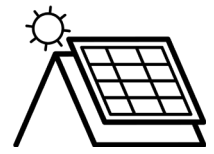




Case Study — Belle Terrace Residence

PVKIT® & ProteaBracket™



At-A-Glance

Project Name

Belle Terrace Residence

Location

Onetangi, New Zealand

Architect

LITE-HOUSE Ltd., Auckland, NZ

General Contractor

JRB Construction Ltd., Auckland, NZ

Solar Installer

Frontier Electrical, Albany, NZ

Module Manufacturer

Canadian Solar

Inverter Manufacturer

Enphase Energy

Roof Profile

Trapezoidal, exposed-fixed metal roof

Industry

Residential



Situation

The residence is located on the edge of a cliff overlooking the sea. Installing solar on a steep roof in high-wind conditions presented many challenges.

Result

The S-5! direct-attach (rail-less) solar PV mounting solution along with the ProteaBracket provided the precise low-profile, aesthetic solution the homeowner desired, making it easier for installers than a traditional rail system.

Project Stats:

- Roof Pitch: 15 degrees
- Project Size: 7kW (21 modules)
- Products Supplied:
 - PVKIT® MidGrab (36)
 - PVKIT® EdgeGrab (12)
 - ProteaBracket™ (52)

The Project

The Belle Terrace Residence is located on the island of Waiheke, the most populated and the second largest island in the Hauraki Gulf of New Zealand. Designed and built on the edge of a cliff overlooking the sea, this 279+ square meter vacation home features floor-to-ceiling windows in every room to allow for stunning views of the Pacific Ocean.

The environmentally-conscious homeowner wished to have a greener approach to his power usage and to offset the energy required to run his home by supplementing with alternative, clean energy sources. In this case, solar was his choice.

The home features a trapezoidal, exposed-fixed metal roof with a 7kW solar array mounted to the ribs of the roof using the S-5! **PVKIT** direct-attach™ solar PV mounting solution and the **ProteaBracket**. The roof was optimal for solar due to its orientation, which receives sun from the morning all the way through to the evening, allowing the homeowner to maximise solar panel efficiency.

The Challenge

The homeowner was concerned about aesthetics. He desired a sleek-looking, low-profile system that would complement the look of his roof and his hi-end, architecturally-designed home.

The location of his home is considered a high-wind area. Installing rooftop solar on the edge of a cliff during high winds was extremely difficult for the solar installers and required an extensive harness system. Installers had to work from the bottom of the PV array upwards, securing the panels in place with the ProteaBracket, so that the bottom row would support the weight of the top row and prevent the panels from sliding down the roof. Therefore, a lightweight solar mounting solution was desired.

Furthermore, the harsh environmental conditions associated with the island's salt air and salt spray, which accelerate corrosion made ensuring the longevity of construction materials a challenge so the homeowner needed a system that could withstand these conditions.

Of course, delivery logistics to the island is always a challenge. Transporting traditional rail would be extremely costly and suffer long delivery times since there is no direct shipping from the United States.

The Solution

Solar installer, Mark O'Shea with Frontier Electrical introduced the S-5! product to the architect who has since specified it on a number of other projects. O'Shea was familiar with the S-5! solar mounting system—the PVKIT along with the ProteaBracket—and knew it would provide the precise low-profile, aesthetic solution the homeowner desired.

The S-5! system also allowed for the maximum number of solar panels due to its ability to screw into the ridges of the roof, instead of the roof purlins, providing a vast number of potential attachment points to choose from and infinite flexible module placement and module density.

Additionally, it enabled the architect to achieve a design engineered to withstand the area's high winds. By directly attaching the PV to the ribs of the roof, it provided for installation efficiency and flexibility, and distributed the load more uniformly into the structure.

On any project by the sea, the installer prefers to use aluminium and stainless steel components to combat corrosion and the effects of salt air. S-5! uses non-corrosive materials made from high-tensile aluminium and A2-70 stainless steel that are salt-fog corrosion tested for metallurgical compatibility in accordance with ASTM B117 standards.

The logistical challenge of delivery to the island was eliminated because the entire solar mounting solution of 16 kg could easily be transported in a single carton along with all tools required for installation. (This is 85% less weight and 90% less volume of rail components.)

How Did the S-5! Products Help?

- Cut mounting material costs in half (compared to rail-mounting), and eliminated all freight costs
- Simplified assembly using only three components
- Reduced installation costs by eliminating the requirement for long, cumbersome rails
- Minimised the amount of time workers must spend in harness
- Improved aesthetics
- All roof penetrations are tested by ASTM E2140—the most rigid static water testing in the construction industry
- Quality-assured by roof-lifetime warranty

Long-Term Outlook

The homeowner was able to achieve a greener, cleaner image for his power usage and offset the energy required to run his home with an aesthetically-pleasing rooftop solar solution.

"We strive to align our brand with the desires of the architects and the designers with whom we work, as we are a known provider of market-leading technologies. We never substitute on quality because we know the products we install will stand the test of time, and the warranties in place will make our customers happy. S-5! is our mounting system of choice. A lot of thought and research has gone into the S-5! product—simple things like how it's designed and put together, the materials used and how it makes the installer's life so much easier. There's really no other system! For us, it is either S-5! or nothing."

—Mark O'Shea, Owner, Frontier Electrical, Albany, New Zealand



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