Strong Enough to *Resist Category 4 Hurricane Winds*

Case Study — Dairy Manufacturing Facility, Kingston, Jamaica

PVKIT® | RibBracket™ II

At-A-Glance

Project Name
Dairy Manufacturing Facility

Location
Kingston, Jamaica

EPC Contractor
Grid Electrical Solutions

Solution
On-Grid Microgrid Hybrid Solution

Solar Modules
Jinko 580 W

Hybrid Inverter
Megarevo

Battery Storage
Jinko

Roof Profile
26-gauge, exposed-fastened trapezoidal metal roof

Industry
Commercial

The Situation
The building owner required a solar mounting solution that could withstand hurricane winds, backed by robust engineering reports and certifications.

The Result
They chose S-5! due to its long-term performance, extensive third-party testing and certifications, including ASTM E-2140 certified watertightness.

Project Stats

Project Size

708.76 kW Solar & 810 kWh Battery Capacity

S-5! Products Used

- **3,021** PVKIT® MidGrab
- **1,157** PVKIT® EdgeGrab
- **4,178** RibBracket™ II
- **326** DynoBond®
- **20** Grounding Lugs
- **2,246** ACC-F90-1 wire clips

The Project

Grid Electrical Solutions (GES), based in Miami, Florida offers tailor-made microgrid solutions that integrate the latest in renewable energy, electrical distribution and co-generation technologies. Serving the hospitality, commercial, industrial, institutional and government sectors, GES was commissioned to develop a microgrid for a state-of-the-art cheese and dairy manufacturing facility in Jamaica.

The project features a 709 kW solar PV system on a metal roof engineered to withstand Category 4 hurricane conditions. The system was designed to provide reliable, sustainable power in a tropical coastal environment known for high winds and heavy rainfall.

Part of the facility's roof had already been outfitted with a conventional rail-based solar mounting system. The remaining solar installation was to be completed using S-5!'s **PVKIT®** DirectAttach™ rail-less solar mounting system paired with **RibBracket™ II**, designed and engineered for the trapezoidal metal roof profiles. For rooftop sections built over a concrete slab, GES used a traditional Unirac rail-based system, ensuring compatibility and structural consistency throughout the installation.

The Challenge

This project presented several challenges. The solar mounting system needed to meet strict engineering and structural standards, including resilience to extreme wind uplift forces typical of Category 4 hurricanes. Equally important was preserving the watertight integrity of the metal roof—any risk of leakage would be unacceptable in Jamaica's tropical, rain-prone climate.

The building owner and consulting engineering team required detailed reporting, including wind load analyses, attachment spacing, and third-party-tested performance data, to ensure full compliance with local and international standards.

Furthermore, the solution had to be efficient, safe and easy to install, while remaining low-maintenance and aesthetically clean to ensure proper solar panel alignment.

The Solution

GES selected S-5! for its strong engineering reputation, its extensive testing and certifications, including Florida Product Approval (FPA) for High Velocity Hurricane Zones (HVHZ)—a key indicator of performance in extreme wind conditions, and robust technical support. Early in the project, S-5! conducted a thorough review of site-specific conditions, including roof geometry, exposure levels, building height and panel thickness.

Based on this analysis, S-5! developed a comprehensive engineering report detailing the specific zones of the roof where additional attachment points were required to resist Category 4 hurricane conditions. It also included wind uplift resistance calculations, wind load zones and attachment spacing tailored to the roof profile, all backed by rigorous laboratory testing.

The S-5! system proved to be an ideal solution. Its rail-less design significantly reduced the number of roof penetrations, helping to preserve watertightness and eliminate the risk of leaks—a critical factor. The streamlined installation process allowed the system to be deployed more quickly and safely than traditional racking systems. To ensure a smooth installation, S-5! deployed two application engineers onsite to provide support and guidance for the installation crew.

S-5!'s components offered high reliability, third-party certifications, and laboratory-tested performance—including 5,000+ individual load tests across a wide range of material types, gauge thicknesses, and manufactured brands. With proven mechanical strength, ASTM E-2140 certified watertightness, and fast, secure installation, the system enabled GES to meet the project's strict structural and environmental demands while significantly reducing installation time.

How Did the S-5! Products Help?

- **Proven resistance to extreme wind events gave the building owner peace of mind—backed by engineering and testing.**
- **Installation time was significantly reduced, allowing the project to be completed ahead of schedule.**
- **S-5! components are compact, 15% the weight and 10% the volume of rails; made of high-strength aluminum; easy to transport and carry to the roof.**
- **Pre-assembly on the ground reduced installation time and minimized the time crews spent working at height—greatly reducing the risk of falls and accidents.**
- **Reduced carbon footprint of the mounting system by 85%.**
- **Maintained the roof's integrity, avoiding leaks and ensuring high wind resistance.**

Long-term Outlook

The system is expected to deliver clean, resilient energy for 30+ years, with S-5!'s engineering and proven strength providing confidence in its long-term performance. Its ASTM E-2140 certified watertightness and Florida-approved hurricane resistance make it ideal for the region's tropical climate.

By providing a durable, low-maintenance solution that streamlined installation, S-5! helped GES achieve the project's sustainability and reliability goals.

"From the outset, S-5!'s technical documentation stood out for its thoroughness, immediately capturing the attention of our design team. Their solutions are specifically engineered to withstand extreme weather conditions, including Category 5 hurricanes often experienced in the Caribbean—an essential requirement for the building owner. This project is a clear example of how the collaboration between specialized engineering and high-quality products enables us to meet the highest standards of safety and performance."

—Santiago Prieto, CEO, Grid Electrical Solutions