



BRANZ Appraised

Appraisal No.462 [2010]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 462 (2010)**

This Appraisal replaces Appraisal
No. 462 (2004) issued
30 November 2004.

**SHELTERSEAL 3000X
AND SHELTERSEAL
HD DAMP-PROOF
MEMBRANES**

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Product

1.1 Shelterseal 3000X and Shelterseal HD are self adhesive damp-proof membranes (DPM) 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 water vapour penetrating to the interior face in spaces where moisture may cause damage.

1.2 The products are supplied as self-adhering, cold-applied, polymer-rubber modified bitumen sheets in roll form and are applied as single or double layer systems.



Typical waterproofing using Shelterseal 3000X

Scope

2.1 Shelterseal 3000X and Shelterseal HD have been appraised for use as damp-proof membranes under basement floors and on basement walls within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraphs 10.3 and 12.

2.2 Shelterseal 3000X and Shelterseal HD have also been appraised for use as damp-proof membranes under basement floors and on basement walls subject to a specific design, where:

- the substrates comply with NZS 3101 for in-situ or precast concrete or with NZS 4230 for concrete masonry.

2.3 The reinforced concrete or masonry substrates must be dry, clean, sound and continuous. The membranes must be adequately protected against damage during backfilling and in service.

2.4 Basement walls must have subsoil drainage and free draining granular backfill placed behind them.

2.5 The products must be installed by Ardex New Zealand Limited approved applicators.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Shelterseal 3000X and Shelterseal HD 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. Shelterseal 3000X and Shelterseal HD meet this requirement. See Paragraph 11.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.3. Shelterseal 3000X and Shelterseal HD meet this requirement. See Paragraphs 13.1 – 13.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Shelterseal 3000X and Shelterseal HD meet this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Acceptable Solution** in terms of New Zealand Building Code compliance. The membranes comply with NZBC Acceptable Solution E2/AS1, Paragraph 10.3.3, 10.3.4, 12.2.1 (a), (b) and (c) and 12.2.2 (b). The products are also Appraised as an **Alternative Solution** as outlined in Paragraph 2.2.

Technical Specification

4.1 Materials supplied by Ardex New Zealand Limited are as follows:

Shelterseal 3000X and Shelterseal HD

- The membranes are manufactured from a bituminous asphalt compound modified with SBS (styrene-butadiene-styrene) rubber and high tack resins. The self-adhesive inner face is protected by a release paper with the outer surface protected by either a layer of cross-laminated high-density polyethylene film (Shelterseal 3000X) or a layer of polypropylene mesh (Shelterseal HD). Shelterseal HD is designed for use where a more robust system is required.
- The membranes are 1.5 mm thick, and supplied in rolls 1 metre wide by 20 metres long. The roll weight is approximately 30 kg.

Shelter Primer

- A solvent based, bitumen-modified primer. It is supplied in 5 or 20 litre containers and is coloured black.

WPM 247 Primer

- A water based, bitumen emulsion primer. It is supplied in 5 or 20 litre containers and is coloured black.

WA 98 Contact Adhesive/Primer

- A contact adhesive that can be used as a primer in difficult drying conditions. It can be spray applied. It is supplied in 4 or 20 litre containers and is coloured red or clear.

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 Shelterseal 3000X and Shelterseal HD. 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

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

8.1 Where control or construction joints are formed in the substrate, Ardex New Zealand Limited must be consulted for use of the membranes over these joints.

Concrete Slab-on-ground

9.1 The membranes must be laid on a minimum of 75 mm thickness of site concrete. The structural concrete slab placed over the membranes must be a minimum of 100 mm thick.

Backfilling and Drainage

10.1 The membranes must be protected against damage by the placement of a protection material between the membranes and the granular fill.

10.2 Backfilling, drainage and the backfill capping must be in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 12 when used within the scope of E2/AS1. For specific design, 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.

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.

Durability

Serviceable Life

11.1 Shelterseal 3000X and Shelterseal HD are suitable DPM materials (Modified bitumen sheet) as set out in NZBC Acceptable Solution E2/AS1, Paragraphs 10.3.3, 10.3.4 and 12.2.2 (b), 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 Shelterseal 3000X and Shelterseal HD, when installed in accordance with this Appraisal and the Technical Literature, will prevent water vapour 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 as required by NZBC Acceptable Solution E2/AS1, Paragraphs 10.3.3 (a) and 12.2.1 (a).

13.2 The membranes self-adhere, and can be used to form sealed joints and to seal penetrations as required by NZBC Acceptable Solution E2/AS1, Paragraphs 10.3.3 (g) and 12.2.1 (b). The top edge of the membranes 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 Ardex New Zealand Limited approved applicators.

System Installation

Substrate Preparation

15.1 All 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, Ardex New Zealand Limited, 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 membranes must be installed in accordance with the Technical Literature. Sheet edges must be overlapped a minimum of 60 mm as marked on the sheets. End laps must be a minimum of 100 mm, with upper sheets lapped over lower sheets. Internal and external corners of single layer systems must be reinforced with an extra layer of membrane 300 mm wide. Where two layer systems are specified, lap joints must be staggered. 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

15.4 Membranes must be installed in accordance with the Technical Literature. Sheet edges must be overlapped a minimum of 60 mm as marked on the sheets and end laps must be a minimum of 100 mm. The membranes must be inspected for damage and any damage must be repaired in accordance with the Technical Literature. The membranes must not be exposed to UV radiation for any longer than two months before the structural concrete slab is placed.

Inspections

15.5 The Technical Literature and the installation company's Quality Control sheets must be referred to during the inspection of the membrane installation by building consent authorities and territorial authorities.

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 Shelterseal 3000X has been undertaken by the following organisations:

- Istituto Giordano S.p.A., Italy – Resistance to chemical agents, tensile properties, determination of dielectric strength, resistance to tearing, resistance to static perforation, resistance to dynamic perforation and resistance to hydrostatic pressure.
- Singapore Institute of Standards and Research – Thickness, dimensional stability, tensile properties, tensile strength at joints, puncture resistance, water absorption, pliability, water vapour transmission, hydrostatic head and resistance to leakage at joints.
- Isoltema, S.p.A., Italy – Adhesion to cement (concrete).

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

17.2 The following testing of Shelterseal HD has been undertaken by the following organisations:

- Istituto Giordano S.p.A., Italy - Puncture resistance, tensile properties and elongation.
- Autostrade S.p.A., Italy – Tensile strength, elongation, resistance to dynamic perforation and cold flexibility.
- Isoltema, S.p.A., Italy – Adhesion to cement (concrete).

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 primer 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.

19.2 The quality management system of the membrane manufacturer has been assessed and found to be satisfactory.

19.3 The quality of materials supplied to the market is the responsibility of Ardex New Zealand Limited.

19.4 Quality of installation on site is the responsibility of the Ardex New Zealand Limited approved applicator.

19.5 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 Ardex New Zealand Limited.

19.6 Building owners are responsible for the maintenance of the membrane systems in accordance with the instructions of Ardex New Zealand Limited.

Sources of Information

- NZS 3101: 2006 Concrete structures standard.
- NZS 4229: 1999 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 2004 Design of reinforced concrete masonry structures.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- 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.



BRANZ

In the opinion of BRANZ, Shelterseal 3000X and Shelterseal HD 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 Ardex New Zealand 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. [Ardex New Zealand 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 [Ardex New Zealand 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 [Ardex New Zealand Limited](#) or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 29 April 2010