



**BRANZ Appraised**

Appraisal No.656 [2009]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 656 (2009)**

**ENVIROCLAD  
ROOFING MEMBRANE**

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Waterproofing**  
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## Product

1.1 Enviroclad is a single ply, adhesive fixed, polyester fabric reinforced, thermoplastic polyolefin (TPO) waterproofing sheet membrane for building roofs.



**SKELLERUP VIKING**

**ROOFING & WATERPROOFING**

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## Scope

2.1 Enviroclad has been appraised as a roof waterproofing membrane on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan areas; and,
- with building structures designed and constructed to meet the requirements of the NZBC; and,
- with roof supporting structures of timber framing with substrates of plywood; and,
- with substrates of suspended concrete slabs; and,
- situated in NZS 3604 Building Wind Zones, up to, and including 'Very High'.

2.2 Enviroclad has also been appraised for use as a roof waterproofing membrane on specifically designed buildings within the following scope:

- with building structures designed and constructed to comply with the NZBC; and,
- with roof supporting structures of timber framing with substrates of plywood; and,
- with substrates of suspended concrete slab; and,
- subjected to maximum wind pressures (Refer Paragraph 8.1); and,
- with the weathertightness design of all junctions being the subject of specific design by the designer.

*Note: The design of these junctions has not been appraised by BRANZ and is outside the scope of this Appraisal.*

2.3 Roofs waterproofed with Enviroclad must be designed and constructed in accordance with the following limitations:

- nominally flat, curved or pitched roofs constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
- constructed to suitable falls (Refer Paragraph 13.3); and,
- with no integral roof gardens.

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 Skellerup Viking Roofing & Waterproofing Licensed and Trained Installers.

## Building Regulations

### New Zealand Building Code (NZBC)

**3.1** In the opinion of BRANZ, Enviroclad, 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. 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 Enviroclad meet these requirements. See Paragraphs 13.1 – 13.8.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Enviroclad meets this requirement and will not present a health hazard to people.

**3.2** This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

## Technical Specification

**4.1** Materials supplied by Skellerup Viking Roofing & Waterproofing are as follows:

### Enviroclad

- Is a fully adhered, polyester fabric reinforced, multilayer, synthetic roof waterproofing sheet based on thermoplastic polyolefin (TPO). It is supplied in light grey rolls either 1.14 or 1.5 mm thick, 3.0 m wide and 30.4 m long.

### HP-X Fasteners

- Are #15 wire diameter, mini drill point, buttress style thread fasteners for the mechanically fastened Enviroclad system. They always used with the piranha plates (washers).

### 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.

### Heat Weldable Walkway

- Heat weldable walkway pad with a rough upper surface for traction. It is available in a 3 mm thick, 750 mm wide x 15 m long roll.

### Sure-Weld Bonding Adhesive

- Is a high strength, solvent based contact adhesive that is used to bond Enviroclad to various porous or non porous substrates. It is supplied as a yellow liquid in 5 US Gallon pails.

### Pipe Seal

- Is an injection moulded, performed 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.

### Universal Corners

- Weldable performed internal and external corners for detailing.

### CCW-102 Sealant

- Is a one part, moisture curing, elastomeric polyurethane sealant. It is used to fill the sealant pockets to waterproof around penetration. It is supplied as a white paste in cartridges of 10.3 Fl Oz each.

### Sealant Pockets

- Are pre-fabricated polymer pockets used for placing around penetration prior to filling with CCW 102 sealant to ensure weathertight detailing.

## Cut Edge Sealant

- Is a free flowing polymeric sealant designed to seal cut edges of Enviroclad and therefore seal in any loose reinforcing strands at the cut edge. It is supplied as high solids, gun consistency material or medium solids, free flowing material. It is either white, gray or tan coloured in 8oz bottles or 11 oz tubes.

## Handling and Storage

**5.1** Handling and storage of all materials whether on or off site is under the control of the Skellerup Viking Roofing & Waterproofing 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** Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Enviroclad. 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** Enviroclad is for use on roofs where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.

**7.2** Enviroclad can be adversely affected by contact with bituminous materials or polystyrene insulation. Skellerup Viking Roofing & Waterproofing should be contacted for advice in either of these situations.

**7.3** The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to BRANZ publication "Good Practice Guide to Membrane Roofing".

**7.4** 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.

**7.5** Where regular foot traffic is envisaged i.e. maintenance of lift equipment, a heat weldable walkway should be used to ensure the membrane is protected. Enviroclad is designed for limited, irregular pedestrian access only.

### Structure

**8.1** Enviroclad fully bonded is suitable for use in areas subject to maximum wind pressure of 3 kPa Ultimate Limit State 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.** 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.

## 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.

## Durability

### Serviceable Life

10.1 Enviroclad 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 the membrane supplier.

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.

## Outbreak of Fire

12.1 The membrane must be protected from heat sources such as flues and chimneys in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

## External Moisture

13.1 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 by the Technical Literature.

13.2 When installed in accordance with this Appraisal and the Technical Literature, 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.

13.3 The minimum fall for roofs is 1 in 40 and for gutters is 1 in 60. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane.

13.4 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 plywood substrate.

13.6 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.

13.7 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of roof drainage.

13.8 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

# Installation Information

## Installation Skill Level Requirement

14.1 Installation of the membrane must be completed by trained installers, approved by Skellerup Viking Roofing & Waterproofing.

14.2 Installation of substrates must be completed by tradespersons with an understanding of roof construction, in accordance with instructions given within the Skellerup Viking Roofing & Waterproofing Technical Literature and this Appraisal.

## Preparation of Substrates

15.1 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.

15.2 Concrete substrates can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 424. The relative humidity of the concrete must be 75% or less before membrane application.

15.3 The moisture content of a timber substructure must be a maximum of 20% and plywood sheet 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

16.1 The installation of this membrane system is very complex and limited to trained applicators only. The Enviroclad Applicators Manual should be referred in all instances for the correct procedures.

## Inspections

17.1 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

18.1 Safe use and handling procedures for the membrane system is provided in the Technical Literature.

The product 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

19.1 Testing has been carried out on the membrane by various organisation for shear/joint strength, adhesion, peel resistance, resistance to aging, resistance to impact, resistance to frost, resistance to freeze/thaw, resistance to 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 and low temperature flexibility retention. Results and test methods have been reviewed by BRANZ and found to be satisfactory.

### Other Investigations

20.1 A durability opinion has been given on Enviroclad by BRANZ technical experts.

20.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

20.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

### Quality

21.1 The manufacture of the 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.

21.2 The quality of supply of the product to the market is the responsibility of Skellerup Viking Roofing & Waterproofing.

21.3 Quality on site is the responsibility of the Skellerup Viking Roofing & Waterproofing Licensed and Trained Installers.

21.4 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Skellerup Viking Roofing & Waterproofing and this Appraisal.

### Sources of Information

- AS/NZS 2269: 1994 Plywood – structural.
- BRANZ Good Practice Guide – Membrane Roofing, reprint October 2003.
- AS/NZS 1170: 2002 Structural Design action – general principles.
- NZS 3101: 1995 The design of concrete structures.
- NZS 3604: 1999 Timber framed buildings.
- 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, **Enviroclad Roof 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 **Skellerup Viking Roofing & Waterproofing**, 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. **Skellerup Viking Roofing & Waterproofing**:
  - 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.
3. 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.
4. 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 **Skellerup Viking Roofing & Waterproofing**.
5. 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.
6. BRANZ provides no certification, guarantee, indemnity or warranty, to **Skellerup Viking Roofing & Waterproofing** or any third party.

For BRANZ

P Burghout  
Chief Executive

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