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# **TECHNICAL & INSTALLATION MANUAL**

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## **VERSION 2.2**

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## 1 GENERAL INFORMATION

### 1.1 Introduction

This **Technical Manual** is intended for specifiers/installers in order to correctly assemble Asphalt Shingle Roofs over plywood on timber framed buildings complying with NZS 3604. Detailed drawings of the most common construction situations are found at the rear of this Manual.

Any changes to Asphalt Shingle Roofing New Zealand (ASRNZ) specifications must be confirmed in writing with designer, contractor, and builder.

- ① All action for remedial work to rectify problems such as misaligned framing, irregular substrates, lack of blocking etc, must be agreed and confirmed in writing with the designer, contractor, and builder with ASRNZ representative.

### 1.2 Building Code Clauses

When installed in accordance with this Technical Manual the **Asphalt Shingle Roof** will meet the relevant provisions of the New Zealand Building Code (NZBC) Clauses.

- ① B1 Structural  
B1.3.2 and  
B1.3.3(a),(b),(c),(g),(h),(j)  
B1.3.4
- ① B2 Durability  
B2.3.1(b) 15 years
- ① E2 External Moisture  
E2.3.1 and E2.3.2
- ① F2 Hazardous Building Materials  
F2.3.1

### 1.3 Health and Safety

- ① Please refer to the Manufacturers MSDS (Material Safety Data Sheets) for Identification of Hazards associated

with products used.

- ① Building frames must be erected and must be solid enough prior to Asphalt Shingle installations. Do NOT commence work unless the work environment and building frames are safe to work on.

## 2 PRODUCT INFORMATION

### 2.1 Pabco Asphalt Shingles

The Pabco **Asphalt Shingle Roof** consists of mainly asphalt saturants, coatings and fibreglass base materials. These components are then combined during the production process. Asphalt is a unique material which occurs both naturally and as a by-product of crude oil refining.

Asphalt Shingles are most commonly available in strips of shingles for convenience. Typical shingles are in rectangular shapes with textural cut-outs which are exposed to the naked eye in order to form aesthetically pleasing tile effects.

#### ***Pabco Asphalt Shingles consist of;***

- ① **A base material is made of fibreglass mat.**

Serves as the matrix which supports the other components and gives the product the strength to withstand manufacturing, handling, installation and service conditions.

- ① **A specially-formulated asphalt coating.**

Provides the long-term ability to resist weathering and remain stable under severe service temperature extremes.

- ① **A surfacing of weather resistant mineral granules.**

Shields the asphalt coating against the UV rays, adds colour to the product and provides fire resistance.

## 2.2 Materials and Components

### Plywood

- ① Plywood must be a minimum of 15mm or 17mm DD graded Tongue and Groove (T&G) complying with AS/NZS 2269.0:2008 and 1604.3:2004.
  - ① A minimum standard of treatment to H3 MUST be used in areas where roof pitch is 10 degrees or under or on a skillion roof.
  - ① Plywood sheets must have staggered joints in order to provide more shear strength of the roof.
  - ① Fixings used must comply with Table 20 of Compliance Document E2/AS1.
  - ① *Dimensions :*
  - ① Length: 2400mm or 2700mm
  - ① Width: 1200mm
  - ① Thickness: 15mm or 17mm.
  - ① Other suppliers, grades and thicknesses may be used with an agreement between the contractor, specifier and ASRNZ representative.

### Roofing Underlay

- ① #15, #30 saturated Felt underlay complying with ASTM:D4869 or D226 standards for use under asphalt shingles. (40m<sup>2</sup> rolls.)
- ① A minimum requirement of 15lb saturated felt Underlay is laid over the plywood.
- ① Synthetic roofing underlay complying with ASTM: D4869 or D226 Roofing manufactured as an alternative to #15 and #30 saturated felt. (93m<sup>2</sup> rolls)

**(refer to technical drawing 1.31sheet 03) .**

### Asphalt Shingles

- ① 340mm wide x 1030mm long Pabco Asphalt Shingles are

laid over the Roofing Underlay in specific installation methods provided by ASRNZ Shingle Installations Guide at the rear of this manual.

### Drip edge

- ① The Drip Edge Flashing shall be of colour steel, copper, aluminium, stainless steel or galvanized iron compliant with table 20 of E2/AS1.
- ① Provide fixings at every 200mm.

**(refer to technical drawing 1. 32 - sheet 03) .**

### Gable Flashing (Barge)

- ① The Gable Flashing shall be of colour steel, copper, aluminium, stainless steel or galvanized iron compliant with table 20 of E2/AS1
- ① Colour steel or copper barge flashings are most common.

**(refer to technical drawing 1.34 - sheet 03) .**

### Roof to wall junction (apron and step flashings)

- ① Butynol or Epdm or colour steel are the materials used to flash the Roof to wall junction.

### Ridge Ventilation

- ① Pre-fabricated Ridge Ventilation shall be supplied by the ASRNZ installer and shall be installed as per this Technical and Installation Manual.
- ① ASRNZ approved pre-fabricated ridge vents.
- ① In most cases, the ventilated ridge provides the best form of ventilation for the roof space below. All nogs MUST NOT restrict air movements.
- ① Ridge Ventilation can be fragile when fixings penetrate

too deep, and the installer must be careful not to damage ventilation gaps (refer to technical drawing 2.10 / sheet 07).

- ① Pabco Ridge shingles are installed above for cosmetic reasons.

### Ridge & Hip Shingles

- ① Pabco Ridge shingles are to be installed on top of Ridge Ventilations.
- ① It is important to overlap Ridge shingles away from the prevailing wind direction, to prevent wind driven moisture to fall away from the ridge shingle overlap

(refer to technical drawing 1.51-sheet 05)

### Adhesives

- ① A modified bitumen based adhesive used for additional bonding of shingles on barges, valleys and other critical points including roof penetrations, skylights etc.

### Starter Course

- ① Starter shingles or peel & stick
- ① ASRNZ P&S Starter Course is to provide extra protection against the weather.
- ① P&S Starter Courses MUST be installed around the perimeter of the Roof and elsewhere specified, by the ASRNZ installer (refer to technical drawings 1.21-sheet 02/ 2.30 sheet 09/ 2.40 - sheet 10)

### 2.3 Storage

An important aspect of maintaining the quality of the product that emerges from the manufacturing line is proper storage. Do NOT install any ASRNZ Roofing materials or accessories that show signs

of damage or deterioration. If there is doubt, contact ASRNZ.

### 2.4 Storage Guide

- ① Store Asphalt Shingle bundles in a cool, dry place in stacks of not more than 2 stacks high.
- ① Store roll materials upright.
- ① It is not recommended to store asphalt roofing products outdoors for extended periods of time. Shingles may be stored outdoors provided they are stored on raised platform or pallets so that they are not in contact with the ground and are covered from the weather.

## 3 PRIOR TO INSTALLATION

### 3.1 General Instruction

ENSURE all building work complies with NZS 3604 New Zealand Building Code.

***TO QUALIFY FOR FULL WARRANTY PROTECTION AND TO OBTAIN STATED COVERAGE, THE INSTALLATION INSTRUCTIONS CONTAINED IN THIS MANUAL MUST BE FOLLOWED.***

Ask your supplier/installer for more details with regards to warranty information. Ventilation;

- ① In order to prevent harmful condensation, air MUST circulate freely under the roof deck. Refer to Technical drawings at the rear of this manual for more detailed information for ventilation at Ridge, Apron and Fascia junctions.
- ① The main contractor shall be responsible for achieving sufficient ventilation, and all nogs shall NOT restrict the free air circulation within the roof space.

### 3.2 Substrates

The substrate that is referred to in this manual deals with the main substrate that the asphalt shingles are directly laid upon, which is 15mm DD graded or better complying with AS/NZS 2269. If another substrate other than that specified in this manual is to be used, the ASRNZ representative must be consulted prior to installation.

### 3.3 Timber Treatment

Minimum treatment requirements are untreated plywood for ventilated truss roof cavities above 10 degrees and H3 treated plywood for all closed cavity roofs, skillion roofs and roofs 10 degrees or lower.

### 3.4 Roof Frame layout and nogs

The ASRNZ roofing system may be fixed to new or existing timber or steel frame constructions. New timber frame construction must be in accordance to NZS3604, 3603 and 1170 depending on situations. DO NOT commence work if roof frames does not meet the appropriate New Zealand Standards.

### 3.5 Fly Rafters

Do NOT commence work where the main contractor has not left sufficient spacing for ASRNZ roofing system to be fitted into, between Fly Rafter and Pitched Truss member. The main contractor shall be responsible for achieving this spacing prior to ASRNZ Roofing system installation. Refer to technical drawing 2.90-sheet 17 for details.

### 3.6 Flat Deck to Pitched Roof Junction

Asphalt Shingles are NOT to be installed on flat decks or roofs. The main contractor and ASRNZ installer shall work in conjunction in order to achieve the correct layering of Deck membrane and ASRNZ roofing system for weather tightness.

### 3.7 Repair/remedial works

- ① Do NOT attempt to remove existing layers of Asphalt Shingles. Apply new Asphalt shingles directly over the existing shingles.
- ① In order to correctly determine the main cause of defects, always check for moisture damages in plywood prior to resurfacing of shingles.
- ① If in doubt contact the ASRNZ representative.

## 4 INSTALLATIONS

### 4.1 Regulations

It is the builder's or framing installer's responsibility to ensure frame work is set out true in the correct alignment, as required by the Designer. Before installing plywood, check roof framing is true and in the correct alignment with rafters or trusses at 600mm, 800mm or 900 mm centres, nogs are in place, and blocking is provided for support of plywood edges where required. All framing shall comply with the requirements of NZS 3604 code of practice for light timber frame buildings not requiring specific design, or be to a specific structural design.

Pipes and service penetrations E2/AS1 reference. Any pipes, chimneys or other protrusions through the roof must be sealed/flashed with a suitable sealant or designed flashing. Roofing Underlay is ASRNZ installer's responsibility for installing.

### 4.2 Plywood installation

- ① Plywood sheets laid directly to trusses, rafters or purlins depending on roof details.
- ① 15mm DD grade (refer to CHH ecoply plywood calculations) is tongue and grooved and is staggered to provide additional shear strength.
- ① Plywood is fixed using 64mm flathead ring shank nails at a maximum spacing of 150mm sheet joins and around

- perimeter of roof plain and 200mm centers to the rafters/ trusses in the centre of the plywood sheet.
- ① Fixings shall comply with Table 20 of E2/AS1.
- ① Always start installation of plywood at the eaves refer technical drawing 1.21-sheet 02)

### 4.3 Underlay Installation

- ① After the plywood has been properly installed and is sufficiently dry, install appropriate water-proof underlay over the plywood. Where roof pitch is greater than 15 degrees, single layer of felt underlay is sufficient.
- ① Always lay the felt underlay parallel to the eaves.
- ① Underlay MUST be overlapped 50mm horizontally and 100mm vertically at junctions (refer to technical drawing 1. 31 - sheet 03).
- ① For roof pitches between 9.5 to 12 degrees, double layer of felt underlay or a Bitumen Self Adhesive membrane that meets ASTM D 1970 is used.
- ① Pabco shingles cannot be installed over roofs with pitch less than 9.5 degrees.

### 4.4 Pabco Asphalt Shingle Installation

#### General Installation

- ① Starting point of shingle installation is vital to achieve good workmanship quality. Where there is a valley, dormer and hip junctions
- ① start with a full shingle at the rake corner and start working towards the junction.
- ① In a simple roof layout, where there is no critical junction in roof form, it is a good idea to start with a full shingle at the most visible

- ① rake corner of the roof. Always lay Pabco Asphalt Shingles parallel to the eaves.
- ① Starter shingle or P&S Starter Course is applied around the perimeter of the roof prior to installation of Asphalt Shingles.
- ① 340mm wide by 1020 long Pabco Asphalt Shingle has 142mm exposure All fixings MUST be covered by the subsequent layers above.
- ① Refer to technical drawing 1.41- sheet 04 for more detail
- ① Shingles are fixed in Low and Medium Wind Zones by 4 evenly spaced Hot-dip galvanized or Stainless steel wide head nails per shingle, one of which is located 25mm in from each edge. In High, Very High and Extra High Wind Zones 6 nails are evenly spaced.

#### Hips

- ① Shingles are laid up to within 10mm of hips and not lapped over the hip.
- ① Pabco Ridge Shingles are used to cover hip junctions.

#### Valleys

- ① Asphalt shingles are laid through the valley to a minimum of 300mm up onto the next face of the roof.
- ① The next face of the roof is laid with shingles being cut to the line of the valley off set by 50mm from the valley centre line. The top corner of this shingle is cut off on an angle and a layer of sealant is applied between the shingles to stop water tracking.
- ① No fixings shall be within 150mm of the bottom of the valley and no vertical joints within 300mm of the valley.
- ① Refer to technical drawing 2.20- sheet 08 for more details.

### Step Flashing

- ① Butynol, Epdm or colour steel (refer to technical drawing 1.61-sheet 06).

### Kickout Flashing

- ① Colour steel or PVC
- ① All Kick out flashings MUST be installed prior to any Asphalt Shingle installation begins.

### Barge/ Gable Flashing

- ① Colour steel, Copper, Aluminium Barge/ flashings must be installed by ASRNZ as per this manual (refer to technical drawing 2.40-sheet 10)

pigments in the algae may gradually turn a white or light roof to dark brown or black over a period of years.

Algae discolouration is difficult to remove from roof surfaces but it may be lightened with a diluted cleaning solution (contact one of the ASRNZ representatives). Sponge the solution on the roof surface gently; scrubbing will loosen and remove granules. Apply the solution careful to avoid damaging other parts of the building and/or surround landscape. If possible, work from a ladder or walkboards to avoid walking directly on the roof surface. Observe safety precautions whenever working on or near the roof. After sponging, rinse the solution off the roof with a hose.

The effectiveness of such cleaning is only temporary and the discolouration may recur.

## 5 ROOF CARE & MAINTENANCE

### 5.1 General Information

Properly installed Asphalt Shingle Roofs will provide years of protection. Even so, there are certain aspects of roof care such as those listed below that the owner should be made aware of to ensure maximum roof performance.

Do NOT paint over Pabco Asphalt Shingles without consultant of ASRNZ representative.

Do NOT allow any downpipes to pour water directly onto shingles.

Minimise any forms of litter settle on roof surfaces. Make annual inspections.

### 5.2 Maintenance

A type of roof discolouration caused by algae and commonly referred to as "fungus growth" is a frequent problem throughout the country. It is often mistaken for soot, dirt, moss or tree droppings. Pabco Scotchgard Algae Resistant Roofing System can prevent this problem for a period of 20 years. The algae that cause this discolouration do not feed on the roofing material and, therefore, do not affect the service life of the roofing. However, the natural