THERMOSHIELD®
thermal insulation coating

THE UNIVERSITY OF MELBOURNE

Victorian College of the Arts
Pre Solar PV installation - Roof Protective Coating Work

Rust Conversion | Heat reduction | Future Proofing | Solar PV Efficiency

CORROSION control
Waterproof
THERMOSHIELD PROUDLY MADE IN AUSTRALIA
10 YEAR warranty IF APPLIED BY THERMOSHIELD APPROVED APPLICATORS
ISO 9001 & 14001 Certified

Gavin Batty

Managing Directgor
Thermoshield Australia PTY LTD

Phone: (03) 9728 8800
Mobile: 0417 563 955
Email: gavin@thermoshield.com.au

Solar PV efficiency | Thermal insulation | Future proofing

Roof protection coating system

Project Site: Victorian College of the Arts

Site address: 234 St Kilda Road, Southbank VIC 3006

Executive summary

The Victorian College of the Arts roof had heavily weathered, aging sheeting as well as heavily rusted flashings in many areas.

With solar PV investment being undertaken for the ageing roof, consideration was required for the life of the roof to match the 25-30 year lifespan of the panels.

The coating works were a mixture of restoration, aesthetics renewal as well as providing major increases in surface temperature profile.

Opposed to roof replacement, the Thermoshield restoration coating system is often preferred due to lower health & safety risks in completing the project, no disruption to site use and the coating option is a significant cost saving exercise.

In addition to prolonging the life of the roof, the Thermoshield coating was chosen to decrease the heat load on the building, leading to greater increases in internal comfort in hotter periods of the year.

Section 1: **Original Condition:**

The VCA roof was heavily ageing and showing widespread signs of deterioration.

A very unique design, the roof had many difficulties relating to access and required many 'high risk' working at heights processes to be carried out.

Below aerial photos of the weathered, ageing roof:






Section 1: **Original Condition** continued:

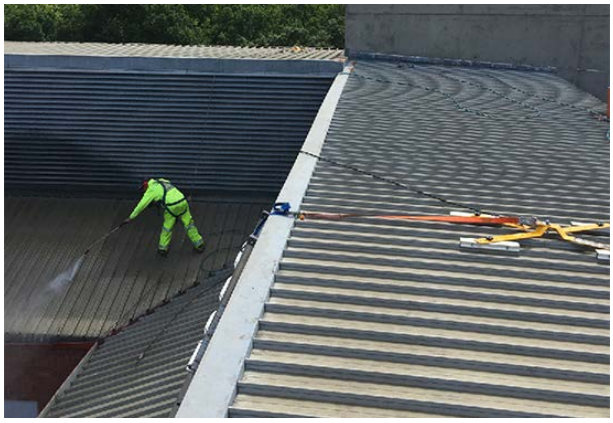
Wider angle photo of the unique roof design:

Heavy surface rusting along flashings as well as spot corrosion:

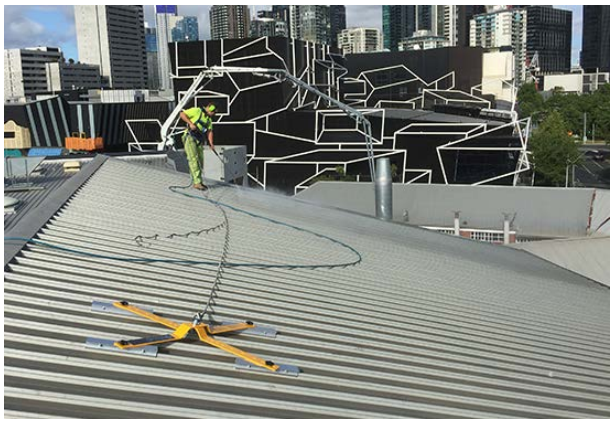
Wider angle image of various VCA roofs, as well as roof safety anchors being installed:

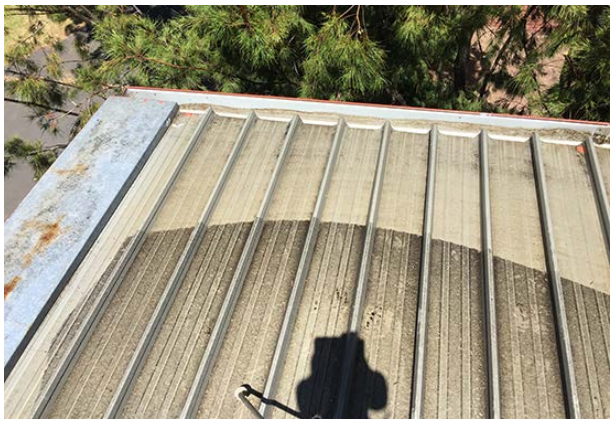
Section 2: **Pressure washing:**

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



Below (right) shows the power washing contrast on the ageing sheets:





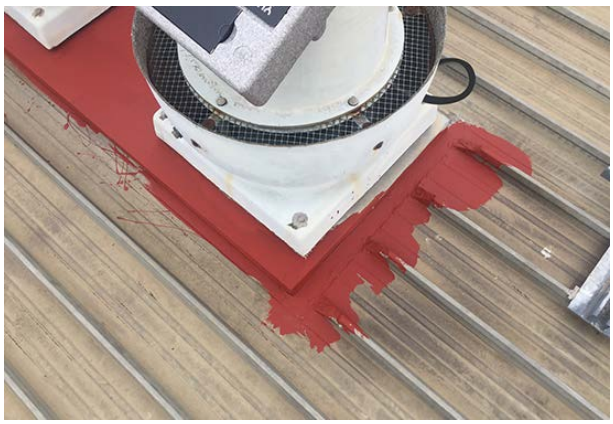
In addition to the roof sheets, gutters that were completely filled with debris were cleaned and power washed:

Section 3: **Rust conversion (where required):**

Many of the flashing were suffering from surface rusting. Rust conversion was not in the original scope however prioe to coating works, we felt it was necessary to treat the rusted flashing to ensure longevity:

Rust converter goes on vivid red:


Water pooling around penetrations caused surface rusting:

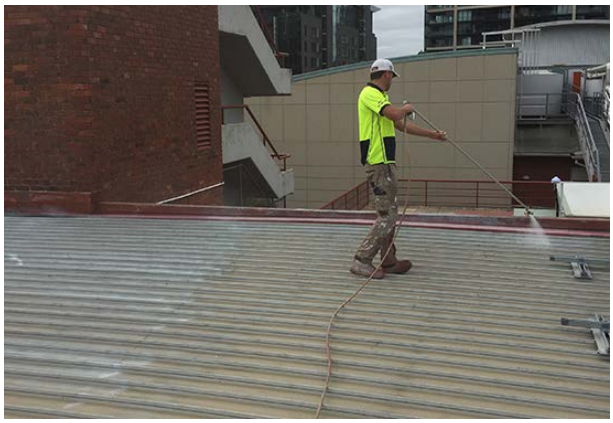


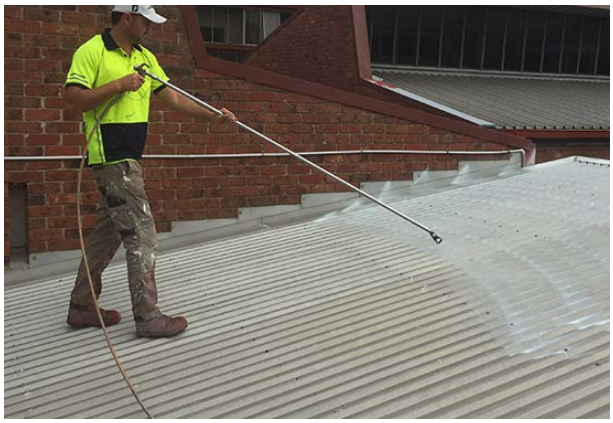

Most flashings were/are galvanised steel whereas the roof sheeting is zincalume. The electrical mismatch in the dissimilar metals resulting in accelerated corrosion of the flashings:


Section 4: **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 ageing roof sheets.

The etch primer is misted on fairly indiscriminately as it dries clear.





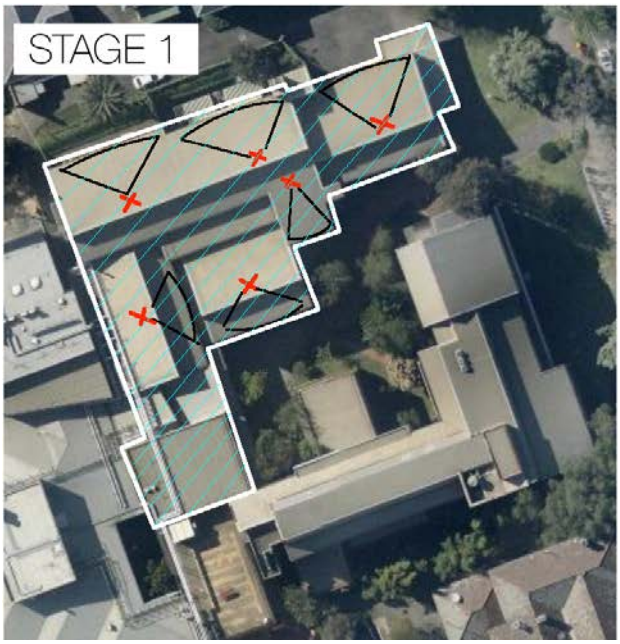
Section 5: **Thermoshield – coating process**

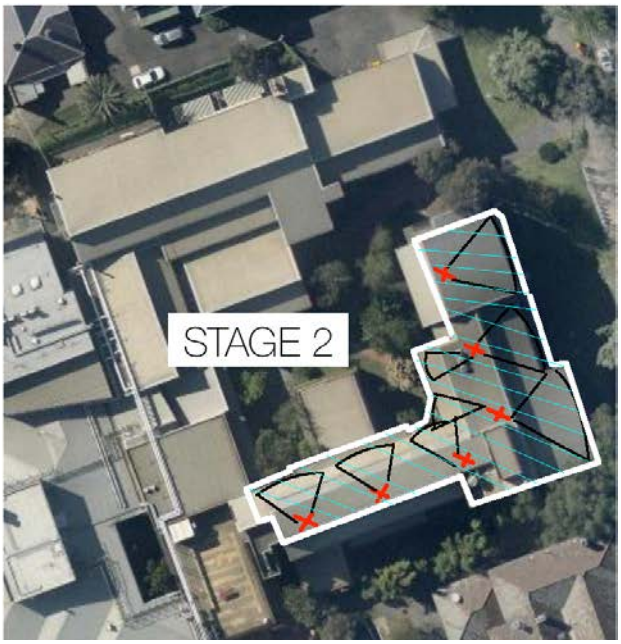
Thermoshield thermal ceramic coating creates a thick, non-permeable membrane that acts to thermally insulate the roof sheeting & add a layer of waterproofing protection.

The roof design was/is very unique and required harness use in nearly all areas.

As a result, the coating was separated into 2 sections in order to setup all the roof safety systems and not have to keep uninstalling and re-installing them.

Below is a diagram of the roof safety points along all live edges as well as an outline of each stage, which was completed in full prior to moving across:





Section 5: **Thermoshield – (stage 1) first coat:**

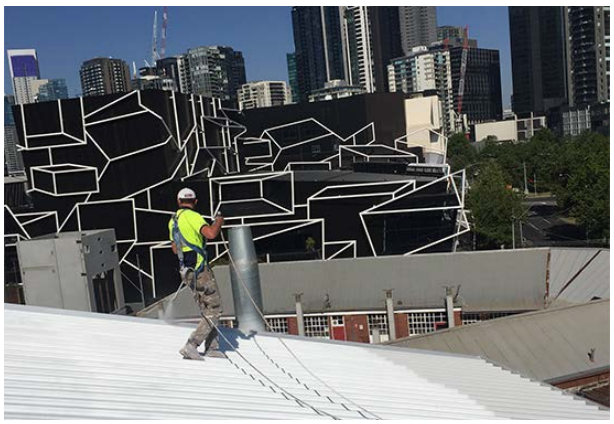
The first coat commenced (stage 1) in basic white Thermoshield:

Below (left) shows application near live edge. You can see harnesses in use for both sprayer and spotter. Below (right) shows eye level progress shot:

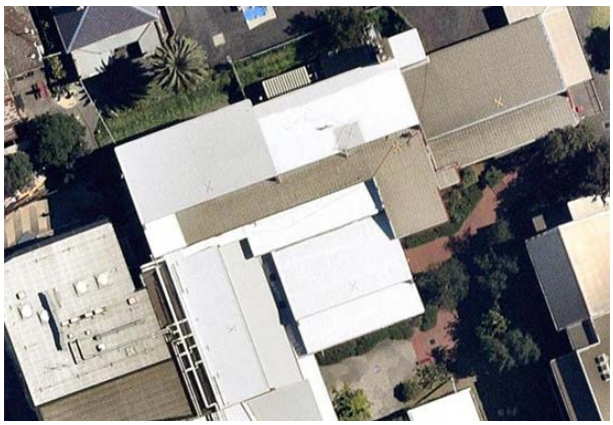
Aerial photos showing the vivid white of the Thermoshield coating:

Section 5: **Thermoshield – (stage 1) second coat:**

The second (top coat) was completed in infrared pigment shale grey. The infrared pigment reflects greater amounts of UV radiation, therefore increasing the thermal performance of the ceramic membrane compared with regular tinting.



Contrast between white first coat and shale grey second coat:



Aerial photo of colour contrast as well as wide angle eye level demonstration:

Section 6: **Temperature comparisons:**

Whilst completing the project in stages – an opportune moment occurred whereby we were able to test the surface temperatures of the various surfaces:

- Bare metal (aged and weathered)
- Thermoshield – basic white
- Thermoshield – shale grey (infrared tint)

At the time of temperature readings, temperatures were high and solar radiation levels were nearly at maximums.

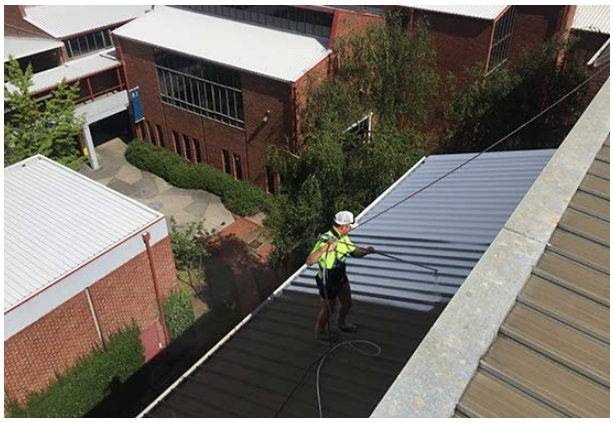
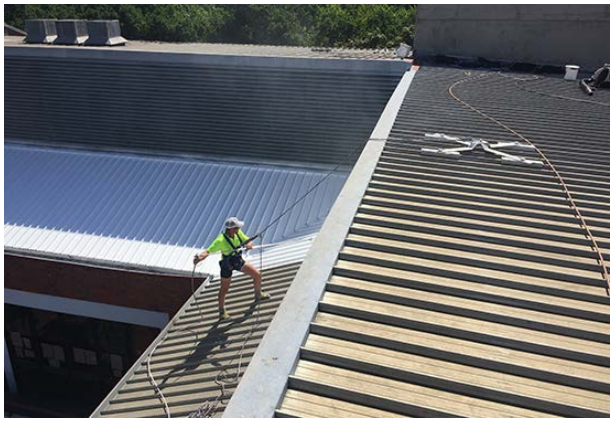
2016	Oct	Nov	Dec
Graph			
16th	2.2	7.2	5.7
17th	4.1	8.0	6.3
18th	4.6	4.3	8.4
19th	6.1	8.3	8.1
20th	7.1	6.1	7.2
21st	0.5	5.5	8.0
22nd	4.7	0.4	8.2
23rd	5.2	4.7	8.0
24th	5.6	6.0	7.3
25th	6.4	4.4	9.0
26th	2.5	5.2	2.8

Solar radiation of 8.0 kWh p/sqm is nearly as high as Melbourne reaches. Therefore, surface temperature of the bare metal (below) is near to theoretical maximums

- **Thermoshield Basic white** – 63% reduction in surface temperature
- **Thermoshield Shale Grey (infradred)** - 53% reduction in surface temperature

Section 7: **Thermoshield – (stage 2) first coat:**

Stage 2 – First coat in basic white Thermoshield commencement:

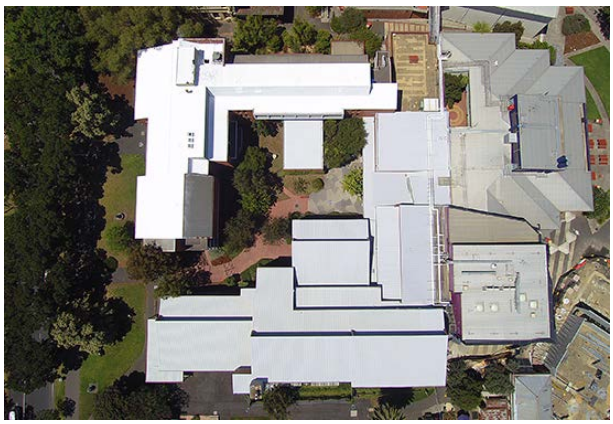






Section 7: **Thermoshield – (stage 2) first coat:**

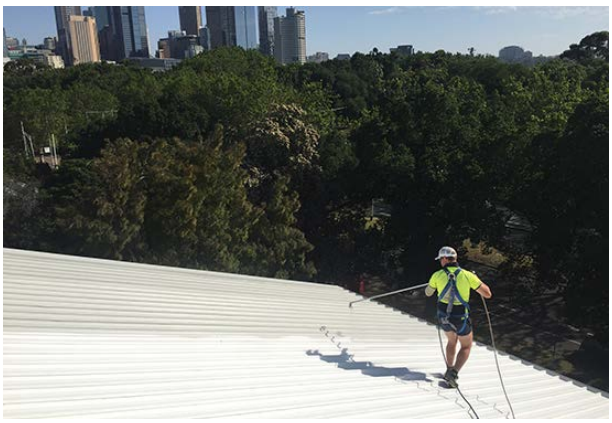
Arial photos demonstrating the differences between the white (first coat) applied to stage 2 areas as well as shale grey (second coat) Thermoshield applied to stage 1:



Section 7: **Thermoshield – (stage 2) second coat:**

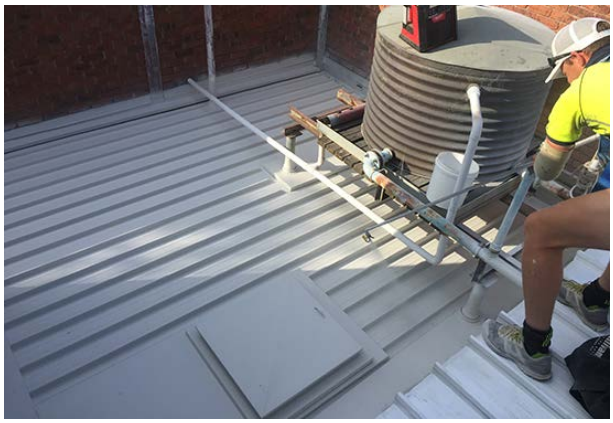
Second coat in shale grey, applied over the white first coat:

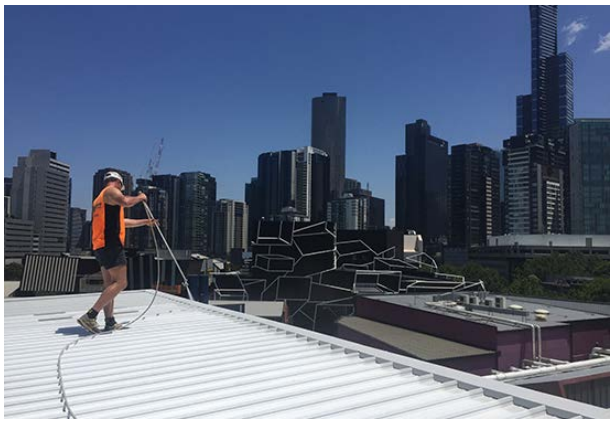
Section 7: **Thermoshield – (stage 2) second coat** continued:

Below (left) you can see the roof being swept free from tree debris that had fallen on the roof in between coats. Below (right) shows shale grey over white first coat:


First coat white (left), second coat shale grey (right):

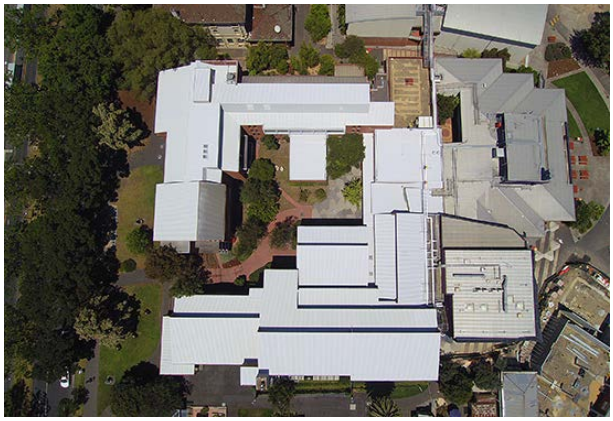
Final passes to complete stage 2 and overall coating:




Section 8: **Thermoshield – completed aerial photos:**








Section 9: **Before and after photos:**








Section 10: **Conclusion:**

The ageing roof has been comprehensively sealed beneath a thick, ceramic thermal barrier.

The coating will greatly reduce surface temperatures, which will eliminate the ability for thermal expansion to potentially cause damage to the roof, therefore potentially compromise the solar PV investment.

The coating will also greatly reduce the building heat load by removing the solar radiation heat ingress from the roof sheeting. This will reduce internal temperatures and lower A/C cooling loads and add overall efficiency.

The Thermoshield coating is a perfect pairing to solar PV panel investment by adding longevity to the roof sheeting as well as increasing electrical output in hotter months by removing radiant heat exposure to the panels.

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

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

Gavin Batty
Managing Director
Mobile: **0417 563 955**
Email: gavin@thermoshield.com.au
Website: thermoshield.com.au