ADEILADU ARBENIGRWYDD YNG NGHYMRU
CONSTRUCTING EXCELLENCE IN WALES

Awards
2013 Case Study

Award Winner

Innovation

Dawnus Construction Limited

Using innovation to add value to clients' businesses is a cornerstone of Dawnus Construction's manifesto. But recognising the potential of waste energy and using it to create the largest carbon negative development in Wales demonstrated innovation at its absolute best.

When Tata Steel was faced with creating a new site entrance due to the construction of the Port Talbot peripheral distributor road, the decision was taken to refresh the site's image with the construction of three visually striking buildings – a stores facility, visitor centre and training centre.

Dawnus Construction won the scheme with a competitive tender in 2011 accompanied by an innovative design proposal. The design and build contract that ensured its team would be able to take the project all the way from concept to handover.

Operations manager Matthew Morgan said: "We were involved in the project from the very early stages, pre-planning, so there was the opportunity for different disciplines to work together and come up with innovative solutions right from the start. We all had the mind-set that enabled that to happen.

"The client set out their expectations and end goals – in which they stated their BREEAM aspirations - but indicated that they were committed to taking a fresh approach to making a visual and sustainable impact."

The design team, comprising of Powell Dobson (architects), Jacobs (structural engineer) and McCann & Partners (building services), worked closely with the contractor, client and other stakeholders to develop their concepts into energy-efficient buildings. The designs were to prioritise the reduction of whole-life costs, incorporating sustainable technologies, whilst acting as a showcase for Tata's brand and identity.

Early in the process, the team realised that the key to making this an outstanding development was right on their doorstep. Waste heat and energy is generated by the adjacent steelmaking plant: developing the means of harnessing it to provide the electricity needed by the stores building was a major innovation of the project.

"The client set out their expectations and end goals – in which they stated their BREEAM aspirations - but indicated that they were committed to taking a fresh approach to making a visual and sustainable impact."

Matthew Morgan

Operations manager Dawnus Construction Limited

It was done by routing excess steam from the water-cooling process within the blast furnace to the development, and converting it into low pressure hot water (LPHW) to provide hot water to the stores and training centre. Power is generated by converting flared gas from the basic oxygen steelmaking (BOS) plant into electricity. This will generate 10MW extra capacity to be fed into the electrical grid.

The completed building boasts a -0.6 CO2 emission rate. It achieved the desired BREEAM Outstanding rating, was awarded an A+ energy rating certificate and has won several awards including CIBSE South Wales Sustainable Project of the Year 2012, and now the CEW Award for Innovation 2013.

Other sustainability features include the extensive use of materials rated A+ or A by the Green Guide, selected with durability in mind to ensure low maintenance costs. Measures such as the use of recycled Tata steel products, among them aggregates from a crushing and processing facility on site, helped divert all site waste from landfill.

The end result supports Tata's aim to demonstrate that steelmaking can be a sustainable process and allowed the steelmaker to move closer to its CO2 reduction targets.

Other impressive elements to this build were the robust processes that enabled the team to obtain planning consent against tight deadlines within the statutory minimum time for approval. Remaining on budget and on time were critical, so a degree of standardisation was applied across the three buildings, such as cladding systems, glazing, flooring and colour schemes, which led to improved certainty on costs and a simplified procurement process.

Social considerations were also high on the agenda both during the build and for the future of community relations with the plant. Suppliers and labour were sourced from within a 30-mile radius wherever possible. The training centre is being used to teach young apprentices skills for the future and was designed and located to be available for community use, without compromising site security. The development has improved the immediate environment for nearby households, with new green areas and planting around the site entrance where there were previously industrial railway sidings.

But ultimately, it is the harmonisation of the development with the local environment to provide a source of free and renewable water and electricity that is the stand-out innovation of the scheme, with the prospect of providing power to properties beyond the site boundaries an exciting possibility.

Dawnus Construction's Matthew Morgan said: "The Welsh Assembly's requirement for public buildings to be zero carbon in the foreseeable future is driving innovation in the building industry. As part of that, harnessing waste energy should now be championed and shared across the industry regardless of whether we are working in the public or private sectors."