

# 4421WR WPS ECOROOF™ GREEN/PEBBLE MEMBRANE ROOFING

## 1. GENERAL

This section relates to **Waterproofing Systems Ltd** ecoROOF™ and Warm Roof torch on membrane roofing, bonded to:

- construction plywood, including all underlays and accessories
- concrete, including all underlays and accessories
- black pearl insulation panels including all underlays and accessories

## 1.1 RELATED WORK

Refer to ~ for ~.

## 1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

MGNZ                      Membrane Group New Zealand Inc.

### Documents

## 1.3 DOCUMENTS REFERRED TO

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
AS/NZS 2269	Plywood - Structural - Specifications
MGNZ	Code of practice for torch-on membranes
BRANZ BU 345	Flat membrane roofs - design and installation
BRANZ BU 346	Flat membrane roofs - materials

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

## 1.4 MANUFACTURER/SUPPLIER DOCUMENTS

**Waterproofing Systems Ltd** documents relating to work in this section are:

bituFLAME® Product Manual (3<sup>rd</sup> Edition November 2007)

Standard detailed drawings

[BRANZ Appraisal 404](#) - bituFLAME® Roof Membrane Systems

For copies of the above documents, or for technical assistance, contact your local **Waterproofing Systems Ltd** representative:

Northland, Auckland	021 - 917 773
Waikato, Bay of Plenty	021 - 457 953
Gisborne	021 - 457 953
Hawkes Bay, Manawatu	021 - 402 434
Wanganui, Taranaki	021 - 402 434
Wairarapa, Wellington	021 - 402 434
Marlborough, Nelson	027 - 544 5534

Christchurch, Dunedin                      027 - 5445 534

Southland, Central Otago                      027 - 5445 532

Web:    [www.waterproofing.co.nz](http://www.waterproofing.co.nz)

Telephone:                                      03 - 366 9495 (Head office) or 0508 (2WATER) 292837

Facsimile:                                        03 - 366 9496 (Head office)

## Warranties

- 1.5 WARRANTY - INSTALLER/APPLICATOR  
Warrant this work under normal environmental and use conditions against failure.  
Warranty period: 5 years

Refer to the 1237WA WARRANTY AGREEMENT section for the required form of warranty agreement and details of when completed warranties must be submitted.

- 1.6 WARRANTY - MANUFACTURER/SUPPLIER  
Provide a materials warranty in the suppliers standard form.  
  
Warranty period: 20 years materials double layer system  
From: Date of completion of the application

## Requirements

- 1.7 QUALIFICATIONS  
Roofing work to be carried out by licensed applicators approved by **Waterproofing Systems Ltd**. Approved applicators may be found at:  
Web: [www.waterproofing.co.nz](http://www.waterproofing.co.nz)  
Telephone: 06 - 366 9495 or 0508 (2WATER) 292837
- 1.8 NO SUBSTITUTIONS  
Substitutions are not permitted to any specified **Waterproofing Systems Ltd** system, or associated components and products.
- 1.9 PROJECT REGISTRATION  
Contact **Waterproofing Systems Ltd** to confirm that the project has been registered.  
Web: <http://www.waterproofing.co.nz/project-registration.html>  
Telephone: 03 - 366 94985 or 0508 (2WATER) 292837  
If the project has not been registered, telephone and provide all required details.

## Performance

- 1.10 PRE INSTALLATION MEETING  
Convene a meeting between the applicator, contractor, all associated consultants and **Waterproofing Systems Ltd** to ensure all parties know what is required for effective performance of the system.
- 1.11 SPECIAL DETAILS  
Where a standard detail does not exist, or if a standard detail cannot be applied, an approved alternative must be obtained from **Waterproofing Systems Ltd** before proceeding with the installation.
- 1.12 TEST  
Flood test horizontal applications with a minimum 50mm depth of water for 24 hours. Make good any lack of watertightness when the surface is completely dry.
- 1.13 PERFORMANCE  
Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.

1.14 QUALITY ASSURANCE

Maintain quality necessary to assure that work is performed in accordance with this specification and the qualifying requirements of **Waterproofing Systems Ltd.**

Ensure that **Waterproofing Systems Ltd's** Quality Control sheets are completed fully and faithfully for each installation area.

2. PRODUCTS

**Materials**

2.1 DOUBLE LAYER ecoROOF™ GREEN ROOF SYSTEM

bituFLAME® BS, an AAP modified bitumen base sheet with glass fibre reinforcement.

bituFLAME® AR, an AAP modified bitumen waterproofing membrane with 180 gsm composite spunbond polyester reinforcement and anti-root additive all marked with the manufacturer's mark.

2.2 DOUBLE LAYER ecoROOF™ PEBBLE ROOF SYSTEM

bituFLAME® BS, an APP modified bitumen base sheet with glassfibre reinforcement.

bituFLAME® CS, an APP modified bitumen cap sheet with 180 gsm composite spunbond reinforcement all marked with the manufacturer's mark.

2.3 FLASHING MEMBRANE FOR EXPOSED/VISIBLE AREAS

bituFLAME® CS, an APP modified bitumen cap sheet with 180gsm composite spunbond reinforcement all marked with the manufacturer's mark.

2.4 BITUFLAME THERMO AD BS

An APP modified bitumen base sheet with 2.5mm thick which is a heat activated membrane all marked with the manufacturer's mark.

2.5 BITUPRIME PRIMER

bituPRIME quick drying bituminous primer compatible with the waterproofing membrane and formulated to prepare the substrate for optimum application of the membrane.

2.6 BITUBOND® WB ADHESIVE

Liquid applied bituminous adhesive all marked with the manufacturer's mark for areas of installation where a torch cannot be safely used and areas specified in **Waterproofing Systems Ltd** specifications or when the membrane system is being installed using the cold-applied adhesive method.

2.7 UV COATING SYSTEM FOR POLYPROPYLENE FINISHED MEMBRANES

Proprietary coating systems to provide UV protection to the membrane roofing system.

**Components**

2.8 EDGE TRIM

Metal to **Waterproofing Systems Ltd** details and to suit the specific location.

2.9 OUTLETS

Eterno roof drains, overflows and WPS sumps as supplied and required by **Waterproofing Systems Ltd.**



- 2.10 GREEN ROOF DRAINAGE CELL  
Plastic drainage cell sheet with cusps and drainage holes to ensure retention of sufficient water to support plant growth while draining excess water.
- 2.11 PEBBLE BALLAST DRAINAGE CELL  
Plastic drainage cell designed for the purpose of draining water from membrane system
- 2.12 FILTER FABRIC  
Geotextile filter fabric manufactured from recycled plastic. Installed to prevent soil or similar getting into the drainage cell preventing flow of water
- 2.13 INSULATION PANELS  
Black Pearl rigid insulating panels 80mm thick x 1200mm wide x 2450mm long providing an R value of 2.58. Installed onto the substrate with bituBOND WB adhesive.

### 3. EXECUTION

#### Conditions

- 3.1 GENERALLY  
Work and materials to BRANZ Bulletins 345: Flat membrane roofs - design and installation. 346: Flat membrane roofs - materials, and to **Waterproofing Systems Ltd** documents.
- 3.2 STORAGE  
Take delivery of rolls undamaged and include for site handling facilities where required. Stack on end, off the ground on a level surface, out of sunlight and above 5°C and with accessories. Do not allow rolls to become crushed.
- 3.3 CONFIRM LAYOUT  
If not detailed on the drawings, confirm the layout to suit site conditions, and **Waterproofing Systems Ltd** specification.

#### Application - preparation

- 3.4 PRELIMINARY WORK  
Ensure that preliminary work, including formation of falls, flashing rebates, provision of battens and fillets and fixing of vents and outlets to levels, is complete and properly constructed to enable the system to work as intended. Ensure timber fillets fit neatly to plywood substrates and that mitres are neatly formed. This work and the substrate to be smooth, clean and dry. Identify areas of potential movement and plan for movement joints. On concrete substrates install mortar fillets.
- 3.5 ACCEPTANCE OF SUBSTRATE  
Confirm that the substrate complies with the [NZBC E2/AS1](#) for the relevant substrates and **Waterproofing Systems Ltd** documents, including fillets, sumps, outlets and projections, and ensure work of the required standard. Ensure falls to outlets to allow free draining.
- 3.6 CONCRETE SUBSTRATE  
Ensure concrete substrate has been allowed to cure for at least 28 days and has a moisture content of less than 75% RH before commencing application. Prepare surface, including vacuum cleaning and acid etching/diamond grinding as necessary to leave smooth, clean, dry and free of debris. Make good any cracks with non shrink grout. Install mortar fillets to internal angles.



- 3.7 **PLYWOOD SUBSTRATE**  
Lay plywood sheets with staggered joints (brick bond), and lay tight-butted, with all edges fully supported. Ensure sheets are rigid, with joints flush, no lumps or hollows, smooth, clean, dry (20% maximum moisture content) and free of debris. Plywood to be minimum 18mm, H3 CCA treated and conform to AS/NZS 2269. Sheets to be fixed with glue and stainless steel screws counter sunk, chamfered edges, coving fillets to all up-stands and installed to **Waterproofing Systems Ltd** specification. Do not use LOSP treated plywood.
- 3.8 **TURN DOWNS**  
Where the membrane is to be turned down at an external corner, chamfer the corner to provide a minimum 5mm radius.
- 3.9 **UPSTANDS**  
Install fillets minimum 20mm to all upstands and ensure tight and neat fit. Timber fillets H3.1 treated minimum.
- 3.10 **WARM ROOF DETAILING AND FLASHING**  
For the warm roof Black Pearl panels no fillets are required at the substrate base. The top surface of the panel will finish flush with a timber up stand for internal gutters, and will finish at the base of a timber barge board with a fillet angle formed allowing the membrane to dress up and over as a termination detail. Scupper and roof drain fittings are fitted to sit on the bituFLAME Thermo AD BS.
- 3.11 **FLASHINGS**  
Fit membrane flashings to all internal and external corners and upstands and to all penetrations to **Waterproofing Systems Ltd** specifications. Neatly mould membrane up all upstands and around all roof penetrations with a tight cove.
- 3.12 **SET-OUT**  
Neatly set out rolls starting at the lowest point of the roof and run perpendicular to the roof pitch. Lay out membrane and allow to relax for 30 minutes prior to laying. In cooler conditions allow additional time for the membrane to fully relax.
- Application - laying**
- 3.13 **CONDITIONS**  
Do not lay membrane in wet or misty conditions or below 7°C. Check that the substrate is dry at time of laying. Concrete maximum moisture content 75% RH; plywood maximum moisture content 20%.
- 3.14 **APPLICATION TORCH ON MEMBRANES - GENERALLY**  
Unless other specified, install reinforced modified bitumen membrane system to MGNZ Code of practice for torch-on membranes.
- 3.15 **PRIMING**  
All surfaces to be primed strictly to **Waterproofing Systems Ltd** recommendations, ensuring good even coverage. Primed roofs will need re-priming if left more than 3 days before membrane installation.
- 3.16 **BITUBOND WB ADHESIVE WARM ROOF PANELS**  
The bituBOND adhesive is applied to the substrate in 1 coat at a coverage rate of 1.5mm wet film thickness. While the adhesive is still wet immediately install the black Pearl panels tight butted at all edges with top surfaces kept flush to the bituBOND WB adhesive.



- 3.17      LAYING AND JOINTING  
Lay membrane using torch applied bonding unless the location will not allow the application of heat. When cold applied under-surface adhesive may be used. Lay in order from sumps, through gutters, valleys, eaves, verges, main roof and upstands to cover flashings.
- 3.18      HEAT CONTROL  
Control heat to ensure the membrane is fully installed to the substrate with all laps properly formed. Ensure full bonding between the bituFLAME® base sheet and bituFLAME® cap sheet. Do not over heat membrane.
- 3.19      BITUFLAME® BASE SHEET  
Fully torch to substrate to **Waterproofing Systems Ltd** installation instructions. Fully torch weld and seam all laps, 100mm side laps and 150mm end laps.
- 3.20      BITUFLAME THERMO AD  
Loose lay onto Black Pearl insulation panels with all side laps 100mm and end laps 150mm, and spot torch to hold in place.
- 3.21      BITUFLAME® CAP SHEET  
Fully torch to base sheet to **Waterproofing Systems Ltd** installation instructions ensuring full bonding to the base sheet. All side laps 100mm wide and end laps 150mm wide. All laps fully welded and seamed off. Set the bituFLAME® caps sheets to ensure laps are off set.
- 3.22      FLASHING MEMBRANE  
Fully torch the bituFLAME® CS flashing membrane to all exposed and visible turn downs or up stands and other flashing situations, and to **Waterproofing Systems Ltd** installation instructions. Ensure full bonding to the ecoROOF™ membrane system and that laps are fully formed and watertight.
- 3.23      BOX GUTTERS  
Lay membrane in box gutters with the membrane neatly dressed into proprietary preformed sump and downpipe outlets. Fix membrane into downpipes and overflows.
- 3.24      WELD JOINTS  
Weld joints using heat to **Waterproofing Systems Ltd** requirement ensuring a watertight seal. For bituFLAME® Granule, remove granules from the end-lap area to create bitumen to bitumen contact.
- 3.25      PENETRATIONS  
Form, or mould by torching, with required upstands and downturns and all penetrations to **Waterproofing Systems Ltd** details ensuring a fully durable watertight seal.
- 3.26      ROOF DRAINS, OVERFLOWS AND SUMPS  
Install Eterno roof drains, overflows and sumps to **Waterproofing Systems Ltd** installation details.
- 3.27      MOVEMENT JOINTS  
Install required movement joints to **Waterproofing Systems Ltd** details.
- Finishing**
- 3.28      FOOT TRAFFIC  
Heavy foot traffic is not allowed on the membrane after laying.



- 3.29 **DRAINAGE TO GREEN ROOF**  
Lay drainage cell with cusps facing downward and overlap adjacent sheets by 100mm (or 3 cusps). Across the top of the drainage cell lay the geotextile filter fabric ensuring fabric is lapped 100mm to prevent ingress of soil. Tape the geotextile filter fabric to the wall to prevent soil entering the drainage cell. Ensure the entire area is covered and that there is sufficient drainage to remove excess water from the installation. Do not walk on or place heavy materials onto the drainage cell.
- 3.30 **SOIL COVER**  
Cover the ecoROOF™ membrane system with 25mm to 300mm of soil depending on the planting requirements.
- 3.31 **PEBBLE BALLAST**  
Cover the ecoROOF™ membrane system with decorative pebbles or similar.
- 3.32 **ACCESS BOARDS**  
Provide access boards for later operations and remove when no longer needed.
- 3.33 **SUBSEQUENT WORK**  
Make good any covering, cut or deformed by later work. Making good to take the form of inserting a new whole or part infill sheet to maintain the appearance of the covering as originally laid.

#### **Completion**

- 3.34 **CLEAN UP**  
Clean up as the work proceeds.
- 3.35 **ACCEPTANCE**  
- Arrange for an inspection of the completed work.  
- Complete **Waterproofing Systems Ltd** Quality Control sheets and provide to them for the issuing of the Materials Warranty.  
- Protect the membrane until completion of the contract works.
- 3.36 **LEAVE**  
Leave work to the standard required by following procedures.
- 3.37 **REMOVE**  
Remove debris, unused materials and elements from the site.

#### **4. SELECTIONS**

Substitutions are not permitted to the following, unless stated otherwise.

- 4.1 **WATERPROOFING MEMBRANE - DOUBLE LAYER GREEN ROOF**  
Base sheet: 3mm bituFLAME® BS  
Cap sheet: 4mm bituFLAME® AR  
Drainage cell: Cusped Drainage Cell  
Geotextile fabric: Geotextile filter fabric of 140 gsm  
Soil: ~
- 4.2 **WATERPROOFING MEMBRANE - DOUBLE LAYER PEBBLE ROOF**  
Base sheet: 3mm bituFLAME® BS  
Cap sheet: 4mm bituFLAME® CS Mineral  
Drainage cell: Plastic drainage cell  
Geotextile fabric: Geotextile filter fabric of 140 gsm  
Ballast: ~



- 4.3 WATERPROOFING MEMBRANE WARM ROOF DOUBLE LAYER  
Substrate adhesive: bituBOND WB adhesive  
Insulation panels: Black Pearl 80mm thick  
Base sheet: 2.5mm bituFLAME Thermo AD  
Cap sheet: 4mm bituFLAME CS Mineral finish  
Colour: ~
- 4.4 FLASHING MEMBRANE  
Brand bituFLAME® CS  
Finish: ~  
Colour: ~
- 4.5 UV COATING TO ecoROOF™ MEMBRANE SYSTEM  
Brand: ~  
Colour: ~

