexible layer to reduce the likelihood of tile cracking due to building movement.
- 1.3 The membrane is self-adhesive on the underside. A release film protects the adhesive surface, and is removed during installation.



## Scope

- 2.1 Protecto Wrap AFM®-WM membrane has been appraised for use as a waterproofing membrane for pedestrian decks and balconies within the following scope:
  - on substrates of plywood on timber framed decks and balconies within the scope of E2/AS1 Third Edition June 2004; or,
  - on substrates of concrete; and,
  - when protected from ultra-violet (UV) exposure and physical damage by ceramic tiles; and,
  - where decks and balconies are designed and constructed such that deflections do not exceed 1/360<sup>th</sup> of the span.
- 2.2 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the movement and control joints is specific to the building and therefore is the responsibility of the building designer and building contractor and is outside the scope of this Certificate.
- 2.3 Tiling finishes are outside the scope of this Certificate.
- 2.4 Installation of AFM®-WM membrane and accessories must be carried out only by Marshall Waterproofing NZ/Aus Ltd licenced applicators.

*Note: An alternative anti-fracture membrane is available for use when a waterproofing membrane is not required. Protecto Wrap AFM® membrane is similar to AFM®-WM membrane except without an overlap strip for waterproofing. This membrane is outside the scope of the NZBC and this Certificate. For further information please refer to Marshall Waterproofing NZ/Aus Ltd.*

## Building Regulations

New Zealand Building Code (NZBC)

**3.1 In the opinion of BRANZ, Protecto Wrap AFM®-WM membrane, if designed, used, installed and maintained in accordance with the statements and conditions of this Certificate, will meet or contribute to meeting the following provisions of the NZBC:**

**Clause B2 DURABILITY:** Performance B2.3.1(b), 15 years. Protecto Wrap AFM®-WM membrane meets this requirement. See Paragraph 9.1.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. Decks and balconies incorporating Protecto Wrap AFM®-WM membrane meet this requirement. See Paragraph 12.1-12.7.

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

3.2 This Certificate appraises AFM®-WM membrane as an Alternative Solution in terms of New Zealand Building Code Compliance. Protecto Wrap AFM®-WM membrane is an alternative to the membranes specified in NZBC Acceptable Solution E2/AS1 Third Edition June 2004.

## 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.
- #100 Primer is an exterior-grade solvent-based primer. 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 in a dry place indoors, away from direct sunlight and heat, at temperatures between 10°C and 32°C. Materials must not be removed from the packaging until ready to use. The products have a shelf life of two years from the date of manufacture.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ Website for details of the current Technical Literature for Protecto Wrap AFM®-WM membrane. The Technical Literature must be read in conjunction with this Certificate. All aspects of design, use, installation and maintenance contained within the scope of this Certificate and the Technical Literature must be followed.

## Design Information

### General

7.1 Protecto Wrap AFM®-WM membrane is for use where an impervious waterproof membrane is required on decks and balconies to prevent damage to building elements and adjoining areas.

7.2 The membrane must be covered with ceramic tiles. The tiling finish must protect the membrane from exposure to UV light and physical damage.

7.3 Movement and control joints may be required depending on the shape and size of the deck and the tiling finish. Design guidance can be found in the BRANZ Tiling Good Practice Guide.

7.4 Effective control of moisture in the structure must be considered due to the impermeability of the membrane.

### Substrates

8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, at least CD grade and used with the C face upwards.

8.2 Where LOSP treated plywood is used, the solvents must be allowed to evaporate off over a period of at least one week before installation of the membrane.

8.3 Concrete substrates must be designed in accordance with NZS 3101.

### Durability

#### Serviceable Life

9.1 Protecto Wrap AFM®-WM 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 tiling finishes with a design service life of 15 – 25 years. This is conditional on the membranes not being exposed to the weather or UV light for a total of more than four weeks.

### Maintenance

10.1 No maintenance of the membrane will be required provided significant substrate movement does not occur and the tiling finish remains intact. Regular checks must be made of 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, grout and sealants.

10.2 In the event of damage to the waterproofing membrane the tiling must be removed. Repair can be carried out by applying a patch of suitable membrane. See Paragraph 15.6.

10.3 Drains and outlets must be maintained to operate effectively, and tiling finishes must remain clean. Cleaning materials that could affect polymer modified asphalt must not be used.

### Outbreak of Fire

11.1 Protecto Wrap AFM®-WM membrane must be protected or separated from fireplaces, heating appliances, chimneys and flues in accordance with the requirements of Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

## External Moisture

12.1 Decks and balconies must be designed and constructed to meet code compliance with Clause E2.3.1 (shed precipitated moisture). They must also take account of snowfalls in snow prone areas. A means of code compliance to meet Clause E2.3.1 is given by NZBC Acceptable Solution E2/AS1 Third Edition June 2004 Paragraph 8.5.

12.2 When installed in accordance with this Certificate and the manufacturer's Technical Literature, Protecto Wrap AFM®-WM membrane will prevent the penetration of water and will therefore meet code compliance with Clause E2.3.2. The membrane is impervious to water and will give a weathertight deck capable of accepting minor structural movements.

12.3 Protecto Wrap AFM®-WM membrane is impermeable, therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with Clause E2.3.6.

12.4 The minimum fall to decks and balconies must be 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 tiling finish.

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.

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.

## Installation Information

### Installation Skill Level Requirements

13.1 Installation and finishing of materials supplied by Marshall Waterproofing NZ/Aus Ltd must be completed in accordance with the Technical Literature by trained applicators, licenced by Marshall Waterproofing NZ/Aus Ltd.

13.2 Installation of substrates must be completed by tradespersons with a thorough understanding of deck and balcony construction, in accordance with instructions given within the Technical Literature and this Certificate.

### Preparation of substrates

14.1 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.

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

14.3 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.

14.4 Plywood must be installed in accordance with NZBC Acceptable Solution E2/AS1 Third Edition June 2004 Paragraph 8.5.5.1 and the relevant manufacturer's instructions.

14.5 Substrates must be primed with #100 Primer and allowed to cure before the membrane is installed. When fully cured the primer is tacky and will not come off the surface.

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

## Membrane Installation

15.1 All corners (floor to wall) and areas around pipes, conduits and other penetrations through the substrate must be primed with #100 Primer and then taped with piece of AFM500 Detail Tape. The tape must be formed to fit tightly to the penetrations and the substrate.

15.2 Drain openings must be primed with #100 Primer and then taped with AFM500 Detail Tape. The tape must extend at least 150 mm beyond the perimeter of the drain.

15.3 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.

15.4 Adjoining 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.

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

15.6 After installation, the membrane must be inspected, and any defects repaired. If the membrane is damaged or requires repair, the area is to be cleaned and lightly primed with #100 Primer to 150 mm beyond the damaged area. A patch of 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

16.1 Tiling directly to the Protecto Wrap AFM®-WM membrane may be carried out immediately after the membrane has been laid.

16.2 All tiling must be carried out in accordance with AS 3958.1 and BRANZ Tiling Good Practice Guide. The compatibility of tile adhesives must be confirmed with the adhesive manufacturer or Marshall Waterproofing NZ/Aus Ltd.

## Inspections

17.1 The Technical Literature must be referred to during the inspection of Protecto Wrap AFM®-WM membrane installations by building consent authorities and territorial authorities.

## Health and Safety

18.1 Extra precautions must be taken when using #100 Primer and JS160H Mastic in areas where there is insufficient ventilation. Suitable respiratory equipment must be worn at all times.

18.2 Additional information on Protecto Wrap AFM®-WM membrane and accessories is available in the Material Safety Data Sheets available from Marshall Waterproofing NZ/Aus Ltd.

## Basis of Appraisal

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

### Tests

19.1 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.

19.2 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 test results were reviewed by BRANZ experts and found to be satisfactory.

### Other Investigations

20.1 An assessment was made of the durability of Protecto Wrap AFM®-WM membrane by BRANZ technical experts.

20.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

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

### Quality

21.1 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.

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

21.3 The quality of supply to the market is the responsibility of Marshall Waterproofing NZ/Aus Ltd.

21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing system and the substrates.

21.5 Quality on site is the responsibility of the Marshall Waterproofing NZ/Aus Ltd licenced applicator.

21.6 Building owners are responsible for the maintenance of the ceramic tiles in accordance with the instructions in Paragraph 10.1 to 10.3.

### Sources of Information

- ANSI 118.10: 1999 Load bearing, bonded, waterproof membranes for thin-set ceramic tile and dimension stone installations.
- AC 115 Interim Criteria for Waterproof Membranes for Flooring and Shower Liners, June 2003.
- AS 3958.1 - 1991 Guide to the installation of ceramic tiles.
- AS/NZS 2269: 1994 Plywood – structural.
- NZS 3101.1 & .2: 1995 The design of concrete structures
- Approved Document for New Zealand Building Code External Moisture Clause E2, Building Industry Authority, Third Edition June 2004
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992
- The Building Regulations 1992, up to, and including April 2003 Amendment.
- Tiling Good Practice Guide, BRANZ, March 2004.



**BRANZ**

In the opinion of BRANZ, Protecto Wrap AFM®-WM Deck and Balcony Membrane is fit for purpose and will comply with the Building Code to the extent specified in this Certificate provided it is used, designed, installed and maintained as set out in this Certificate.

The Appraisal Certificate is issued only to the Certificate Holder, Marshall Waterproofing NZ/Aus Ltd, and is valid until further notice, subject to the Conditions of Certification.

#### Conditions of Certification

1. This Certificate:
  - 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. The Certificate Holder:
  - 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.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation 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 the Certificate Holder.
5. Any reference in this Certificate to any other publication shall be read as a reference to the version of the publication specified in this Certificate.

For BRANZ

J R Vial

M E Reed

Date of issue: 4 February 2005