Standard Specification for the installation of the EQUUS SOPREMA FLAGON TPO-THERM Single Layer TPO Warm Roof System to concrete surfaces

Project:
Prepared for:
Specification:
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1.0 PREAMBLE:

This specification is for the installation of the **EQUUS SOPREMA FLAGON TPO-THERM** roofing membrane system, in a single layer configuration over rigid insulation board to create a warm roof system. The system provides a durable, fully insulated and waterproof roof with high solar reflectivity. As the insulation is continuous over the entire roof structure, thermal bridging is largely eliminated. The energy efficiency of the building is improved as a result thereby reducing heating and ventilation costs for the building owner.

The **EQUUS SOPREMA FLAGON TPO-THERM** single-layer TPO warm roof system consists of a self-adhesive vapour barrier, PIR or mineral wool insulation (adhered or mechanically fixed) to the vapour barrier with a flameless TPO membrane system installed over the insulation to provide a fully waterproof covering for the roofing system.

TPO (Thermo Plastic Poly-Olefin) roofing membrane is a modified polyolefin synthetic membrane obtained by co-extrusion which is dimensionally stabilised by a glass fibre. The upper grey layer has a high resistance to weather agents and UV rays. The membrane is manufactured in a plant certified by UNI EN ISO 9001 (Quality management system) and UNI EN ISO 14001 (environmental management system).

The **EQUUS SOPREMA FLAGON TPO-THERM** self-adhered warm roof system has been assessed for use on roofs, decks and gutters installed on metal deck or panel, treated plywood and concrete substrates on buildings within the following scope:

- Buildings where the supporting structure and associated elements are designed and constructed within the scope of New Zealand Building Code E2/AS1 clause 1.1.

- Specifically designed buildings constructed to comply with the New Zealand Building Code.

2.0 SURFACE PREPARATION:

2.1 General - Responsibility:

Unless expressly agreed otherwise at the time of contract pricing, all work in this section shall be the responsibility of the main contractor, whether carried out by their own staff, other sub-trades or the roofing membrane sub-contractor.

2.2 Concrete:

(a) Concrete structures must be specifically engineered to meet the requirements of the New Zealand Building Code.

Concrete curing times are dependent on location, mix designs and climate conditions.

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Allow sufficient drying time after the concrete has been poured which is generally between 14 and 28 days. To verify concrete has sufficiently dried, a measurement can be taken using a hygrometer. A maximum relative humidity of 75% is required, measured at the time of vapour barrier application.

Concrete curing compounds are not recommended. Consult Equus Industries Ltd for advice if specified by others. Ensure that all traces of the compound are gone or removed before commencing installation.

(b) Shall be finished to NZS3114:1987 U3, with a light trowel texture.

(c) Shall have all ridges and protrusions stoned flush.

(d) Depressions shall be flushed with Schomburg **ASOCRET BIS 5/40** and allowed to cure 48 hours before overcoating.

(e) Roof, deck and gutter falls must be laid in accordance with the New Zealand Building Code.

(f) Shall have leading edges chamfered to 5mm radius.

(g) Shall be water-blasted to remove all detritus and allowed to dry.

(h) Existing substrates and structures must be thoroughly inspected prior to specification to ensure that they will not compromise the performance of the warm roof system when installed.

(i) **Outlets:**
Roof and deck outlets shall be installed as per clause 8.5.6 of E2 External Moisture of the New Zealand Building Code.

Outlets shall be sized in accordance with section E1 Surface Water of the New Zealand Building Code.

Outlets shall be from the Aquaknight Industries range, sourced from Equus Industries, unless otherwise specified.

INSTALLATION:

Note: A prestart meeting should be held onsite with the Main Contractor and the Equus Certified Applicator prior to commencement of warm roof installation.

3.0 VAPOUR BARRIER:

3.1 Primer: (For self-adhered membrane)
To the dried and prepared surface apply one (1) full coat of **EQUUS PEEL AND STICK** primer at a spreading rate of 6 to 8 m²/L depending on the porosity of the substrate. Allow to dry for minimum one (1) hour depending upon prevailing weather conditions.

3.2 NOVA-SK: (Self- adhesive)
Self-adhesive membrane for use as a vapour barrier when the PIR insulation is to be fully adhered by EASYFOAM.
Decide the most suitable direction to follow. Unroll and discard packaging. Align the first roll and cut to length as required. Remove the siliconized film and press the membrane into place on the surface ensuring even rolling and no creasing or bubbling. The self-adhesive properties

are automatically activated during installation. Use a weighted roller to ensure full coverage. Repeat in sequence with all rolls, maintaining minimum side laps of 80 mm laps and end laps of 100 mm. Offset end laps in adjacent runs. The lap automatically closes during application however it is recommended to have a hot air gun on hand during the process if additional heat is required (temperature dependent). Over upstands, the vapour barrier shall be taken up 50mm past the top of the insulation board. This ensures a suitable connection to create a complete waterproof envelope of the insulation.

3.3 COLPHENE 3000: (Self- adhesive)

Self-adhesive membrane for use as a vapour barrier when the insulation is to be mechanically fastened.

Decide the most suitable direction to follow. Unroll and discard packaging. Align the first roll and cut to length as required. Remove the siliconized film and press the membrane into place on the surface. The self-adhesive properties are automatically activated during installation. Repeat in sequence with all rolls, maintaining minimum laps of 100 mm. Offset end laps in adjacent runs. Over upstands, the vapour barrier shall be taken up 50 mm past the top of the insulation board. This ensures a suitable connection to create a complete waterproof envelope of the insulation.

4.0 INSULATION:

4.1 General:

On site cutting of boards is permitted and should be done using a fine-toothed saw or by scoring with a knife and snapping the board over a straight edge. Ensure accurate trimming to achieve a close tight butt finish. Any gaps between boards can be filled with **EASYFOAM.**

Refer to Equus project specific data for fixing patterns and full installation instructions.

4.2 Mechanically fastened:

Where the insulation is to be covered by roofboard.

Install Equus PIR or mineral wool insulation in a brick bond pattern using full boards where possible. Use one fastener per board to tack in place. Insulation is fully fastened with the roof board installation as per section 5.1.

Note: In areas where mineral wool insulation is used, roofboard must also be installed.

4.3 Mechanically fastened:

Where the TPO is adhered directly to the insulation.

Install the specified **EQUUS SOPREMA** fixings through the PIR boards into the concrete substrate following the project specific **SOPREMA** wind uplift report fixing layout plan. Ensure the fixings are securely fastened but not overly tightened to crush the insulation boards. Apply silver tape to all sheet joints and over top of fixings.

4.4 Fully adhered:

Install Equus PIR insulation in a brick pattern using full boards where possible. Boards shall be fixed in place using **EASYFOAM** adhesive applied in accordance with the fixing pattern in the project specific **SOPREMA** wind uplift report fixing layout plan. Multiple layers of board shall be glued with adhesive between each board. Apply silver tape to all sheet joints.

5.0 ROOFBOARD: (where required)

5.1 Install **PERMABASE DEK** roofboard in a brick bond pattern over insulation, using full boards where possible. Boards shall be fixed in place using **EQUUS SOPREMA** fixings installed in accordance with the fixing pattern in the project specific **SOPREMA** wind uplift report.

Apply silver tape over top of fixings.

6.0 MEMBRANE APPLICATION:

6.1 Membrane: FLAGON TPO EP/PR or FLAGON EP/PV-F

Decide the most suitable direction to follow. Align the roll and unroll into final position. Discard packaging. Fold back the required length of TPO to be glued exposing both the substrate and the back of the membrane. Secure temporarily to prevent wind uplift.

6.2 Adhesive:

Apply one (1) coat of **EQUUS TPO ADHESIVE** by means of spraying. This is a bottle spray kit application. Apply adhesive to both substrate and underside of membrane.

6.3 Membrane installation: FLAGON TPO EP/PR

Where the TPO is adhered directly to the insulation.
Once the adhesive has tacked off, carefully unfold the membrane into place, using a heavy weight roller 20 kg+, evenly roll membrane to ensure full contact adhesion between the membrane and concrete substrate. Repeat in sequence with all rolls. Offset end laps in adjacent runs if possible.

Repeat in sequence with all rolls maintaining side and end laps of minimum 50 mm. On completion, edge laps are welded closed using a suitable hot air welding machine such as Leister. Perform a test weld to confirm the correct machine heat setting for the prevailing weather conditions onsite. Weights are to be used on sheets while adhesive cures over the next few hours.

6.4 Membrane installation: FLAGON TPO EP/PV-F

Where the TPO is adhered to roofboard.
Once the adhesive has tacked off, carefully unfold the membrane into place, using a heavy weight roller 20 kg+, evenly roll membrane to ensure full contact adhesion between the membrane and concrete substrate. Repeat in sequence with all rolls. Offset end laps in adjacent runs if possible.

Repeat in sequence with all rolls maintaining side and end laps of minimum 50 mm. On completion, edge laps are welded closed using a suitable hot air welding machine such as Leister. Perform a test weld to confirm the correct machine heat setting for the prevailing weather conditions onsite. Weights are to be used on sheets while adhesive cures over the next few hours.

*Note: Where the TPO is adhered to roofboard **FLAGON TPO EP/PV-F** is to be used. This membrane has a fleece-backed underside and provides a smoother finish when the TPO is being installed over the rough roofboard.*

6.5 Detailing:

Detailing shall be carried out using **FLAGON TPO EP/S** unreinforced membrane welded to the **FLAGON TPO EP/PR** or **FLAGON TPO EP/PV-F** waterproofing membrane, **Cantac ROOF-TAC Spray,** and a double-sided tape to create one single impervious waterproofing system at all critical joins.

This includes all outlets, pipe penetrations, gutter stop ends, parapet upstands, machinery plinths and anything above or below the roof surface. This is carried out before, during or, in some cases, after laying the membrane, depending on the type of detail. All detailing shall be completed in accordance with the manufacturer's technical literature current at the time of design, use, installation and/or maintenance.

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6.6 Sealant:
SOPRASEAL SEALANT shall be used where required.

6.7 Membrane Termination:
The membrane will be terminated with **FLAGON TPO TERMINATION BAR** and **SOPRASEAL SEALANT** on upstands and parapets as per the manufacturer's termination details.

6.8 Completion:
Upon completion of the system it shall be inspected and left for a short period (up to 2-3 weeks) to stabilise. At this time the entire installation shall be rechecked prior to any warranties being issued. Where possible, particularly on the deck areas, a pond-test (24 hours) should be carried out.

Note*:* Damage caused to the completed installation by other trades working over the membrane after the initial inspection shall be the responsibility of the Main Contractor, who shall arrange appropriate protection for the finished membrane system as required.

6.9 Trafficability:
The **EQUUS SOPREMA FLAGON TPO-THERM** warm roof system is suitable for light foot traffic after the installation of duckboards, roof walk systems or **EQUUS FIXPLUS** pedestals and pavers or **KRAITEC STEP** rubber tiles. Alternatively, **WALKWAY TPO** can be installed over the finished system to delineate regular pathways across the roof.

PERMABASE DEK roofboard shall be installed if additional compressive strength for the roof system is required in areas of high traffic, around plantrooms, air conditioning units and other such roof mounted equipment. This will resist crushing from machinery or plant that may be temporarily placed on the roofing system during maintenance.

The **EQUUS SOPREMA FLAGON TPO-THERM** warm roof system shall be protected using a temporary protection board before objects are placed on the roof to prevent damage to the waterproofing membrane.

6.10 Photovoltaic Panel Supports (if required):
Where photovoltaic panels are to be installed, **SOPRASOLAR FIX EVO TILT** for bitumen roofs are to be installed as per the installation sheet provided by Equus Industries.

7.0 SPECIFICATION NOTES:

7.1 Quality Assurance (QA):
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.

8.0 MAINTENANCE AND WARRANTY:

8.1 Maintenance:
As normal maintenance, Equus Industries Limited recommends that the finished roof areas are inspected every six months for cleaning, and annually, by an Equus Certified Applicator, to ensure weathertightness and durability.

Ensure all outlets are free of blockages and clear of unwanted debris and that all associated flashings and membrane cap flashings are sound. Check the general condition of the

membrane and ensure it is free from surface moss, mould, or lichen.
Check all associated building elements that can impact on the durability of the membrane.

Higher risk areas such as sheet joints, substrate movement, edging, gutters, penetrations, corners, upstands, outlets, and overflows require a thorough inspection for weathertightness on an annual basis.

8.2 Warranty:

The **EQUUS SOPREMA FLAGON TPO-THERM** warm roof system described in this specification may be warranted to be waterproof for a period of up to twenty (20) years providing that:

(a) All work is carried out by an Equus Certified Applicator.

(b) The system is installed in accordance with the manufacturers' technical literature and the Warm Roof Application Manual at the time of design, use, installation and maintenance.

(c) The warranty is issued in conjunction with the appropriate maintenance statement.

The warranty period shall be determined for any contract in consultation with the Manufacturer or their representative prior to application. The period of warranty is determined by, but not limited to, the situation of the installation (e.g., old, or new substrate, plain poof or open plant roof, etc.)

The warranty is provided to the client by the Equus Certified Applicator carrying out the work and is backed by the Manufacturer as to the fitness for the purpose of the materials supplied for the contract.

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