

4421WR SEALCO GREENSEAL FLAMESEAL ROOF MEMBRANES

1. GENERAL

This section relates to **Sealco Ltd** GreenSEAL and WarmSEAL torch on membrane roofing, bonded to:

- construction plywood, including all underlays and accessories
- concrete, including all underlays and accessories
- Lexboard polyiso 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:

WMAI Waterproofing Membrane Association NZ Inc.
PIR Polyiso Insulation Panels

Documents

1.3 DOCUMENTS

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

[NZBC E2/AS1](#) External moisture
[AS 1366](#) Rigid cellular plastic sheets for thermal insulation - Rigid cellular polyurethane (RC/PUR)
[AS/NZS 2269.0](#) Plywood - Structural - Specifications
WMAI Code of Practice for Torch-on Membrane Systems for Roofs and Decks

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
FlameSEAL® Product Manual (3rd Edition November 2007)
Standard detailed drawings

Manufacturer/supplier contact details

Company: **Sealco Ltd**
Web: www.sealco.co.nz
Email: info@sealco.co.nz
Telephone: 03 366 9495 (head office) or 0508 (SEALCO)
Northland, Auckland 027 544-5532

Warranties

1.5 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

1.6 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.

Requirements

- 1.7 **QUALIFICATIONS**
Waterproofing work to be carried out by Licensed Building Practitioners who are also licensed applicators approved by Sealco Ltd.
- 1.8 **NO SUBSTITUTIONS**
Substitutions are not permitted to any specified Sealco Ltd system, or associated components and products.
- 1.9 **PROJECT REGISTRATION**
Contact Sealco Ltd to confirm that the project has been registered.
Web: www.sealco.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 Sealco 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 Sealco 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 Sealco Ltd.

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

2. PRODUCTS

Materials

- 2.1 **DOUBLE LAYER GREENSEAL™ GREEN ROOF SYSTEM**
Double layer green roof system comprised of:
- FlameSEAL® BS, an AAP modified bitumen base sheet with glass fibre reinforcement.
- FlameSEAL® 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 GREENSEAL™ PEBBLE ROOF SYSTEM**
Double layer pebble roof system comprised of:
- FlameSEAL® BS, an AAP modified bitumen base sheet with glass fibre reinforcement.
- FlameSEAL® CS, an AAP 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**
FlameSEAL® CS, an AAP modified bitumen cap sheet with 180gsm composite spunbond reinforcement all marked with the manufacturer's mark.

- 2.4 **FLAMESEAL THERMO AD BS**
An SBS modified bitumen base sheet with 2.5mm thick which is a heat activated membrane all marked with the manufacturer's mark.
- 2.5 **FLAMESEAL PRIMER**
A 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 Sealco Ltd specifications or when the membrane system is being installed using the cold-applied adhesive method.

Components

- 2.7 **EDGE TRIM**
Standard and purpose made metal trim to Sealco Ltd details and to suit the specific location.
- 2.8 **OUTLETS**
SEALCO drainRite roof drains, overflows and SEALCO drainFlow sumps as supplied and required by Sealco Ltd.
- 2.9 **CLAMP GRATE DROPPER**
SEALCO drainRite clamp grate dropper as supplied and required by Sealco Ltd.
- 2.10 **SCUPPER**
SEALCO drainFlow scupper as supplied and required by Sealco Ltd.
- 2.11 **OVERFLOW DROPPER**
SEALCO drainRite overflow dropper as supplied and required by Sealco Ltd.
- 2.12 **PIPE BOOTS**
SEALCO flashRite moulded unreinforced pipe boots as supplied and required by Sealco Ltd. Designed to fit 20mm-150mm penetrations. Boots are welded to substrate and mechanically clamped and sealed around pipes.
- 2.13 **GREENSEAL MAXISTUD 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.
- 2.14 **DREENSEAL Q-DRAIN PEBBLE BALLAST DRAINAGE CELL**
Plastic drainage cell designed for the purpose of draining water from membrane system
- 2.15 **FILTER FABRIC**
Geotextile filter fabric manufactured from recycled plastic. Installed to prevent soil or similar getting into the drainage cell preventing flow of water
- 2.16 **INSULATION PANELS**
Lexboard polyiso rigid insulating panels comply with AS 1366. Panel size 80mm thick x 1200mm wide providing an R value of 2.58. Installed onto the substrate with WarmSEAL foam adhesive or insulation screws and washers. See Swalco WarmSEAL specification for further details.

3. EXECUTION

Conditions

3.1 GENERALLY

Work and materials to WMAI manual (3rd Edition November 2007), and to Sealco Ltd product requirements.

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 Sealco 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 Sealco Ltd documents, including fillets, sumps, outlets and projections, and ensure work of the required standard. Ensure the fall complies with E2/AS1 including correct fall to rainwater outlets to avoid ponding,

- Lay roofs to a minimum fall of 1:30 (2°) to [NZBC E2/AS1](#), 8.5.1 a.
- Lay decks to a minimum of 1:40 (1.5°) to [NZBC E2/AS1](#), 8.5.1 b.
- Lay gutters to a minimum fall of 1:100 (0.57°) to [NZBC E2/AS1](#), 8.5.1 c.

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 17.5mm, H3 CCA treated and conform to [AS/NZS 2269.0](#). Sheets to be fixed with glue and 10 gauge x 50mm stainless steel screws counter sunk, chamfered edges, coving fillets to all up-stands, internal corner fillets, installed to Sealco Ltd specification. Fix at 150mm centres on edges and 200mm in the body of the sheets. 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 Lexboard polyiso 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 FlameSEAL Thermo AD BS.
- 3.11 **FLASHINGS**
Fit membrane flashings to all internal and external corners and upstands and to all penetrations to Sealco 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 FlameSEAL® Product Manual specification.
- 3.15 **PRIMING**
All surfaces to be primed strictly to Sealco 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 Lexboard polyiso 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 FlameSEAL® base sheet and FlameSEAL® cap sheet. Do not over heat membrane.
- 3.19 **FLAMESEAL® BASE SHEET**
Fully torch to substrate to Sealco Ltd installation instructions. Fully torch weld and seam all laps, 100mm side laps and 150mm end laps.
- 3.20 **FLAMESEAL BASE SHEET PEEL & STICK OR THERMAL ADHERED**
Loose lay onto Lexboard polyiso insulation panels with all side laps 100mm and end laps 150mm, and spot torch to hold in place if necessary.
- 3.21 **FLAMESEAL® CAP SHEET (OR PEEL & STICK)**
Fully torch to base sheet to Sealco 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 FlameSEAL® caps sheets to ensure laps are off set.

- 3.22 **FLASHING MEMBRANE**
Fully torch the FlameSEAL® CS flashing membrane to all exposed and visible turn downs or up stands and other flashing situations, and to Sealco Ltd installation instructions. Ensure full bonding to the GreenSEAL™ 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 Sealco Ltd requirement ensuring a watertight seal. For FlameSEAL® 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 Sealco Ltd details ensuring a fully durable watertight seal.
- 3.26 **ROOF DRAINS, OVERFLOWS AND SUMPS**
Install SEALCO roof drains, overflows and sumps to Sealco Ltd installation details.
- 3.27 **INSTALL ROOF VENTS**
Install SEALCO ventRite for roof space/moisture venting to Sealco Ltd installation details.
- 3.28 **INSTALL CLAMP GRATE DROPPER**
Install SEALCO drainRite clamp grate dropper to Sealco Ltd installation details.
- 3.29 **INSTALL SCUPPER**
Install SEALCO drainRite scupper to Sealco Ltd installation details.
- 3.30 **INSTALL OVERFLOW DROPPER**
Install SEALCO drainRite overflow dropper to Sealco Ltd installation details.
- 3.31 **INSTALL PIPE BOOT**
Install SEALCO flashRite pipe boot to Sealco Ltd installation details.
- 3.32 **MOVEMENT JOINTS**
Install required movement joints to Sealco Ltd details.
- Finishing**
- 3.33 **FOOT TRAFFIC**
Heavy foot traffic is not allowed on the membrane after laying.
- 3.34 **DRAINAGE TO GREEN ROOF**
Lay drainage cell with cups facing upward and overlap adjacent sheets by 100mm (or 3 cups). Across the top of the drainage cell lay the Q-Drain filter mat and 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. Once geotextile cloth drainage layer is in place overlay surface with 25mm grit sand prior to covering with soil.
- 3.35 **SOIL COVER**
Cover the GreenSEAL membrane system with 25mm to 300mm of soil depending on the planting requirements.
- 3.36 **PEBBLE BALLAST**
Cover the GreenSEAL membrane system with decorative pebbles or similar.
- 3.37 **ACCESS BOARDS**
Provide access boards for later operations and remove when no longer needed.

- 3.38 **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

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

4. SELECTIONS

For further details on selections go to www.sealco.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Materials

- 4.1 **WATERPROOFING MEMBRANE - DOUBLE LAYER GREEN ROOF**
- Location: ~
Manufacturer: Sealco Ltd
Type/brand: FlameSEAL®
Base sheet: 3mm FlameSEAL® BS
Cap sheet: 4mm FlameSEAL® AR
Drainage cell: Cusped Drainage Cell
Geotextile fabric: Geotextile filter fabric of 140 gsm
Soil: ~
- 4.2 **WATERPROOFING MEMBRANE - DOUBLE LAYER PEBBLE ROOF**
- Location: ~
Manufacturer: Sealco Ltd
Type/brand: FlameSEAL®
Base sheet: 3mm FlameSEAL® BS
Cap sheet: 4mm FlameSEAL® CS Mineral
Drainage cell: Plastic drainage cell
Geotextile fabric: Geotextile filter fabric of 140 gsm
Ballast: ~
- 4.3 **WATERPROOFING MEMBRANE WARM ROOF DOUBLE LAYER**
- Location: ~
Manufacturer: Sealco Ltd
Type/brand: FlameSEAL®
Substrate adhesive: bituBOND WB Adhesive
Insulation panels: Lexboard Polyiso 80mm or 100mm thick
Base sheet: 3mm FlameSEAL Thermo AD or Peel & Stick
Cap sheet: 4mm FlameSEAL CS Mineral finish
Colour: ~
- 4.4 **FLASHING MEMBRANE**
- Location: ~
Manufacturer: Sealco Ltd
Brand: FlameSEAL® CS
Finish: Black