



demonstration project



A58 Blackbrook Diversion

A58 Blackbrook Diversion – St. Helens More than a road

Client:	St. Helens Council
Contractor:	Birse Civils
Case Study Ref:	294
Project Number:	2844
Publication Date:	October 2007
Region:	North West
Sector:	Local Government, Infrastructure
Contract value:	£6.3m
Project timescales:	June 2003 to February 2007
Themes:	Integrated teams, sustainability, waste

The A58 diversion scheme at Black Brook near St. Helens is a single-carriageway bypass involving 1.6km of new road and a new roundabout. The road runs close to Clipsley Brook, passing over Black Brook which has been diverted through a new culvert.

The bypass runs through one of the most environmentally important areas in St. Helens, with a local nature reserve, Stanley Bank Site of Special Scientific Interest (SSSI) and Semi-Natural Ancient Woodland sitting alongside industrial remnants such as an iron-slitting mill.

The approved Stanley Bank Environmental Planning Framework provides a coherent masterplan for environmental enhancement of the area and knits the Blackbrook Diversion improvements into the wider area.

Delivering environmental and community benefits

The scheme design included:

- Providing mitigation for sensitive habitats and species impacted by the scheme
- Creating additional areas of nature conservation value
- Providing ecological linkages to areas of nature conservation
- Integrating the landscape and ecological principles outlined within the Stanley Bank Environmental Planning Framework
- Provision of a Sustainable Urban Drainage System, incorporating new ponds, wetlands, etc., which have greatly alleviated flooding risk
- Landscaped bunds and acoustic fencing.

The bypass will:

- Significantly reduce traffic on West End Road, improving the environment and safety
- Improve access to St. Helens for commercial traffic, assisting the economic regeneration of the town

- Provide for a wide range of environmental improvements in the Stanley Bank area
- Allow landscaping for the new road, sympathetic to the character of the area, enriching the wildlife habitat of formerly intensively farmed land
- Allow the creation of wetlands and grassland, benefiting water voles and dragonflies, whilst woodland and scrub planting will provide nesting space for a variety of birdlife
- Improve access to Stanley Bank area by provision of new recreational footpaths.

The forefront of environmental sustainability

The approach taken by the team delivering the project has been to ensure environmental sustainability is embedded into the centre of the project rather than being considered a statutory bolt-on. This approach has not been taken in isolation by the core project team; the constructor team has included the expertise of the Environment Agency, local stakeholder groups and regional advisory groups such as Remade North West, Envirolink North West, English Nature and the Liverpool Environmental Forum. This approach has meant the project team can draw on the local and technical knowledge of a wide range of individuals and organisations and ensure ideas and opportunities are built into the wider project as a whole.

Management Processes

New management processes have been developed to ensure environmental issues are considered and championed throughout the life of the project.

Such processes include specific sustainability workshops and management systems designed to deliver not only statutory requirements, but something considered as a real exemplar project. This has meant the adoption of environmental best practice in design and construction processes, addressing issues such as wildlife, habitat, waste and pollution.

The Project Team

The project team have looked to attain the highest standards in externally audited performance.

Through the Civil Engineering Environmental Quality Assessment (CEEQUAL) the team committed itself to a rigorous externally audited process.

The project did not just focus on environmental sustainability – social sustainability was also high on the agenda.

The use of local labour on the project was important to St. Helens and they were also keen to consult with local residents at every opportunity.

Key Practice and Policy Drivers

Environmental justification for the scheme

A bypass for the A58 through Black Brook was first proposed by Lancashire County Council over 40 years ago. When the Highway Authority role for the area passed to Merseyside County Council, the alternative routes were considered further and, following public consultation, the preferred route was identified in the Haydock Local Plan 1984. The route chosen through Black Brook offered St. Helens Council the opportunity to maximise the potential enhancement of the area.

The Blackbrook Diversion scheme has always been justified on environmental grounds but, over the years, has failed to be considered as a central government priority. However, in the Local Transport Plan Annual Progress Report of August 2001, the proposed bypass was included as an 'Emerging Major Scheme'. St. Helens Council initiated a full review of the scheme and its justification in the light of local and national transport and planning policies.

A new Environmental Statement was commissioned, a detailed Traffic Appraisal Report was prepared and a full public consultation exercise was carried out. The results of the consultation were taken on board and a planning application was submitted, resulting in planning consent being granted in June 2003.

Sustainability in planning, procurement and design

A detailed Environmental Impact Assessment was conducted by St. Helens Council. After extensive planning consultation it was considered very important that the scheme should take into consideration the natural habitat and environment of the existing area and, where possible, enhance and expand on this to ensure the people of St. Helens could enjoy nature and open green space.

St. Helens wished for an environmentally friendly project – one that respected local landscape character and complimented the nearby SSSI and nature reserve. The project was implemented through the early engagement of organisations such as the Environment Agency to form a multi-disciplined advisory group. This was enhanced through the use of Early Contractor Involvement when St. Helens Council appointed the main contractor, Birse Civils Limited and their design consultants, Gifford Limited.

This partnership approach enabled St. Helens Council to develop a strong commitment to their own policy throughout the design and to their delivery team, backed by Council Members' support of the project. From the outset of the project the client was determined they wanted to achieve "something special" in terms of environmental sustainability.

The procurement process was central to identifying the right contractor

A quality/price approach to procurement was adopted to ensure this happened. Once Birse Civils were appointed, the assembly of key members of the supply chain was arranged in the same way. Key sub-contractors were selected on quality and price, with the client involved in the interviewing process. This meant the partnering ethos, driven by the client, was supported by the contractor throughout the supply chain.

Involvement with a number of regional advisory and stakeholder groups

As mentioned previously, the Environment Agency were involved at the earliest stage to ensure their ideas and concerns were built into the project, driving benefit in the same way as Early Contractor Involvement does in terms of project build. Rather than trying to "fix" environmental issues down the line, the issues were discussed and embedded at the earliest stage of the project.

The Stanley Bank Biodiversity Working Group was set up to guide the wider Stanley Bank Project and extensive liaison was conducted throughout the design and construction of the bypass. The partnership of this group comprises: Environment Agency, English Nature (now Natural England) Merseyside Environmental Advisory Service and St. Helens Council (Planning and Rangers).

Local labour and supply chain

The issue of local labour and supply chain was targeted from the outset and the project team worked closely with Construction for Merseyside.

Construction for Merseyside is an organisation made up of private sector developers and public agencies to assist Merseyside's construction industry in becoming more competitive, by investing in the skills it needs and maximising employment opportunities for local people. The project team worked with Construction for Merseyside to source local labour and Birse and St. Helens ensured there was continuity of work for these people on site.



Extensive stakeholder engagement

There were a number of key wildlife populations within the site that had to be considered:

- Prior to commencement, a survey undertaken by the project team identified a population of water voles near to the construction footprint. There was a requirement to move the water voles from the site until a later date (work was undertaken by a trained ecologist). Their habitat was improved through the application of the SUDS.
- An Environmental Impact Assessment undertaken, identified the presence of bats roosting at the site as well as a number of environmental features which supported this population. During construction, a survey was undertaken by a bat ecologist of all habitat features which could have been impacted. The long-term wellbeing of the population was supported through habitat connectivity, sensitive use of street lighting and numerous bat boxes installed around the site.
- The local area was identified as an important area for wintering birds and therefore timing of works such as scrub clearance were sensitively timed to avoid the bird nesting season. In addition, it was hoped habitat created during the construction phase would lead to an increase in populations.

“Further good practice on site included two drainage ponds created and landscaped with three overflow areas created for sustainable drainage with reed bed and wet grassland.”

Blue Butterfly Biodiversity Audit
Score 95%

Specialist subcontractors to manage invasive weeds

A number of invasive weeds, such as Japanese Knotweed and Himalayan Balsam, were identified during the Environmental Impact Assessment. These were considered detrimental to the indigenous flora and affect the integrity of the actual road therefore they needed to be controlled. A specialist sub-contractor used a combination of excavation and spraying to remove the weeds using a ‘Knotweed Eradication Strategy’ that followed the Environment Agency’s Code of Practice. No materials were taken off-site; instead the materials were relocated on-site for treatment. This material would be developed into a feature for the St. Helens Gateway on completion of the treatment regime. A protocol was developed by Birse which was later adopted company-wide for treatment and management of invasive weeds.

The long-term management of the habitat of the project was also taken on board by the project team at an early stage, with St. Helens’ maintenance division being involved at an early stage to ensure that known maintenance issues could be avoided and future maintenance kept at a minimum.

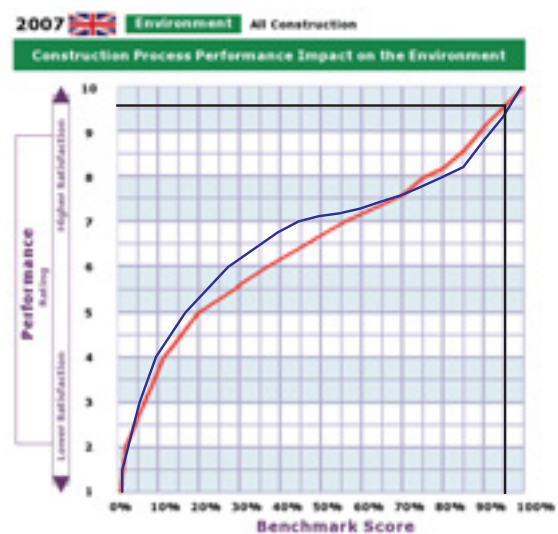
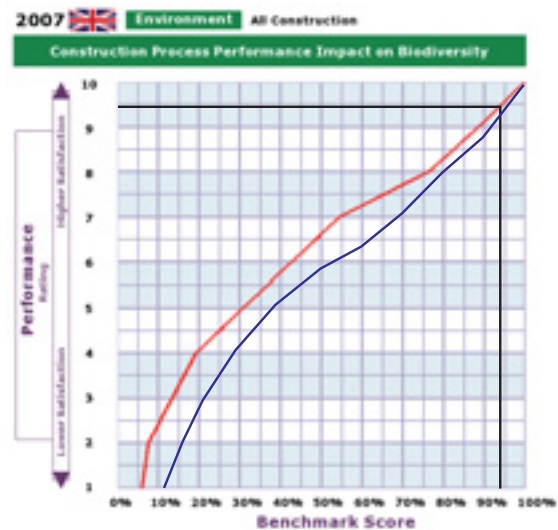
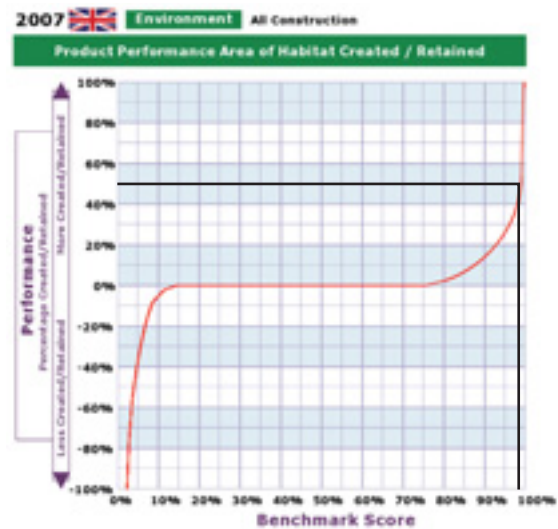
Issues of energy efficiency were also considered important for the project

The project addressed this in a number of ways, including looking at the introduction of renewables and energy efficiency for the lighting on the site.

The Mayflower Intelligent Management System (MIMS) was implemented to control the lighting. This introduced a number of features to allow for more specific control of the lighting systems on the project:

- Lux capacity can be adjusted to suit the requirements of the user. This means lighting can be dimmed late at night when traffic is minimal, saving energy and reducing light pollution

- MIMS can predict bulb failure, which is important as failing bulbs use more energy
- Energy consumption can be measured and allows savings to be made over traditional billing methods
- The use of down-lighting along the road reduces disruption to the local bat roosts.



— Construction process
— Product

Processes and Management Systems

Environmental issues

A number of environmental management processes were embedded into the existing project processes to ensure environmental issues remained at the forefront of the minds of the project team.

Central among these were the Construction Environmental Management Plans (which incorporated a number of operational issues such as water pollution) and Site Waste Management Plans, as well as considering longer-term issues of environmental impact. It was developed using guidance from the Department of Trade and Industry, Envirowise and the Groundwork Trust. This was implemented on a voluntary basis by the project team to demonstrate best practice. As many of the planning issues revolved around the environment, a robust system was needed to deliver over and beyond the statutory minimum.

Sustainability workshops with all stakeholders

A sustainability workshop facilitated by the Centre for Construction Innovation (CCI) was undertaken at the early stages of the project to ensure the risks and opportunities for embracing environmental benefit were undertaken on the project. The process is run in a similar way to a risk management or a value engineering workshop which identifies potential practices to either manage or mitigate environmental risks or to add environmental value to the project with key stakeholders and specialists. Attendees included St. Helens Council, Birse Civils Ltd., Gifford, ReMade NW, Environment Agency, and St. Helens Countryside Officers.

“The team quickly grasped my aspirations to deliver the Stanley Bank Environmental Framework during the ECI partnering workshop for the A58 Blackbrook Diversion Project. They have ensured this is integral to all design and construction decisions. They even involved me in the interview and selection process prior to awarding the landscaping package. The Project has been delivered to a consistently high environmental standard.”

Rick Rogers
Countryside Development Officer

Independent, audit assessments of environmental performance

In addition to new management processes, audited assessments were put in place to drive environmental performance through the project. The main ones were CEEQUAL, the Blue Butterfly Biodiversity Assessment, Envirowise Site Audit, Considerate Constructors Scheme and Constructing Excellence Key Performance Indicators.

CEEQUAL assessment

CEEQUAL assessment is used to benchmark against a wide range of environmental and sustainability performance measures.

CEEQUAL is an environmental assessment similar to the Building Research Establishment's (BRE) Environmental Assessment Method (BREEAM) for buildings. This has been designed by the Institution of Civil Engineers, BRE and CIRIA to address similar environmental issues for Civil Engineering projects. The Blackbrook project team decided to aim for a 'Whole Project Status', of which there are only 56 worldwide. This is a rigorous model which contains 120 questions to be answered with supporting evidence that covers the following key aspects of project processes and performance in Table 1.

Factor	Weighting
Project Environmental Management	12.0%
Land Use	8.2%
Landscape	6.9%
Ecology and Biodiversity	8.5%
Archaeological and Cultural Heritage	6.2%
Water Issues	8.9%
Energy	8.5%
Use of Materials	9.5%
Waste	8.7%
Transport	7.6%
Nuisance to Neighbours	7.3%
Community Relations	7.7%

Table 1

Blue Butterfly audit focusing on biodiversity on the project

The second key assessment model focused on Biodiversity. The assessment criteria were developed from the BRE and CIRIA biodiversity indicators, designed for simplicity of use and applicability to construction. These indicators assess how biodiversity issues are considered during the planning process, how they are undertaken during construction and quality of the monitoring and management of the outcomes. Examples of the types of issues considered within the Blue Butterfly Biodiversity assessment include:

- Seeking advice from recognised authorities
- Scheduling work to minimise disruption to wildlife
- Training on biodiversity issues carried out as part of site induction and in Toolbox Talks
- Constructor led ecological enhancements.

By identifying key assessment areas, the Blackbrook Project Team were able to effectively identify and embrace nationally recognised best practice with regards to biodiversity issues.

Focusing on waste and resource efficiency with advice from Envirowise

The Envirowise Site Audit addressed exactly what waste was being produced, and its location, so it could be reduced. The site audit helped to:

- Identify what was being done before the resource efficiency initiative was started
- Quantify the environmental and financial savings made.

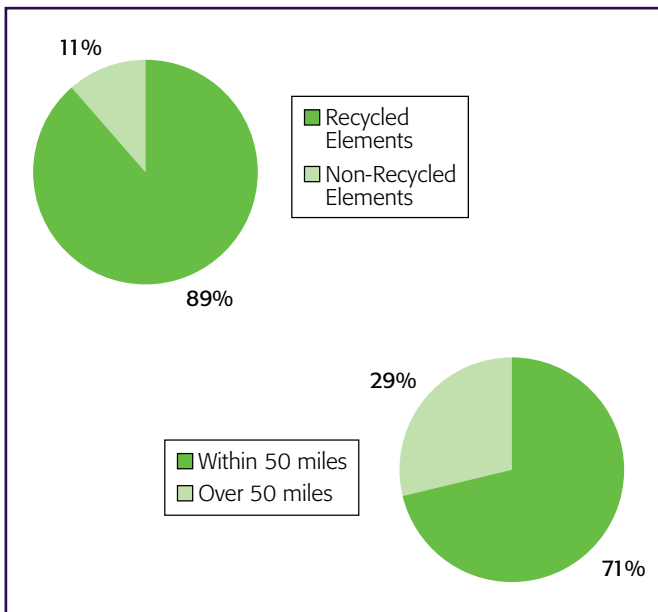
The aim of the first part of the audit was to identify low-level waste producers, such as leaking taps then move on to the big waste producers (the areas where large amounts of excess waste were likely to be produced). This was carried out by observing whilst walking around the site.

Award winning recognition for Considerate Constructors Scheme

The Considerate Constructors Scheme was a central issue of site management for both the client and contractor. This externally audited standard looks at how issues of site management and third party interfaces are managed. The Blackbrook scheme scored 40 out of a possible score of 40, the best report St. Helens had seen for a project it had commissioned.

"In eight years and 1500 site visits as a Considerate Constructors Scheme Monitor this is by far the best highways project I have ever seen. The degree of cooperation between Birse and its client St. Helens Council is most impressive and this contract is an example of what can be done to exceed even the high standards of the Considerate Constructors Scheme when both parties are determined to demonstrate 'best practice' in every way."

Brian Williams
Considerate Constructors Scheme Monitor



Benchmarking environmental performance using Key Performance Indicators

Both Birse and St. Helens have had long experience of using both Constructing Excellence and bespoke Key Performance Indicators. Two specific bespoke KPIs used on the Blackbrook project were the level of recycled elements within the finished product, measured at 89%, and the level of local employment, measured at 71% (see charts below).

Whilst there is no national data to benchmark these scores against, it was obvious to both the client and the contractor that these were excellent indicators of their performance on recycled content and the level of local employment.

Innovative waste management to avoid landfill use and reduce carbon emissions

The issue of waste is a key element in any civil engineering process: the removal of spoil to land-fill tips is a costly affair and land-fill, in general, is not good for the environment. The project team looked to minimise the effects of waste by gaining a Waste Exemption License from the Environment Agency allowing excavated materials to be retained on-site for reuse. Not only did this stop land-fill tipping, it also had the affect of vastly reducing vehicle movements on and off-site. This alternative strategy reduced carbon emissions by 85%.



Environmental impact was a priority

Implementing Change

Sustainable Urban Drainage System (SUDS) to relieve flood and create wildlife habitats

The implementation of the Sustainable Urban Drainage System was a main planning consideration, forming part of the Stanley Bank Environmental Framework. This was a key requirement for St. Helens and the Environment Agency. SUDS is designed to address some of the problems of traditional drainage management in populated areas. Traditional drainage is generally designed to move water as quickly as possible away from the point of falling.

This can create a number of problems:

- Run-off from paving in urban areas can be too quick and create flooding problems downstream
- Surface water run-off can contain contaminants in low levels. Over time, this can create a reduction in the quality of water courses
- Running water to piped systems can reduce the level of ground water and leave natural water courses depleted in dry weather.

The design consultant, Gifford, looked at approaches that would create attenuation ponds and store as much surface water on the site which could then later be dissipated through natural means. This means that solids will settle and water can be filtered naturally back into the substrata.

Biodiversity and habitat management was central to the project

The project team did not seek to only meet basic statutory requirements, but looked to add value to a site considered as a public amenity. This meant active consideration and management of biodiversity issues.

The development of the SUDS approach has created added value in terms of biodiversity by creating a natural habitat for water voles, dragonflies, invertebrates and moths. This led to an increase in wild birds within the St. Helens area. The Blackbrook Scheme made a major contribution to the North Merseyside Biodiversity Action Plan.

Performance Measurement

- Impact on the environment, measured by customer satisfaction, at 95%
- Customer satisfaction for Impact on Biodiversity at 95%
- The habitat area created and retained in the project is 47%
- Level of recycled elements within the finished product, measured at 89%
- Level of local employment, measured at 71%.

Key Lessons Learned

- The project team has built on strong existing relationships. This was augmented by including a wide number of stakeholders and advisory bodies, ensuring that the best solutions to environmental issues were found. The inclusion of these individuals from an early stage meant that issues that were of both statutory and public interest could be identified and managed within the process.
- Environmental issues were embedded in management processes from the start. The Sustainability Workshop, as well as a number of audited management processes, meant that environmental issues were an intrinsic part of the design and construction process rather than a "bolt-on", which can sometimes be the case.
- Measurement and monitoring were applied from the start of the project. Looking to achieve performance goals against environmental issues has meant the project team were committed, not only to delivering the statutory minimum, but a more stringent set of internally and externally audited standards.
- The contractor, Birse, has taken the sustainable measures used on this contract and will disseminate the best practice learned throughout their organisation.
- The availability and use of recycled materials does not hinder a project and can be cost effective, if not a cost saving.



Community tree planting