



## BRANZ Appraised

Appraisal No. 713 [2018]

## VIKING WARM ROOF/ WARMSPAN SYSTEM

### Appraisal No. 713 [2018]

This Appraisal replaces BRANZ  
Appraisal No. 713 [2011]

Amended 06 August 2021



### BRANZ Appraisals

Technical Assessments of products  
for building and construction.



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## Product

- 1.1 The Viking Warm Roof/WARMSPAN System is an insulating roofing system for limited access flat roofs with concrete, plywood or steel structural decks. It consists of a thermal insulation layer and a roof finish of either a thermoplastic polyolefin (TPO) waterproofing sheet membrane or a torch-applied modified bitumen membrane.

## Scope

- 2.1 The Viking Warm Roof/WARMSPAN System has been appraised for use as an insulating roof on buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and maximum floor plan areas; and,
  - on limited access flat roofs with concrete, plywood or steel structural decks subject to specific structural design; and,
  - with roofs constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
  - with roofs constructed to suitable falls (refer to Paragraphs 15.3 and 15.4); and,
  - with no integral roof gardens; and,
  - situated in NZS 3604 Building Wind Zones up to, and including, Extra High.
- 2.2 The Viking Warm Roof/WARMSPAN System has also been appraised for durability and thermal performance as an insulated roofing system on buildings that are the subject of specific design with no building height restriction, situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 6kPa.
- 2.3 Building designers are responsible for the building design and for the incorporation of the Viking Warm Roof/WARMSPAN System into their design in accordance with the declared properties and instructions of Viking Roofspec.
- 2.4 The Viking Warm Roof/WARMSPAN System must be installed by Viking Roofspec licensed and trained installers.

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Viking Warm Roof/WARMSPAN System, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

**Clause B2 DURABILITY:** Performance B2.3.1 (b) 15 years. The Viking Warm Roof/WARMSPAN System meets this requirement. See Paragraph 10.1.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1 and E2.3.2. The Viking Warm Roof/WARMSPAN System meets these requirements. See Paragraphs 15.1–15.9.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. The Viking Warm Roof/WARMSPAN System meets this requirement.

**Clause H1 ENERGY EFFICIENCY:** Performance H1.3.1 (a). The Viking Warm Roof/WARMSPAN System will contribute to meeting this requirement. See Paragraph 14.1.

## Technical Specification

4.1 The Viking Warm Roof/WARMSPAN System is an insulating roofing for flat roofs. The thermal layer is a polyisocyanurate board available in a number of thicknesses to suit design requirements. The insulation board is adhesive-fixed on limited access flat roofs of concrete, plywood and steel structural decks. The roof finish is a single ply, polyester fabric reinforced, thermoplastic polyolefin (TPO) waterproofing sheet membrane, or a double layer modified bitumen membrane torch-applied, which are applied to the insulation board.

4.2 Materials supplied by Viking Roofspec are as follows:

- **Viking Enviroclad** - a fully adhered, polyester fabric reinforced, multilayer, synthetic TPO roof waterproofing membrane. It is supplied in light grey or white rolls, either 1.14 or 1.52 mm thick, 3 m or 3.66 m wide and 30.4 m long.
- **Gemini APP Base 3 mm** - an APP-modified, non-woven polyester/fibreglass composite reinforced, torch-on bitumen membrane, used as a base sheet in a double layer system. It is coloured black and supplied in rolls 3 mm thick, 1 m wide and 10 m long.
- **Gemini APP Cap 4 mm Ceramic** - an APP-modified, non-woven polyester/fibreglass composite reinforced, torch-on bitumen membrane used a cap sheet in a double layer system. It is available in various ceramic chip colours and supplied in rolls 4 mm thick, 1 m wide and 10 m long.
- **Lybra SBS Base 3 mm** - a SBS-modified, non-woven polyester/fibreglass composite reinforced, torch-on bitumen membrane used a base sheet in a double layer system. It is coloured black and supplied in rolls 3 mm thick, 1 m wide and 10 m long.
- **Lybra SBS Cap 4 mm Ceramic** - a SBS-modified, non-woven polyester/fibreglass composite reinforced, torch-on bitumen membrane used a cap sheet in a double layer system. It is available in various ceramic chip colours and supplied in rolls 4 mm thick, 1 m wide and 10 m long.
- **Phoenix Super APAO Base** - an APAO-modified, non-woven polyester/fibreglass composite reinforced, torch-on bitumen membrane used a base sheet in a double layer system. It is coloured black and supplied in rolls 4 mm thick, 1 m wide and 10 m long.
- **Phoenix Super APAO Cap Ceramic** - an APAO-modified, non-woven polyester/fibreglass composite reinforced, torch-on bitumen membrane used a cap sheet in a double layer system. It is available in various ceramic chip colours and supplied in rolls 4 mm thick, 1 m wide and 10 m long.
- **Viking Bitumen Primer** - a solvent-based bitumen primer for all substrates prior to the installation of the membrane. It is available in 20 L containers.
- **Carlisle 725TR Membrane** - a 1 mm thick, self-adhesive, SBS rubberised asphalt sheet waterproofing membrane used as a vapour barrier between the substrate and the insulation when required. Supplied in 1 m wide x 22.9 m long rolls.

- **Carlisle FAST™ Adhesive Dual Cartridge** - a two-component, polyurethane adhesive used to bond the insulation to the structural deck. Supplied as a dual cartridge with a total volume of 1.5 L.
- **Sure Weld Adhesive** - a solvent-based contact adhesive used to bond the membrane to the insulation. It is supplied in 19 L pails.
- **Kingspan Therma TR27 LPC/FM Insulation** - a fibre-free rigid roof insulation board composed of closed-cell polyisocyanurate foam core, bonded on each side to a coated glass tissue. Supplied in various thickness and R-values with a board size of 1,220 mm x 2,270 mm.

## Handling and Storage

- 5.1 Handling and storage of all materials, whether on-site or off-site, is under the control of the Viking Roofspec licensed and trained installers. Dry storage must be provided for all products and the rolls of membrane must be stored in a horizontal position.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Viking Warm Roof/WARMSPAN System. 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 The Viking Warm Roof/WARMSPAN System is a roof system which provides thermal insulation and waterproofing. It is for use on limited access flat roofs subject only to light foot traffic for maintenance purposes. The insulation board is adhesive fixed to concrete, plywood or metal structural decks which are subject to specific structural design. The insulation board is available in several thicknesses, to suit various thermal insulation designs.
- 7.2 The system can be used on new or existing roofs subject to the suitability of the structural deck of existing roofs. The waterproofing membrane is either a single layer, adhesive-fixed, TPO waterproofing sheet membrane with heat welded joints, or a double layer torch-applied modified bitumen membrane system.
- 7.3 A vapour control membrane must be used in Climate Zone 3 [as defined in NZBC Verification Method H1/VM1 and NZBC Acceptable Solution H1/AS1]. The vapour control membrane, Carlisle 725TR, is self-adhesive and applied over a prime structural deck before the installation of the insulation board.
- 7.4 The effective control of internal moisture must be considered at the design stage due to the impermeability of the roof system. Refer to the BRANZ Good Practice Guide: Membrane Roofing.

### Structure

- 8.1 For buildings situated in NZS 3604 Building Wind Zones up to, and including, Extra High, the adhesive is applied as shown in the Technical Literature.
- 8.2 The Viking Warm Roof/WARMSPAN System is suitable for use in areas subject to a maximum design differential ULS wind pressure of 6 kPa, subject to the limitations of the substrate.

## Structural Decking

### Plywood

- 9.1 Plywood must be treated to H3 [CCA treated]. LOSP treated plywood must not be used. Plywood must be a minimum of 17 mm to comply with AS/NZS 2269, at least CD Grade Structural with the sanded C face upwards.

### Concrete

- 9.2 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101.

### Steel

- 9.3 The profiled steel must be G550, complying with AS 1397.

### Existing Construction

- 9.4 A thorough inspection of the structural deck must be made.  
9.5 Repairs or replacement must be undertaken, where applicable, to ensure the structural deck is sound. Fixings must be checked, and if necessary refixed as for new plywood and steel.

## Durability

### Serviceable Life

- 10.1 The Viking Warm Roof/WARMSPAN System is expected to have a serviceable life of at least 15 years, provided it is designed, used, installed and maintained in accordance with this Appraisal and the Technical Literature.

### Chemical Resistance

- 10.2 Industrial air pollutants and windborne salt deposits should not significantly affect the durability of the membrane. However, the long term properties of the material may be affected by contact with petroleum-based products such as oils, greases and solvents.

## Maintenance

- 11.1 The membrane roof system, must be regularly (at least annually) checked for damage, rubbish and debris. Damage, such as small punctures and tears must be repaired and coatings reapplied as recommended by Viking Roofspec.  
11.2 Special care must be taken when inspecting the membrane roof systems to ensure the continuing prevention of moisture ingress, and repairs must be undertaken where required.  
11.3 Drainage outlets must be maintained to operate effectively.

## Prevention of Fire Occurring

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

## Control of Internal Fire and Smoke Spread

- 13.1 The Viking Warm Roof/WARMSPAN System insulation board used in the Viking Warm Roof/WARMSPAN System has been tested and complies with the flame propagation criteria of AS 1366 as required by NZBC Acceptable Solution C/AS1 Section 4.3 and C/AS2 Paragraph 4.17.2.  
13.2 The Viking Warm Roof/WARMSPAN System also meets the requirements of NZBC C/VM2, Section A1.7.

## Energy Efficiency

- 14.1 The thermal resistance [R-value] of building elements may be verified by using NZS 4214. The R-values for the Therma TR27 LPC/FM Insulation are given in Table1.

**Table 1: R-values**

Therma TR27 LPC/FM Insulation - Thickness	R - Value
25 mm	0.93
50 mm	1.87
75 mm	2.8
100 mm	3.85

### External Moisture

- 15.1 Roofs 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 in the Technical Literature which aligns with details in NZBC Acceptable Solution E2/AS1.
- 15.2 When installed in accordance with this Appraisal and the Technical Literature, the Viking Warm Roof/WARMSPAN System will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membrane is impervious to water and will give a weathertight roof.
- 15.3 Roof falls must be built into the substrate.
- 15.4 The minimum fall to roofs is 1 in 30 and gutters are 1 in 100. All falls must slope to an outlet or external spouting. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane.
- 15.5 Allowance for deflection and settlement of the substrate must be made in the design of the roof to ensure falls are maintained and no ponding of water can occur.
- 15.6 The Viking Warm Roof/WARMSPAN System 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.
- 15.7 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 roof does not drain to an external gutter or spouting.
- 15.8 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by the blockage of roof drainage.
- 15.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

### Condensation Control

- 16.1 In Climate Zone 3, as defined by the definitions, NZBC H1/VM1 & AS1, a vapour control membrane must be installed. Where required, Carlisle 725TR Membrane, must be installed over a primed structural deck prior to installing the insulation.

### Water Supplies

- 17.1 The Viking Warm Roof/WARMSPAN System has not been assessed for roofs used for the collection of potable water.

## Installation Information

### Installation Skill Level Requirement

- 18.1 Installation of the Viking Warm Roof/WARMSPAN System must be completed by Viking Roofspec licensed and trained installers.
- 18.2 Installation of the structural deck must always be carried out in accordance with the Viking Warm Roof/WARMSPAN System Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

### Preparation of Structural Deck

- 19.1 The structural deck must be dry, clean and stable before installation commences.
- 19.2 The relative humidity of concrete structural decks must be 75% or less before the application of the vapour control membrane or insulation. The concrete can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 585.
- 19.3 The moisture content of the plywood and timber substructure must be a maximum of 20% and the plywood sheets must be dry at the time of system application.



## System Installation

- 20.1 The Viking Warm Roof/WARMSPAN System must be installed in accordance with the Technical Literature.
- 20.2 Where the vapour control layer is required it is installed onto the primed structural deck followed by the insulation. The insulation is set out in a brick bond fashion and is adhered in accordance with the Technical Literature.
- 20.3 The membrane system is then installed over the insulation, following the instructions of Viking Roofspec.

## Inspections

- 21.1 Critical areas of inspection are:
  - Construction of the structural deck, including crack control and installation of bond breakers and movement control joints.
  - Moisture content of the structural deck prior to the application of the system.
  - Acceptance of the structural deck by the system installer prior to application of the system.
  - Installation of the system to the Technical Literature.

## Health and Safety

- 22.1 Safe use and handling procedures for the Viking Warm Roof/WARMSPAN System is provided in the Technical Literature. The products must be used in conjunction with the relevant Material Safety Data Sheets.

## Basis of Appraisal

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

### Tests

- 23.1 The following is a summary of the testing and test reports on the Viking Warm Roof/WARMSPAN System:
  - Assessment by Trinity ERD, the testing covered compressive strength, dimensional stability, flexural strength, tensile strength, water absorption, water vapour transmission and density.
  - Assessment by BRANZ for tensile adhesive strength of the Viking Warm Roof/WARMSPAN System.The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

### Other Investigations

- 24.1 A durability opinion has been provided by BRANZ technical experts.
- 24.2 Installation of the insulation and membranes have been assessed by BRANZ for practicability of installation and found to be satisfactory.
- 24.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

### Quality

- 25.1 The manufacture of the components of the system 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.
- 25.2 The quality of the supply of products to the New Zealand market is the responsibility of Viking Roofspec.
- 25.3 Quality on-site is the responsibility of the Viking Roofspec licensed and trained installers.
- 25.4 Designers are responsible for the building design, and building contractors are responsible for the quality of construction of structural deck systems in accordance with the instructions of Viking Roofspec and this Appraisal.
- 25.5 Building owners are responsible for the maintenance of the roof system in accordance with the instructions of Viking Roofspec and this Appraisal.



## Sources of Information

- AS 1397:2011 Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium.
- AS/NZS 1170:2002 Structural design actions - General principles.
- AS/NZS 2269:2012 Plywood – structural.
- BRANZ Bulletin No. 585 Measuring Moisture in Timber and Concrete, June 2015.
- BRANZ Good Practice Guide: Membrane Roofing, 2015.
- NZS 3101:2006 Concrete structures Standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4214:2006 Methods of determining the total thermal resistance of parts of buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

## Amendments

### Amendment No. 1, dated 16 August 2019

This Appraisal has been amended to update the structural information.

### Amendment No. 2, dated 26 September 2019

This Appraisal has been amended to update the name of the product.

### Amendment No. 3, dated 06 August 2021

This Appraisal has been amended to reflect building code updates relating to fire.



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05 December 2018

VIKING WARM ROOF/WARMSPAN  
SYSTEM



**BRANZ**

In the opinion of BRANZ, the **Viking Warm Roof/WARMSPAN System** 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 **Viking Roofspect**, 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. **Viking Roofspect**:
  - 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 **Viking Roofspect**.
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 **Viking Roofspect** or any third party.

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**For BRANZ**

**Chelydra Percy**

Chief Executive

Date of Issue:

5 December 2018