CASE STUDY: Scottish Water Horizons – The ‘Difgen Programme’

The Project

Scottish Water Horizons sought to capture the commercial opportunities provided by many of its assets (e.g. treatment works, reservoirs and water and wastewater pipes) and utilise them for power generation through the installation of Zeropex Difgen turbines.

The turbine is installed within the distribution network and generates power from a pressure differential, usually a site presently occupied by Pressure Reducing Valves. The technology was first introduced at Denny, near Falkirk, Scotland, where a 100kW twin Difgen turbine unit was installed on an existing 500 diameter potable water distribution main.

Following the completion of this initial project, the design and construction team was invited to discuss how the technology could be delivered as a rolling programme across other assets, along with the potential efficiencies and savings.

This led to the development of the ‘Difgen Programme’ which includes a standardised design to allow for the fabrication of an entire power house, complete with generation equipment, within a controlled environment. This allows for testing and certification to be completed prior to delivery to the site.

A key element of the programme was the ability to deliver pre-assembled buildings to the site, minimising the potential for inefficient site-work, disruptions and the risk of weather delays.
The Benefits

- **Reduced carbon** – Optimised delivery and reduced waste and delay have resulted in lower project carbon footprints, maximising the green energy contribution and reducing investment costs.
- **Labour and procurement** – as each structure is essentially similar, procurement is optimised over five or six units at a time, with skilled labour more effectively utilised across the series of structures in fabrication.
- **Delivery on time** – reduced risk of delays due to site conditions, availability of labour and plant, and adverse weather conditions by ensuring that the bulk of construction takes place offsite.
- **Project confidence** – increased delivery confidence for Scottish Water Horizons, resulting in an early switch on date and production of electrical energy for export.
- **Efficiency** – Data shows that switching from a single bespoke unit, such as that at Denny, to a programme-based delivery has reduced the cost by around 12%. This is in part due to the 30% reduction in the duration of on-site work.
- **Cost** – Factory delivery allows the units to be cost effectively delivered throughout the year, overcoming inefficiencies of site work caused by winter weather.

Key Learning Points

By taking a longer term view of the opportunity available, the investment can realise significant savings over the course of the programme.

This requires commitment from all parties and a fixed long term view on all aspects. Without this, short term issues can cloud the overall aim.

End User Feedback

The programme delivery is currently in fabrication with delivery on site due in early 2013. The baseline project scheme (Denny) is now delivered and awaiting commissioning.

Learn more

[www.jnbentley-lintonfalls.co.uk/denny-scotland](http://www.jnbentley-lintonfalls.co.uk/denny-scotland)

The Process

The key processes that have contributed to the delivery of the programme and its expected savings include:

- Visibility and security of future work, which encourages investment for setting up fabrication facilities.
- Collaborative working to allow designs to be modified to suit prefabrication optimisation.
- Clear definitions to allow multiple partners to contribute without overlap or commercial conflict.

For more information on
The Green Construction Board
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