

Case Study – Locamotive Workshops, Australian Technology Park CorruBracket[™] 500T & ProteaBracket[™]



At-A-Glance

Project Name Locomotive Workshops, Australian Technology Park

Location Eveleigh, NSW, Australia

General Contractor Mirvac Construction

Solar Installer Prana Energy

Module Manufacturer Trina Tallmax 445W

Inverter Manufacturer SMA

Roofing Contractor Red 8 Roofing

Primary Roof Profile Colorbond corrugated steel roof

S-5! Distributor No. 1 Roofing & Building Supplies

Industry Commercial

The Situation

This heritage project required an innovative, lightweight solution that would both maximise rooftop real estate and avoid fastening through the structure into the original purlins.

The Result

The S-5! solar mounting solution provided installers with the flexibility to lay the solar panels in landscape position, which in this case maximised the rooftop space.

Project Stats

Each Roof Measured: 3 to 4 meters each; 15 bays Roof Pitch: up to 30 degrees Project Size: 669kW

Products Supplied:

- CorruBracket[™] 500T (847)
- ProteaBracket[™] (45), used for cable tray management on another roof ssection

The S-5-Q[™] Mini clamp is also featured on a separate portion of the Locomotive Workshops roof project, securing solar panels to a Kingspan Kingzip Standing Seam Metal Roof.



The Project

The historic Locomotive Workshops at the new Australian Technology Park in Sydney's Eveleigh date back to 1882 and have since been converted into a mixed-use retail, commercial, educational and recreational precinct. Inspired by a variety of successful precincts around the world including Chelsea Market in London and the Millennial Park in Chicago, the former industrial workshops offer the space, flexibility and enjoyment of large open-plan office facilities. The blacksmith workshop remains active, and on the site's northern boundary runs the railway line.

Architecturally striking inside and out, the formerly open space features a suspended steel mezzanine floor offering unique horizontal and vertical lines of sight complementing the building's generous voids, all further emphasising the character of this fascinating heritage structure.

The building features 15 separate bays of metal roofing with various pitches including one as steep as 30 degrees. The solar install, by Prana Energy, was completed on an existing roof structure comprised of two layers of sheet metal, with a layer of contemporary corrugated sheet metal and polycarbonate added later in the 1990s. Beneath it are the original roof trusses and other associated historic fabric.

The retrofit project sought to improve the thermal and daylight performance while maintaining the heritage look. The original structure of the roof and its interior heritage fabric were preserved including trusses, soffits and historic louvres. In some areas, the contemporary outer sheet metal layer was removed and modern polycarbonate cladding added over the curved lanterns. Numerous purlins were added along with an outer layer of insulation and metal sheeting consistent in colour and profile of the existing roof. Skylight 'slots' were used to provide daylighting.

As part of the project conversion, Prana Energy installed 669kW of solar PV on the retrofitted metal roof. The modules were secured in place using the S-5! **CorruBracket 500T** over corrugated roofing and the **ProteaBracket** on a section of trapezoidal roofing.

How Did the S-5! Products Help?

- Reduced cost for materials, material handling and freight
- Reduced cost for installation by eliminating the assembly and installation required using a double-rail mounting system
- Reduced the added dead load of mounting components
- Minimised the amount of time workers
 must spend in harnesses on a steep roof
- Improved aesthetics with a lower profile system
- All S-5! components are warranted for the life of the system
- With S-5!'s published load testing, the system could easily be engineered

The Challenge

The challenges were many. The project required careful planning and necessitated specific council approval, developer's approval and approval by a designated heritage architect.

Working in harness on a steep roof with various curves and navigating around the large glass atrium in the middle (an 85-degree pitched dome) made for a challenging solar installation.

Traditionally, installers would fasten through the existing screw line and into the purlin structure. On this job, that would have been quite restrictive given the available spacing of purlins. The number and placement of the purlins on the existing roof were inconsistent.

The spacing was so far apart, had they done it traditionally, the number of modules on the roof would have been greatly reduced. Since installers were not able to adhere to the appropriate purlin spacing and the correct clamping zones, and because they could not screw directly into the purlins, they needed an innovative solution.

The logistics of transporting materials up to the roof was also a challenge and required both the use of a crane and an innovative buggy/ladder system engineered to Australian standards, so a lightweight solar mounting solution was desired.

The Solution

The CorruBracket 500T was the only practical solution that made sense to the installer. Custom-engineered for this project and specifically designed for exposed-fixed metal roof profiles, this top-fixed, low-profile metal roof bracket fastens directly into the crest of the corrugation, leaving the drainage plane free of fastening holes.

This S-5! mounting solution enabled the installation of solar panels in landscape orientation, which in this instance maximised the rooftop's real estate. The standard weight for solar panels on a roof in Australia is 15 kilograms per square meter, so the solution was ideal for this heritage project.

Moreover, the S-5! brackets allowed for increased wind uplift resistance and better load distribution because the additional attachment points were engineered to provide maximum wind uplift resistance as each point transfers a small section (tributary area) of the system.

In addition, the ProteaBracket was used for cable tray management on another section of the roof. Attached to the sheeting only, this bracket features a factory-applied, EPDM gasket on the base to ensure quick installation, a weather-proof fit, and accurate and secure placement.



"Without the S-5! products, the project would not have been possible. We would have had to construct a double-rail system with L-feet over purlins and adjustments; then cross rail, to make it work. S-5! made it faster and more practical to complete the job with a workable design and engineered solution specific to the project and without all that fuss. We would recommend S-5! and have had great success doing complex installations that otherwise wouldn't have been practical to install, which has saved us on costs and time."

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-Edward Bennison, Head of Growth & Partnerships, Prana Energy, Australia





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