



BRANZ Appraised

Appraisal No. 1035 [2023]

PROOFEX ENGAGE AND PROOFEX 3100 MEMBRANES

Appraisal No. 1035 [2023]

This Appraisal replaces BRANZ
Appraisal No. 1035 [2018]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Proofex Engage is a pre-applied DPM or tanking membrane and Proofex 3100 is a post-applied DPM membrane for basement retaining walls and floors. They are applied under floor slabs and foundations and to the exterior face of basement retaining walls to prevent liquid water or water vapour penetrating to the interior face in spaces where moisture may cause damage.
- 1.2 Proofex Engage is supplied as a multi-layered composite sheet and Proofex 3100 is supplied as a self-adhering, polymer-rubber modified bitumen sheet, both in roll form.

Scope

- 2.1 Proofex Engage and Proofex 3100 have been appraised as DPMs for use:
 - on buildings subject to non-specific design under floor slabs complying with NZS 3604 and behind concrete masonry basement walls and under floor slabs complying with NZS 4229; and,
 - in buildings subject to specific design with substrates of in-situ or precast concrete complying with NZS 3101 or concrete masonry complying with NZS 4230 and 4210; and,
 - where subsoil drainage and free draining granular backfill has been placed behind basement walls.
- 2.2 Proofex Engage has been appraised as a tanking membrane for use:
 - on buildings subject to specific design with substrates of in-situ or precast concrete complying with NZS 3101; and,
 - where the membrane is subject to hydrostatic pressure with the pressure not to exceed 2 bar [20 metres head of water].
- 2.3 Proofex Engage and Proofex 3100 must be adequately protected against damage during backfilling and in service.
- 2.4 The products must be installed by a Concrete Plus Limited preferred applicator.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Proofex Engage and Proofex 3100 Membranes, 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 [a] not less than 50 years. Proofex Engage and Proofex 3100 Membranes meet this requirement. See Paragraph 9.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.3. Proofex Engage and Proofex 3100 Membranes meet this requirement. See Paragraphs 11.1-11.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Proofex Engage and Proofex 3100 Membranes meet this requirement.

Technical Specification

4.1 Materials supplied by Concrete Plus Limited are as follows:

- **Proofex Engage** – a unique patented waterproof membrane system comprising a cell mesh bonded to a blended polyethylene/polypropylene membrane which allows poured concrete to interlock, forming a mechanical bond. It is supplied in a roll 4-5 mm thick, 1.27 m wide and 30 m long.
- **Proofex 3100** – a post-applied, self-adhesive, SBS modified bitumen based membrane. It is supplied in a roll 1.5 mm thick, 1 m wide and 20 m long.
- **Proofex Corner Pieces** – internal and external corners pieces made from polyethylene with a butyl selvedge, supplied as pieces 125 mm x 125 mm x 125 mm.
- **Proofex “L” Section** – an “L” shaped polyethylene section with butyl adhesive selvedge strip(s). It is used to detail between horizontal and vertical membrane applications, supplied in 10 m long and 250 mm wide lengths.
- **Proofex Engage Detail Strip** – a reinforced, double-sided waterproofing adhesive tape for sealing and jointing roll ends, cut edges and corner pieces. It consists of a strong synthetic fibre fabric impregnated on both sides with a bitumen rubber adhesive, protected with removeable siliconized paper. It is supplied in rolls 1.5 mm thick, 200 mm wide x 10 m long.
- **Proofex Top Hat** – a polyethylene/polypropylene membrane incorporating an aluminium foil layer, used to waterproof pipe entries. It is supplied in units 110-330 mm x 330 mm, or 160-380 mm x 380 mm.
- **Fosroc Polyurea Gun Grade** – a two part polyurea used to seal butt end joints in Proofex Engage and on to the epoxy grout around pile caps. It also seals mechanical fixings through Proofex Engage. It is supplied in a twin pack of 2 x 300 ml cartridges and 40 L bulk kits for use with an appropriate pump and gun.
- **Conbextra EP300DP, Nitomortar 903 + F4 Fillers & Conbextra EP65 Plus** – epoxy grouts used to encapsulate the pile caps and the Proofex Engage. Conbextra EP300DP is supplied in 11.4 L packs, Nitomortar 903 is supplied in 1.5, 6 and 30 L packs and Conbextra EP65 Plus is supplied in 14 L packs.
- **Nitoseal MS400** – a high performance elastomeric trafficable joint sealant based on silyl modified polymers, used for sealing terminations. Nitoseal MS400 is supplied in 600 ml sausages.
- **Proofex Sheetdrain 81** – a dimpled polypropylene sheet with an adhered geotextile/filter fabric for vertical and horizontal protection and drainage of waterproofing membranes. It is supplied in rolls 8 mm thick, 2 m wide and 20 m long.

Handling and Storage

5.1 Handling and storage of all materials, whether on-site or off-site, is under the control of the installer. Dry storage must be provided for all products and the membranes must be protected from sunlight and ultraviolet [UV] radiation. Rolls of membrane must be stored on end.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Proofex Engage and Proofex 3100. 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

Substrate Design

Walls - Proofex 3100

- 7.1 Substrate design must be in accordance with the NZBC to a relevant standard, such as NZS 3101 for concrete, and NZS 4229 or NZS 4230 for concrete masonry.
- 7.2 The substrate must have a surface finish that is smooth, clean and free from defects or irregularities which may damage the membrane or allow water to trap behind the membrane.

Control Joints

- 7.3 Where control or construction joints are formed in the structure where Proofex Engage or Proofex 3100 is part of the design, Concrete Plus Limited must be consulted for advice on selection of appropriate joint protection. A range of Supercast PVC profiles and Hydrotite hydrophilic waterstops are available.

Concrete Slab-on-ground

- 7.4 Proofex Engage can be laid on 50-75 mm concrete blinding, well compacted sand blinding and well compacted site fill with a blinded topping. Concrete Plus Limited must be consulted for other acceptable substrates for both horizontal and vertical applications. The structural concrete slab placed over the membrane must be a minimum of 100 mm thick.

Backfilling and Drainage

Proofex 3100

- 8.1 The membranes must be protected against damage by the placement of a protection material between the membranes and the granular fill.
- 8.2 The minimum requirement for backfilling is that a granular, free-draining material is used with the top of the backfill capped with an impervious clay fill that may be covered with topsoil if required. The impervious capping and topsoil must slope with a minimum of 1:30 fall away from the wall.
- 8.3 A minimum 100 mm diameter subsoil perforated drainage pipe must be installed at the bottom of the wall. The pipe must be covered with a geotextile filter fabric, be laid at a minimum 1:200 fall and discharge to a drainage outlet. Provision for cleaning the pipe must also be provided.
- 8.4 Backfilling should begin as soon as possible.

Proofex Engage

- 8.5 Proofex Engage is a pre-applied DPM and tanking membrane and can be applied to sacrificial shuttering, therefore no backfill is required. Where Proofex Engage is applied within conventional shuttering, backfilling measures are outlined in Paragraphs 8.1-8.4.

Durability

Service Life

- 9.1 Proofex Engage and Proofex 3100 Membranes are suitable DPM and tanking materials, therefore they are expected to have a serviceable life of at least 50 years, provided they are installed and maintained in accordance with this Appraisal and are continually protected from sunlight and UV radiation.



Maintenance

- 10.1 Annual inspections must be made of the membranes top edge seal and protection, the backfill capping, and the drainage pipe to ensure all are functioning as originally designed.
- 10.2 If required, the drainage pipe must be cleared to remove any sediment or silt build-up. The slope of the backfill capping must be maintained at all times.

External Moisture

- 11.1 Proofex Engage and Proofex 3100 Membranes, when installed in accordance with this Appraisal and the Technical Literature, will prevent water vapour [DPM] and water [tanking] from penetrating to the interior face of basement retaining walls and floors in spaces where moisture may cause damage. The membranes have a vapour flow resistance of not less than 90 MN s/g.
- 11.2 The membranes can be used to form sealed joints and to seal penetrations. The top edge of the membranes must be sealed to the wall as set out in the Technical Literature and protected.
- 11.3 Building designers must ensure junctions with other membranes, such as at the floor/wall junction, form a waterproof joint. These junctions have not been assessed and are outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirement

- 12.1 All design and building work must be carried out in accordance with the Proofex Engage and Proofex 3100 Membranes Technical Literature and this Appraisal. All building work must be undertaken by a Concrete Plus Limited preferred applicator.

System Installation - Proofex 3100

Substrate Preparation

- 13.1 All vertical surfaces must be checked to ensure they are dry, clean, smooth and free from sharp edges, loose or foreign materials, oil, grease or other deleterious material that may affect adhesion or may damage the membrane.

Priming

- 13.2 All substrates must be primed before application of the membrane. Concrete Plus Limited should be contacted to confirm the most suitable primer. Application instructions for the primer is contained in the relevant Technical Data Sheet.

Membrane Installation - Walls

- 13.3 Starting at the lowest point, the membrane must be installed in accordance with the Technical Literature. Sheet edges must be overlapped a minimum of 50 mm as marked on the sheets. End laps must be a minimum of 150 mm, with upper sheets lapped over lower sheets. Internal and external corners must be reinforced with an extra layer of membrane 300 mm wide. Protection material must be installed before backfilling. Backfilling must commence immediately after the membranes are installed to ensure the membranes is not left exposed to sunlight or UV radiation.

Membrane Installation - Floors

- 13.4 The membrane must be installed in accordance with the Technical Literature. Sheet edges must be overlapped a minimum of 50-60 mm as marked on the sheets and end laps must be a minimum of 70-80 mm. The membrane must be inspected for damage and any damage must be repaired in accordance with the Technical Literature. The membrane must not be exposed to UV radiation for any longer than 30 days before the structural concrete slab is placed.

System Installation - Proofex Engage

Site Preparation

- 14.1 All surfaces are to be sound and solid to eliminate movement during concrete placement. The substrate must be regular and smooth with no gaps or any high or low areas of 1-10 mm. Grout must be used around all penetrations such as utility conduits for stability.

Membrane Installation

- 14.2 Proofex Engage membrane must be installed to all areas required to achieve a waterproof finish in accordance with Concrete Plus Limited Technical Literature. Temperatures must be greater than 5°C during installation.
- 14.3 The membrane is cut to convenient lengths for installation, aligned and rolled out with the ribbed surface uppermost.
- 14.4 The end joints and cut edges of the Proofex Engage sheets are butt joined onto Proofex Engage Detail strip. The top surface of the join can be further sealed with a 40 mm wide strip of Fosroc Polyurea GG.
- 14.5 Horizontal to vertical joints are lapped onto the Proofex Engage using the Proofex "L" section and over sealed with a 40 mm wide strip of Fosroc Polyurea GG.
- 14.6 Concrete must be placed within 30 days.

Inspections

- 15.1 The Technical Literature and the installation company's Quality Control sheets must be referred to during the inspection of the membrane installation.

Health and Safety

- 16.1 Safe use and handling procedures for the membranes are provided in the Technical Literature.

Basis of Appraisal

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

Tests

- 17.1 The following testing of Proofex Engage has been undertaken:
- Tensile strength and elongation, dimensional stability, heat ageing at 70°C for 56 days prior to tensile strength and elongation, UV ageing for 100 light hours with UVB lamps prior to tensile strength and elongation, water vapour transmission and resistance, resistance to water pressure, chisel impact, static indentation, dynamic indentation, bond strength to concrete, joint tensile strength, butt joint tensile strength, resistance to leakage at joints, heat ageing at 70°C for 28 days prior to joint tensile strength, water soak at 60°C for 7 days prior to joint tensile strength.
- 17.2 The following testing of Proofex 3100 has been undertaken:
- Tensile strength and elongation, low temperature flexibility, resistance to water penetration at joints, resistance to fatigue, heat ageing at 70°C for 84 days prior to low temperature flexibility, chisel impact at 0°C and -21°C, bond strength to concrete, water soak at 23°C for 28 days prior to bond strength, shear of joints, water soak at 23°C for 28 days prior to shear of joints.
- 17.3 Test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 18.1 A durability opinion has been given by BRANZ technical experts.
- 18.2 Practicability of installation has been assessed by BRANZ and found to be satisfactory.
- 18.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.



Quality

- 19.1 The manufacture of the membranes and primers have 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.
- 19.2 The quality of materials supplied to the market is the responsibility of Concrete Plus Limited.
- 19.3 Quality of installation on-site is the responsibility of the Concrete Plus Limited preferred applicator.
- 19.4 Designers are responsible for the building design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of Concrete Plus Limited.
- 19.5 Building owners are responsible for the maintenance of the membrane systems in accordance with the instructions of Concrete Plus Limited.

Sources of Information

- NZS 3101:2006 Concrete structures standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4229:2013 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230:2004 Design of reinforced concrete masonry structures.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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26 July 2023

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In the opinion of BRANZ, **Proofex Engage and Proofex 3100 Membranes** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Concrete Plus 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. **Concrete Plus 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 **Concrete Plus 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 **Concrete Plus Limited** or any third party.

For BRANZ

Claire Falck
Acting Chief Executive

Date of Issue:
26 July 2023