THERMOSHIELD®
thermal insulation coating

care of
ASKIN™
Performance Panels

americold
CUSTOMER FIRST

Arndell Park, NSW
Insulation Panel Waterproofing - Roof Protective Coating Works

Waterproofing | Thermal Insulation | Future Proofing

CORROSION control
Waterproof
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10 YEAR warranty
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Waterproofing | Thermal insulation | Future proofing

Insulation panel waterproofing – Roof protective coating system

Project Site: Americold

Site address: 21 Holbeche Road, Arndell Park NSW

Executive summary

The ageing insulation panels had been incurring widespread water ingress which lead the ultimate need for full replacement.

The waterlogged sheets had reached dangerous weights that resulted in visual warping, as well as putting dangerous load on the supportive structure beneath.

Askin performance panel were installed as replacement.

Following installation, a waterproofing coating system was chosen as a "*future proofing*" insurance policy to ensure the same ultimate demise would not occur to the replacement insulation panels.

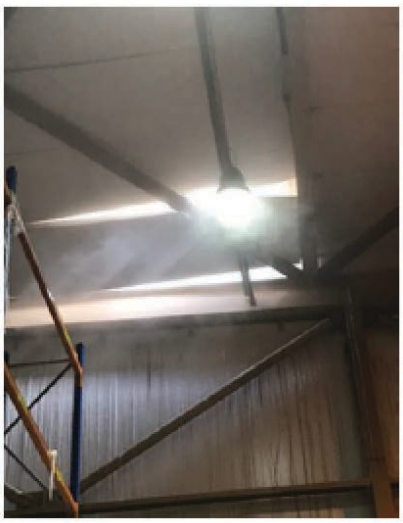
This document follows the process undertaken to waterproofing the panel joints, butt joints, "*mushroom heads*" (screws) as well as the panels themselves.

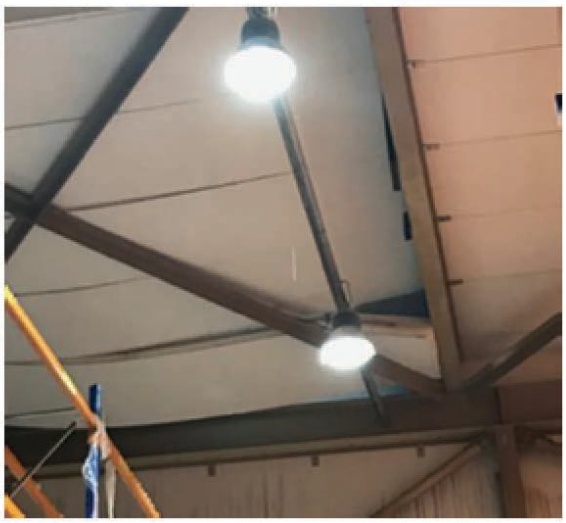
The waterproofing system is ultimately sealed beneath the Thermoshield ceramic membrane in order to thermally regulate the top layer of the insulation panel in order to remove the damaging effects of thermal expansion from the underlying waterproofing measures.

Section 1: **Original Condition:**

You can see from the below photos that the 20+ year old existing insulation panels were damaged, dangerous and in no way functional:

The panels had absorbed so much water the weight had become far too heavy for the roof structure below it, which had become unable to prevent the roof falling into the freezer itself:





The external thermal expansion over time lead to panel joins losing their waterproofing integrity and over time, the constant water ingress caused their ultimate demise.

Regardless of the quality of waterproofing installations, the underlying movement over the joints caused through thermal expansion will often lead to even best waterproofing works breaking underlying the large force of the small constant movements.

Section 2: **Scope:**

Pre Thermoshield coating works

Panels installed & sheet joins (grooves) sealed with Sika Pro (paintable polyurethane) prior to coating works commencing. By Askin team.

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Coating works | Thermoshield crew -

- **Roof cleaning**

- **Weatherproofing all panel joints (& butt joints)**

  1. Apply specialised etch primer 100micron WFT along the **panel joins**. 180mm centred to the joint
  2. Lay 100mm polyester/fibreglass waterproofing bandage over wet primer
  3. Re-apply etch primer 100micron WFT above bandage to wet & seal the waterproofing bandage

  1b. Apply specialised etch primer 100micron WFT along the **butt joins**. 240mm centred to the joint
  2b. Lay 200mm polyester/fibreglass waterproofing bandage over wet primer
  3b. Re-apply etch primer 100micron WFT above bandage to wet & seal the waterproofing bandage

- **Dedicated waterproofing 'wet area' membrane**

  Application of micro-fibre reinforced polyurethane membrane across the above laid bandage – 1 x 500micron WFT coat to cover waterproof bandage width only.

- **Applying 2 x coats of the Thermoshield ceramic membrane ALL ROOF AREA**

  Each coat applied at 250micron WFT. To yield 350-400micron dry film.

  In addition to additional strength, the coating will significantly reduce the temperature range of the external metal – eliminating the damaging effects of thermal expansion.

  Regardless of how comprehensive a waterproofing solution may be, thermal expansion & UV degradation is near certain to result in the waterproofing losing its integrity.

TOTAL COATING THICKNESS – Dry Film thickness

Along joins – etch primer& bandage 100micron /waterproof membrane 500micron / Thermoshield ceramic coating 350micron **– total thickness along joins 850micron**

Panels excluding joints - Thermoshield ceramic coating 350micron minimum
- total thickness along roof panels 350micron

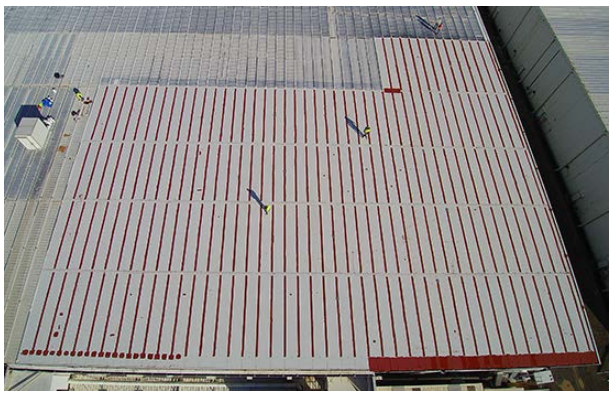
Section 2b: **Scope – Coating summary** (imagery):

Below is a visual summary of the respective stages in the waterproofing coating system:

1. Power washing
2. Waterproofing bandage along panel joins
3. Waterproofing bandage along butt joins
4. Waterproofing membrane over all joins
5. Etch primer coating all areas
6. Thermoshield thermal ceramic membrane to seal

Before:

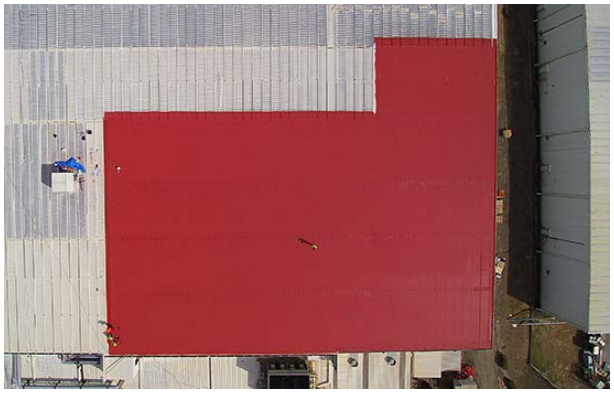
Panel joins bandaged (1,530LM):



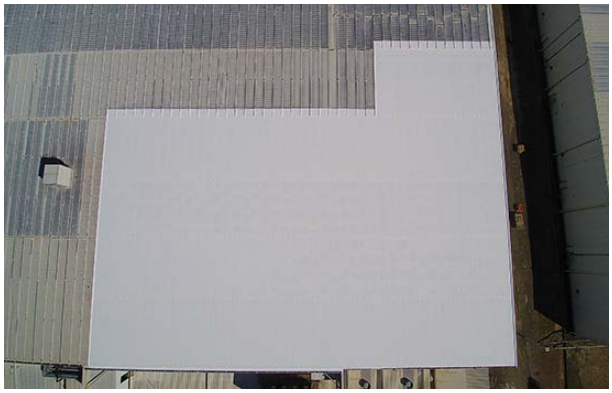
Butt joints (228LM) & mushroom heads bandaged:

Waterproofing membrane over all joins:

Etch primer :

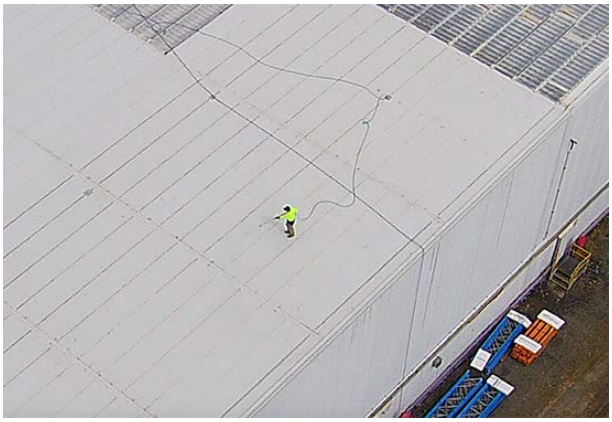


Thermoshield protective membrane:



Section 3: **Pressure washing:**

All surfaces cleaned under high pressure water prior to coating works:



A fairly self explanatory process, the power washing removed grime, dirt & as much as the excess silicone that had been trampled around the roof under guys feet.

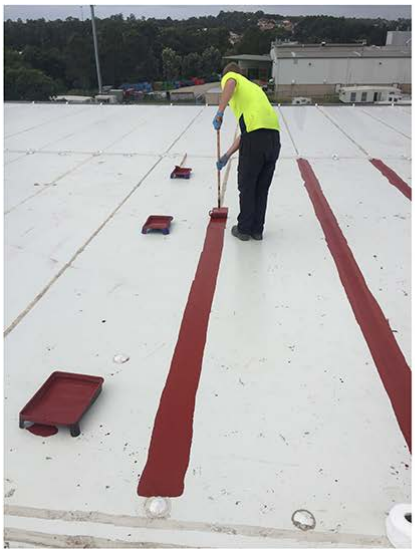
Section 4: **Panel joins – Waterproofing bandage application:**

The process to lay the bandage went as follows:

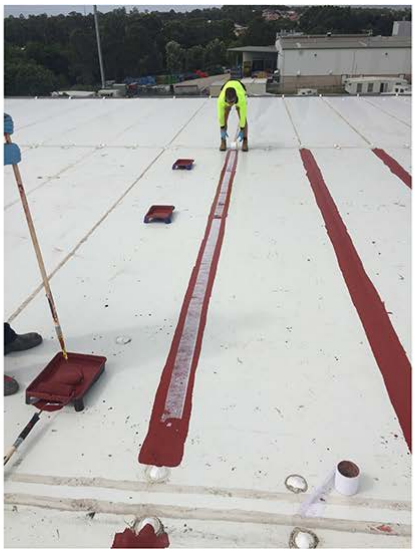
- Apply specialised etch primer (centred) along the **panel joins**.
- Lay 100mm polyester/fibreglass waterproofing bandage over wet primer
- Re-apply etch primer above bandage to wet & seal the waterproofing bandage

Example of process:

Wetting along join:



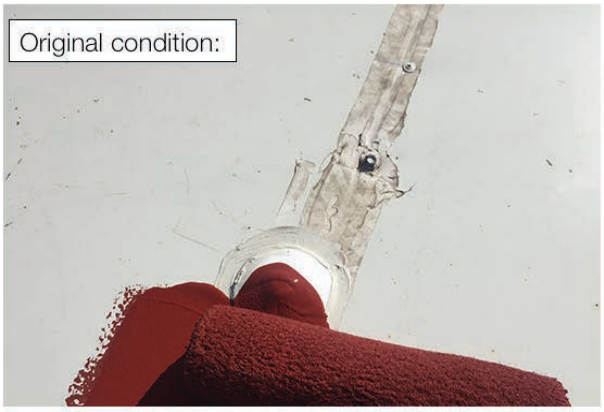
Laying bandage over join:

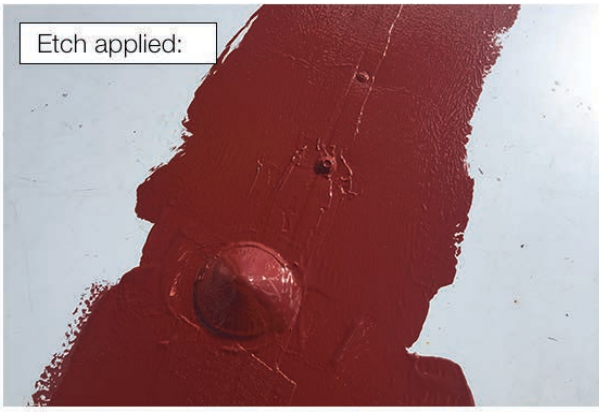


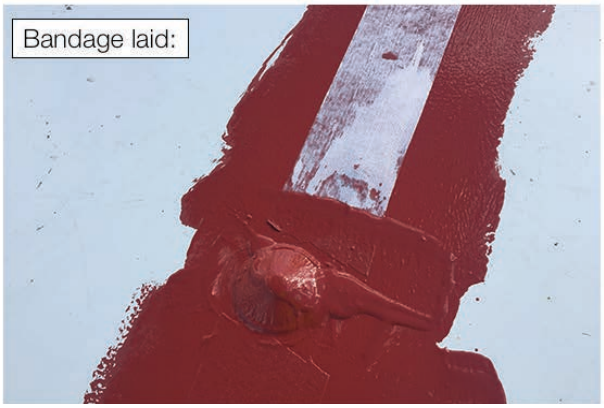
Sealing(sinking) bandage in primer:

Section 4: **Panel joins – Waterproofing bandage application** continued:

This process was repeated along all joins, totally 1,530LM.



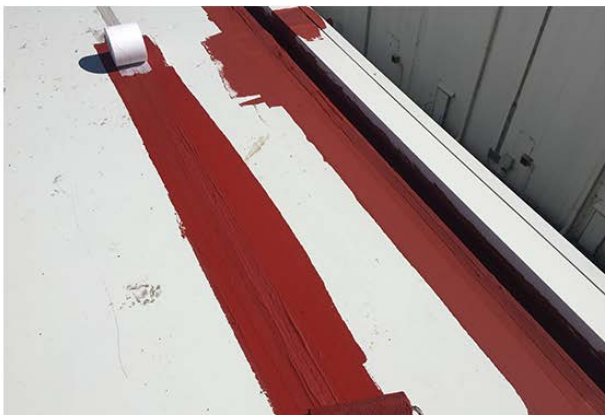




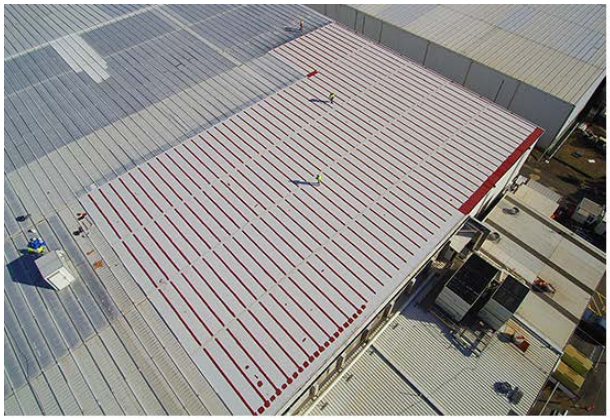
Wider angle example:

Section 4: **Panel joins – Waterproofing bandage application** continued:

Waterproof bandage applied over panel joins & include side capping:


Completed panel joins – aerial photos:




Section 5: **Butt Joints (& '*mushroom heads*') – Waterproofing bandage:**

The butt joints (the run perpendicular to the panel joins) we then sealed beneath the waterproofing bandage & primer combination.

The new roof to old roof join particularly problematic in that there was/is a lack of fall over the joint. You can see from the closer in (below) image that there is large water pooling & an extremely thick coverage of silicone.

Wider angle new/old roof join:

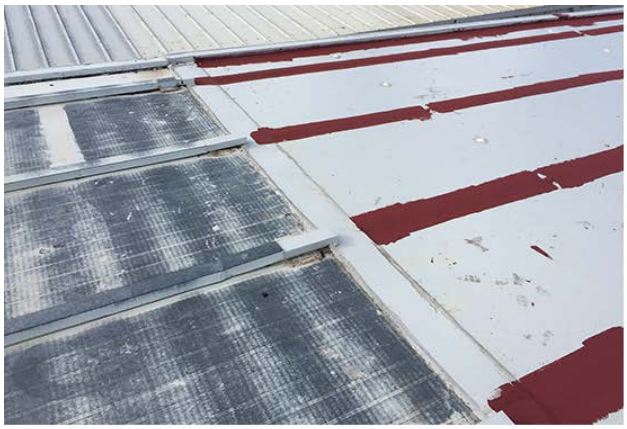
Water pooling – upslope in fall:

Bandage being applied:

Bridging the old/new roof join:

Section 5: **Butt Joints (& '*mushroom heads*') – Waterproofing bandage** continued:

More examples of butt joints & '*mushroom head*' bandage coverage:




Aerial view:




Section 6: **Waterproofing 'wet area' membrane:**

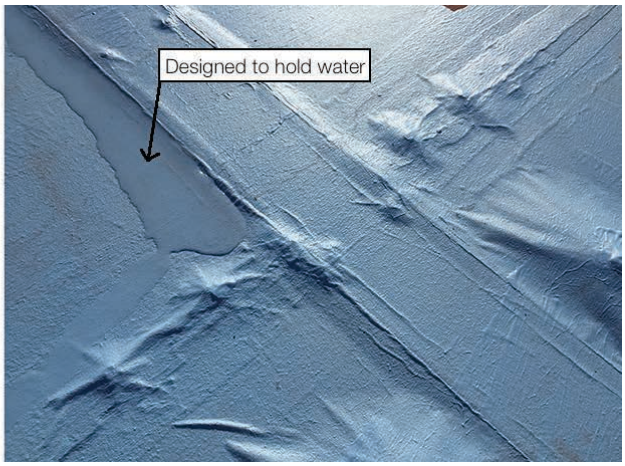
Once the waterproof bandage had been laid over all area of possible water ingress (panel joins, butt joins & any penetrations) – a dedicated waterproofing membrane was applied.

Water must track down to the butt joints, then there is a small rise to get over before continuing its journey down the sheet. As a result, water pools at the butt joints before it continues one – making these areas major "*hot spots*" for water proofing concerns.

We applied a product designed to hold water. A micro-fibre reinforced polyurethane membrane was applied to approximately 500micron over the bandaged areas (only).

Photos below show the vivid light blue of the waterproofing membrane:

Same roof spot – before & after stages:



You can see in the above (right) image demonstrates how water pools at the butt joints before reaches a level high enough to continue running down the sheet.

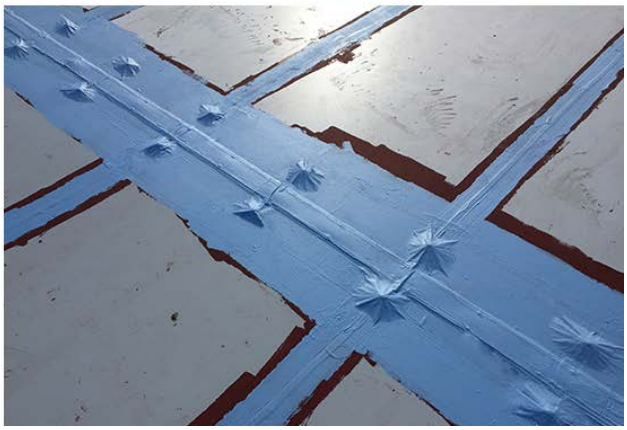
Overnight condensation pools often remained until the afternoon. Leaving water over these water ingress '*hots spots*' for up to half a day & longer.

This demonstrates the reason why the membrane was applied over these sections (only) as water doesn't drain freely across the join.

Section 6: **Waterproofing 'wet area' membrane** continued:

More examples of waterproofing membrane applied over all panel join, butt joints & all roof penetrations:



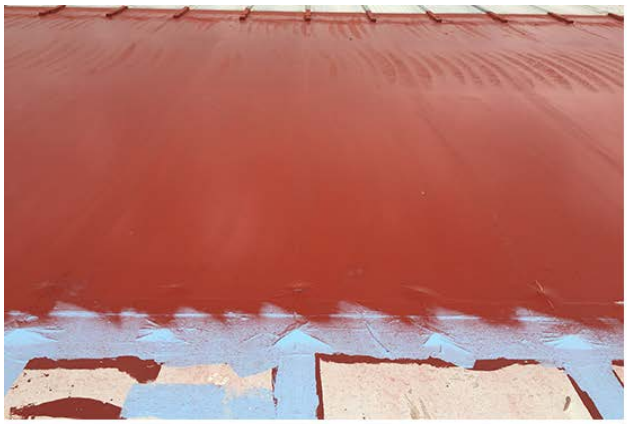



Aerial view:

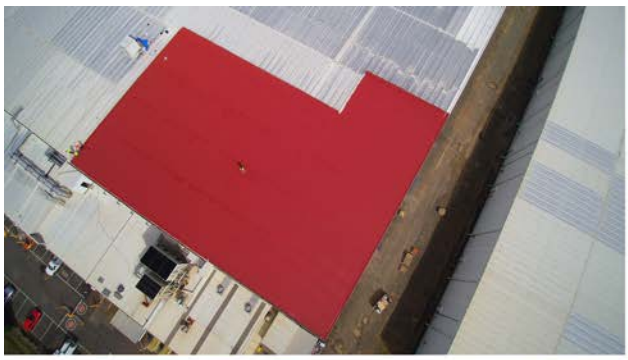



Section 7: **Etch primer coating (all areas):**

Etch primer is then applied over all areas prior to the ceramic top coat.
This particular etch primer ensures maximum adhesion to the colourbond polymer coating.




Aerial photos:




Section 8: **Thermoshield – top coating process:**

Waterproofing installations have the ability to fail due to thermal expansion over & along roof joins. By eliminating the extreme peaks in surface temperatures the thermal expansion is near eliminated. This ensures the waterproofing measures have the ability to remain intact.

Thermoshield thermal ceramic coating creates a thick, non-permeable membrane that acts to thermally insulate the roof sheeting & add another layer of waterproofing protection.

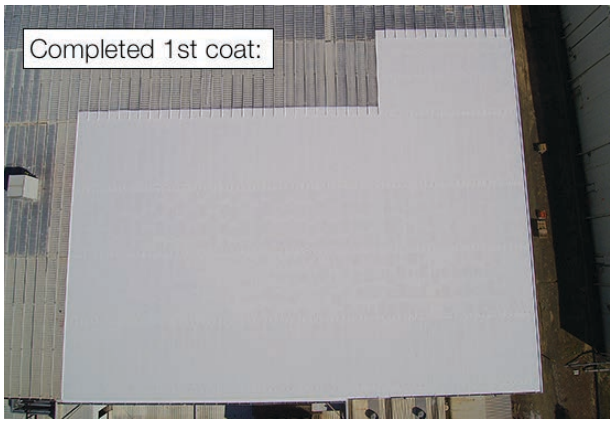
First coat photos:

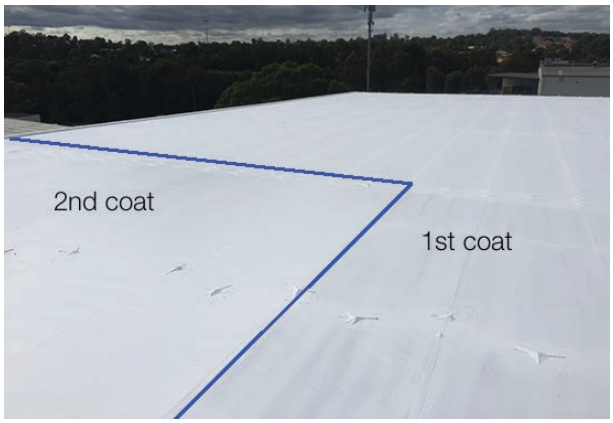



Aerial progress (half way) photos:


Section 8: **Thermoshield – top coating process** continued:

Aerial progress (3/4) photos:





Above right, you can see the slight visual difference in the 1st and 2nd coats.

Below photos shows a before & after caulking touch ups. The below photo shows a loose fitting capping in which water could pool. You can see it was caulked & smoothed for water run off.

These were carried out on a needs basis, where required:

Section 9: **Thickness testing:**

From earlier (scope – section 2):

Along joins – etch primer& bandage 100micron /waterproof membrane 500micron / Thermoshield ceramic coating 350micron **– total thickness along joins 850micron**

Panels excluding joints - Thermoshield ceramic coating 350micron minimum
- total thickness along roof panels 350micron

Panel joins | Butt joins | New/Old roof join – thickness testing achieved:

Roof panels excluding joins – achieved:

***** Testing witness by Askin staff**

Section 10: **Completed photos:**

Roof level completed photos:




Aerial completed photos:




Section 10: **Conclusion:**

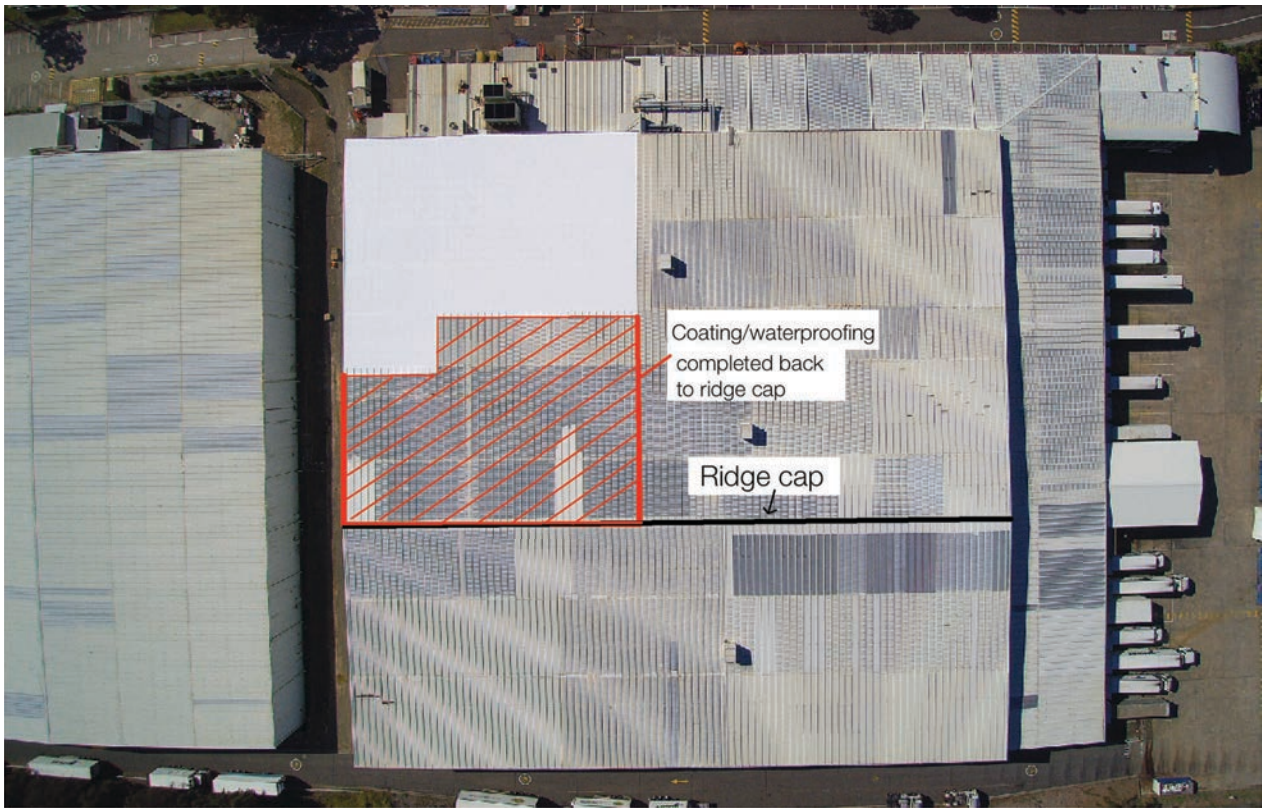
The very comprehensive waterproofing measures have been well sealed beneath a thick, ceramic thermal barrier. This will eliminate the ability for thermal expansion to apply force across the waterproofed joins.

The coating system comes with a 10 year warranty – with the ability to extend with scheduled maintenance.

Recommendation:

There appeared to be evidence of water ingress above the new roof, in the old/existing roof sections. Water could have the ability to enter & track down to the new roof section & potentially under the coating .

Ideally an extension of the waterproofing works all the way back to the ridge cap:



If this were completed, any leaks in this section could only be attributable to the coating system failure. If left as is, any leaks could be a result from a variety of factors but most likely due to the very highly prone leaking areas above the new roof.

For any addition information or enquires, please contact us at Thermoshield Australia.

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