Viking Technical Series – Warm Roofs: Knowing your options

Many of you are will be very familiar with warm roofs, so it's not a question of what's a warm roof vs a cold roof, but more importantly the difference between our warm roof portfolio and others in the market.

A warm roof – in short, is a roof that insulates a building from the outside. It's traditionally made up of a rigid insulation layer covered by a sheet waterproofing membrane. Conversely, a cold roof insulates a building from the inside by stuffing glass wool fibre insulation between the rafters in the ceiling cavity which also needs to be vented.

Therefore, the advantages of a warm roof is that it provides 100% thermal cover, takes the dew point to outside and is more energy-efficient. With the insulation being continuous and not sliced up into sections to fit between rafters, you have an uninterrupted thermal cover.

With the insulation protecting the substrate from the external temperatures, rising moist air from inside the building has no cold underside of the substrate to convert it to condensation - so the dew point finds itself on the membrane surface on the outside of the building. Warm roofs using Polyiso foam board for insulation have the highest thermal efficiency per thickness compared with other materials.

The removal of condensation inside makes for a healthier building and unlike a number of insulation materials; especially wool-type ones, Polyiso board loses hardly any of its thermal efficiency over the life of the product.

There are many warm roof options in the market. Starting with the 'everything but the kitchen sink' – complete 'bells and whistles' warm roof…..this is made up of (from the top down):

The waterproofing membrane which protects the whole assembly which, starting at the top layer and working our way down, is adhered to the cover board which has screws and plates fastening through it and the other layers. The next layer is the thermal insulation board. Then there's the sound barrier with a vapour barrier below that. Lastly there's the substrate which in this case is a steel tray.

At the other end of the warm roof spectrum is the fundamental 'bread n butter' warm roof assembly which consists of just a membrane covering the rigid insulation, which is bonded to the substrate. For Climate zone 3 (South Island and Nth Island's Volcanic plateau) a vapour barrier between the substrate and insulation is required. Having said that, if a vapour barrier is requested for installations in other regions, it can easily be included.

Then there's the sandwich panel assembly which is made up of profiled foam sandwiched between two profiled metal skins.

<u>Which situations would these warm roof options typically be best suited?</u>

Starting with the full bells and whistles assembly, this kind of roof is useful for buildings with very specific requirements – especially in the area of acoustics eg. Theatres and concert halls; so a sound insulation layer to add to the acoustic properties of thermal board is a must. Other buildings may possess a disproportionate amount of plant on the roof which is not only noisy while functioning, but such machinery imposes heavy point loads on the roof assembly - and - these roofs can have a

lot more foot traffic in the form of maintenance staff than normal commercial buildings. – in these instances, high density cover boards add more compressive strength and protection to the foam.

The fundamental warm roof will work well for almost every commercial and residential situation provided the insulation has good compressive strength.

As a gross generalisation, sandwich panel roofing is ideal for larger ice-cream container type commercial buildings; especially those where the control of condensation and indoor temperature is the number one priority and needs to be exact.

Furthermore, a warm roof overlay is an ideal solution to add a further 20+ years to the life of the roof.

Additional to our WarmRoof system, the Viking portfolio also includes Viking WarmSpan – our hero 'warm roof' system.

WarmSpan is made up of the critical components required for a successful warm roof (and no more). It has a steel tray substrate on top of which polyiso insulation board is bonded, with a Viking waterproofing membrane completing the external layer. A vapour barrier is still required between the substrate and insulation for buildings in Climate zone 3. A Vapour barrier can also be used in Climate Zones 1 & 2 if desired, however this isn't mandatory.

What's so special about Viking WarmSpan?

Simplicity - Viking WarmSpan possesses the critical integral components required for a successful commercial or residential installation, without imposing unnecessary extra layers - which are superfluous to requirements and add avoidable extra cost.

It's a versatile system - In the event that the building has specific needs, eg: an observatory with telescopes on the roof which will end up receiving more foot traffic than a normal roof, then cover boards could be installed under walkway pads; directing people down a pre-determined path that may take up less than 5% of the roof area, as opposed installing a cover board on the whole roof which would add tonnes of weight at extra cost for no extra value.

The system was engineered, rigorously tested and certified accordingly - Viking WarmSpan is code compliant by reputable engineers - Holmes solutions

Adhesive bonded - a specialised two-part urethane adhesive system bonds the insulation board to the steel tray; as opposed to using thousands of screws and washers which puncture the layers and promote thermal bridging from the building's interior.

Additional WarmSpan advantages:

- Wind uplift - wind uplift resistance up to 6.5kpA
- Structural savings - saving in structural costs of 60% if the span between supports is at its maximum of 3.6m (compared to a traditional plywood roof with supports at 400mm centres)
- Spanning-ability of 3.6m - certified by Holmes Engineers (and we're talking about some serious loading testing for the likes of snow loading) is the industry's largest for roofs of this type.
- Instant protection - in terms of the sequence of construction – the installation of the steel tray provides instant protection for the building's structure and interior.

- Fast drying - It's able to be instantly dried off when wet - so that insulation can be installed immediately. In contrast, wet plywood can be a real problem.
- Two vapour barrier options - a tape and sealant system to deal with all steel tray junctions, or a full self-adhered sheet installed on top of the tray.
- Most energy efficient of warm roof of its kind - due to Kingspan PIR board's high R-value per inch of thickness, and absence of screws and plates negated thermal bridging.
- Fire rating – WarmSpan is tested and certified as having the best possible fire resistance rating in the industry (Called Group 1S) – this actually negates the need for ceilings to be hung below the underside of the steel tray.

The WarmSpan system can waterproofed with our Enviroclad and Epiclad wide-sheet adhered membrane systems as well as any of our Torch-On systems.

Viking WarmSpan's track record or the more technical term, 'history in use', over the last decade is more than impressive, having been installed on hundreds of roofs; which continue to stand up to NZ's harsh conditions.

Auckland Office
80 Alexander Crescent, Otara
PO Box 14-541, Panmure
Auckland 1741, New Zealand

Christchurch Office
2 Nazareth Avenue, Middleton
PO Box 9117, Tower Junction
Christchurch 8149, New Zealand

T: 0800 729 799
F: 0800 729 788
info@vikingroofspec.co.nz
www.**vikingroofspec**.co.nz
A division of Viking Group Limited