



BRANZ Appraised
Appraisal No. 1046 [2023]

JOHNS MANVILLE TPO MEMBRANE

Appraisal No. 1046 [2023]

This Appraisal replaces BRANZ
Appraisal No. 1046 [2018]

Amended 24 May 2024



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 JM TPO Membrane is a single-ply, polyester fabric reinforced, thermoplastic polyolefin (TPO) fully bonded waterproofing sheet membrane for roofs and decks.

Scope

- 2.1 JM TPO Membrane has been appraised as a roof and deck waterproofing membrane on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to building height and floor plan area when subject to specific structural design; and,
 - with substrates of plywood, strandsarking (roofs only) or suspended concrete slab; and,
 - with minimum falls for plywood and strandsarking roofs of 1:30, concrete roofs of 1:60 and decks of 1:40; and,
 - with deck size limited to 40 m²; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 JM TPO Membrane has also been appraised as a roof and deck waterproofing membrane on buildings within the following scope:
 - subject to specific structural and weathertightness design; and,
 - with substrates of plywood, strandsarking (roofs only) or suspended concrete slab; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 6 kPa; and,
 - with the weathertightness design of junctions for each specific structure being the responsibility of the building designer.
- 2.3 Roofs and decks waterproofed with JM TPO Membrane must be designed and constructed in accordance with the following limitations:
 - nominally flat roofs and decks and pitched roofs constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
 - with no steps within the deck level, no integral roof gardens and no downpipes directly discharging to decks; and,
 - with the deck membrane continually protected from physical damage by a pedestal protection system.
- 2.4 The design and construction of the substrate and movement and control joints is specific to each building, and therefore is the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.
- 2.5 The membrane must be installed by Allco Waterproofing Solutions Ltd approved applicators.

Building Regulations

New Zealand Building Code [NZBC]

3.1 In the opinion of BRANZ, JM TPO 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. JM TPO Membrane meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1, E2.3.2 and E2.3.6. Roofs incorporating JM TPO Membrane meet these requirements. See Paragraphs 13.1–13.8.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. JM TPO Membrane meets this requirement.

Technical Specification

4.1 Materials supplied by Allco Waterproofing Solutions Ltd are as follows:

- **JM TPO 45 mil** – is a 1.14 mm thick membrane manufactured using an ultraviolet (UV) resistant TPO formulation. It is available in roll sizes [width x length] of 1.52 x 30.48 m, 2.44 x 30.48 m, and 3.04 x 30.48 m and are coloured white or grey.
- **JM TPO 60 mil** – is a 1.5 mm thick membrane manufactured using an UV-resistant TPO formulation. It is available in roll sizes [width x length] of 1.52 x 30.48 m, 2.44 x 30.48 m, and 3.04 x 30.48 m and are coloured white or grey.
- **JM TPO 80 mil** – is a 2 mm thick membrane manufactured using an UV-resistant TPO formulation. It is available in roll sizes [width x length] of 1.52 x 22.86 m, 2.44 x 22.86 m, and 3.04 x 22.86 m and are coloured white or grey.
- **JM TPO FB 115** – is a 2.9 mm thick TPO membrane with a reinforced polyester fabric and integral polyester fleece backing. It is available in roll sizes [width x length] of 3.05 x 15.24 m and are coloured white or grey.
- **JM TPO FB 135** – is a 3.4 mm thick TPO membrane with a reinforced polyester fabric and integral polyester fleece backing. It is available in roll sizes [width x length] of 3.05 x 15.24 m and are coloured white or grey.
- **JM Roofing System Urethane Adhesive** – is for use with fleece-backed TPO membranes and is available in 18.9 L pots or 57 L drums.
- **JM Bonding Adhesive** – is for use with smooth-backed TPO membranes and is available in 18.9 L pots.
- **Allco Roof-Tac Contact Adhesive** – is a spray-applied contact adhesive for use with smooth-backed TPO membranes and is available in 17 kg canisters.
- **JM TPO Walkway** – is a textured walkway protection membrane. It is available in rolls of 762 mm wide and 15.24 m long and is coloured grey.
- **JM TPO Detail Membrane** – is a non-reinforced membrane for wrapping pipe flashings and vertical stacks. It is available in roll sizes [width x length] of 610 mm x 15.24 m and 122 mm x 15.24m, and are coloured white or grey.
- **JM TPO Universal Corners** – are corner flashings. They are 152 mm diameter and are coloured white or grey.
- **JM All Purpose Fasteners** – are case-hardened steel fasteners with a number 3 Phillips head. They are available in sizes of 3.2-102 mm, 127-279 mm and 305-610 mm; and are coloured grey.
- **JM TPO T-Joint Patch** – is a non-reinforced membrane for covering t-joints, discs and fasteners. It is 114.3 mm in diameter and are coloured white or grey.
- **JM TPO Pipe boots** – are cone-shaped boots for flashing pipe penetrations. They are sized 25-152 mm in diameter and are coloured white or grey.



- **JM TPO Split Pipe Boots** – are reinforced JM TPO square boots [in various sizes] for flashing pipe penetrations. They are available in sizes 25-152 mm [nominal diameter] and are coloured white.
- **JM TPO Cover Tape** – is a TPO membrane tape with peel and stick adhesive for covering metal flanges. It is available in roll sizes [width x length] of 152 mm x 30.48 m and 254 mm x 30.48 m and are coloured white or grey.
- **JM TPO Penetration Pocket** – is a two-piece moulded pocket with rigid vertical wall and pre-formed flanges. It is 190 x 150 mm [nominal diameter] and are coloured white.
- **JM TPO Coated Metal** – is a laminate of TPO membrane and galvanised steel. It is sized 1.22 x 3.05 m and are coloured white or grey.
- **JM Peel and Stick Reinforced Termination Strip (RTS)** – is a TPO membrane strip with factory-laminated tape on one edge. It is 152 mm x 30.48 m and are coloured white.
- **JM TPO Curb Flashing** – is a TPO membrane for flashing curbs and parapet walls. It is 457 mm x 15.24 m and are coloured white or grey.
- **JM TPO Reinforced Cover Strip** – is a heat-weldable TPO membrane strip for mechanically fastened systems. It is 403 mm x 15.24 m and are coloured white or grey.
- **JM Polyester Slipsheet** – is a separation layer between an existing roof system and a new single ply re-cover system. It is 3.3 x 152.4 m and are coloured white.
- **JM TPO Weathered Membrane Cleaner** – is used to thoroughly clean the release agent and dirt from JM TPO Membranes before applying primers or splice adhesives. It is available in a 18.9 L pot and is clear in colour.
- **JM TPO Single Membrane Primer (Low VOC)** – is used to prime JM TPO Membrane surfaces before adhering. It is available in a 3.78 L pot and is coloured clear to light yellow.
- **JM Single Ply Caulk** – is used to seal the edges around flashing terminations, peel and stick products and exposed edges of JM Membrane cement splices. It is available in 304.6 ml and are coloured black or white.
- **JM Pourable Sealer** – is a two-part polyurethane sealant, used as a penetration pocket filler. It is available as Part A in a 2.84 L can and Part B in a 0.24 L can. Part A is white and Part B is black.
- **JM TPO Edge Sealant** – is used to seal cut edges of JM TPO Membrane. It is available in 473 ml bottles and is clear in colour.
- **Aquaknight Roof Drain Outlet** – is a stainless steel dome with extended leaf guard, with a PVC-U DWV pipe, side or bottom exit, and is 80 mm in diameter.
- **Aquaknight Deck Drain Outlet** – is a stainless steel flat lid, with a PVC-U DWV pipe, side or bottom exit and is 80 mm in diameter.

Handling and Storage

- 5.1 Handling and storage of all materials, whether on-site or off-site, is under the control of the Allco Waterproofing Solutions Ltd approved applicators. Dry storage must be provided for all products and the rolls of membrane must be lying down on pallets and protected.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- JM TPO Membrane Detail Set, dated 16 November 2023.
- 6.2 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 JM TPO Membrane is for use on roofs, decks, balconies, gutters and parapets where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 JM TPO Membrane can be adversely affected by contact with bituminous substances. Allco Waterproofing Solutions Ltd should be contacted for advice in this situation.
- 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 Where regular foot traffic on the roof is envisaged i.e. maintenance of lift equipment, a walkway should be installed to ensure the membrane is protected. The JM TPO Membrane is designed for limited, irregular pedestrian access only.
- 7.5 JM TPO Membrane, when used on decks, requires a pedestal protection. Allco Waterproofing Solutions Ltd should be contacted for the best system to meet design requirements.

Structure

- 8.1 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 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.
- 8.2 JM TPO Membrane fully bonded is suitable for use in areas subject to maximum wind pressure of 6 kPa ULS subject to the limitations of the substrate.

Substrates

Plywood

- 9.1 Plywood must be treated to H3 (CCA treated). LOSP treated plywood must not be used. 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.

Strandsarking

- 9.2 Strandsarking must be installed in accordance with the manufacturer's instructions and BRANZ Appraisal No. 946.

Concrete

- 9.3 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

- 10.1 JM TPO Membrane, when subjected to normal conditions of environment and with proper maintenance, can expect to have a serviceable life of at least 15 years.

Maintenance

- 11.1 Maintenance requirements of the membrane are provided by Allco Waterproofing Solutions Ltd.
- 11.2 In the event of damage to the membrane, it must be repaired by removing the damaged portion and applying a patch as for new work. This should be carried out by an Allco Waterproofing Solutions Ltd approved applicator.
- 11.3 Drainage outlets must be maintained to operate effectively.



Prevention of Fire Occurring

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

External Moisture

- 13.1 Roofs and decks 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.
- 13.2 When installed in accordance with this Appraisal and the Technical Literature, JM TPO Membrane will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membranes are impervious to water and will give a weathertight roof or deck.
- 13.3 The minimum fall for plywood and strandsarking roofs is 1 in 30, for concrete roofing is 1:60, for decks is 1 in 40 and for gutters is 1 in 100. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane. *[Note: Where possible, BRANZ recommend a fall of 1:60 for gutters.]*
- 13.4 JM TPO 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.
- 13.5 Roof and deck falls must be built into the plywood substrate.
- 13.6 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 roof does not drain to an external gutter or spouting.
- 13.7 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of roof drainage.
- 13.8 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

Water Supplies

- 14.1 Water is not contaminated by JM TPO Membrane which complies with AS/NZS 4020.
- 14.2 The first 25 mm of rainfall from a newly installed JM TPO Membrane roof must be discarded before drinking water collection starts. This is to remove residues which may have developed in the processes involved in the production of a JM TPO Membrane roof.
- 14.3 Though the JM TPO Membrane has been shown to comply with AS/NZS 4020, it must be noted that all water collected off roof surfaces made from any material is considered to be non-potable due to possible contamination from other sources. Water collection in this way can only be considered potable if it has been passed through a suitable sterilisation system. Sterilisation systems such as this have not been assessed and are outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirement

- 15.1 Installation of the membrane must be completed by Allco Waterproofing Solutions Ltd approved applicators.
- 15.2 Installation of substrates must be completed by, or under the supervision of, Licensed Building Practitioners with the relevant Licence Class, in accordance with instructions given within the Allco Waterproofing Solutions Ltd Technical Literature and this Appraisal.



Preparation of Substrates

- 16.1 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.
- 16.2 Concrete substrates can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 585. The relative humidity of the concrete must be 75% or less before membrane application.
- 16.3 The moisture content of a timber substructure must be a maximum of 20% and plywood sheet must be dry at time of membrane application. This will generally require plywood sheets to be covered until just before the membranes are laid, to prevent rain wetting.

Membrane Installation

- 17.1 The installation of these membrane systems is very complex and limited to approved applicators only. The Allco Waterproofing Solutions Ltd Installation Guide should be referred in all instances for the correct procedures.

Inspections

- 18.1 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 Technical Literature instructions.

Health and Safety

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

Basis of Appraisal

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

Tests

- 20.1 Testing has been carried out on the membrane for elongation, tensile strength, seam strength, breaking strength, low temperature, resistance to aging, water absorption, resistance to UV and peel adhesion to plywood and concrete.
- 20.2 Test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 21.1 A durability opinion has been given of the JM TPO Membrane by BRANZ technical experts.
- 21.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 21.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 22.1 The manufacture of the JM TPO Membrane 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.
- 22.2 The quality of supply of the product to the market is the responsibility of Allco Waterproofing Solutions Ltd.
- 22.3 Quality on-site is the responsibility of the Allco Waterproofing Solutions Ltd approved applicators.
- 22.4 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, Allco Waterproofing Solutions Ltd and this Appraisal.



Sources of Information

- AS/NZS 1170:2002 Structural Design action – general principles.
- AS/NZS 2269:2012 Plywood – Structural.
- AS/NZS 4020:2018 Testing of products for use in contact with drinking water.
- BRANZ Good Practice Guide: Membrane Roofing (Second Edition), October 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. Amendments

Amendments

Amendment No. 1 dated 24 May 2024

This Appraisal has been amended to update minimum fall requirements for concrete roofs.



BRANZ Appraised
Appraisal No. 1046 (2023)

BRANZ Appraisal
Appraisal No. 1046 (2023)
29 November 2023

JOHNS MANVILLE
TPO MEMBRANE



In the opinion of BRANZ, **Johns Manville TPO 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 **Allco Waterproofing Solutions 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. **Allco Waterproofing Solutions 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 quality of work;
 - 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 **Allco Waterproofing Solutions 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 **Allco Waterproofing Solutions Ltd** or any third party.

For BRANZ

Claire Falck
Chief Executive

Date of Issue:
29 November 2023