# TABLE OF CONTENTS

# 4422EB EQUUS SOPREMA DUOTHERM WARM ROOF

## 1 GENERAL

NOTE: Formerly known as *Equus De Boer Duotherm Warm Roof.*

This section relates to the supply and installation of the Equus Industries Ltd - Equus SOPREMA Duotherm warm roof system applied on concrete, plywood or metal tray substrates. The system has a green roof option.
It consists of:

- vapour barrier
- thermal PIR rigid insulation
- thermal mineral wool insulation
- two layer waterproofing membrane system
- and accessories necessary to complete the warm and/or green roof system.

### 1.1 RELATED WORK

Refer to 8361 GREEN ROOFS for the supply and construction of extensive and intensive green roofs.
Refer to 4337 PLYWOOD ROOFING AND DECKING for plywood substrate.

### 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:

| | |
|---|---|
| Equus | Equus Industries Limited |
| PIR | Polyisocyanurate |
| SBS | Styrene-Butadiene-Styrene |
| APP | Atactic polypropylene |
| CRA | Condensation risk analysis |
| ODP | Ozone depletion potential |
| GWP | Global warming potential |
| BMT | Base metal thickness |
| ~ | ~ |

The following definitions apply specifically to this section:

| | |
|---|---|
| TPO modified bitumen membrane | Thermoplastic Polyolefin modified bitumen which have an excellent UV-resistance |
| SBS modified bitumen | Elastomer modified bitumen which are more elastic and have a better adhesion compared to APP modified bitumen. Ideal for colder climate application. |
| APP modified bitumen | Plastomer modified bitumen which have a higher melting point and are harder compared to SBS modified bitumen. Ideal for warmer climate application |
| ~ | ~ |

**Documents**

### 1.3 DOCUMENTS

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

| | |
|---|---|
| NZBC B1/AS1 | Structure |
| NZBC B1/VM1 | Structure |
| NZBC B2/AS1 | Durability |
| NZBC E1/AS1 | Surface water |
| NZBC E1/AS2 | Surface water |
| NZBC E2/AS1 | External moisture |
| NZS 1170.2:2011 | Structural design actions - Wind actions |
| AS/NZS 2269 | Plywood - Structural |
| AS/NZS 3500.3: 2018 | Plumbing and drainage - Stormwater drainage |
| NZS 3114 | Specification for concrete surface finishes |

| | |
|---|---|
| AS 1397 | Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium |
| AS 1562.1 | Design and installation of sheet roof and wall cladding - Metal |
| BS 476-3 | Fire tests on building materials and structures. Classification and method of test for external fire exposure to roofs |
| BS 476-7 | Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products |
| HB39-1997 | Installation code for metal roof and wall cladding |
| AS 2122.1 | Determination of Fire Propagation- Surface Ignition of Vertically Oriented Specimens of Cellular Plastics. |

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Equus - The Waterproofing Manual
Equus SOPREMA standard warm roof details
Duo Durability report for New Zealand
DeboPlast 2.5 T/F C175 or DeboFlex 2.5 T/F C175 Technical Data Sheet and specification
DeboPlast 2.5 T/F C175 or DeboFlex 2.5 T/F C175 Safety Data Sheet
DeboTack 2.5 T/F C175 Aero Technical Data Sheet and specification
DeboTack 2.5 T/F C175 Aero Safety Data Sheet
Duo HT 4 Slates/F C180 Firecare (FC) Technical Data Sheets and specifications
Duo HT 4 Slates/F C180 Firecare (FC) Safety Data Sheets
Easy Foam PU adhesive Technical Data Sheet and specification
Easy Foam PU adhesive Safety Data Sheet
PIR thermal insulation board Technical Data Sheet
PIR thermal insulation board Safety Data Sheet
PermaBase Dek Roof Board Technical Data Sheet
Soprarock mineral wool thermal insulation Technical Data Sheet
Soprarock mineral wool thermal insulation Safety Data Sheet
BRANZ Appraisal 685 - SOPREMA DuO Roof and Deck Membrane Systems
BRANZ Appraisal 1169 - Equus Soprema Warm Roof System
BBA Appraisal 20/5843 - SOPREMA DuO Roof and Deck Membrane Systems
WMAI torch-on Code of Practice
Tekton NZBC Compliance Report 2021

Manufacturer/supplier contact details

| | |
|---|---|
| Company: | Equus Industries Ltd |
| Web: | https://equus.nz/ |
| Email: | tech.support@equus.co.nz |
| Telephone: | +64 (0)3 353 2434 |

**Warranties**

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material Equus Industries Ltd warranty:

| | |
|---|---|
| 20 years | For Equus SOPREMA Duotherm warm roof system and proprietary products. It includes an appropriate Maintenance Statement and schedule. |

Note: SOPREMA provide an additional material manufacturer warranty to the above. Refer to Equus SOPREMA Waterproofing Solutions for details.

- Provide this warranty on the Equus Industries Ltd standard form (if unavailable, use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an Equus certified applicator warranty:

| | |
|---|---|
| 10 years | For application of Equus SOPREMA Duotherm warm roof system |

- Provide this warranty on the applicator standard form (if unavailable, use the standard form in the general section 1237WA WARRANTY AGREEMENT)

- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

**Requirements**

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Equus system, or associated components and product.

1.8 QUALIFICATIONS

Waterproofing work to be carried out by certified applicators approved by Equus Industries Ltd. Approved applicators can be found at:
Web: https://equus.nz/
Telephone: +64 (0)3 578 0214

1.9 PROJECT NOTIFICATION

Prior to installation of Equus SOPREMA Duotherm warm roof system, approved applicators to return project notification on the standard Project Notification Form to Equus Industries Limited

1.10 PRE-INSTALLATION MEETING

Convene a meeting between the applicator, contractor, all associated consultants and Equus Industries Ltd where appropriate to ensure all parties know what is required for effective performance of the system.

1.11 SPECIAL DETAILS

Where a standard Equus SOPREMA Duotherm warm roof detail does not exist, or if a standard warm roof detail cannot be applied, an approved alternative must be obtained from Equus Industries Ltd before proceeding with the installation.

1.12 QUALITY ASSURANCE

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

1.13 INFORMATION FOR OPERATION AND MAINTENANCE

Provide Equus Industries Ltd and SOPREMA inspection, maintenance and cleaning instructions to the owner at completion of the work.

1.14 MAINTENANCE CONTRACT PROPOSAL (OPTIONAL)

Provide a proposed contract for the annual inspection of the waterproofing membrane by Equus SOPREMA Certified Applicator to ensure weather tightness and to comply with NZBC B2/AS1, 'Durability'. In particular:

- Ensure the roof and all outlets are free of blockages and are clear of unwanted debris, all associated flashings and capping are sound, the general condition of the membrane, and the membrane is free of surface moss, mould or lichen.
- Check all associated building elements that could impact the durability of the membrane.
- In higher risk areas such as sheet joints, substrate movement, edging, gutters, penetrations, corners, upstands, outlets and overflows, carry out a thorough weather tight inspection.

Equus SOPREMA Duotherm complies with NZBC B2/AS1 when maintained to Equus SOPREMA maintenance requirements.

**Compliance information**

1.15 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicator's approval certificate from the manufacturer / importer / distributor
- Importer's warranty
- Manufacturer's warranty
- Applicator's warranty
- Producer Statement - Construction from the applicator
- Other information required by the BCA in the Building Consent Approval documents.

**Performance**

1.16 TESTING - FLOOD

Where practical flood test horizontal applications with a minimum 50mm depth of water for 48 hours to Equus Industries Limited requirements. Make good any lack of water tightness when the surface is completely dry and repeat water test process after making any necessary repairs.

1.17 TESTING - ALTERNATIVE FORMS OF LEAK DETECTION

Contact Equus Industries Ltd +64 (0)3 578 0214 or SOPREMA for appropriate methods of leak detection.

1.18 WIND LOAD RESISTANCE

Provide a job-specific wind load calculation as per AS/NZS 1170.2 in order to determine distance between fasteners or application pattern of Easy Foam PU-adhesive.

1.19 INTERNAL AND INTERSTITIAL CONDENSATION RISK ANALYSIS

Provide a job-specific condensation risk analysis (CRA) in order to determine that the proposed warm roof is both internal and interstitial condensation risk free.

1.20 WEATHER-TIGHTNESS

Accept responsibility for the weather-tight performance of the completed membrane roofing system, including all penetrations through the roof and junctions with walls and parapets. All penetrations to comply with NZBC E2/AS1 clause 8.5.9 - 'Penetrations' and Equus' recommendations.

1.21 ENERGY EFFICIENCY

Equus PIR rigid thermal insulation board has an aged thermal resistance (R Value) of the following:

- 50mm = R2.25
- 60mm = R2.70
- 80mm = R3.65
- 90mm = R4.05
- 100mm = R4.50
- 120mm = R5.45

based on an aged thermal conductivity of 0.022W/mK.

Equus SOPREMA Mineral Wool thermal insulation board has an aged thermal resistance (R Value) of the following:

- 60mm = R1.55
- 80mm = R2.05
- 100mm = R2.63
- 120mm = R3.16
- 140mm = R3.68

based on an aged thermal conductivity of 0.038 W/mK.

1.22 FIRE SAFETY

The fire-retardant performance of the Equus Duo Firecare by SOPREMA waterproofing cap sheet is in accordance with European Norm EN13501-5:2016 Test 1, 2 and 4 (Broof(t1), (t2) and (t4)) and achieves an EXT.F.AA rating in accordance with BS476.3.

Equus PIR thermal insulation board complies with AS 2122.1 'Determination of Fire Propagation - Surface Ignition of Vertically Oriented Specimens of Cellular Plastics', has a classification of Class 1 according to BS 476-7 or shall be FM approved.
Equus SOPREMA Mineral Wool insulation is not flammable.

**Quality control and assurance**

1.23 QUALITY ASSURANCE (QA) & INSPECTIONS

The Equus Certified Applicator is responsible for onsite QA. The Equus project checklists detailing the required processes shall be completed and signed as each stage of installation is completed. Photographs of each stage shall be taken and submitted as part of the overall QA documentation. A Warranty will not be issued unless a copy has been filed with Equus Industries Ltd. Third party QA documentation is acceptable provided it is in accordance with the Equus issued project QA.

1.24 INSPECTIONS

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## 2 PRODUCTS

**Materials - Equus SOPREMA Duotherm warm / green roof system**

2.1 VAPOUR BARRIER

Equus SOPREMA vapour barrier laid between substrate and thermal insulation. Type and thickness dependent on type of substrate, e.g. concrete, plywood or metal. Selection of vapour barrier is based on results of the Equus SOPREMA job-specific condensation risk analysis (CRA).

2.2 PIR FLAT THERMAL INSULATION BOARD

Equus PIR Insulation boards are comprised of a polyisocyanurate (PIR) core faced on both sides with multi-layer composite aluminium foil facing or a coated glass-fibre tissue facing. The boards comply with AS 2122 'Determination of Fire Propagation- Surface Ignition of Vertically Oriented Specimens of Cellular Plastics', and have zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP). Available in several thicknesses. Standard board size is 1200mm x 2400mm.

2.3 PIR TAPERED THERMAL INSULATION BOARD

Equus PIR Insulation boards are comprised of a polyisocyanurate (PIR) core faced on both sides with multi-layer composite aluminium foil facing or a coated glass-fibre tissue facing. The boards comply with AS 2122 'Determination of Fire Propagation- Surface Ignition of Vertically Oriented Specimens of Cellular Plastics'. It has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP). Available in several thicknesses. Standard board size is 1200mm x 2400mm.

2.4 MINERAL WOOL FLAT THERMAL INSULATION BOARD

Equus SOPREMA Soprarock HD60 is a non-flammable water-repellent mineral wool thermal and sound insulation board. Soprarock HD60 is compatible with SOPREMA's mechanically fastened base sheet membranes. Available in several thicknesses. Standard board size is 1200mm x 2400mm.

2.5 MINERAL WOOL TAPERED THERMAL INSULATION BOARD

Equus SOPREMA Soprarock DD is a dual-density mineral wool board insulation with a rigid upper layer for durability and enhanced strength. Soprarock DD is impregnated with a bitumen layer which is compatible with SOPREMA's torch applied membranes. The boards are mechanically fastened. Available in several thicknesses in order to form tapered scheme. Standard board size is 1200mm x 1200mm.

2.6 WATERPROOFING BASE SHEET - COLD CLIMATE

DeboFlex 2.5mm T/F C175 is a flexible waterproofing membrane consisting of elastomer (SBS) modified bitumen and reinforced with a layer of 175g/m² non-woven polyester with glass-fibre scrim. The membrane has an overlap of 80mm. It is used as a base sheet on top of Equus thermal insulation boards or roof boards. All laps are heat welded. Supplied in 1m x 10m rolls.

2.7 WATERPROOFING BASE SHEET - WARM CLIMATE

DeboPlast 2.5mm T/F C175 is a flexible waterproofing membrane consisting of a plastomer (APP) modified bitumen and reinforced with a layer of 175g/m² non-woven polyester with glass scrim. The membrane has an overlap of 80mm. It is used as a base sheet on top of Equus thermal insulation boards or roof boards. The membrane is loose laid and mechanically fastened following the manufacturer's mechanical fixing plan. All laps are heat welded. Supplied in 1m x 10m rolls.

2.8 WATERPROOFING BASE SHEET - SELF ADHERED, PARTIALLY BONDED

DeboTack 2.5mm T/F C175 Aero is a flexible waterproofing membrane consisting of elastomer (SBS) modified, self-adhesive bitumen and reinforced with a layer of 175g/m² non-woven polyester with glass scrim. The membrane has a pattern of self-adhesive stripes at the back. The membrane is used as a base sheet partially bonded to the Equus PIR thermal insulation boards or the Roof Cover Boards. All laps are heat welded. Supplied in 1m x 11.25m rolls.

2.9 CAP SHEET - STANDARD TWO-LAYER SYSTEM, FIRE RETARDANT

Duo HT 4 Slates/F C180 Firecare (FC) a 4mm thick flexible waterproofing membrane system in a two-layer configuration, comprised of a cap sheet with a TPO modified bitumen upper coating with mechanically pressed in coloured slates, a SBS modified bitumen under-coating and a composite reinforcement of 180g/m² polyester and glass-fibre scrim. The membrane has an overlap of 80mm. The cap sheet is installed on top of the base sheet by fully bonded torch application. Laps of base and cap sheet to be staggered for optimal two-layer security.

The cap sheet is fire-retardant according to European Norm EN13501-5 Tests1, 2 and 4 (Broof(t1), (t2) and (t4)) and achieves an EXT.F.AA rating in accordance with BS 476-3.
Supplied in 1m x 8m rolls. Standard colours available are Grey/White (GW), White/Green/Grey (WGG) and Black (AGR). Brown Oxide (BO) available on request.

Refer to SELECTIONS for options.

2.10 CAP SHEET - ROOT RESISTANT FOR EXTENSIVE OR SEMI-INTENSIVE GREEN ROOF

Duo HT 4 Slates/F C180 Firecare Landscape (FC LC) is a 4mm thick flexible waterproofing membrane comprised of TPO modified bitumen upper coating with mechanically pressed-in coloured slates, a SBS modified bitumen under coating and a composite reinforcement of 180g/m² polyester and glass-fibre scrim. The membrane has an overlap of 80mm. The cap sheet is installed on top of the base sheet by fully bonded torch on application.

The membrane is root-resistant according to European Norm EN13948.
The cap sheet is fire retardant to European Norm EN13501-5 Tests 1,2 and 4 (Broof(t1), (t2) and (t4)) and achieves an EXT.F.AA rating in accordance with BS 476-3.
Supplied in 1m x 8m rolls. Standard colour available is White/Grey/Green (WGG).
Refer to SELECTIONS for options

**Components**

2.11 CONCRETE SUBSTRATE FILLER - FOR MINOR SURFACE PRE-TREATMENT

Equus Thermexx Binder / Premix M1, filler for 1-3mm deep repairs.

2.12 CONCRETE SUBSTRATE FILLER - FOR MAJOR SURFACE PRE-TREATMENT

Equus Chevacryl Admix/ patch plaster, for 3-10mm deep repairs.

2.13 PLYWOOD SUBSTRATE FILLER

Equus Epar Epoxy filler 802.

2.14 METAL TRAY ROOFING

Dimond metal tray, reverse run, as manufactured by Dimond Roofing, comprised of G550 aluminium-zinc AZ150, 0.75mm BMT, to AS 1397. Refer to SELECTIONS for options.

2.15 PRIMER

Equus Sopradere Quick by SOPREMA primer.

2.16 PRIMER

Equus Peel and Stick Primer.

2.17 BITUMINOUS SEALANT

Equus Alsan Mastic 2200 by SOPREMA bitumen sealant.

2.18 MINERAL CHIP DRESSING

Equus SOPREMA Duo Mineral Chip scattered as needed to form uniform appearance.

2.19 EQUUS PRE-FORMED ANGLE FILLETS

Equus pre-formed mineral wool angle fillets or PIR angle fillets of minimum 50mm x 50mm in all internal corners.

2.20 FASTENERS

Equus SOPREMA fasteners appropriate to the substrate on which the Duotherm system will be installed. Refer to SELECTIONS.

2.21 ROOF EDGE PROFILE

Equus SOPREMA roof edge profile is used to terminate the cap sheet at roof edges.

2.22 C-PROFILE

Equus SOPREMA C-Profile to terminate the cap sheet to walls or upstands.

2.23 ROOF COVER BOARD

High performance roof board to add extra load resistance to the warm roof or green roof system.

2.24 DRAINAGE CELL - GREEN ROOF

Equus drainage & filter layer to ensure retention of soil and provide sufficient water to support plant growth while draining excess water.

2.25 EQUUS WATERPROOFING - LIQUID

Equus Matacryl liquid applied waterproofing for membrane penetrations and other details as per detail drawings. .

2.26 THERMAL INSULATION BOARD ADHESIVE

Equus Easy Foam PU by SOPREMA rapid curing gun grade polyurethane adhesive for use of adhering thermal insulation only.

2.27 PEDESTALS

Equus Fixplus range of pedestals and tile supports. Pedestals are customisable to be compatible with a range of flooring materials such as concrete pavers or timber decking.

## 3 EXECUTION

3.1 RUBBER WALKWAY TILES

Equus Kraitec Step by SOPREMA are rubber walkway tiles designed for protection of waterproofing membranes on flat roofs, balconies and terraces. The tiles allow water to drain underneath and are inter-locked.

**Conditions**

3.2 GENERALLY

All work and materials to comply with Equus Industries Ltd Waterproofing Manual and NZBC E2/AS1 - 'External moisture', BRANZ Appraisal 685, and BRANZ Appraisal 1169

3.3 ROUTINE MATTERS

Refer to the general section 1250 TEMPORARY WORKS & SERVICES for protection requirements. Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements

3.5 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Confirm that the substrate, including sumps, outlets and projections, will ensure work of the required standard. Ensure the falls are the correct falls to rainwater outlets to avoid ponding.

3.6 PRE-COATING/FINISHING REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for specified finish. Carry out such additional preparatory work as required bringing the substrate to suitable condition.

3.7 EQUIPMENT

Equus Industries Limited requires the approved applicator to use the following equipment:
- Standard gas torch for application of modified bitumen membrane
- Detail gas torch for detailing of modified bitumen membrane
- Round tipped trowel
- Knife for bitumen membrane with hook blade
- Primer brush or roller
- Lap pressure roller
- Membrane roller for self adhesive membranes
- Tools for mechanical fastening
- PU adhesive gun

3.8 STORAGE

Take delivery of waterproofing membranes, thermal insulation boards and accessories undamaged. Include for site handling facilities where required. Store, on a level surface, off floors, out of direct sunlight and with the required accessories under conditions that ensure no deterioration or damage. Store rolls upright to maintain roll shape. Protect thermal insulation boards from rain and wind. Store primer in a shaded and ventilated space.

3.9 WEATHER

Lay vapour barrier, thermal insulation and waterproofing membranes in fair weather, with ambient air temperature no less than 5°C or as per recommended application temperature mentioned on the TDS of a specific material. Cooler / humid conditions may prolong primer dry times.

## Application

3.10 PRELIMINARY WORK

Ensure that preliminary work, including formation of falls, flashing rebates, grooves, ducts, roof penetrations and fixing of outlets is complete and properly constructed to enable the system to work as intended. This work and the substrate to be smooth, clean, dry and stable.

3.11 ACCEPTANCE OF SUBSTRATE

Confirm that the substrate, including fillets, sumps, outlets and projections, will ensure work of the required standard. Ensure the substrate fall complies with NZBC E2/AS1, 8.5.6 - 'Roof and deck drainage', including correct fall to rainwater outlets to avoid ponding.

Ensure that the substrate is well braced against movement and deflection and structurally sound. Ensure all surfaces are clean, dry and free from dust and dirt, oils or grease with no projections of sharp materials. Complete any substrate remedial work identified before commencing any membrane work.

## Installation - plywood substrate

3.12 PLYWOOD SUBSTRATE - GENERAL

Plywood to be minimum 17mm C-D structural plywood to comply with AS/NZS 2269, with the sanded 'C' face upwards. Plywood to be treated to a minimum grade of H3 CCA treated. Do not use LOSP treated plywood. Inspect existing substrates and structures to ensure they will not affect the performance of the membrane when applied. The moisture content of the plywood and the timber substructure must not exceed 20% when the membrane is adhered to NZBC E2/AS1, 8.5.5.1, 'Plywood'.

3.13 LAY PLYWOOD SUBSTRATE

Lay sheets to maximise the use of whole sheets. Lay sheet joints over framing members in a staggered brick bond pattern running across the fall in roof to NZBC E2/AS1, 8.5.5.1 - 'Plywood'. All plywood sheets to be tight butted. Back prime sheets used over non vented spaces with **Equus Chevaline Dexx** primer where required.

3.14 FIX PLYWOOD SUBSTRATE

Fix plywood to plywood manufacturer's instructions and to NZBC E2/AS1, 8.5.5.1 - 'Plywood', taking into account wind loading, frame spacing and ply thickness. Screw-fix using countersunk stainless steel screws, gauge 10 with length three times the thickness of the plywood to NZBC E2/AS1, 8.5.5.1 - 'Plywood'. Lay sheets in a bead of construction adhesive along all framing members. For two-layer plywood surfaces the first layer can be power-nailed but the second layer must be screw-fixed with all joints offset from the first layer. Recess all fastener heads below level of sheet face. Fix screws at 150mm centres on sheet perimeter and 200mm through the body of the sheet.

Ensure substrate framing supports plywood at a maximum 600mm centres each way for roofs and 400mm each way for decks. Fully support all sheet joints.

3.15 PLYWOOD FALLS

Construct membrane seams parallel with the fall to minimise ponding and flow restriction where possible. Ensure plywood is laid across falls.
Generally:

- 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.

3.16 PLYWOOD CORNERS

Chamfer all leading edges of plywood with a 5mm radius corner.

3.17 PLYWOOD OUTLETS - NZBC E1/AS1

Install roof and deck outlets to NZBC E2/AS1, 8.5.6 - 'Roof and deck drainage'. Size outlets in accordance with NZBC E1/AS1.

3.18 PLYWOOD OUTLETS - AS/NZS 3500.3: 2018 & NZBC E1/AS2

Install roof and deck outlets to NZBC E2/AS1, 8.5.6 - 'Roof and deck drainage'. Size outlets in accordance with AS/NZS 3500.3: 2018 as modified by NZBC E1/AS2.

3.19 SURFACE PREPARATION

Remove projections and all debris, leaving the surface dust-free, oil-free and clean, with nothing that could diminish the adhesion of primers. All surface defects and fasteners to be flushed out with as approved filler such as **Equus Epar Epoxy 802** and allowed to dry before membrane application. Include any gaps due to irregularities in sheet edges at tight-butt joints.

3.20 CONTROL AND EXPANSION JOINTS

For control and expansion joints refer to details on the drawings.

3.21 PRIME SUBSTRATE

Prime all dried and prepared plywood surfaces with Equus SOPREMA primer, as per manufacturers instructions depended on primer selected , before membrane application. A double-prime system may be needed in certain cases.

3.22 APPLY VAPOUR BARRIER

Unroll Equus SOPREMA vapour barrier onto the plywood and install in accordance with the manufacturer's instructions. Discard all packaging prior to installation. The vapour barrier is self-adhesive or installed by torch-on application depending on the type.

3.23 INSTALL PIR FLAT THERMAL INSULATION BOARD

Install Equus PIR insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA stainless steel fasteners for plywood or Easy Foam PU adhesive and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners.
The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant or Easy Foam PU adhesive.
Roof cover board may be installed over PIR thermal insulation.
PIR thermal insulation board is also available in tapered insulation boards.

3.24 INSTALL PIR TAPERED THERMAL INSULATION BOARD

Install Equus PIR tapered insulation boards over the vapour barrier in a brick-lay pattern as per the tapered scheme. Secure boards using Equus SOPREMA stainless steel fasteners for plywood or Easy Foam PU adhesive and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners.
The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant or Easy Foam PU adhesive.
Roof board may be installed over PIR thermal insulation.

3.25 INSTALL MINERAL WOOL FLAT THERMAL INSULATION BOARD

Install Soprarock HD 60 Mineral Wool insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for plywood and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200 bitumen sealant. Discard all packaging prior to installation. Roof cover board may be installed over mineral wool thermal insulation.

3.26 INSTALL MINERAL WOOL TAPERED THERMAL INSULATION BOARD

Install Soprarock DD Mineral Wool insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for plywood and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200 bitumen sealant. Discard all packaging prior to installation. Roof cover board may be installed over mineral wool thermal insulation.

3.27 INSTALL ROOF COVER BOARD

Install PermaBase Dek boards over the insulation board in a brick-lay pattern. Secure boards using Equus fasteners for plywood, concrete or metal and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant.

3.28 APPLY WATERPROOFING BASE SHEET

Unroll and align DeboPlast 2.5mm T/F C175 or DeboFlex 2.5mm T/F C175 base sheet in the most suitable direction. Discard all packaging prior to installation. The membrane is loose laid on top of the thermal insulation boards and mechanically fastened by means of Equus SOPREMA stainless steel fasteners for plywood. The membrane is fully-bonded by torch-on application on top of the roof boards. Repeat in sequence with all rolls maintaining side laps of 80mm and end laps of 150mm. All laps are to be heat welded. Offset end laps by minimum 500mm in adjacent runs.

3.29 APPLY WATERPROOFING BASE SHEET - SELF-ADHESIVE APPLICATION

Unroll and align DeboTack 2.5mm T/F C175 Aero base sheet in the most suitable direction. Discard all packaging prior to installation. Remove back covering and self-adhere evenly to the PIR thermal insulation boards or roof cover board. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 200mm. All laps are to be heat welded. Offset end laps by minimum 500mm in adjacent runs.

3.30 APPLY CAP SHEET - FIRE RETARDANT WARM ROOF

Unroll and align Duo HT 4 Slates/F C180 Firecare (FC) cap sheet, offsetting half sheet from base sheet to create staggered laps. Discard all packaging prior to installation. Cut the cap sheet to length as required. Re-roll both ends to the middle and torch evenly overall to the base sheet as it is unrolled. Ensure even heat application. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. Ensure all laps are offset to prevent coincidence with the base sheet laps. Following application of the cap sheet, inspect all laps separately to ensure they are neatly and correctly closed.

Where required scatter Duo Mineral Chip carefully over the bitumen joint while welding in order to provide a uniform appearance. Scatter Duo Mineral Chip where detailing of the cap sheet has been carried out to provide protection and uniformity of finish where required.

3.31 INSTALL PEDESTALS

For balconies, walkways and roofing applications with raised floors, install Equus Fixplus Pedestals as per manufacturer's instructions.

3.32 INSTALL RUBBER WALKWAY TILES

For protection of the Duo Membrane on flat roofs (e.g. walkways for roof maintenance), balconies and terraces. Start the installation of the tiles in a corner of the area and connect the Kraitec Step tiles using the pre-intergrated connector pins. Where required, apply SOPRACOLLE 300 N adhesive to tiles at a rate of 250g per tile (5x 50g dots per tile, 1 dot in each corner and one in the centre). Install the first row across the full length of the area and check for proper alignment. It is recommended that the tiles are installed in a masonry type configuration, with every second row starting with a half tile to stabilise the placement. Tiles can be cut to size with a low-speed sabre saw or carpet knife.

3.33 APPLY CAP SHEET - ROOT RESISTANT FOR EXTENSIVE OR SEMI-INTENSIVE GREEN ROOF

Unroll and align Duo HT 4 Slates/F C180 Firecare Landscape (FC LC) cap sheet, offsetting half sheet from base sheet to create staggered laps. Discard all packaging prior to installation. Cut the cap sheet to length as required. Re-roll both ends to the middle and torch evenly overall to the base sheet as it is unrolled. Ensure even heat application. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. Ensure all laps are offset to prevent coincidence with the base-sheet laps. Following application of the cap sheet, inspect all laps separately to ensure they are neatly and correctly closed.

Refer to the appropriate GREEN ROOF section(s) for the supply and construction of growing medium and planting as required by the project-specific requirements.

3.34 DRAINAGE - GREEN ROOF

Lay drainage cell and overlap adjacent sheets with the 100mm filter fleece overlap. At the edges and at details, lay the geotextile filter fabric across the top of the drainage cell 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 place heavy materials on the drainage cell.

Once geo-textile cloth drainage layer is in place overlay surface with 25mm grit sand prior to covering with soil.

3.35 GROWING MEDIUM AND PLANTING - GREEN ROOF

Refer to appropriate GREEN ROOF section(s) for supply and construction of green roof.

**Installation - concrete substrates**

3.36 CONCRETE SUBSTRATE - GENERALLY

Confirm concrete structures are specifically engineered to meet the requirements of the NZBC B1/VM1, 3.0 - 'Concrete'. Inspect the existing substrate and structure to ensure that they will not affect the performance of the membrane when applied.

Ensure concrete substrate has been allowed to cure for at least 28 days before commencing application. The relative humidity of concrete substrates must be 75% or less before membrane application to NZBC E2/AS1, 11.0 - 'Construction moisture'. **Equus** do not recommend the use of curing compounds; however, when used ensure all traces of compound are gone or removed. Concrete to be finished to NZS 3114, U3 with a light trowel texture.

3.37 SURFACE PREPARATION

Remove projections and all debris, leaving the surface dust-free, oil-free and clean, with nothing that could diminish the adhesion of primers. All ridges and protrusions to be stoned flush.

Flush depressions with an Equus Thermexx or Equus Chevacryl admix-gauged patch mix and allow curing at least 48 hours before over-coating.

3.38 CONCRETE FALL

Note that compliance with NZBC E2/AS1 for falls and drainage on concrete roofs and decks is achieved using specific design criteria to suit the project. Assistance is available from Equus. Generally, default criteria are as follows:

- 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.

3.39 CONCRETE CORNERS

Chamfer all leading edges to 5mm radius.

3.40 CONCRETE OUTLETS - NZBC E1/AS1

Install roof and deck outlets to NZBC E2/AS1, 8.5.6 -' Roof and deck drainage'. Size outlets in accordance with NZBC E1/AS1. Ensure outlets are level or below the substrate to prevent water from ponding around outlets.

3.41 CONCRETE OUTLETS - AS/NZS 3500.3: 2018 & NZBC E1/AS2

Install roof and deck outlets to NZBC E2/AS1, 8.5.6 -' Roof and deck drainage'. Size outlets in accordance with AS/NZS 3500.3: 2018 as modified by NZBC E1/AS2. Ensure outlets are level or below the substrate to prevent water from ponding around outlets.

3.42 INTERFACE OF CONCRETE, METAL AND PLYWOOD SUBSTRATE

Equus recommends a specifically designed expansion joint be installed between dissimilar materials.

3.43 EXPANSION / SEISMIC / MOVEMENT JOINTS

For expansion / seismic / movement joints refer to details on the drawings.

3.44 PRIME SUBSTRATE - CONCRETE

Prime all dried and prepared plywood surfaces with Equus SOPREMA primer, as per manufacturers instructions depended on primer selected before membrane application. A double-prime system may be needed in certain cases. Ensure a good even coverage and penetration as recommended by Equus Industries Ltd. Application to include upstands to a minimum height of 150mm above the PIR finished level. Consumption rates will depend on surface profile and porosity.

3.45 APPLY VAPOUR BARRIER TO CONCRETE SUBSTRATE

Unroll vapour barrier onto the concrete in accordance with the manufacturer's instructions. Discard all packaging prior to installation. Vapour barrier is self-adhesive or installed by torch-on application depending on the type.

3.46 INSTALL PIR FLAT THERMAL INSULATION BOARD

Install Equus PIR insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for concrete or Easy Foam PU adhesive and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant or Easy Foam PU adhesive. Discard all packaging prior to installation. Roof cover board may be installed over PIR thermal insulation.
PIR thermal insulation board is also available in tapered insulation boards.

3.47 INSTALL PIR TAPERED THERMAL INSULATION BOARD

Install Equus PIR tapered insulation boards over the vapour barrier in a brick-lay pattern as per the tapered scheme. Secure boards using Equus SOPREMA fasteners for concrete or Easy Foam PU adhesive and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners.
The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant or Easy Foam PU adhesive. Roof board may be installed over PIR thermal insulation.

3.48 INSTALL MINERAL WOOL FLAT THERMAL INSULATION BOARD

Install Soprarock HD 60 Mineral Wool insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for concrete and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant. Discard all packaging prior to installation. Roof cover board may be installed over mineral wool thermal insulation.

3.49 INSTALL MINERAL WOOL TAPERED THERMAL INSULATION BOARD

Install Soprarock DD Mineral Wool insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for concrete and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by an Alsan Mastic 2200 bitumen sealant. Discard all packaging prior to installation. Roof cover board may be installed over mineral wool thermal insulation.

3.50 INSTALL ROOF COVER BOARD

Install PermaBase Dek boards over the insulation board in a brick-lay pattern. Secure boards using Equus fasteners for plywood, concrete or metal and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant.

3.51 APPLY WATERPROOFING BASE SHEET TO CONCRETE

Unroll and align DeboPlast 2.5mm T/F C175 or DeboFlex 2.5mm T/F C175 base sheet in the most suitable direction. Discard all packaging prior to installation. The membrane is loose laid on top of the thermal insulation boards or roof cover board and mechanically fastened by means of Equus SOPREMA fasteners for concrete. The membrane is fully-bonded by torch-on application on top of the roof cover boards. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. All laps are to be heat welded. Offset end laps by minimum 500mm in adjacent runs.

3.52 APPLY WATERPROOFING BASE SHEET - SELF-ADHESIVE APPLICATION

Unroll and align DeboTack 2.5mm T/F C175 Aero base sheet in the most suitable direction. Discard all packaging prior to installation. Remove back covering and self-adhere evenly to the PIR thermal insulation boards or roof cover board. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 200mm. All laps are to be heat welded. Offset end laps of minimum 500mm in adjacent runs.

3.53 APPLY CAP SHEET - FIRE RETARDANT WARM ROOF

Unroll and align Duo HT 4 Slates/F C180 Firecare (FC) cap sheet, offsetting half sheet from base sheet to create staggered laps. Discard all packaging prior to installation. Cut the cap sheet to length as required. Re-roll both ends to the middle and torch evenly overall to the base sheet and cap sheet as it is unrolled. Ensure even heat application. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. Ensure all laps are offset to prevent coincidence with the base sheet laps. Following application of the cap sheet, back seal all joints separately to ensure they are neatly and correctly closed.

Where required scatter Duo Mineral Chip carefully over the bitumen joint while welding in order to provide a uniform appearance. Scatter Duo Mineral Chip where detailing of the cap sheet has been carried out to provide protection and uniformity of finish where required.

3.54 INSTALL PEDESTALS

For balconies, walkways and roofing applications with raised floors, install Equus Fixplus Pedestalsas per manufacturer's instructions.

3.55 INSTALL RUBBER WALKWAY TILES

For protection of the Duo Membrane on flat roofs (e.g. walkways for roof maintenance), balconies and terraces. Start the installation of the tiles in a corner of the area and connect the Kraitec Step tiles using the pre-intergrated connector pins. Where required, apply SOPRACOLLE 300 N adhesive to tiles at a rate of 250g per tile (5x 50g dots per tile, 1 dot in each corner and one in the centre). Install the first row across the full length of the area and check for proper alignment. It is recommended that the tiles are installed in a masonry type configuration, with every second row starting with a half tile to stabilise the placement. Tiles can be cut to size with a low-speed sabre saw or carpet knife.

3.56 APPLY CAP SHEET - ROOT RESISTANT FOR EXTENSIVE OR SEMI-INTENSIVE GREEN ROOF

Unroll and align Duo HT 4 WGG/F C180 Firecare Landscape(FC LC) cap sheet, offsetting half sheet from base sheet to create staggered laps. Discard all packaging prior to installation. Cut the cap sheet to length as required. Re-roll both ends to the middle and torch evenly overall to the base sheet as it is unrolled. Ensure even heat application. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. Ensure all laps are offset to prevent coincidence with the base-sheet laps. Following application of the cap sheet, inspect all laps separately to ensure they are neatly and correctly closed.

Refer to the appropriate GREEN ROOF section(s) for the supply and construction of growing medium and planting as required by the project specific requirements.

3.57 DRAINAGE - GREEN ROOF

Lay drainage cell and overlap adjacent sheets with the 100mm filter fleece overlap. At the edges and at details, lay the geotextile filter fabric across the top of the drainage cell 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 place heavy materials on the drainage cell..

Once geo-textile cloth drainage layer is in place, overlay surface with 25mm grit sand prior to covering with soil.

3.58 GROWING MEDIUM AND PLANTING - GREEN ROOF

Refer to appropriate GREEN ROOF section(s) for supply and construction of green roof.

**Installation - metal tray substrate**

3.59 METAL TRAY SUBSTRATE - GENERALLY

Confirm that the metal tray roofing and supporting structure has been installed in accordance with AS 1562.1, HB39-1997 and to the metal tray roofing manufacturer requirements and specifications. Metal tray thickness to be a minimum of 0.75mm BMT.

3.60 METAL TRAY SURFACE PREPARATION

Remove all swage leaving the surface dust-free, oil-free, grease-free and clean, leaving nothing that could diminish the adhesion of the membrane.

3.61 METAL TRAY FALL

Note that compliance with NZBC E2/AS1 for falls and drainage on metal tray roofs is achieved using specific design criteria to suit the project. Assistance is available from **Equus**.
Generally, default criteria are as follows:

- 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.

3.62 METAL TRAY OUTLETS - NZBC E1/AS1

Install roof and deck outlets to NZBC E2/AS1, 8.5.6 - 'Roof and deck drainage'. Size outlets in accordance with NZBC E1/AS1. Ensure outlets are level or below the substrate to prevent water from ponding around outlets.

3.63 METAL TRAY OUTLETS - AS/NZS 3500.3: 2018 & NZBC E1/AS2

Install roof and deck outlets to NZBC E2/AS1, 8.5.6 - 'Roof and deck drainage'. Size outlets in accordance with AS/NZS 3500.3: 2018 as modified by NZBC E1/AS2. Ensure outlets are level or below the substrate to prevent water from ponding around outlets.

3.64 APPLY VAPOUR BARRIER

Unroll self-adhesive vapour barrier onto the metal tray in accordance with the manufacturer's instructions. Discard all packaging prior to installation

3.65 INSTALL PIR FLAT THERMAL INSULATION BOARD

Install Equus PIR insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for metal substrates and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200sealant. Roof cover board may be installed over PIR thermal insulation.
PIR thermal insulation board is also available in tapered insulation boards.

3.66 INSTALL PIR TAPERED THERMAL INSULATION BOARD

Install Equus PIR tapered insulation boards over the vapour barrier in a brick-lay pattern as per the tapered scheme. Secure boards using Equus SOPREMA stainless steel fasteners for plywood or Easy Foam PU adhesive and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners.
The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant or Easy Foam PU adhesive. Roof board may be installed over PIR thermal insulation.

3.67 INSTALL MINERAL WOOL FLAT THERMAL INSULATION BOARD

Install Soprarock HD 60 Mineral Wool insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for metal and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200bitumen sealant. Discard all packaging prior to installation. Roof cover board may be installed over mineral wool thermal insulation.

3.68 INSTALL MINERAL WOOL TAPERED THERMAL INSULATION BOARD

Install Soprarock DD Mineral Wool insulation boards over the vapour barrier in a brick-lay pattern. Secure boards using Equus SOPREMA fasteners for metal and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by an Equus SOPREMA bitumen sealant. Discard all packaging prior to installation. Roof cover board may be installed over mineral wool thermal insulation.

3.69 INSTALL ROOF COVER BOARD

Install PermaBase Dek boards over the insulation board in a brick-lay pattern. Secure boards using Equus fasteners for plywood, concrete or metal and install in accordance with manufacturer's instructions. Add pre-formed angle fillets in internal corners. The angle fillets can be temporarily fixed by Alsan Mastic 2200 sealant.

3.70 APPLY WATERPROOFING BASE SHEET

Unroll and align DeboPlast 2.5mm T/F C175 or DeboFlex 2.5mm T/F C175 base sheet in the most suitable direction. Discard all packaging prior to installation. The membrane is loose laid over the thermal insulation board and mechanically fastened at the overlap area by means of Equus SOPREMA fasteners for metal substrates. The membrane is fully-bonded by torch-on application on top of the roof cover boards. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. All laps are heat welded. Offset end laps of minimum 500mm in adjacent runs.

3.71 APPLY WATERPROOFING BASE SHEET - SELF-ADHESIVE APPLICATION

Unroll and align DeboTack 2.5mm T/F C175 Aerobase sheet in the most suitable direction. Discard all packaging prior to installation. Remove back covering and self-adhere evenly to the PIR thermal insulation boards and roof cover board. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 200mm. All laps are to be heat welded. Offset end laps of minimum 500mm in adjacent runs.

3.72 APPLY CAP SHEET - FIRE RETARDANT WARM ROOF

Unroll and align Duo HT 4 Slates/F C180 Firecare (FC) cap sheet, offsetting half sheet from base sheet to create staggered laps. Discard all packaging prior to installation. Cut the cap sheet to length as required. Re-roll both ends to the middle and torch evenly overall to the base sheet and cap sheet as it is unrolled. Ensure even heat application. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. Ensure all laps are offset to prevent coincidence with the base-sheet laps. Following application of the cap sheet, inspect all laps separately to ensure they are neatly and correctly closed.

Where required scatter Duo Mineral Chip carefully over the bitumen joint while welding in order to provide a uniform appearance. Scatter Duo Mineral Chip where detailing of the cap sheet has been carried out to provide protection and uniformity of finish where required.

3.73 INSTALL PEDESTALS

For balconies, walkways and roofing applications with raised floors, install Equus Fixplus Pedestalsas per manufacturer's instructions.

3.74 INSTALL RUBBER WALKWAY TILES

For protection of the Duo Membrane on flat roofs (e.g. walkways for roof maintenance), balconies and terraces. Start the installation of the tiles in a corner of the area and connect the Kraitec Step tiles using the pre-intergrated connector pins. Where required, apply SOPRACOLLE 300 Nadhesive to tiles at a rate of 250g per tile (5x 50g dots per tile, 1 dot in each corner and one in the centre). Install the first row across the full length of the area and check for proper alignment. It is recommended that the tiles are installed in a masonry type configuration, with every second row starting with a half tile to stabilise the placement. Tiles can be cut to size with a low-speed sabre saw or carpet knife.

3.75 APPLY CAP SHEET - ROOT RESISTANT FOR EXTENSIVE OR SEMI-INTENSIVE GREEN ROOF

Unroll and align Duo HT 4 WGG/F C180 Firecare Landscape (FC LC) cap sheet, offsetting half sheet from base sheet to create staggered laps. Discard all packaging prior to installation. Cut the cap sheet to length as required. Re-roll both ends to the middle and torch evenly overall to the base sheet as it is unrolled. Ensure even heat application. Repeat in sequence with all rolls, maintaining side laps of 80mm and end laps of 150mm. Ensure all laps are offset to prevent coincidence with the base sheet laps. Following application of the cap sheet, inspect all laps separately to ensure they are neatly and correctly closed.

Refer to the appropriate GREEN ROOF section(s) for the supply and construction of growing medium and planting as required by the project specific requirements.

3.76 DRAINAGE - GREEN ROOF

Lay drainage cell and overlap adjacent sheets with the 100mm filter fleece overlap. At the edges and at details, lay the geotextile filter fabric across the top of the drainage cell 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 place heavy materials on the drainage cell.

Once the geotextile fabric drainage layer is in place, overlay surface with 25mm grit sand prior to covering with soil.

3.77 GROWING MEDIUM AND PLANTING - GREEN ROOF

Refer to appropriate GREEN ROOF section(s) for supply and construction of green roof.

**Detailing**

3.78 DETAILING

Detail all outlets, pipe penetrations, gutters, parapet up-stands, machinery plinths and any other details that come into contact with the **Duotherm** system. Detailing is carried out before, during or in some cases after the membrane is laid depending on the detail type. All detailing to be done in accordance with the manufacturer's technical literature and application manual current at the time of design, use, installation and maintenance. Note that roof vents are not permitted to be fitted on a warm roof concept

**Finishing**

3.79 COMPLETION INSPECTION

Inspect the system upon completion and leave up to 2-3 weeks to stabilise. Recheck the entire system prior to any warranties being issued.

Main contractor to arrange appropriate protection for the completed installation. Damage caused to the completed installation, by other trades working over the membrane after the initial inspection, to be the responsibility of the main contractor.

3.80 TESTING - FLOOD

Where practical, flood test all horizontal applications with a minimum 50mm depth of water for 48 hours. Make good any lack of water-tightness when the surface is completely dry. Ensure that an overflow is incorporated during the flood testing and that there are no load limitations that might prevent testing.

3.81 TESTING – ALTERNATIVE TEST METHODS

Consult with Equus Industries Ltd / SOPREMA regarding alternative test methods.

### Completion - general

3.82 CLEAN UP

Clean up as the work proceeds.

3.83 ACCEPTANCE

- Arrange for an inspection of the completed work.
- Protect the membrane until completion of the contract works.

3.84 LEAVE

Leave this work in a sound and waterproof condition and free of any defect.

3.85 REMOVE

Remove debris, unused materials and elements from the site.

3.86 COMPLETION MATTERS

Refer to the general section 1270 CONSTRUCTION for completion requirements and if required, commissioning requirements.

## 4 SELECTIONS

For further details on selections go to https://equus.nz/
Substitutions are not permitted to the following **Equus** product, unless stated otherwise.

### Materials

4.1 EQUUS SOPREMA DUO MEMBRANE - WARM ROOF SYSTEM

| | |
|---|---|
| Location: | ~ |
| Supplier: | Equus Industries Ltd |
| Substrate: | ~ |
| Type: | Equus SOPREMA Duotherm |
| Vapour barrier: | Equus vapour barrier by SOPREMA |
| PIR type/thickness/R value: | ~ |
| Mineral Wool type/thickness/R value: | ~ |
| Roof Cover Board: | ~ |
| Base sheet: | ~ |
| Cap sheet: | Duo HT 4 Slates/F C180 FC (Firecare) by SOPREMA |
| Colour: | ~ |

4.2 EQUUS SOPREMA DUO MEMBRANE - GREEN WARM ROOF SYSTEM

| | |
|---|---|
| Location: | ~ |
| Supplier: | Equus Industries Ltd |
| Substrate: | ~ |
| Type: | Equus SOPREMA Duotherm |
| Vapour barrier: | Equus vapour barrier by SOPREMA |
| PIR type/thickness/R value: | ~ |
| Mineral Wool type/thickness/R value: | ~ |
| Roof Cover Board: | ~ |
| Base sheet: | ~ |
| Cap sheet: | Duo HT WGG/F C180 Firecare Landscape (FC LC) by SOPREMA |
| Drainage cell: | Equus drainage cell |
| Geotextile fabric: | Geotextile filter fabric of 140gsm |
| Growing medium: | ~ |
| Colour: | White-Grey-Green |