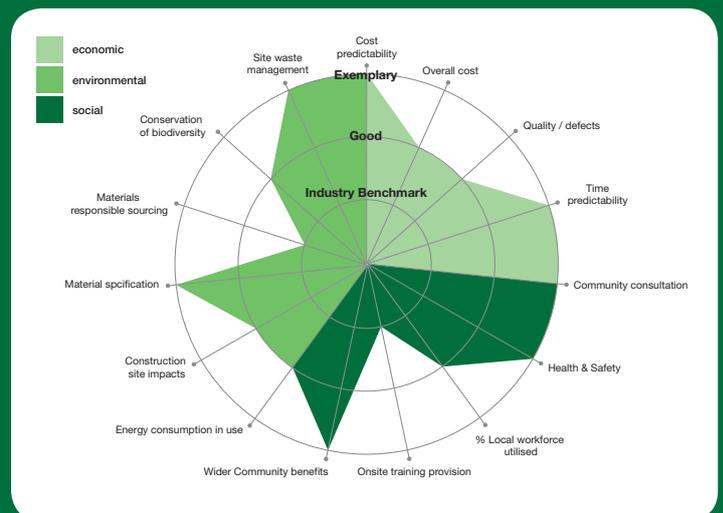


Wrexham Industrial Estate Access Road



project details

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| client: | Wrexham County Borough Council |
| design engineer: | Wrexham CBC/Ramboll |
| contractor: | Birse Civils Ltd |
| value: | £18 million |
| project size: | 4.4 km highway - 2 major structures |
| procurement strategy: | Single Stage Price: Quality |
| contract strategy: | NEC3 Design and Build Target Cost |



The Wrexham Industrial Estate Access Road is a Welsh Government funded highway scheme providing improved access to one of the largest industrial estates in Europe. The scheme involved the construction of 4.4km of new highway with two reinforced concrete overbridges and a number of culverts. It also dealt with a high concentration of existing services that required diverting.

The project demonstrated how strong client leadership combined with an integrated delivery team working together from the early stages of a project has developed a positive “can do” team culture underpinned by a very open approach to communication. This led to the delivery of a high quality piece of infrastructure to a tight timescale and budget whilst gaining positive community support and minimising environmental impacts.

The proactive, flexible and holistic approach of the team to risk management and the changes required to respond to risks as they arose was particularly noteworthy. This has ensured that the project has been delivered ahead of time and within the agreed budgetary constraints established by the client. Throughout the process the team have maintained a clear focus on the aspirations of the end user.

Minimal impacts were experienced locally by the public and the environment with new initiatives being introduced covering waste, biodiversity and site safety.

This case study exemplifies some of the successful economic, social and environmental outcomes.



what is an Exemplar project?

An Exemplar is defined as 'something worthy of being copied'. The purpose of the Exemplar programme is to identify what actions have taken place at key stages of a project that has led to a successful outcome, so that this learning can be adopted on other projects. The Exemplar programme has been developed to help identify the reasons why certain projects are successful in a standardised, quantifiable way, and to share with the industry what enabled these successes. An Exemplar considers all aspects of sustainability, including economic, social and environmental factors. Projects must demonstrate that they have been innovative in one or more of these aspects in a way that exceeds normal industry practices, while achieving at least minimum standards in all other areas of the project. This is to demonstrate that the scheme is well rounded and has not sacrificed one aspect to be successful in another, while also incorporating best practice measures that can advance the state of the industry. An Exemplar project therefore reflects the ideal industry goal of achieving a scheme's primary aims in a sustainable way, at acceptable costs.

what will make the project successful

- The collaborative attitude of all team members and the approach to problem solving (problems shared and solved by all) was cited as a key component in the success of the scheme and the reason for being able to deliver on time and within the overall budget
- The client was extremely proactive and brought a lot of good experience and guidance regarding what may or may not work on the scheme, as well as engaging early with Planners, the Environment Agency etc. to ensure they were all adequately informed and key parameters were understood by all parties prior to the commencement of works
- A strong emphasis was placed on the environmental aspects of the scheme e.g. efforts to reintroduce biodiversity to the area, to leave a lasting legacy beyond simply the new infrastructure
- Close liaison with the public, to ensure a smooth build process and that the needs of users and neighbours were considered throughout

notable achievements

- Despite the economic downturn forcing up the cost of raw materials, the contractor sought initiatives to minimise cost rises and helped achieve savings of £5Million on the scheme overall, while finishing 3 weeks ahead of schedule
- All site personnel were encouraged to take pride in the quality of workmanship on the scheme, which helped to ensure high quality delivery on the project
- A CEEQUAL Excellent rating was achieved for the scheme
- The scheme incorporated and remediated additional surrounding land as part of the project with the view to encouraging improved biodiversity in the area
- No construction waste arose from site during the project
- The team's open and proactive communication with stakeholders helped smooth the delivery process and limit disruption and inconvenience to the general public and local businesses
- Implementation of new initiatives and communication mechanisms helped to ensure a 'safe site'

economic considerations

Despite the economic downturn forcing up the cost of raw materials (diesel, steel, bitumen), the contractor sought initiatives to minimise cost rises and helped achieve savings of £5million on the scheme overall, while finishing 3 weeks ahead of schedule.

The economic downturn in the UK began to take effect just as the project was due to commence, forcing up the price of key commodities such as diesel, steel and bitumen and causing sub-contractor package costs to increase. From the outset the contractor was very open with the client and informed them, with as much notice as possible, when costs were likely to change to negotiate possible amendments. (The contract included a 50/50 pain/gain arrangement, whereby the contractor and client would share any cost increases or savings achieved.) The client was understanding of the circumstances and so was prepared to work with the contractor to identify appropriate solutions. This reinforced the team approach.

The design team also worked continuously to seek cost-saving options and innovative approaches that would help reduce overall costs. In particular:

- Re-designed the pavement to reduce the bitumen content
- Increased the use of cement stabilised site-won materials in place of bitumen-based sub layers
- Reinforced earth was used instead of pre-cast abutments

The contractor also identified that they could take on additional elements of non-specialist preparatory works for the Statutory Utility services. This allowed better planning of such works within the programme, saved money and time since the contractor already had the necessary equipment on site and subsequently reduced the impact of this project risk. The contractor still liaised very closely with the Statutory Utilities via weekly meetings and had dedicated Utilities coordinators to ensure the interface between each of their work elements ran smoothly. Overall, this saved the project significant costs and actually reduced the work programme by 3 weeks.

Although unforeseen issues arose which increased the contract cost by £4.6m, the team's continual drive to help seek savings elsewhere through value engineering helped bring significant cost benefits to the scheme overall.

The key areas where this occurred are:

- Savings against statutory undertakers costs – £500k
- Works for a new access for Welsh Water – £250k
- Construction of a new noise fence – £100k
- New mitigation works – £300k
- Additional modifications to highway junction – £120k

The close working relationship between the client and the project team led to an open approach and shared problem solving, allowing the best solutions for the scheme as a whole to be found. This cultural shift represented a key learning point from this case study.

Wrexham County Council's Approval Authorities were closely involved with the scheme, were empowered to make necessary key decisions and were focussed on turning things around quickly, meaning that when meetings were held to determine solutions and seek approvals, issues were resolved quickly so site activities could continue without delay. This was essential in maintaining the project on programme.

All site personnel were encouraged to take pride in the quality of workmanship on the scheme, which helped to ensure high quality delivery on the project.

Birse introduced the 'Take PRIDE' initiative across the scheme, where everyone on site was encouraged to report any issues they felt could cause problems or impact on the quality of the delivery. There was a 'no blame' culture - instead all members of the project team and supply chain would work together to find the best solution. The relationships within the team obviously help drive the success of such initiatives, which essentially involved keeping an open mind and focussing on solutions rather than blaming others was seen as key for such an approach to work. By the time of Substantial Completion on the scheme, there were no outstanding defects and end user satisfaction levels remained high.

In addition, the use of GPS technology helped ensure accuracy when setting out the works and helped eliminate errors and the need for re-working to meet the proposed alignment. Those trained to use the technology really bought into it found it to be a very useful tool for both speed and accuracy, stating that they would prefer to use the GPS technology than do the works using 'traditional techniques' in future. This technology also helped contribute to a safe site by reducing the number of operatives having to interface with heavy plant.

environmental considerations

A CEEQUAL Excellent rating was achieved for the scheme.

The scheme was registered with the Civil Engineering Environmental Quality Assessment and Award (CEEQUAL) scheme and achieved an 'Excellent' rating. Having personnel within the project team that were qualified CEEQUAL assessors helped to ensure that the various credit-scoring aspects of the CEEQUAL assessment could be built into the design and the day-to-day considerations for the project.

The scheme incorporated and remediated additional surrounding land as part of the project with the view to encouraging improved biodiversity in the area.

Ecological assessments and surveys had been carried out for a number of years for the site, as the road project had been anticipated for a long time. A good relationship was built with the Countryside Council for Wales (CCW), who effectively set the requirements for the site with regard to the environmental impacts. As part of the compromise for the road building activities, the Council agreed to take on 5 hectares of land around the site that would not be used for farming or other activities, in order to protect and support biodiversity in the area.

As part of the works, newt fencing was introduced at the appropriate time during the year to stop newts entering the site. The fences were then regularly inspected throughout the development. New habitats have been introduced around the site to try to re-introduce species such as newts and badgers back to the area. Additionally, local ponds were cleared of silt and over-shading obstacles removed to help provide suitable environments for increased biodiversity. The client will also establish and maintain a contract with an independent company for 5 years after completion to carry out an ongoing assessment of the site and the new amenities to gauge the success of the initiatives that have been implemented.

No construction waste arose from site during the project

Thanks to the extensive consideration for balancing the earthworks that was given during the design stage of the scheme and the use of cement stabilisation techniques for site-won materials, there were no site waste arisings requiring removal or disposal during the project. In addition, all waste from the site offices was sent to a local recycling facility for processing.

social considerations

The team's open and proactive communication with stakeholders helped smooth the delivery process and limit disruption and inconvenience to the general public and local businesses

The Public Liaison Officer engaged with the public and the Wrexham Industrial Estate Forum (users of the industrial estate) continuously throughout the project. Meetings were held with the Forum group every 2-3 months to inform them of the latest activities and how the works could affect them over the coming period. This was gratefully received and comments were made on completion of the works about how the project had brought very little disruption to their businesses. Overall there were approximately 6 billion vehicle movements through the works and no complaints received from the Industrial Estate users.

The Council proactively engaged with the local press, inviting them out onto site to explain what was happening next on the scheme and how traffic may be affected. They would then run articles in the local paper to inform people of upcoming activities and features of the development.

The public were encouraged to provide feedback to the project team via regularly issued newsletters and consultations, as it is far easier to potentially take actions and make changes during the works rather than going back when things are already complete. If anyone raised issues, these were taken on board and the team jointly developed solutions.

Implementation of new initiatives and communication mechanisms helped to ensure a 'safe site'

In addition to the text service that was put in place to allow site personnel to report health and safety observations and to inform about toolbox talks and safety training that were taking place on site, other initiatives were instigated that helped contribute to improved site safety:

- A special lifting device for moving pre-cast manhole units - a 'spider lifter' on an excavator - made them easier and safer to move around
- Using lockable manhole covers to prevent them being left open and potentially leading to falls. The bespoke covers could not be used for anything else, so they would not be taken for other uses.
- A contractor initiative to identify key, common safety issues around sites (via workshops with site foremen) and standard methods for dealing with them, presented as a laminated, flip page pocket guide to all site foremen and engineers.