

4422WT WPS ECOTUFF® TPO WATERPROOFING MEMBRANE

1. GENERAL

If you have pre-customised this work section using the "questions and answers" provided as part of the downloading process, it may be necessary to amend some clauses to suit the final project-specific version.

The section must still be checked and customised to suit the project being specified, by removing any other irrelevant details and adding project-specific details and selections.

This section relates to **Waterproofing Systems Ltd ecoTUFF®** membrane roofing, bonded to:

- construction plywood, including all underlays and accessories
- concrete, including all underlays and accessories.

Modify or extend the above description to suit the project being specified.

1.1 RELATED WORK

Refer to ~ for ~

Include cross references to other sections where these contain related work.

Refer to 4337 PLYWOOD ROOFING AND DECKING for plywood substrates.

Refer to appropriate concrete section(s) for concrete slabs.

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:

TPO Thermoplastic Polyolefin (reinforced rubber sheet)

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/NZS 2269.0](#) Plywood - Structural - Specifications

Delete from the DOCUMENTS clause any document not cited. List any additional cited documents.

The following are related documents and if referred to in the work section need to be added to the list of DOCUMENTS.

[NZBC E1/AS1](#) Surface Water

BRANZ publication: Selecting roof claddings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Waterproofing Systems Ltd Product Manual (2014)

Standard detailed drawings

Manufacturer/supplier contact details

Company: Waterproofing Systems Ltd

Web: www.waterproofing.co.nz

Email: info@waterproofing.co.nz

Telephone: 09 579 1460 or 0508 (2WATER) 292837

Northland, Auckland 021- 917 773

Waikato, Bay of Plenty 021 - 457 953

Wellington & Lower North Island 027 - 5445 532

Christchurch, South Island 027 - 5445 532

It is important to ensure that all personnel on site have access to accurate, up to date technical information on the many products, materials and equipment used on a project. In most cases individual products are not used in isolation, but form part of a building process. Also a particular manufacturer's and/or supplier's requirements for handling, storage, preparation, installation, finishing and protection of their product can vary from what might be considered the norm.

Warranties

- 1.5 WARRANTY - MANUFACTURER/SUPPLIER
Provide a material manufacturer/supplier warranty
20 years: for materials

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of completion of application.

Refer to the general section 1237 WARRANTIES for additional requirements.
Waterproofing Systems Ltd issue warranties on the basis that installations comply with their specification requirements and their on-site Quality Control process has been completed.

- 1.6 WARRANTY - APPLICATOR
Installer's warranty for the system under normal environmental and use conditions against failure.
5 years: Execution warranty

- Provide this warranty on the installer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.
Waterproofing Systems Ltd issue warranties on the basis that installations comply with their specification requirements and their on-site Quality Control process has been completed.

Requirements

- 1.7 QUALIFICATIONS
Roofing work to be carried out by applicators approved by Waterproofing Systems Ltd to install the ecoTUFF® membrane system, and who hold a Licensed Building Practitioner's licence for external membrane applications.

- 1.8 NO SUBSTITUTIONS
Substitutions are not permitted to any specified Waterproofing Systems Ltd system, or associated components and products.

Performance

- 1.9 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.

- 1.10 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.

- 1.11 TEST
Flood test horizontal applications with a sprinkler system for 2 hours. Make good any lack of water tightness when the surface is completely dry.
Not all applications can be checked. All gutters should be checked.

- 1.12 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. All penetrations to comply with NZBC E2/AS1 and Waterproofing Systems Ltd recommendations.
Refer to later EXECUTION clause on co-operating with others on the installation of elements which penetrate or adjoin the roofing system; including walls and parapets, skylights, sundry elements fixed through the roofing surface, service pipework etc.

- 1.13 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 the applicator's Quality Control sheets are completed fully and faithfully for each installation area.

2. PRODUCTS

Materials

- 2.1 PRIMER
50/50 mixture of solvent and ecoTUFF® adhesive
For use on concrete and plywood substrates to prepare the concrete for optimum application of the membrane.
- 2.2 ECOTUFF® ADHESIVE
WPS TPO contact adhesive system.
To adhere the membrane to the substrate.
- 2.3 ECOTUFF® TPO SHEET
Single ply TPO reinforced membrane bearing the manufacturer's mark. Refer to SELECTIONS for type and thickness.
- 2.4 ECOTUFF® TPO FLASHING
WPS unreinforced flashing for use in corners, heat welded to ecoTUFF® TPO.
Unreinforced T joint covers used to seal T joint sections in ecoTUFF® TPO sheet.
For flashing in designated areas.
- 2.5 ECOTUFF® CUT EDGE SEALANT
WPS specially formulated TPO sealant for ecoTUFF® cut edge finishes.
- 2.6 ECOTUFF® SEALANT
WPS specially formulated TPO sealant for general purpose flashing.
For termination flashing.

Components

- 2.7 DROPPER
drainRite TPO dropper available in 80mm, 100mm and 150mm diameter sizes, supplied and required by Waterproofing Systems Ltd.
- 2.8 OVERFLOW DROPPER
drainRite TPO overflow dropper available in 80mm, 100mm and 150mm diameter sizes supplied and required by Waterproofing Systems Ltd.
- 2.9 SCUPPER
flowRite scuppers in 65mm x 100mm, 100mm x 100mm and 200mm x 75mm widths supplied and required by Waterproofing Systems Ltd.
- 2.10 OVER FLOW SUMP
drainRite overflow sumps available in sizes 455mm x 310mm x 187mm deep and 470mm x 290mm x 80mm deep supplied and required by Waterproofing Systems Ltd.
- 2.11 ROOF VENT
ventRite TPO vent 200mm x 75mm diameter supplied and required by Waterproofing Systems Ltd.
Air vents are recommended on any confined roof space cavity to provide ventilation and reduce the stress on the roof system. At least two vents are required for each roof space, or a maximum of one vent per 70 m² of roof area. Where the roof space is part of ventilation system, then specific design should apply. Additionally, WPS vents can be used to vent moisture that might occur during inclement weather during installation or contained within the substrate.
- 2.12 PIPE BOOTS
flashRite moulded unreinforced pipe boots supplied and required by Waterproofing Systems Ltd. Designed to fit 20mm-150mm penetrations. Boots are welded to substrate and mechanically clamped and sealed around pipes.

- 2.13 **EDGE TRIM**
Aluminium drip edge trim 3m and 5m lengths Waterproofing Systems Ltd details to suit the specific location.

Accessories

- 2.14 **PAVER SUPPORTS - ADJUSTABLE WITH LEVELLING HEAD**
WPS ecoJack Adjustable Paver Supports with levelling head, comprised of a base, height control ring, a threaded top and a 3mm high levelling disc. Extension ring provides adjustable height from 42mm to 451mm. Levelling head provides up to 5% slope justification.
Suitable for flat roof and trafficable decks with uneven surface or slope.

3. EXECUTION

Conditions

- 3.1 **STORAGE**
Take delivery of Waterproofing Systems Ltd ecoTUFF® branded rolls, undamaged and allow for site handling facilities where required. Store membranes and accessory materials under conditions that ensure no deterioration of damage. Ensure all tapes and adhesives are within their expiry dates. Note: Some of the ecoTUFF® materials are Class 3 flammable goods.
- 3.2 **CONFIRM LAYOUT**
Confirm layout as detailed on drawings. If not detailed on the drawings, confirm the layout to suit site conditions, and Waterproofing Systems Ltd specification.
- 3.3 **WEATHER**
Apply ecoTUFF® membrane system in dry atmospheric conditions and only when the air or substrate temperature is 6°C and above.

Application - preparation

- 3.4 **PRELIMINARY WORK**
Ensure that preliminary work, including formation of falls, flashing rebates, grooves, ducts, 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. No timber fillets are required. This work and the substrate to be smooth, clean and dry.
- 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 is 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.
Check with the BCA if they have requirements in addition to the NZBC.
- 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 the surface, including vacuum cleaning and acid etching as necessary to leave smooth, clean, dry and free of debris. Install grid tapes in 600mm x 600mm grid for venting that lead to one-way vents or other suitable approved venting outlet. No mortar fillets are required.
- 3.7 **PLYWOOD SUBSTRATE**
Plywood to be minimum 18mm thick square-edged sheets and complying to [AS/NZS 2269.0](#), minimum CD structural grade with the sanded C side upwards. Treated H3 with waterborne CCA treatment and kiln dried after treatment. Lay with staggered joints (brick bond) with all edges of the sheets fully supported. Chamfer all external edges with a

minimum radius of 5mm. Fix with glue and 10 gauge x 50mm stainless steel countersunk head screws, with all sheets tight butted. Fit internal corner fillets. Fix at 150mm centres on edges and 200mm in the body of the sheets. Plywood and the timber substructure to have a maximum moisture content of 20% when the membrane is installed. Plywood must not be LOSP treated.

Plywood substrates are best fixed with stainless steel, self-tapping, counter-sunk screws and tight butted. Specify in 4337 PLYWOOD ROOFING AND DECKING, along with a requirement to bring the substrate up to an acceptable standard for this clause. Do not use hardboard or MDF board. Chamfer 5mm radius to the outer edges of plywood sheets that run into gutters or rainwater heads to prevent the roof edge-to-gutter junction forming a lip and the free run of water into the gutters. With tight butted sheets, expansion of large areas will need to be considered carefully. T&G plywood unacceptable unless all plywood sheet joints are fully supported with timber nogs.

Application - laying ecoTUFF®

- 3.8 **GENERAL - PLYWOOD SUBSTRATE**
Tape plywood joints using a polyethylene bond-breaker 36mm tape. Run out the ecoTUFF® membrane and allow to relax for 20 minutes before laying. Do not stretch sheets or tapes when laying.
- 3.9 **GENERAL - CONCRETE SUBSTRATE**
Run out the ecoTUFF® membrane and allow to relax for 20 minutes before laying. Do not stretch sheets or tapes when laying.
Apply grid tapes to concrete substrate (for venting purpose) to Waterproofing Systems Ltd installation requirements.
- 3.10 **SET-OUT**
Neatly set out rolls starting at the lowest point of the roof and run perpendicular to the roof pitch. Allow for 40mm side laps and end laps. Pre-plan the work to keep the number of membrane laps to a minimum. ecoTUFF® rolls to be relaxed prior to installation.
- 3.11 **APPLY PRIMER**
Mix ecoTUFF® adhesive and ecoTUFF® solvent 50/50 into a uniform consistency and apply to substrate at a rate of 5m²/litre.
- 3.12 **APPLY ECOTUFF**
Apply ecoTUFF® TPO adhesive to the substrate at a rate of 1.5m² per litre by brush or roller ensuring good even coverage and leave to tack dry before bonding the two surfaces together.
- 3.13 **BONDING LAPS**
Clean laps where required with weathered lap cleaner, form all laps at 40mm cover using the Leister heat welder carefully heat both mating surfaces at the back of the lap evenly at the same time whilst firmly rolling the on top of the sheet with the hand roller. Using the Leister heat welder make your final run by placing the nozzle between the sheets at the front lap area, heat both surfaces (to the point of melting the mating surfaces) and creating a bonded lap of 40mm. Firmly roll the lap with a lap roller immediately and test the lap joint on completion with a lap probe.
- 3.14 **MINOR MOVEMENT JOINTS**
Lay membrane across joint but leave unbonded underneath ecoTUFF® on both sides of the joint. Refer to Waterproofing Systems technical dept for a specially designed movement joint detail.
Unbonded width: ~mm
- 3.15 **INSPECT**
Inspect and test lap joints on completion with lap probe ensuring the lap is fully bonded
- 3.16 **PENETRATIONS**
Use a heat gun (Leister) to form and finish upstands, downturns, penetrations, sumps and vents to conform to the ecoTUFF® Product Manual and [NZBC E2/AS1](#). Use the gun to form and heat weld flashing patches to the exterior of the ecoTUFF membrane.

- 3.17 **PENETRATIONS AND JUNCTIONS**
Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof.
Required work includes the following:
- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions.
- installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).
- 3.18 **INSTALL DROPPER**
Install drainRite TPO dropper to Waterproofing Systems Ltd installation details.
- 3.19 **INSTALL OVERFLOW DROPPER**
Install drainRite TPO overflow dropper to Waterproofing Systems Ltd installation details.
- 3.20 **INSTALL SCUPPER**
Install flowRite TPO scupper to Waterproofing Systems Ltd installation details.
- 3.21 **INSTALL OVERFLOW SUMP**
Install drainRite overflow sump to Waterproofing Systems Ltd installation details.
- 3.22 **INSTALL ROOF VENTS**
Install ventRite TPO vent for roof space/moisture venting to Waterproofing Systems Ltd installation details.
- 3.23 **INSTALL PIPE BOOT**
Install flashRite pipe boot to Waterproofing Systems Ltd installation details.
- 3.24 **MOVEMENT JOINTS**
Install required movement joints to Waterproofing Systems Ltd details.

Accessories

- 3.25 **PAVER SUPPORTS - ADJUSTABLE WITH LEVELLING HEAD**
Install WPS ecoJack Adjustable Paver Supports with levelling head to Waterproofing Systems Ltd installation details. Install 1.5mm thick EPDM rubber as impact isolation pads to prevent wear on the ecoTUFF® membrane system.
Suitable for flat roof and trafficable decks with uneven surface or slope.

Finishing

- 3.26 **FOOT TRAFFIC**
Foot traffic is to be limited during and after laying. Providing access boards for later operations and remove when no longer needed. Protect and maintain roofing until completion of the contract works.
- 3.27 **ECOTUFF® TPO WALKWAY PADS**
Walkway pads and rolls for direct fix to ecoTUFF® for high trafficable areas.
- 3.28 **ACCEPTANCE**
Sign off acceptance of completed areas using the applicator's Quality Control sheets.
- 3.29 **SUBSEQUENT WORK**
Make good any damage by other trades by welding an ecoTUFF® patch to the installed membrane neatly to maintain the appearance of the covering as originally laid.

Completion

- 3.30 **ROUTINE CLEANING**
Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused materials and elements from the site.
Use this standard generic clause and add additional specific requirements.

ESD note: Re-cycling is addressed in the general section 1256 WASTE MANAGEMENT; amend this clause if it is to apply to this section.

- 3.31 DEFECTIVE OR DAMAGED WORK
Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.
Use this standard generic clause and add additional specific requirements.

4. SELECTIONS
For further details on selections go to www.waterproofing.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.
If substitutions are permitted modify the statement above, ensure the NO SUBSTITUTIONS clause from GENERAL is treated the same.

Select the options to suit the project and delete options not specified.

Materials

- 4.1 ECOTUFF® TPO ROOFING MEMBRANE
Location: ~
Manufacturer: Waterproofing Systems Ltd
Type/brand: ecoTUFF® TPO
Thickness: ~
Colour: ~
Options:
Thickness: 1.1mm or 1.5mm
Colour: White or tan, often available only on indent, check with Waterproofing Systems Ltd

Accessories

- 4.2 PAVER SUPPORTS - ADJUSTABLE WITH LEVELLING HEAD
Location: ~
Supplier: Waterproofing Systems Ltd
Brand: WPS ecoJack Adjustable Paver Supports with levelling head