



BRANZ Appraised

Appraisal No. 656 [2020]

VIKING ENVIROCLAD ROOFING AND DECK MEMBRANE

Appraisal No. 656 [2020]

This Appraisal replaces BRANZ
Appraisal No. 656 [2015].

Amended 28 March 2024



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Viking Enviroclad is a single-ply, polyester fabric reinforced, thermoplastic polyolefin (TPO) waterproofing sheet membrane for flat or pitched roofs and decks. It can be applied as a fully bonded or mechanically fixed system.

Scope

- 2.1 Viking Enviroclad 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 respect to building height and maximum floor plan areas when subject to specific design; and,
 - with building structures designed and constructed to meet the requirements of the NZBC; and,
 - with substrates of plywood, Cross Laminated Timber (CLT), Strandsarking (roofs only) or concrete slab; and,
 - with minimum falls for plywood roofs of 1:30 [2°], concrete structures 1:60 [1°] and decks of 1:40 [1.5°]; and,
 - with decks that have a maximum area of 40 m²; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Viking Enviroclad has also been appraised for use as a roof and deck waterproofing membrane on specifically designed buildings within the following scope:
 - subject to specific structural and weathertightness design; and,
 - with substrates of plywood or concrete slab; and,
 - situated in specific design wind pressures (refer to Paragraph 8.1); 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 Viking Enviroclad must be designed and constructed in accordance with the following limitations:
 - nominally flat or pitched roofs and decks 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 the deck; 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 Viking Roofspec licensed and trained installers.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Viking Enviroclad, 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 B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4. Viking Enviroclad meets these requirements for loads arising from wind [i.e. B1.3.3 [h].] See Paragraph 8.1.
- Clause B2 DURABILITY:** Performance B2.3.1 [b] 15 years. Viking Enviroclad meets this requirement. See Paragraph 10.1.
- Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1, E2.3.2 and E2.3.6. Roofs incorporating Viking Enviroclad meet these requirements. See Paragraphs 13.1-13.9.
- Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Viking Enviroclad meets this requirement.

Technical Specification

- 4.1 Materials used with the Viking Enviroclad Roofing and Deck Membrane supplied by Viking Roofspec are as follows:
- **Viking Enviroclad** - a light grey 1.14, 1.5 or 2 mm polyester fabric reinforced, multilayer, synthetic roof waterproofing sheet based on TPO. It is supplied in rolls 3 m wide x 30.4 m long, 3.66 m wide x 30.4 m long and 5 m wide x 30.4 m long.
 - **Viking Enviroclad with APEEL™ Protective Film** - as per Viking Enviroclad but with a removable protective film to protect the Viking Enviroclad during construction. *[Note: APEEL™ Protective Film is to be removed within 90 days of installation.]*
 - **Viking FleeceBACK (FBS) Enviroclad** - a light grey 2.52 mm polyester fabric reinforced, multilayer, synthetic roof waterproofing sheet based on TPO with a fleece backing. It is supplied in rolls 3.6 m wide x 30.4 m long.
 - **HP-X Fasteners** - #15 wire diameter, mini drill point, buttress style thread fasteners for the mechanically fixed Viking Enviroclad.
 - **Piranha Plates (washers)** - Galvalume coated plates (washers) with twelve barbs (in two rows of six). They are 60 mm diameter, 0.9 mm thick with upturned edges.
 - **Rhino Bond System:**
 - Induction welding tool.
 - 80 mm round specially coated plates.
 - Magnetic heat sink poles.
 - **Heat Weldable Walkway** - heat weldable walkway pad with a rough upper surface for traction. It is available in 3 mm thick rolls, 750 mm wide x 15 m long.
 - **Sure-Weld Bonding Adhesive** - a high strength, solvent-based contact adhesive that is used to bond Viking Enviroclad to various porous or non-porous substrates. It is supplied as a yellow liquid in 5 US Gallon pails.
 - **Flexible FAST Dual Cartridge Adhesive** - a low-rise VOC free, construction grade, two component polyurethane adhesive used to bond Viking FleeceBACK (FBS) Enviroclad to various substrates. It is supplied in 1.5 L dual cartridge (750 ml of A and B).



- **CAV-GRIP III Adhesive/Primer** - is a spray-applied, aerosol contact adhesive and primer used to bond standard Viking Enviroclad to various substrates. It is supplied as 13.6 kg of adhesive in a self contained spray system.
- **Pipe Seal** - an injection moulded, pre-formed flashing for pipes from 25 to 650 mm diameter. They are approximately 200 mm in height with a stepped configuration with a large base diameter to cover plates used for attaching the membrane.
- **Coated Metal** - a galvanised metal sheet covered with unreinforced Enviroclad membrane. It is used for edge flashing details and is supplied as a sheet 3.1 m long x 1.2 m wide, and then cut to size.
- **Universal Corners** - weldable pre-formed internal and external corners for detailing.
- **CCW-102 Sealant** - a one-part, moisture curing, elastomeric polyurethane sealant. It is used to fill the sealant pockets to waterproof around penetrations. It is supplied as a white paste in cartridges of 10.3 Fl oz each.
- **Sealant Pockets** - pre-fabricated polymer pockets used for placing around penetrations prior to filling with CCW 102 sealant to ensure weathertight detailing.

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 lying down on pallets.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- Viking Enviroclad, Viking Roofspec Details, dated 23 November 2020.
- 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 Viking Enviroclad Roofing and Deck Membrane can be installed using three different fixing methods, one fully bonded, the other two mechanical. The standard method is fully bonded with heat welded seams. The first mechanical method uses HP-X Fasteners and Piranha Plates fixed through the membrane and then covered by the membrane laps. The second mechanical method, Rhino Bond System, induction welds the membrane to pre-installed washers beneath the membrane.
- 7.2 Viking Enviroclad 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.
- 7.3 Viking Enviroclad can be adversely affected by contact with bituminous materials or polystyrene insulation. Viking Roofspec should be contacted for advice in either of these situations.
- 7.4 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to BRANZ Good Practice Guide: Membrane Roofing.
- 7.5 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.
- 7.6 Roofs where regular foot traffic is expected i.e. for the maintenance of lift equipment, a heat weldable walkway should be used to ensure the membrane is protected. Viking Enviroclad is designed for limited, irregular pedestrian access only.
- 7.7 Decks must always be protected by a pedestal protection system.

Building to NZBC Acceptable Solution E2/AS1

- 7.8 NZBC Acceptable Solution E2/AS1 limits the size of decks to 40 m² as covered by the scope of this Appraisal. Viking Enviroclad is suitable for use on decks larger than 40 m². These decks are the subject of specific design and are outside the scope of this Appraisal.

Structure

- 8.1 Viking Enviroclad installed using the standard method of fully bonded with heat welded seams is suitable for use in areas subject to a maximum design differential ultimate limit state [ULS] wind pressure of 6.5 kPa, subject to the limitations of the substrate. Viking Enviroclad installed using either of the mechanical fastenings methods, HP-X Fasteners and Piranha Plates or Rhino Bond System is suitable for use in areas subject to maximum design differential ULS wind pressure of 2.7 kPa, 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. Plywood must comply with NZBC Acceptable Solution E2/AS1, Paragraphs 8.5.3 and 8.5.5. Where specific design is required [i.e. the building is outside the scope of NZS 3604 and NZBC Acceptable Solution E2/AS1], the plywood thickness and fixing size may increase and centres may decrease to meet specific wind loadings.

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.

Strandsarking

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

Cross Laminated Timber [CLT]

- 9.4 CLT must be installed in accordance with the manufacturer's instructions.

Existing Construction

- 9.5 A thorough inspection of the plywood or concrete substrate must be made to ensure it is in a fit condition and does not contain any materials or contaminants that will adversely affect the performance of the membrane.
- 9.6 Repairs must be undertaken, where applicable, to ensure the substrate is sound, the joints are sealed, and the flashings are sound. Plywood substrates must be checked for screw fixings, and if necessary refixed as for new plywood.

Durability

Serviceable Life

- 10.1 Viking Enviroclad installations 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 Viking Roofspec.
- 11.2 In the event of damage to the membrane, the membrane must be repaired by removing the damaged portion and applying a patch as for new work.
- 11.3 Drainage outlets must be maintained to operate effectively.

Prevention of Fire Occurring

- 12.1 Separation or protection must be provided to Viking Enviroclad from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC 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 be designed and constructed to shed melted snow in snow prone areas. A means of meeting code compliance with NZBC Clause E2.3.1 for buildings within the scope limitations of Paragraph 2.1 is given by the Technical Literature which aligns with details in NZBC Acceptable Solution E2/AS1.
- 13.2 When installed in accordance with this Appraisal and the Technical Literature, Viking Enviroclad 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 or deck.
- 13.3 The minimum fall for plywood roofs is 1 in 30 [2°], for concrete structures is 1 in 60 [1°], for plywood decks 1 in 40 [1.5°] and for gutters 1 in 100 [0.5°]. 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 a gutter fall of 1 in 60 [1°] is preferred.]*
- 13.4 Viking Enviroclad 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 falls must be built into the substrate and not created with mortar screeds over the membrane.
- 13.6 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.
- 13.7 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 or deck does not drain to an external gutter or spouting.
- 13.8 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of roof drainage.
- 13.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design. Weathertightness details that are developed by the designer are outside of the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

Water Supplies

- 14.1 Water is not contaminated by Viking Enviroclad Roofing and Deck Membrane, which comply with AS/NZS 4020.
- 14.2 The first 25 mm of rainfall from a newly installed Viking Enviroclad Roofing and Deck Membrane must be discarded before drinking water collection starts. This is to remove residues which may have developed in the process involved in the production of Viking Enviroclad.
- 14.3 The Viking Enviroclad Roofing and Deck Membrane have been shown to comply with AS/NZS 4020, but 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

- 14.4 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 Viking Roofspec licensed and trained installers.
- 15.2 Installation of substrates must be completed by tradespersons with an understanding of roof and deck construction, in accordance with instructions given within the Viking Enviroclad 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 sheets must be dry at time of membrane application. This will generally require plywood sheets to be covered until just before the membrane is laid, to prevent rain wetting.

Membrane Installation

- 17.1 The installation of this membrane system is very complex and limited to trained applicators only. The Viking Enviroclad Applicators Manual should be referred to 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 system is provided in the Technical Literature. The products 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 by various organisations for shear/joint strength, adhesion, peel resistance, resistance to ageing, resistance to impact, resistance to frost, resistance to freeze/thaw, resistance to ultraviolet [UV], elongation, tensile strength, seam strength, breaking strength, low temperature resistance, static puncture resistance, dynamic puncture resistance and artificial weathering followed by tensile strength, elongation, low temperature flexibility retention, and mechanical fastening. Results and test methods have been reviewed by BRANZ and found to be satisfactory.
- 20.2 Wind face load and fastener pull through testing was completed for the Viking Enviroclad mechanically fastened systems incorporating Piranha Plates and the Rhino Bond System. BRANZ determined design wind suction pressures, and by comparing these pressures with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for plywood and concrete substrates

Other Investigations

- 21.1 A durability opinion has been provided 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 Viking Enviroclad 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. BRANZ has taken note of product certification covering quality aspects associated with this product.
- 22.2 The quality of supply of the product to the market is the responsibility of Viking Roofspec.
- 22.3 Quality on-site is the responsibility of the Viking Roofspec licensed and trained installers.
- 22.4 Designers are responsible for the building and substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Viking Roofspec and this Appraisal.
- 22.5 Building owners are responsible for the maintenance of the Viking Enviroclad Roofing and Deck Membrane in accordance with Viking Roofspec's instructions.

Sources of Information

- AS/NZS 2269:2012 Plywood - Structural.
- AS/NZS 1170:2002 Structural design action - General principles.
- BRANZ Good Practice Guide: Membrane Roofing (Second Edition), dated October 2015.
- BRANZ Bulletin No. 585 Measuring moisture in timber and concrete.
- 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

Amendment No. 1, dated 25 August 2022

This Appraisal has been amended to update minimum fall requirements.

Amendment No. 2, dated 28 March 2024

This Appraisal has been amended to add Viking FleeceBACK (FBS) Enviroclad and two new adhesives, add CLT and Strandsarking substrates and delete Viking Decoupling System. The Appraisal has also been amended to update the Prevention of Fire Occurring paragraph and to add compliance with AS/NZS 4020.



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27 May 2020

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE



In the opinion of BRANZ, **Viking Enviroclad Roofing and Deck 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 **Viking Roofspec**, 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 Roofspec**:
 - 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 Roofspec**.
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 Roofspec** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

27 May 2020