



BRANZ Appraised
Appraisal No.529 [2006]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
CERTIFICATE
No. 529 (2006)**

Amended 5 December 2007.

**GAF-ELK ASPHALT
ROOF SHINGLES**

Greentree NZ Ltd
64 Kath Hopper Drive
Orewa
Auckland

Tel: 0800 GAF ELK
(0800 423 355)
Fax: 09 427 5199

Web: www.gafelknz.co.nz



BRANZ Limited
Private Bag 50 908
Porirua City 5240
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz

BRANZ Pty Ltd
P O Box 830
Brookvale
NSW 2100
Australia
Tel: +61 2 9938 6011
Fax: +61 2 9938 6911
www.branz.com.au



Product

- 1.1 GAF-Elk Asphalt Roof Shingles are glass-fibre reinforced asphalt shingles surfaced with ceramic coated mineral chips. They are available in five series types: Prestique, Gallery, Grande, Capstone and Royal Sovereign.
- 1.2 The shingles and flashing accessories form a roofing system when installed over a plywood substrate and roofing underlayment.



Scope

- 2.1 GAF-Elk Asphalt Roof Shingles have been appraised as a roof cladding for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1 Paragraph 1.1, with regard to floor plan area and building height; and,
 - constructed with timber roof framing and plywood sheathing complying with the NZBC; and,
 - where the roof slope is 10° or greater; and,
 - situated in NZS 3604 Building Wind Zones up to and including 'Very High'.
- 2.2 The system must be installed in accordance with the Technical Literature by a Greentree NZ Ltd trained and approved installer.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, GAF-Elk Asphalt Roof Shingles, if designed, used, installed and maintained in accordance with the statements and conditions of this Certificate, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GAF-Elk Asphalt Roof Shingles meet the requirements for loads arising from self-weight, gravity loads, temperature, snow, wind, impact and creep [i.e. B1.3.3 (a), (b), (c), (g), (h), (j), and (q)]. See Paragraphs 8.1 – 8.7.

Clause B2 DURABILITY: Performance B2.3.1(b), 15 years. GAF-Elk Asphalt Roof Shingles meet this requirement. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. GAF-Elk Asphalt Roof Shingles meet these requirements. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GAF-Elk Asphalt Roof Shingles meet this requirement and will not present a health hazard to people.

3.2 This Certificate appraises an **Alternative Solution** in terms of New Zealand Building Code Compliance.

Technical Specification

4.1 GAF-Elk Asphalt Roof Shingles are glass-fibre reinforced asphalt shingles surfaced with ceramic coated mineral chips, available in four series types. The shingles are combined with plywood sheathing, a roofing underlayment and various flashing accessories to form a roofing system.

4.2 System components and accessories supplied by Greentree NZ Ltd are as follows:

Shingles

- GAF-Elk Asphalt Roof Shingles are based on the range of roofing shingles with profiles, sizes and weights as shown in Table 1.
- The shingles are composed of a fibre glass mat base within two layers of asphalt with chemically inert granules in the top layer of asphalt to provide protection from the elements. Two of these composites are then laminated into the finished shingle

Table 1: Shingle Profiles

| Shingle | Prestique Series RP and HD 30 | Prestique Series HD 40 | Prestique Series HD 50 & Gallery Collections | Grande 40 Series | Capstone Series |
|-----------------------------------|-------------------------------|------------------------|--|---------------------------|--------------------------|
| Type | 4.5 laminates | 4.5 laminates | 5 laminates | 3 laminates (larger tabs) | 7 laminates (slate look) |
| Size (mm) | 335 x 1000 | 335 x 1000 | 335 x 1000 | 335 x 1000 | 308 x 1000 |
| Weather Exposure (mm) | 140 | 140 | 140 | 205 | 127 |
| Approx. mass (kg/m ²) | 11.5 | 16.2 | 19.2 | 11.5 | 16.7 |
| Available colours | 8 | 8 | 8 (Gallery 3) | 4 | 4 |

Accessories

Plywood sheathing

Minimum 15 mm thick, grade DD or better plywood complying with AS/NZS 2269, treated in accordance with the requirements of NZS 3602.

Z Ridge & Hip and Seal 'A' Ridge & Timbertex Hip and Ridge

These products are complimentary to the GAF-Elk shingle range and supplement hip and ridge capping. The Z Ridge & Hip and Timbertex Hip and Ridge are supplied as a 335 x 250 mm shingle and Seal 'A' Ridge & Hip are supplied as 305 x 305 mm shingle.

Trimline, GAF-Elk High Point Ridge and Cobra Ridge Vents

Sectional ridge vents 10 mm to 15 mm wide installed continuously along the ridge. Used to create a cross flow with the 12 mm air gap at the gutter fascia point. They are supplied in approximately 1.2 m lengths.

Henry 208 Adhesive

A modified bitumen based adhesive/sealant used for additional bonding of the shingles at the gutterline and barge, where wind uplift is the most severe. Also used for supplementary bonding/sealing around valley intersections, chimney and vent penetrations, skylights etc. It is supplied in a 325 ml cartridge.

#15 and #30 Underlayment

Standard bitumen impregnated roofing felt for under the shingles installed directly onto the plywood substrate. It is supplied in approximately 40m² rolls. #30 underlayment is a thicker grade installed with all HD40 and HD50 year shingles.

GAF-Elk Self Adhering Underlayment

A flexible, elastic, self adhesive membrane used to provide extra waterproofing in high wind zones and on roofs where the pitch is between 9° and 12°.

Plywood Nails

Ring shanked, galvanized, flooring grade nails 64 mm long and have a 3 mm diameter shank with 7 mm x 5 mm 'D' head.

Shingling Nails

Stainless steel gun nails for nailing roof shingles, semi ring shanked, in lengths of 32 mm or 25 mm and have a 3 mm diameter shank with a 9 mm head.

Step Flashing

Butyl rubber membrane flashings (Butylclad from Skellerup) for flashing raking sides of chimneys or dormer roof penetration. They are 300 mm x 200 mm and 1 mm thick.

Drip Edge and Barge fascia drip flashings

Folded metal flashings made from pre-painted steel coil. The flashings are 70 mm wide with a right angle bend 50 mm from one edge and a deflector bend 5 mm from the other. These are supplied in 3 to 4 m lengths.

Boot Flashing

Rubber boots installed over vent pipes, chimney or penetrations. They seal between the shingle surface and the penetration. They are installed using stainless steel screws and the Henry 208 Adhesive/Sealant or RTV exterior grade silicone sealant. They are available in a range of sizes to match requirements.

Handling and Storage

5.1 GAF-Elk Asphalt Roof Shingles must be transported and handled with care to avoid damaging the pre-finished surfaces.

5.2 Long term storage of shingles and accessories must be under dry, ventilated cover. For short term storage on site, shingles must be stored flat, no more than two pallets high, and off the ground.

5.3 Handling and storage of all materials supplied by Greentree NZ Ltd, whether on or off site, are under the control of the Greentree NZ Ltd approved installer. Materials must be handled and stored in accordance with the relevant manufacturer's instructions.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for GAF-Elk Asphalt Roof Shingles. The Technical Literature must be read in conjunction

with this Certificate. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Certificate must be followed.

Design Information

General

7.1 Roof framing must comply with NZS 3604, or be to a specific design in accordance with NZS 3603 and NZS 4203.

7.2 Timber roof framing and plywood sheathing must be treated as required by NZS 3602 for the building design application.

7.3 Roof design must take into account any requirements for areas subject to regular snowfalls as per the requirements of NZBC E2/AS1, Paragraph 1.3.

7.4 The shingle underlayment must be GAF-Elk Self Adhering Underlayment where the roof slope is between 10° and 15°, 2 layers of #15 underlayment offset by 50% or 1 layer #30 underlayment, and #15 Underlayment at roof pitches greater than 18°. See Paragraphs 16.4 and 16.5 for further information.

7.5 The collection of potable water has not been assessed and is outside the scope of this Certificate.

Structure

Mass

8.1 The approximate mass of the GAF-Elk Asphalt Roof Shingles is given in Table 2. A light roof is defined in NZS 3604 as a roof with a roofing material (cladding and any sarking) having a mass not exceeding 20 kg/m². A heavy roof is defined in NZS 3604 as a roof with a roofing material (cladding and any sarking) having a mass in excess of 20 kg/m², but not exceeding 60 kg/m².

Table 2: Approximate Roof Masses (kg/m²)

| Shingle Type | 15 mm plywood | 17 mm plywood |
|--|---------------|---------------|
| Prestique Series RP and HD 30 | 20 | 21 |
| Prestique Series HD 40 | 24 | 25 |
| Prestique Series HD 50 & Gallery Collection | 27 | 28 |
| Grande 40 Series | 20 | 21 |
| Capstone Series | 25 | 26 |

Snow

8.2 GAF-Elk Asphalt Roof Shingles are suitable for use in areas where buildings are designed for a 1 kPa snow loading. Refer to Greentree NZ Ltd for installation details for snow-prone areas.

Wind Zones

8.3 When fixed in accordance with the manufacturer's instructions and this Certificate, GAF-Elk Asphalt Roof Shingles are suitable for use in all NZS 3604 Building Wind Zones, up to, and including 'Very High'. See Paragraph 16.7.

Plywood Sheathing

8.4 Where LOSP treated plywood is used, the solvents must be allowed to evaporate off for at least one week before installation of the shingle underlayment.

8.5 Rafters or trusses must be at maximum 900 mm centres for 15 and 17 mm thick plywood.

8.6 The plywood face grain must be laid at right angles to supports. The sheets must be laid with staggered joints in a brick bond pattern.

8.7 Tongue and groove plywood edges must be butt-jointed with no gaps between the sheet edges. Square plywood edges must have a 2 - 3 mm gap between the sheet edges.

Durability

Serviceable Life

9.1 GAF-Elk Asphalt Roof Shingles are expected to have a serviceable life of at least 15 years provided maintenance is carried out in accordance with this Certificate.

Weathering

9.2 GAF-Elk Asphalt Roof Shingles may lose stone granules over a period of time. On aging, some surface cracking may appear. These cracks will not affect the weathertightness of the roof covering within 15 years.

Maintenance

10.1 Little maintenance should be required apart from the removal of lichen, moss and organic growth that may become established and the removal of accumulations of the stone granules in spouting.

10.2 Annual inspection must be made to ensure that all aspects of the roof cladding, including the pre-finished coating, the flashings and any joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately.

10.3 A water-based chemical treatment recommended by Greentree NZ Ltd as being suitable for use with bitumen-based products must be used for the removal of organic material. Petroleum-based solvents or cleaners must not be used.

Outbreak of Fire

11.1 GAF-Elk Asphalt Roof Shingles must be separated from flues or chimneys in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

Spread of Fire

12.1 GAF-Elk Asphalt Roof Shingles may be used on buildings intended for all Purpose Groups, including SC and SD, subject to the requirements of NZBC Acceptable Solution C/AS1 Paragraph 7.9. When used for Purpose Groups SC and SD, solid timber sarking at least 18 mm thick must be used.

12.2 Fire rated roof construction systems using the GAF-Elk Asphalt Roof Shingles have not been assessed and are outside the scope of this Certificate.

External Moisture

13.1 GAF-Elk Asphalt Roof Shingles, when installed in accordance with this Certificate, will shed precipitated moisture and therefore meet the performance requirements of NZBC Clause E2.3.1. They will also prevent the penetration of water that could cause undue dampness, or damage to building elements, therefore meeting the performance requirements of NZBC Clause E2.3.2.

Construction Moisture

13.2 Roofs clad with GAF-Elk Asphalt Roof Shingles, if ventilation requirements are met as in the Technical Literature, allow excess moisture present at the completion of construction to be dissipated without permanent damage to building elements and therefore meet the performance requirements of NZBC

Clause E2.3.6. This is achieved by ensuring the construction moisture levels are no higher than 18% when the shingles are laid and before the ceiling is closed-in, as well as providing an adequate level of roof cavity ventilation.

Internal Moisture

14.1 Adequate roof space ventilation is necessary to ensure roof space internal moisture levels and temperatures are controlled. Roof space ventilation requirements are given in the Technical Literature.

14.2 Ideally, air should be allowed to flow from the bottom to the top of the roof. In skillion-type roofs, a clear, uninterrupted, ventilated air gap of at least 25 mm must be present. Plywood with tongue-and-groove joints should be used on skillion roofs to minimise the restrictions caused by timber blocking. If required by the roof design or occupancy, perforated soffit linings, soffits and ridge vents should be used to minimise the quantity of moisture and heat accumulating in the roof space.

14.3 Greentree NZ Ltd should be consulted for further advice and information on roof ventilation and moisture control, especially when the roof design is unusual.

Table 4: Fixing Centres for 15 mm and 17 mm Plywood – Tongue and Grooved Plywood

| NZS 3604 Building Wind Zone | Fixing Centres (mm), at Supports | | |
|-----------------------------------|----------------------------------|---|---------------------------|
| | Roof Slope 10 – 20° | | Roof Slope 20 – 60° |
| | 0.2w* from roof edge** | Beyond 0.2w* i.e. remainder of roof | |
| Low, Med, High | 75 | 150 | 150 |
| Very High | 50 | 100 | 100 |

* Where w = width of building

** Roof edge = eaves, barge, hips, ridges, fascia, gables

Shingle Underlayment

16.3 The shingle underlayment must be tightly laid horizontally across the roof, and completely cover hips, ridges (except where ridge vents are used), and valleys.

16.4 When the roof pitch is greater than 15°, one layer of Underlayment is required. The upper sheets must be lapped by at least 100 mm over the lower sheets.

16.5 When the roof pitch is between 10° and 15°, either one layer of GAF-Elk Self Adhering Underlayment or two layers of Underlayment lapped by half the width of the roll plus 25 mm (resulting effectively in a double thickness of underlayment) is required. End laps must be at least 200 mm.

16.6 #30 Underlayment is used with HD40 and HD50 shingles, the rest use #15 Underlayment.

16.7 Only sufficient fasteners to temporarily hold the underlayment in place need be used.

Fixing Shingles

16.8 Shingles are fixed in 'Low' and 'Medium' Building Wind Zones by four evenly spaced stainless steel nails per shingle, one of which is located 25 mm from each edge. In 'High' and 'Very High' Building Wind Zones this is increased to six evenly spaced stainless steel nails. Fixing methods other than stainless steel nails have not been assessed and are outside the scope of this Certificate. Care must be taken to ensure the fasteners are driven in straight and are flush with the shingle surface.

16.9 Henry 208 Adhesive must be laid in spots on top of all 'drip edges' or eaves where present. The spots of sealant should be approximately 20 mm from the edge of the roof. Where required, Henry 208 Adhesive must also be used to seal under or hold down shingles at ridges, hips, upstands, and around penetrations.

Installation Information

Installation Skill Level Requirements

15.1 Installation of all components and accessories supplied by Greentree NZ Ltd must be completed by installers trained and approved by Greentree NZ Ltd.

15.2 Installation of the components supplied by the building contractor must be completed by tradespersons with an understanding of roofing installation, in accordance with the instructions given within the Technical Literature and this Certificate.

15.3 Technical Literature must be referred to during all inspections.

System Installation

Plywood Sheathing

16.1 Plywood and framing must have a maximum moisture content of 18% at the time of the installation of the shingles.

16.2 Nails must be fixed according to Table 3 and Table 4. Fixings must be positioned no closer than 10 mm from the sheet edges. All sheet edges must be supported by framing or blocking, except that blocking is not required under the joints where tongue and grooved sheets are used.

Table 3: Fixing Centres for 15 mm and 17 mm Plywood – All sheet edges supported

| NZS 3604 Building Wind Zone | Fixing Centres (mm), Sheet Edges, Intermediate Supports | | |
|-----------------------------------|--|--|---------------------------|
| | Roof Slope 10 – 20° | | Roof Slope 20 – 60° |
| | 0.2w* from roof edge** | Beyond 0.2w* i.e. remainder of roof | |
| Low, Med, High | 100 | 150 | 150 |
| Very High | 75 | 150 | 150 |

* Where w = width of building

** Roof edge = eaves, barge, hips, ridges, fascia, gables

Health and Safety

17.1 Safe use and handling procedures for GAF-Elk Asphalt Roof Shingles are provided in the manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

18.1 The following tests have been carried out by overseas laboratories, by or on behalf of Underwriters Laboratories Inc. in order to show compliance with ASTM D3462-1992 Behaviour on heating; tear strength; fire resistance; fastener pull-through

resistance; pliability; wind resistance; penetration of asphalt; asphalt softening point; compatibility; minimum net mass and average net mass; and mass of glass mat-asphalt, and mineral matter.

Other Investigations

19.1 Weathertightness, structural and durability opinions have been provided by BRANZ technical experts.

19.2 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.

19.3 GAF-Elk Asphalt Roof Shingles are the subject of ICC Evaluation Service, Inc. Report No. ESR 1475.

19.4 Site inspections have been undertaken by BRANZ to assess the practicability of installation.

19.5 The long-term performance of properly installed mastic-bonded and self-adhesive roofing shingles in New Zealand and many countries overseas, along with durability and non-hazardous nature of the materials used has been noted. The overseas and New Zealand experience of asphalt roofing shingles forms the basis of the durability opinion.

Quality

20.1 The manufacture of GAF-Elk Asphalt Roof Shingles 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.

20.2 The quality management system of the GAF-Elk Asphalt Roof Shingles manufacturer, GAF-Elk Corp., has been assessed by ICC Evaluation Service Inc. and is covered in ES Report ESR-1475.

20.3 The quality of the materials and accessories supplied by Greentree NZ Ltd is the responsibility of Greentree NZ Ltd.

20.4 Quality on site is the responsibility of the Greentree NZ Ltd trained and approved installer.

20.5 Designers are responsible for the building design, and the building contractor is responsible for the quality of installation of the roof framing and plywood sheathing in accordance with Greentree NZ Ltd's instructions.

20.6 Building owners are responsible for the maintenance of GAF-Elk Asphalt Roof Shingles in accordance with the instructions of Greentree NZ Ltd.

Sources of Information

- AS/NZS 2269:2004 Plywood – Structural.
- AS/NZS 4680: 1999 Hot-dip galvanised (zinc) coatings on fabricated ferrous articles.
- ASTM D3462-92 Standard Specification for asphalt shingles made from glass felt and surfaced with mineral granules.
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber structures standard.
- NZS 3604:1999 Timber framed buildings.
- NZS 4203:1992 General structural design and design loadings for buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.



In the opinion of BRANZ, GAF-Elk Asphalt Roof Shingles are fit for purpose and will comply with the Building Code to the extent specified in this Certificate provided they are used, designed, installed and maintained as set out in this Certificate.

The Appraisal Certificate is issued only to the Certificate Holder, Greentree NZ Ltd, and is valid until further notice, subject to the Conditions of Certification.

Conditions of Certification

1. This Certificate:
 - 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. The Certificate Holder:
 - 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. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation 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 the Certificate Holder.
5. Any reference in this Certificate to any other publication shall be read as a reference to the version of the publication specified in this Certificate.

For BRANZ

P Robertson
Chief Executive

Date of issue: 19 September 2006

Amendment No. 1 dated 5 December 2007.

Appraisal amended to update Manufacturer name change.