How we Supported Balfour Beatty with On-Site Environmental Monitoring

In assistance of The Canvey Island Southern Shoreline Revetment Scheme we provided Balfour Beatty with a means to monitor and evidence levels of noise, dust, wind and vibrations on-site to validate their commitment to causing minimal disruption to nearby residents and businesses.

Test and monitored 3.2km of shoreline

26,280 hours of continuous monitoring

Measuring for noise, dust, wind and vibrations on-site

Equipping people to transform places, spaces and lives.

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The Canvey Island Southern Shoreline Revetment Scheme was commissioned by the Environment Agency to better protect 3.2km of the shoreline along the eastern esplanade at Canvey Island.

This project is a milestone for the overarching plans of Thames Estuary Asset Management 2100 (TEAM2100) to improve and protect miles of embankments and revetments along the Thames Estuary. The current shoreline protection had been slowly failing for many years and was in desperate need of upgrade to the existing defence system.

Challenges

The £60 million revetment project commenced works in January 2023 and is set to complete in 2025, with a considerable amount to be completed within that 2-year project lifespan. These works carry heightened risk due to the possible impact to residents and businesses that are in close proximity to the site, and so Balfour Beatty set out to achieve minimal impact by monitoring for noise, dust, wind and vibration levels 24x7x365.

If the levels of any of these are measured as being too high beyond recommended guidance, it could result in different working methods being introduced or site works pausing entirely. This would not only increase costs for Balfour Beatty, but it could also threaten the wider project delivery timelines, so an efficient and reliable monitoring capability was required to measure all areas of the site and ensure safe thresholds were not exceeded.

Products & Services provided:

Casella Guardian 2 Site Boundary Monitor

Industry-leading 'all in one' environmental monitor

- Class 1 noise monitor
- PM10, PM2.5, PM1 dust particulate monitor
- Tri-axis vibration geophone
- Ultrasonic wind speed & direction sensor

iMetos Environmental Monitoring Station

Solar powered weather & environmental monitoring system

- Rainfall
- Wind speed/direction
- Solar radiation (daylight)
- Air temperature & humidity

SigiCom Infra C22

Wireless tri-axial vibration monitor

- Built-in geophone
- 4G connectivity
- Online, remote access software
- 4 months battery life

"This has been one of the best projects to engage with in my time, from being on-site way back in summer 2022, before the first spade hit the ground to seeing it evolve through each phase has been excellent to see. It has been great to be able to provide a full set of different and more importantly 'appropriate' monitoring equipment to site throughout this project. Being able to support site on important engagement touchpoints with local stakeholders allowing them to continue to be considerate contractors while they carry out this important coastal upgrade."

Connor McLeod

National Business Development Manager, Sunbelt Rentals

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Solution

As part of a wider provision of Sunbelt Rentals equipment to site, the Test and Monitoring team deployed a robust environmental monitoring package that would remotely gather data and provide automated alerts for noise, dust, wind and vibration. The monitoring package consists of:

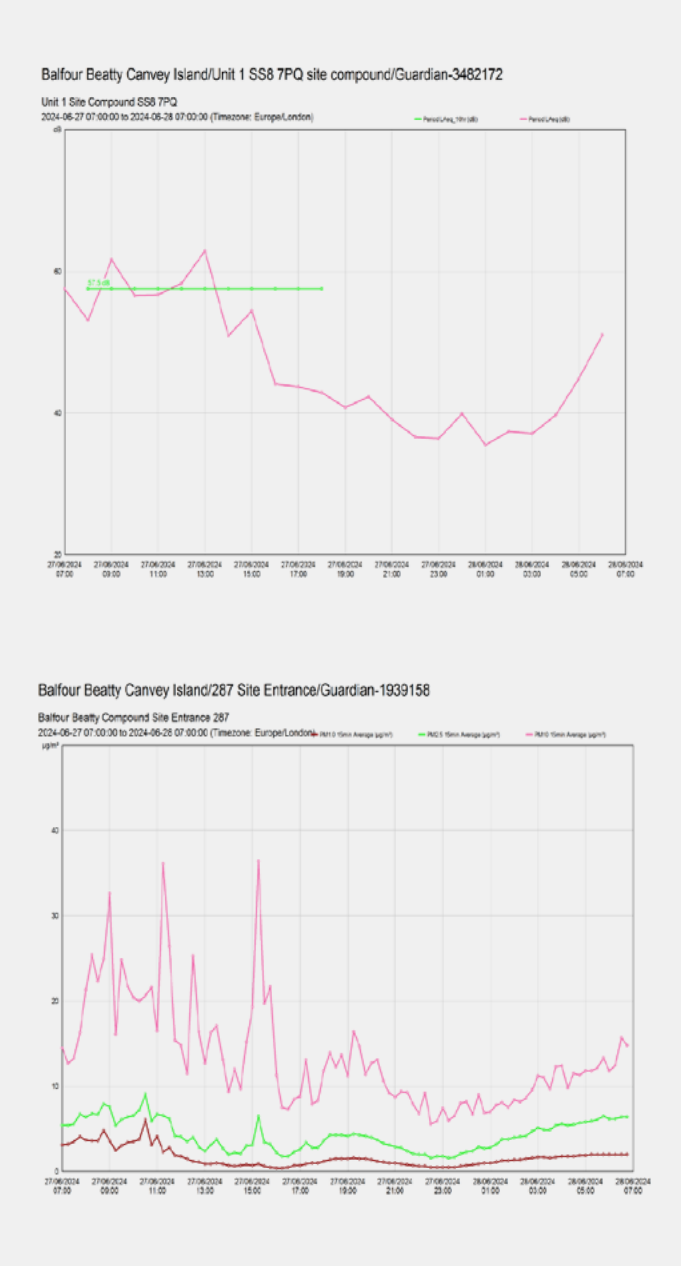
- The industry leading and solar powered Casella Guardian unit, situated at the site boundary of the main compound and each end of the current works, monitoring for noise, dust, wind and vibrations
- The solar powered iMetos Environmental Monitoring Station, erected at compound 1 measuring for rainfall, wind speed and direction, daylight levels, as well as air temperature and humidity
- The wireless tri-axial SigiCom Infra C22, located at a nearby café assessing the vibrations caused by activities like drilling or blasting

Each of these units are static yet mobile when necessary, meaning as site works develop and naturally move around, the units can move in tandem and continue to accurately measure impact. All of the data recorded from these units is automatically fed into an online portal where it is compiled into reports and sent out on an interval basis, or even upon a threshold breach, meaning on-site workers can be alerted if levels are recorded as too high and intervene immediately.

Result

By incorporating environmental monitoring as a capability on their site, Balfour Beatty have been able to successfully record and report upon their impact to their surroundings, adapt their working practices where necessary, and have the ability to immediately cease operations if safe regulatory thresholds were to be surpassed at any point.

Equipping Balfour Beatty with the relevant site data has validated their commitment to minimal impact which has been crucial in upholding the continuity of the project, but more importantly it ensures they are able to carry out vital restoration works without nearby residents and businesses needing to suffer as a result of excessive levels of noise, dust, wind or vibrations.



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"The equipment provided by the Sunbelt Rentals: Test & Monitoring Business Unit has successfully allowed the project team to track and monitor a number of different factors during the course of the project from hazardous weather conditions to excessive noise levels. The T&M team have been vital in successful mobilisation of the kit throughout sensitive locations on the project where concerns have been raised.

We recommend that the Guardian unit would be very useful to install on location to key projects where there may be fears around the impact of the working methodology on the surrounding environment e.g. dust creation, noise and vibration. The unit is also useful to understand the safety implications for the workforce and their exposure risk not just that of the public."

Lee Stamford
Works Manager (Team2100)

"By utilising the Solar Powered Casella Guardian 2 monitor from Sunbelt Rentals specialist Test & Monitoring Division, the Balfour Beatty Team2100 project at Canvey Island can proactively engage with local residents regarding accurate levels of site Noise, Dust & Vibration to ensure they continue to be a considerate contractor and section 61 compliant whilst carrying out much needed coastal defence upgrades at Canvey Island's Eastern Esplanade.

The need for this type of monitoring is important to drive positive discussion between the project team and the local residents in the busy seaside town, who are situated very close to site boundaries.

The innovative features of the Casella Guardian allow automatic reports to be sent daily, weekly or monthly with data, direct to your inbox or by text, users can configure warning alerts for a combination of factors such as Noise/Dust/Vibration levels and get limit breach notifications by text or email including error alerts, e.g. for power loss due to insufficient sunlight etc. This allows site to take action before a problem occurs ensuring there is no loss in data meaning local engagement with residents and information sharing is not affected."

Colin Hudson
Senior Works Manager, Balfour Beatty