CASE STUDY: Nottingham Left Bank FAS

SECTOR TYPE: Flood Risk Management
LOCATION: Nottingham, East Midlands
CLIENT: Environment Agency
PRINCIPAL DESIGNER: Black & Veatch
PRINCIPAL CONTRACTOR: Jackson Civil Engineering
CONTRACT VALUE: £45 million
CONTRACT DURATION: June 2009 – September 2012

The Project

The Nottingham Left Bank Flood Alleviation Scheme protects up to 16,000 residential and commercial properties from flooding. The works extend over a 27km length of the River Trent from the M1 through the centre of Nottingham and downstream to the Radcliffe railway crossing.

The project required the raising of existing embankments and the construction of new or replacement flood walls. Most working areas had limited access to a narrow corridor constrained by existing assets or water. The flood defence also needed to cross roads, canals, areas of public open space and the 100 hectare Attenborough Nature Reserve.

Successfully delivered in September 2012 three months ahead of schedule and £6m under budget, the team set out to deliver the project at the best possible value for money without compromising the quality of the finished product. Several initiatives developed during the project helped to ensure that costs were controlled, carbon content significantly reduced and programme dates achieved.

The Scheme has received the following awards:

UK Green Apple Award – Gold Winner 2012
Considerate Constructors Scheme – One gold, two silver and one bronze
ICE – East Midlands Merit Award - Large Project Category
EA – Project Excellence Awards – Winner – Management of HS&E Risk
EA – Project Excellence Awards – OVERALL WINNER 2013
The Benefits

Adopting Trenchmix, a method which forms an impermeable barrier to ground water movement in flood conditions, in place of steel sheet piles provided benefits to the project by:

- Reducing embodied carbon by 3,000 tonnes when compared to steel sheet piles
- Reducing construction costs and programme duration
- Providing a less hazardous working method that could be safely operated close to a mainline railway
- Lowering noise and vibration in a sensitive location – Attenborough Nature Reserve SSSI

A study of surface water drainage catchments behind the new flood defence line removed the requirement for pumping facilities and enabled the project to adopt flood storage instead.

- This reduced operation and maintenance liability for the end user
- A sustainable solution making the best use of available local resources, which reduced the impact of the project on the public

A project review of the requirement for flood gates found opportunities to eliminate or reduce the number of flood gates required:

- Passive flood defence needing no user action
- Reduced operation and maintenance liability for the end user

The Process

In a bid to drive down costs, the project team developed a ‘Structured Value Engineering Process’ which made substantial savings for the scheme. All members of the extended team including Environment Agency operations staff, contributed to the process. The ideas that the team derived were not solely about the reduction of construction cost. They also related to:

- Ensuring stakeholders’ expectations were met
- Ensuring that value for money did not compromise quality
- Reducing health & safety, environmental and financial risk
- Minimising the consequential impact on local residents and businesses
- Taking positive action to reduce negative publicity
- Improving operation and maintenance of the completed scheme

Risk management was an integral part of the process. Over 450 risks were identified and assessed for consequence. The “top 5” risks were identified weekly and owners and actions circulated to the team. Attention was paid to the timing of risk and as a result, the team consistently met yearly spend profiles despite the huge volume of change which occurs on a project of this magnitude and complexity.

Key Learning Points

Trenchmix is a solution ideal to the site constraints found at Nottingham but it can benefit many other projects that require an impermeable barrier installed below ground. We installed nearly 3km of trenchmix to a typical depth of 7 metres. Mobilisation expense for this solution is significant and therefore a length of 200m or more is a requirement to be cost effective.

Challenging the design for a better solution is something that this project benefited from. No detail or assumption was left unchallenged in an effort to ensure costs were controlled and the correct solution delivered. This required an integrated team prepared to work together in a truly collaborative way.

Contact John Hindle: Environment Agency Project Manager 0121 708 4643.

End User Feedback

It was a feature of the scheme that the Team was dealing with not one but a number of distinct communities. The team set great store in working with the public to achieve satisfaction. There are numerous examples of where they went the extra mile such as providing a churchyard with a memorial stone to commemorate 134 people killed in a munitions explosion during World War 1.

"The way in which the project has been constructed will be a lasting testimony to the design and construction skills of those involved"

Mayor of Broxtowe

Learn more

VIDEO: Nottingham Left bank Flood Defence Scheme – Trenchmix Solution

For more information on
The Green Construction Board
visit www.greenconstructionboard.org
or email green.board@bis.gsi.gov.uk