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A63 Selby Bypass, UK

Case Study 50

The A63 Selby Bypass was constructed to relieve severe traffic problems in Selby town. The project used waste materials in the construction and ensured there were minimal adverse effects on local flora and fauna.

Aspects of Sustainability

This project highlights the following:

Social Aspects

Human Resources

Corporate Community Involvement

Business Ethics

Health and Safety

Environmental Aspects

Energy and Climate

Materials

Ecosystems

Local Impacts

Economic Aspects

Project Selection

Supply Chain

Value Added

Project Introduction

The A63 Selby Bypass is a 10 km single carriageway, which runs south of Selby in North Yorkshire, between Thorpe Willoughby in the west and Barlby in the east. Prior to the bypass, 16,000 cars and 2,000 heavy goods vehicles passed through Selby and over a 5 m wide bridge each day. Local residents and the town council had campaigned for a bypass since 1939, and the project has decreased town centre traffic by around 40 percent, reduced air pollution and improved the quality of life for the residents of Selby. The bypass has also reduced the number of motorists using smaller countryside roads to avoid the old A63 bottleneck in Selby.

Skanska designed and constructed the US$ 75 million A63 Selby Bypass on a design and build contract between 2001 and 2004 as part of a government road improvement scheme. The route includes six junctions, five roundabouts, a road bridge, two railway bridges, a pedestrian bridge and a three span bridge over the Selby canal. The project also included the design and construction of a new 100 m swing bridge over the tidal River Ouse, which is capable of swinging 90 degrees to open to river traffic within 2 minutes of a request being made. Embankments up to 9 m high were built to carry the bypass over the Selby Canal, the River Ouse and the two railway lines, and flood defences adjacent to the swing bridge were constructed.

The site was previously used for agriculture, but included some areas of ecologically valuable grassland and reed beds. Skanska worked alongside the Environment Agency to ensure there were minimal adverse effects on local flora and fauna.

The project won gold in the 2005 Considerate Constructors Scheme's Most Considerate Contractor national award and a Highly Commended Yorkshire Construction Award from the Institution of Civil Engineers in 2004.

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Contributing Toward Sustainable Development

The A63 Selby Bypass has relieved severe traffic congestion, decreased noise and air pollution, and reduced the risk of road accidents in Selby. The bypass has also reduced travel times on the A63 and has allowed land south of the town to be developed. Skanska worked closely with the Selby community during construction to inform and involve them in the project, and to minimising public disruption. The project utilised regional workers, subcontractors and suppliers, invested in vocational training and pioneered innovative techniques to improve workforce health and safety. Environmental impacts were minimised during construction and the impacts on local ecologically valuable flora and fauna were mitigated. Biodiversity was promoted along the embankments adjacent to the new bypass and a sustainable drainage system was constructed to reduce the severity of localised flooding. Mining and power station waste materials were used on the project, which reduced the need for quarrying and transporting non-renewable materials.

Social Aspects

Stakeholder involvement and communication

Skanska worked closely with the Highways Agency and implemented an active public relations plan to regularly inform the public. A two-day public exhibition of the planned proposal was organised together with the Highways Agency, which was attended by 1,200 people. Regular public information meetings were held and Skanska launched a project specific website to inform interested parties. Over 80 presentations and seminars were held for local organisations during the project, which were attended by 2,600 people in total. On-site presentations and tours were also given for universities, engineering societies, the Institute of Civil Engineers and the Institute of Highways and Transportation. No third party formal complaints were made during the project.

Minimising public disruption during construction

There were few private dwellings close to the site, although special measures to reduce disturbance were made when necessary. One of the bridges was located close to a residential area and during night work hay bales were used to silence a generator and blackout blinds were provided to ensure that construction lighting did not disturb one household. Vibration monitoring equipment was used during piling work and noise was monitored during loud construction activities. Work on the railway bridges was scheduled to not disrupt rail services. The project involved extensive landscaping to lessen the noise disturbance and visual impact of the road on the surrounding countryside.

Occupational health and safety

A number of innovative safety solutions were used on the project. Trials with a vacuum kerb-lifting machine were carried out, which reduced the risk of back injury among the kerb laying team and lowered project costs by increasing output. A new type of steel gully cover was designed that did not need to be removed during kerb laying operations and reduced the risk of injury among workers. Deep manholes were constructed within shafts rather than sheet piled excavations, which have greater safety risks. The AIR (Accident Incident Rate) was 15.7, 21.9 and 12.0 accidents per 100,000 workers in 2002, 2003 and 2004 respectively.

Public safety

The bypass has improved road, pedestrian and cyclist safety in Selby by reducing the number of vehicles passing through the town. The Highways Agency has estimated that 250 accidents could be prevented over the next 30 years as a result of the bypass. Skanksa made 32 site safety presentations on the dangers of construction sites at ten local schools. Road safety measures on the new bypass include high friction anti-skid surfacing, which was used at least 55 m before each roundabout.

Less public disturbance

Air and noise pollution have been reduced for almost 400 dwellings in Selby since the construction of the bypass. Noise has increased for 35 homes located near the new bypass, which was anticipated and weighed up against the benefits of the project for the majority of Selby's residents.

Sustainable transport

The Selby Bypass has made the town centre more pedestrian-friendly and has improved the reliability of public bus services and access to the Selby train station by reducing congestion through the town. A bridleway and pedestrian bridge was constructed over the bypass to maintain a public right of way. The roundabouts have cycle paths and pedestrian crossings and each carriageway has a one-meter wide marginal strip that can be used by cyclists.

Charitable donations

Skanska donated around US$ 3,000 to local schools, sports associations, charities and parish councils. Skanska also part-sponsored the Selby Bypass 10 km road race in 2003, which raised US$ 5,000 for five local charities and involved 500 runners who also raised money for various charities.

Economic Aspects

Construction employment

An average of 100 workers worked on the project, with around 140 at the peak of construction. Around half the workforce was from within 50 km of the site.

Regional subcontractors and materials

Subcontractors from the surrounding region included bridge specialists, rail consultants, mobile crane equipment and operators, all laboratory services, road surfacing and a waste management company from Selby. Non-hazardous waste from local mines and power stations was used on the project and sand was excavated from the site.

Vocational training

Over 390 worker training days were provided during the project. 45 members of staff underwent various skill-training courses, including the attainment of Construction Skills Certification Scheme cards, NVQ qualifications in General Construction Operations, safety, first aid and computer courses. Eight student engineers from Selby Technical College shadowed various activities during the course of the project. Two Sergeants from the Royal Engineers also worked on the site during a two-week educational period.

Regional economic development

The bypass has reduced journey times by between 15 and 45 minutes along the A63 and has allowed land to be developed that was allocated for residential and light commercial development in the Selby District Local Plan. A roundabout was specifically constructed to give access to the development land, which has provided new opportunities for business growth and for new companies to establish in the town. The bypass has also made the town centre more attractive to shoppers and businesses due to less traffic congestion and air pollution.

Environmental Aspects

Minimising environmental impacts during construction

Wheel baths and jet washers were installed at site access points and two road sweepers were employed full-time to ensure that the surrounding public highways were kept clean. Visual dust monitoring was carried out during dry periods and water dust suppression equipment was used. Pollution was avoided by using drip trays under pumps, monitoring jet wash water for oil and other vehicle pollutants and by monitoring water in ditches near earthworks for discolouration. Concrete washout pits were constructed at several

points to ensure that wagons did not washout in sensitive locations. Once the pits were full the concrete was allowed to dry out, before being crushed and reused on site.

Environmentally responsible materials

The embankments and landscaping were made with 94 percent secondary materials, including mining waste, PFA (Pulverised Fly Ash), and sand excavated from the site. Excavated mining waste was obtained from two local mines and was used to construct embankments less than 2 m in height. PFA is an inorganic waste residue produced during the combustion of pulverised coal, and was sourced from coal-fired power stations in the area. PFA was used for the larger embankments due to its low-density and reduced ground pressure. Over half a million tonnes of mining waste and 400,000 tonnes of PFA was used in total, which reduced the need to quarry and transport non-renewable primary materials. 150,000 tonnes of PFA was transported 50 km by rail from a power station direct to the site, which averted 8,000 vehicle journeys and a short access road from the railway siding to the site was constructed to avoid using public roads. The sub-base road surface was modified to include 35 percent PFA, which ensured that the limited site-excavated sand was sufficient for the project and that no sand had to be sourced from outside the site. The PFA road surfacing also halved the amount of cement required and proved to be stronger than conventional surfacing containing only sand and cement.

Badger mitigation

A badger survey identified five active badger setts, including one main sett, adjacent to the site. The bypass did not directly disturb the setts but three badger tunnels were constructed under the road to ensure that the badger clan did not loose access to foraging territory. Permanent fencing was erected along the section of the bypass to prevent badgers from venturing on the road and plans to modify a ditch were abandoned to avoid disturbing the badgers.

Biodiversity preservation

An ecologically valuable meadow and reed beds by the Selby Canal that would have been destroyed by the bypass were relocated to new sites adjacent to the new route. The meadow primarily consisted of damp grassland and sedge and a receptor site was prepared with different depth trenches to accommodate both types of turf. The receptor site was fenced off and warning signs were erected to prevent the area being disturbed during the construction of the bypass. The reed beds were relocated to a temporary pond for 15 months before being placed into the newly constructed balancing ponds adjacent to the bypass.

Promoting biodiversity

157,000 trees and shrubs, 75,000 smaller plants, 30,000 bulbs and 11 km of hedgerow were planted. Various local tree species were planted, including oak, pine, birch and field maple to improve biodiversity and provide a natural barrier between the bypass and residential areas. A class of school children from a local school helped plant several hundred trees along the bypass as part of National Tree Week. Wild seeds were sown on the embankments to promote biodiversity and Skanska established a project with a local ornithologist to create winter sustenance for rare birds living in woodland close to the bypass. The project, which included the construction of bird feeding stations, has continued since the completion of the bypass with funding from local organisations.

Sustainable drainage system

The area, particularly around the River Ouse, is susceptible to flooding and embankments, ponds and ditches were constructed. The approach embankments on the Ouse floodplain were reinforced with piles and geo-synthetics to withstand severe flooding. Eight balancing ponds with drainage ditches were created to hold and store flood water during periods of heavy rainfall. The ponds also retain any polluted runoff from the road and the relocated reed beds in the ponds filter out organic and chemical pollutants.

Waste management and recycling

No construction waste was sent to landfill. Non-hazardous construction waste was used as fill material for the embankments and materials from site clearance, such as trees and bushes, were chipped and reused on site. Over 700 bags of office waste was recycled, mainly consisting of paper and cardboard.

Learning From Good Practice

Mining and power station waste materials were used to construct the road embankments and partially for sub-base road surfacing. The recycling of such materials reduced the need for quarrying and transporting non-renewable primary resources and decreased project costs.