



BRANZ Appraised

Appraisal No.768 [2012]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 768 (2012)**

INDEX REINFORCED BITUMEN ROOFING AND DECK MEMBRANE SYSTEMS

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Product

1.1 The Index Reinforced Bitumen Membrane Systems are for nominally flat, pitched and curved roofs, decks, gutters and parapets. They are installed as a torch-on, two-layer system with a top layer finished with mineral chip or plain and coated. They can also be installed as single layer systems onto concrete substrates with either a top layer finished with mineral chip or plain and coated or with traffic protection such as paving slabs or topping screed. The products are reinforced, APP, SBS and SBS/APP polymer-modified bitumen sheet in roll form.



Scope

2.1 Index Reinforced Bitumen Membrane Systems have been appraised for use as waterproofing membranes for buildings within the following scope:

- scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with timber supporting structures designed and constructed in accordance with the NZBC; and,
- with nominally flat or pitched roofs constructed to drain water to gutters and drain outlets complying with NZBC; and,
- with substrates of plywood sheet; and,
- with decks that have a maximum size of 40m²; and,
- situated in NZS 3604 Wind Zones up to, and including 'Extra High'.

2.2 Index Reinforced Bitumen Membrane Systems have also been appraised for use as waterproofing membranes for external reinforced concrete and plywood roofs, pedestrian decks and balconies for buildings within the following scope:

- up to 3 storeys with a maximum height from ground to eaves of 10m and with a floor plan area limited only by seismic and structural control joints; and,
- with the reinforced concrete structure designed and constructed in accordance with the NZBC; and,
- with timber and steel supporting structures designed and constructed in accordance with the NZBC; and,
- subject to maximum ultimate limit state (ULS) wind pressures of 4 kPa; and,
- with nominally flat, curved or pitched roofs constructed to drain water to gutters and drain outlets complying with the NZBC.

2.3 This Appraisal is limited to roofs, decks and balconies within the following scope:

- constructed to suitable falls (Refer Paragraph 14.3 – 14.4); and,
- with no steps within the deck level, no integral roof gardens and no down pipe discharging directly onto the deck.

2.4 The design and construction of the substrate and movement and control joints is specific to each building, and therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.

2.5 The membranes must be installed by Hitchins New Zealand Limited Licensed and Trained Installers.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Index Reinforced Bitumen Membrane Systems, 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 (b), 15 years. The Index Reinforced Bitumen Membrane Systems meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. The Index Reinforced Bitumen Membrane Systems meets these requirements. See Paragraphs 14.1 – 14.6.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Index Reinforced Bitumen Membrane Systems 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. The membranes are an alternative to the membranes specified in NZBC Acceptable Solution E2/AS1, and an Alternative Solution subject to specific design for other buildings.

Technical Specification

4.1 The following materials manufactured by Index and supplied by Hitchins New Zealand Limited are covered by this Appraisal:

- Index Autotene Base P – 3.0 mm thick, self adhesive, bitumen base sheet waterproofing membrane with a sand upper surface used as a base layer for both APP and SBS membranes in multi layer systems. It is supplied in 1 m x 10 m rolls.
- Index Elastocene® Surebase P – 2.6 mm thick modified bitumen, torch applied sheet waterproofing membrane with a sand upper surface used as a base sheet for both APP and SBS membranes in multi layer systems. It is supplied in 1 m x 10 m rolls.
- Index Mineral Protea-Duo Polyester – 4.5 kg/5.0 mm thick APP/SBS composite bitumen, torch applied sheet waterproofing membrane with a slate granule (mineral) upper surface finish used as a cap sheet in a single and multi layer system. It is supplied in 1 m x 10 m rolls.
- Index Protea-Duo Polyester – 4.0 mm thick APP/SBS composite bitumen waterproof membrane with an upper surface finish called Texflamina (requires coating) used as a cap sheet in a single and multi layer system. It is supplied in 1 m x 10 m rolls.
- Index Mineral Nova Polyester – 4.5 kg/5.0 mm thick APP modified bitumen, torch applied sheet waterproofing membrane with a slate granule (mineral) upper surface finish used as a cap sheet in a single or multi layer systems. It is supplied in 1 m x 10 m rolls.
- Index Nova Polyester and Fibreglass (Biamarto) – 4.0 mm thick APP modified bitumen, torch applied sheet waterproofing membrane with sand, talc or texflamina upper surface finish (requires coating) used as a cap sheet in a single or multi layered system. It is supplied in 1 m x 10 m rolls.
- Index Mineral Testudo Polyester – 4.5 kg/4.5 mm thick SBS modified bitumen torch applied sheet waterproofing membrane with a mineral upper surface used as a cap sheet in a single or multi layer system. It is supplied in 1 m x 10 m rolls.

- Index Testudo Polyester – 3.0 and 4.0 mm thick SBS modified bitumen torch applied sheet waterproofing membrane with sand or talc upper surface used as a base sheet in a multi layered system or a cap sheet in a single layer which will require coating. It is supplied in 1 m x 10 m rolls.
- Index Mineral Fidia Polyester – 4.0 mm thick APP modified bitumen, torch applied sheet waterproofing membrane with a slate granule (mineral) finished upper surface used as a cap sheet in single and multi layer systems. It is supplied in 1 m x 10 m rolls.
- Index Fidia Polyester and Fibreglass (Biamarto) – 3.0 and 4.0 mm thick APP modified bitumen, torch applied sheet waterproof membrane with sand or talc upper surface finish used as a cap sheet in single or multi layered system. It is supplied in 1 m x 10 m rolls.
- Index Elastocene Polyester – 3.0 and 4.0 mm thick APP/SBS modified bitumen, torch applied sheet waterproof membrane with a upper surface called Texflamina (requires coating) used as a cap sheet in single or multi layer system. It is supplied in 1 m x 10 m rolls.
- Index Perfobase – is a perforated (199 holes/m²), modified bitumen sheet membrane for use when partially bonded waterproofing system is required. This system allows equalising of pressure in order to avoid blisters, dimensional stability of the waterproofing system and reduction of possible fatigue in the completed membrane caused by cyclic movement or microcracking. It is supplied in 1 m x 30 m rolls.
- Index Techtene BV Strip – is a heat activated, self adhesive vapour barrier for use when adhering insulation material to a substrate prior to the installation of the membrane waterproofing system, or as a venting base sheet in a multi layer system. It is supplied as 3 mm thick in rolls of 1 m x 10 m.
- Index Indeever – is a bituminous primer used for all substrates prior to the application of the membranes. It is black in colour and supplied in 20 litre cans.
- Index Sigilstik – is a bituminous emulsion based elastomeric adhesive/sealant used for all general sealant detailing prior to membrane application. It is coloured black and supplied in 310 ml cartridges.
- Index Solaris-Plus – is a bitumen and solvent based, aluminium filled reflective paint coating for old and new bituminous waterproofing systems. It is silver in colour and supplied 20 litre pails.
- Index Elotene Kontabit – is a double sided adhesive tape for detailing various situations. It is available different widths with a roll length of 10 m.
- Index Triaffili – a reinforced bitumen fillet, torch installed into corners.

Handling and Storage

5.1 Handling and storage of all materials whether on or off site is under the control of the Hitchins New Zealand Limited Licensed and Trained installers. Dry storage must be provided for all products and the rolls of membrane must be stored in an upright position.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Index Reinforced Bitumen Membrane Systems. 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.

Table 1: System Combinations

Two layer systems combinations (Plywood & Concrete Substrate)		
Vented with a Base Layer	Top Layer (Cap Sheet)	Membrane Finish
Index Perfobase & Index Elastocene Surebase 2.6 mm Note: Perfobase, which is a perforated sheet, does not constitute a waterproof layer and must have Index Elastocene Surebase over the top as a base layer.	Mineral Protea-Duo P 4.5 kg/5.0 mm Protea-Duo P Texflamina 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Nova P 4.5 kg/5.0 mm Nova P Biamarto 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Testudo 4.5 kg/4.5 mm Testudo 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Fidia 4.0 mm Fidia P Biamarto 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Elastocene P Texflamina 3.0 mm	Coated Solaris-Plus or Traffigard
Index Techtene BV Strip Note: Index Techtene BV Strip doesn't have perforations and therefore can act as a vent sheet and a base layer.	Mineral Protea-Duo P 4.5 kg/5.0 mm Protea-Duo P Texflamina 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Nova P 4.5 kg/5.0 mm Nova P Biamarto 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Testudo 4.5 kg/4.5 mm Testudo P 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Fidia P 4.0 mm Fidia P Biamarto 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Elastocene P Texflamina 3.0 mm	Coated Solaris-Plus or Traffigard
Base Layer	Top Layer (Cap Sheet)	Membrane Finish
Index Elastocene Surebase 2.6 mm or Testudo P 3.0 or 4.0 mm or Index Autotene Base P 3 mm	Mineral Protea-Duo P 4.5 kg/5.0 mm Protea-Duo P Texflamina 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Nova P 4.5 kg/5.0 mm Nova P Biamarto 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Testudo 4.5 kg/4.5 mm Testudo P 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Fidia P 4.0 mm Fidia P Biamarto 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Elastocene P Texflamina 3.0 mm	Coated Solaris-Plus or Traffigard
Single Layer Systems (Concrete Substrate Only)		
	Waterproofing Layer	Membrane Finish
	Mineral Protea-Duo P 4.5 kg/5.0 mm Protea-Duo P Texflamina 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Nova P 4.5 kg/5.0 mm Nova P Biamarto 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Testudo 4.5 kg/4.5 mm Testudo P 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Mineral Fidia P 4.0 mm Fidia P Biamarto 3.0 or 4.0 mm	Natural Mineral Coated Solaris-Plus or Traffigard
	Elastocene P Texflamina 3.0 mm	Coated Solaris-Plus or Traffigard

Design Information

General

7.1 The Index Reinforced Bitumen Membrane Systems are 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. The products can be used on new or existing buildings. Hitchins New Zealand Limited should be consulted as to the suitability of any existing substrates prior to using the Index Reinforced Bitumen Membrane Systems.

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

7.3 Refer to Table 1 for the composition of the systems within the Index Reinforced Bitumen Membrane Systems.

Structure

8.1 The Index Reinforced Bitumen Membrane Systems are fully bonded single or double layer systems and are suitable for use in areas subject to maximum wind pressures of 4 kPa Ultimate Limit State.

Substrates

Plywood and Timber Roof Framing

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 Paragraph 8.5.3 and 8.5.5. Where specific design is used (i.e. outside the scope of NZBC E2/AS1) the plywood thickness and fixing size may increase and centres may decrease to meet specific wind loadings. Timber framing 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 all sheet edges are fully supported.

Steel Roof Framing

9.2 Steel framing must comply with the NZBC and subject to specific engineering design 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 all sheet edges are fully supported. Particular attention must be paid to steel framing to limit deflection and movement.

Concrete

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

Existing Construction

9.4 A thorough inspection of the substrate must be made to ensure it is in fit condition and does not contain any materials that will adversely affect the performance of the membrane.

9.5 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 The Index Reinforced Bitumen Membrane Systems are expected to have a serviceable life of at least 15 years, provided they are designed, used, installed and maintained in accordance with this Appraisal, the Technical Literature and Hitchins Process Maintenance Advice document.

Chemical Resistance

10.2 Industrial air pollutants and windborne salt deposits should not significantly affect the durability of the membranes. 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 and deck systems must be regularly (at least annually) checked for damage, rubbish, debris or coating breakdown. Damage, such as small punctures and tears must be repaired and coatings reapplied as recommended by Hitchins New Zealand Ltd.

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.

Outbreak of Fire

12.1 Separation or protection must be provided to the membrane and plywood substrate from heat sources such as flues and chimneys.

12.2 NZBC Acceptable Solution C/AS1 Part 9 and Verification Method C/MM1 provide methods for separation and protection of combustible materials from heat sources.

Spread of Fire

13.1 The membranes may be used on roofs of buildings intended for all Purpose Groups, including SC and SD, subject to the requirements of NZBC Acceptable Solution C/AS1 Part 7, Paragraph 7.11.1.

13.2 The membranes may be used for cladding fire-rated roof construction, providing the roof construction complies with the requirements of NZBC Acceptable Solution C/AS1 Part 7.

External Moisture

14.1 Roofs, decks and balconies 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 which aligns with details in NZBC Acceptable Solution E2/AS1.

14.2 When installed in accordance with this Appraisal and the Technical Literature, the Index Reinforced Bitumen Membrane Systems will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membranes are impervious to water and will give a weathertight roof, deck or balcony.

14.3 Roof, deck and balcony falls must be built into the substrate and not created with mortar screeds applied over the membrane.

14.4 The minimum fall to roofs is 1 in 30, decks is 1 in 40 and gutters is 1 in 100. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membranes.

14.5 Allowance for deflection and settlement of the substrate must be made in the design of the roof, deck or balcony to ensure falls are maintained and no ponding of water can occur.

14.6 The Index Reinforced Bitumen Membrane Systems are 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.

14.7 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, deck or balcony does not drain to an external gutter or spouting.

14.8 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by the blockage of roof, deck or balcony drainage.

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

Water Supplies

15.1 The Index Reinforced Bitumen Membrane Systems have not been assessed for roofs used for the collection of potable water.

Installation Information

Installation Skill Level Requirement

16.1 Installation of the membranes must be completed by Hitchins New Zealand Limited Licensed and Trained Installers.

16.2 Installation of substrates must be completed by tradespersons with an understanding of roof, deck or balcony construction, in accordance with instructions given within the Hitchins New Zealand Limited Technical Literature and this Appraisal.

Preparation of Substrates

17.1 Substrates must be dry, clean and stable, smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents before installation commences. All surface defects must be filled to achieve an even and uniform surface.

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

17.3 The moisture content of the plywood and timber substructure must be a maximum of 20% and the 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 or the sheet surface and edges pre-primed, to prevent rain wetting.

17.4 All substrates must be primed with Index Indever and left to dry (4-5 hours) before the membranes are installed. Primed substrates exposed to the weather for more than 96 hours will require re-priming.

Membrane Installation

18.1 The membranes must be installed in accordance with the Technical Literature.

18.2 All roof and wall junctions must have a 20 mm x 20 mm fillet installed at the junction. Concrete substrate junctions must have a 20 mm x 20 mm cement mortar fillet installed. Alternatively Hitchins Triafilli bitumen fillet can be torch applied to the junction. All external edges must be chamfered to a 5 mm radius to remove sharp edges.

18.3 The membranes must be unrolled without tension onto the prepared substrate and allowed to 'relax' for at least 30 minutes prior to installation.

18.4 The membranes are installed from the lowest point and each layer is installed across the roof fall allowing a 100 mm side overlap and a 200 mm end overlap. The cap sheet layer must be offset against the base sheet layer. Note: In certain situations the membranes can also be installed up the roof falls. Please refer to Hitchins New Zealand Limited for technical recommendation.

Inspections

19.1 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 membranes.
- Acceptance of the substrate by the membrane installer prior to application of the membranes.
- Installation of the membranes to the Technical Literature.

Health and Safety

20.1 Safe use and handling procedures for the Index Reinforced Bitumen Membrane Systems are provided in the Technical Literature. The products must be used in conjunction with the relevant Material Safety Data Sheets for each membrane.

Basis of Appraisal

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

Tests

21.1 The Index Reinforced Bitumen Membrane Systems have been tested according to the requirements of EN13707 and are covered by CE Certification. The above information and test results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

22.1 A durability opinion has been provided by BRANZ technical experts.

22.2 Installation of the membrane has been assessed by BRANZ for practicability of installation and found to be satisfactory.

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

Quality

23.1 The manufacture of the membranes 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. The manufacturer of the Index Reinforced Bitumen Membrane Systems has been assessed and registered as meeting the requirements of ISO 9001 and Directive 89/106/EEC.

23.2 The quality of the supply of products to the New Zealand market is the responsibility of Hitchins New Zealand Limited.

23.3 Quality on site is the responsibility of the Hitchins New Zealand Limited Licensed and Trained Installers.

23.4 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 Hitchins New Zealand Limited and this Appraisal.

23.5 Building owners are responsible for the maintenance of the membrane systems in accordance with the instructions of Hitchins New Zealand Limited and this Appraisal.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2269: 2008 Plywood – structural.
- BRANZ Good Practice Guide – Membrane Roofing, reprint October 2003.
- Code of Practice for Torch-on Bitumen Membrane Systems for Roof and Decks, Membrane Group Inc, October 2008.
- NZS 3101: 1995 The design of concrete structures.
- NZS 3604: 2011 Timber-framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005, Amendment 5, 1 August 2011.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, the Index Reinforced Bitumen Membrane Systems 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 Hitchins 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. [Hitchins 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 [Hitchins 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 [Hitchins New Zealand Limited](#) or any third party.

For BRANZ

P Burghout
Chief Executive

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