



BRANZ Appraised

Appraisal No. 1037 [2018]

DEBOFLEX 3.5 CS/F K180 SPECIAL TANKING AND DPM MEMBRANE

[previously known as DeboBase
SBS 3.5 CS/F K180 Special]

Appraisal No. 1037(2018)



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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4 your roof

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Product

- 1.1 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane is a pre-applied or torch applied DPM and tanking membrane for basement retaining walls and floors. It is 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.

Scope

- 2.1 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane has been appraised as a DPM 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 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane has also been appraised as a pre applied 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 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane must be adequately protected against damage during backfilling and in service.
- 2.4 The product must be installed by De Boer certified applicators. *[Note: All De Boer Certified Applicators are also Equus Industries Ltd Certified Applicators]*



Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Deboflex 3.5 CS/F K180 Special Tanking and DPM 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 [a] not less than 50 years. Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane meet this requirement. See Paragraph 11.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.3. Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane meet this requirement. See Paragraphs 13.1 – 13.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane meet this requirement and will not present a health hazard to people.

Technical Specification

4.1 Materials supplied by Equus Industries Ltd are as follows:

- Deboflex 3.5 CS/F K180 Special – is a post applied or pre-applied, torch on, SBS modified bitumen based membrane. It is supplied in a roll 3.50 mm thick, 1.00 m wide and 10 m long.
- DuO Primer – is a solvent-based bitumen coating. It may be used on a dry and porous surface. It is supplied as a black liquid in 4 and 25 litre pails.
- De Boer DuO Kit and De Boer Ultra Seal sealant – are black bituminous sealants with permanent flexibility to seal penetrations, terminations and other details. It is supplied as a black paste in 310 ml cartridges.
- DeboVix 3 T/F P180 – is an SBS-modified bitumen based membrane. It is supplied in a roll of 3.00 mm thick, 1.00 m wide and 10 m long.
- Equus Drainage layer – a drainage and filter layer used to protect the membrane prior to backfill. It is supplied in rolls of 7.3 mm thick, 2.10 m wide and 20 m long.
- AquaFin® - 2 K/M is a two-component waterproofing coating used for detailing the top edge termination of the Deboflex above ground. It is supplied as a Part A - Powder and Part B - polymer.
- Matacyl® Manual – is a highly elastic heavy duty seamless waterproofing membrane used for detailing the top edge termination of the Deboflex above ground. It is supplied in 30kg units.
- De Boer Aquaprimer FD – is a fast drying, thin, liquid bitumen primer. It improves the bond strength between substrate and the De Boer membranes. It is supplied in 25 litre cans.
- Bitumen Angle Fillets – are pre-manufactured triangular angle fillets used between horizontal vertical transitions.
- De Boer Shrink Sleeves – are PVC accessories for sealing penetrations. They are supplied in various diameters from 18mm to 110mm.
- Danodren H15 Plus – is a nodular sheet composed of high density polyethylene (HDPE) and joined to a non-woven geotextile of calendared polypropylene used as a drainage and protection for the Deboflex. It is supplied in rolls, 20m long and 2.1m wide.

Handling and Storage

5.1 Handling and storage of all materials whether on 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 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 Deboflex 3.5 CS/F K180 Special Tanking and DPM 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 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane is a waterproofing membrane that can be pre-applied or post applied

Substrate Design - Pre-Applied Tanking

- 8.1 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane is pre-applied to surfaces before fixing of reinforcing steel and before concreting. For floors the membrane is applied to site concrete. For walls it is applied to either permanent formwork or removable double faced formwork.

Substrate Design - Post Applied DPM

Walls

- 9.1 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.
- 9.2 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

- 9.3 Where control or construction joints are formed in the substrate, Equus De Boer must be consulted for use of the membrane over these joints.

Concrete Slab-on-ground

- 9.4 The membrane must be laid on a minimum of 75 mm thickness of site concrete or well compacted sand. The structural concrete slab placed over the membranes must be a minimum of 100 mm thick.

Backfilling and Drainage

- 10.1 The membrane must be protected against damage by the placement of a protection material between the membranes and the granular fill.
- 10.2 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 away from the wall.
- 10.3 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.
- 10.4 Backfilling should begin as soon as possible.
- 10.5 As Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane is also a pre-applied DPM/tanking membrane, on specifically designed substrates, when the pre-applied option is used there is no backfilling required.

Durability

Serviceable Life

- 11.1 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane is a suitable DPM and tanking material 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 ultra-violet [UV] radiation.

Maintenance

- 12.1 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.
- 12.2 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

- 13.1 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane, 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 membrane has a vapour flow resistance of not less than 90 MN s/g.
- 13.2 The membrane can be used to form sealed joints and to seal penetrations. The top edge of the membrane must be sealed to the wall as set out in the Technical Literature and protected.
- 13.3 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

- 14.1 Installation of the membranes must be completed by Equus Industries Ltd certified applicators.

System Installation – Post Applied

Substrate Preparation

- 15.1 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 membranes.

Priming

- 15.2 All substrates must be primed before application of the membranes. The supplier of the membranes, Equus De Boer, should be contacted to confirm the most suitable primer. Application instructions for the primers are contained in the technical data sheets.

Membrane Installation – Walls

- 15.3 Starting at the lowest point, the membrane must be installed in accordance with the Technical Literature. Sheet edges must be overlapped a minimum of 100 mm. End laps must be a minimum of 200 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 are not left exposed to sunlight or UV radiation.

Membrane Installation – Floors

- 15.4 The membrane must be installed in accordance with the Technical Literature. Sheet edges must be overlapped a minimum of 130 mm and end laps must be a minimum of 150 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 two months before the structural concrete slab is placed.

System Installation – Pre-Applied

Site Preparation

- 16.1 All surfaces are to be sound and solid to eliminate movement during concrete placement. Substrate must be regular and smooth with no gaps or voids greater than 12 mm. Grout must be used around all penetrations such as utility conduits for stability.

Membrane Installation

- 16.2 Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane must be installed to all areas required to achieve a waterproof finish in accordance with Equus Industries Ltd Technical Data. Temperatures must be greater than -4°C or above during installation.
- 16.3 The granular surface must face the new concrete. The end laps must be staggered to avoid buildup of layers.



- 16.4 The end laps must be accurately positioned to avoid buildup of layers. Sheets must overlap the previous sheet by a minimum of 130 mm for side laps and a minimum of 150 mm for end laps. The underside of the sheet must be clean, dry and free from contamination before making the overlaps. All laps are torched together.
- 16.5 Concrete must be placed within 60 days.

Inspections

- 16.6 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

- 17.1 Safe use and handling procedures for the membrane is provided in the Technical Literature.

Basis of Appraisal

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

Tests

- 18.1 The following testing of Deboflex 3.5 CS/F K180 Special Tanking and DPM Membrane has been undertaken:
- Watertightness, tensile strength, elongation, resistance to static load, resistance to impact, joint strength [peel & shear], flow resistance at elevated temperature after heat aging, flexibility at low temperature [-15oC], flexibility at low temperature [-5oC] after heat ageing, water vapour flow resistance, peel adhesion to concrete, resistance to hydrostatic head [sample incorporated a joint] and load strain tear strength.

Test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

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

Quality

- 20.1 The manufacture of the membrane 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.
- 20.2 The quality of materials supplied to the market is the responsibility of Equus Industries Ltd.
- 20.3 Quality of installation on site is the responsibility of the Equus Industries Ltd certified applicator.
- 20.4 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 Equus Industries Ltd.
- 20.5 Building owners are responsible for the maintenance of the membrane systems in accordance with the instructions of Equus Industries Ltd.



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.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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12 November 2018

Deboflex 3.5 CS/F K180 Special
Tanking and DPM Membrane



In the opinion of BRANZ, **Deboflex 3.5 CS/F K180 Special Tanking and DPM 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 **De Boer Waterproofing Solutions nv**, 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. **De Boer Waterproofing Solutions nv**
 - 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 **De Boer Waterproofing Solutions nv**
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 **De boer Waterproofing Solutions nv** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

12 November 2018