prolectric™ SMART CLEAN TECHNOLOGY + Bridges

Case Study

Bridges

We needed a solar power solution we could trust to run continuously, all year round, with no reliance on a grid connection. Prolectric worked closely with our team to engineer a system that met those requirements without compromise.

Their understanding of permanent off-grid solar infrastructure gave us confidence from the outset and the level of detail in the design and sign-off process ensured the system was right before we went to site. The units have performed reliably through the winter period, which was a critical requirement for us and our client.

Prolectric were proactive, technically strong and easy to work with throughout the project and we see real potential for this solution to support future monitoring applications.

Neil Ashwood
Senior Proposals Engineer

Background

In early 2025, Bridges Ltd was appointed by a key client as a delivery partner on a new solar-powered flood monitoring installation programme across multiple water treatment sites.

A core requirement of the scheme was that the monitoring system be powered entirely by 100% renewable energy, removing the need for a permanent grid connection and ensuring resilience in remote and hard-to-access locations.

Within each treatment works are multiple underground chambers housing pipes carrying fresh water supplies. During periods of heavy rainfall, these chambers can fill with flood water, creating a risk of ingress into the clean water network.

To mitigate this, conductivity sensor probes are installed within the chambers to detect rising water levels. When pre-set thresholds are reached, above-ground beacon lights are triggered to provide a clear, immediate alert to site teams so remedial action can be taken.

To meet the operational, environmental and reliability requirements of the scheme, Bridges needed a solar power solution capable of supporting continuous, year-round operation in all conditions.

Challenge

The flood monitoring system was required to operate 24 hours a day, 365 days a year, including during winter months when solar yield is at its lowest.

Bridges was delivering the scheme in a competitive environment and wanted to provide its client with a high-quality, engineered solution that went beyond standard off-the-shelf components. Reliability was non-negotiable: any loss of power could compromise flood detection and site safety.

Key challenges included:

- Designing a fully autonomous solar power system with no grid dependency
- Ensuring consistent performance through winter, poor weather and low light levels
- Creating a solution robust enough to withstand exposed environments and high winds
- Integrating multiple components - sensors, relays and beacons - into a single, dependable system

Recognising Prolectric's expertise in solar-powered infrastructure and permanent off-grid systems, Bridges engaged Prolectric to help turn an initial concept into a manufacturable, deployment-ready solution.

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www.prolectric.co.uk
info@prolectric.co.uk
01275 400 570

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Bespoke Power for Remote Systems

Case Study Bridges

The Solution

Following a joint scoping and design phase, Prolectric took on full responsibility for engineering and manufacturing the solar power element of the flood monitoring system.

The final design was built around:

- A 1.8 m galvanised steel column suitable for permanent installation
- A 200 W solar PV array, optimised for year-round energy capture
- A custom-designed flanged base plate, allowing the column to be securely bolted to a concrete plinth
- A sealed enclosure housing critical components including relay switches and interfaces for the conductivity sensors

Prolectric's engineering team carried out structural and wind-load calculations to ensure the column, brackets and beacon mounts remained secure in exposed conditions. Drawing on experience from designing permanent solar street lighting, the system was engineered to deliver dependable performance during winter and extended periods of low solar generation.

A full system wiring diagram was developed and reviewed with Bridges' technical team prior to sign-off, ensuring complete confidence in the design before production began.

Once approved, three prototype units were manufactured and delivered, supported by a detailed installation guide for Bridges' site teams. This ensured straightforward on-site assembly and safe, correct connection between the solar unit, enclosure and chamber-mounted sensors.

The Outcome

The ProSense solar-powered flood monitoring units have operated reliably throughout the winter months, maintaining continuous performance during periods of lowest solar yield.

By removing the need for a grid connection, the solution:

- Eliminates reliance on external power infrastructure
- Reduces carbon impact by operating solely on renewable energy
- Improves resilience by avoiding downtime associated with grid outages
- Supports the key clients sustainability objectives while maintaining operational safety

The project demonstrates how engineered, site-specific solar power solutions can enable critical monitoring infrastructure in locations where traditional power sources are impractical or undesirable.

Why ProSense?

- Purpose-built solar power for critical remote monitoring systems
- 100% renewable, grid-free operation
- Engineered for reliable, 24/7 performance year-round
- Designed to perform in winter and low solar conditions
- Robust, permanent solution for exposed and remote environments
- Ideal for flood monitoring, environmental sensors, utilities and infrastructure applications

ProSense enables organisations to deploy critical systems with confidence – without compromising on resilience, sustainability or long-term performance.

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