Case study
Seabraes Footbridge, Dundee

Client: Dundee City Council

Architect: Nicoll Russell Studios

Main contractor: Dawnus Construction Holdings Limited

Principal contractor: Midport Construction

Structural engineer: AECOM

Steel fabricator: SH Structures Ltd

Tata Steel products: Celsius® 355 circular hollow section

Year: 2015

Seabraes Footbridge in Dundee is a dramatic arched structure built from tubular steel. Set to become a landmark feature, the 56 metre bridge over the main East Coast railway line opened to public acclaim in June 2015.

High-strength Celsius® 355 circular hollow section was used extensively in the bridge construction. Hot-finished, Celsius® 355 is fully stress-relieved for reliable performance in the most arduous conditions. Seabraes Footbridge was fabricated in North Yorkshire and assembled close to the site. Installing the fully-assembled bridge during a narrow time window was one of the most challenging aspects of the project. There was no room for error.

METICULOUS PLANNING WAS THE KEY TO SUCCESS

The challenge

The new Seabraes Footbridge at Dundee crosses the busy East Coast mainline that runs from Edinburgh to Aberdeen. It creates direct access from the city's west end residential district to the award-winning waterfront development on the River Tay.

Principal contractor for the £3.5 million project, Morgan Sindall plc, contracted fabricators, SH Structures Ltd, to supply, manufacture and install the bridge steelwork. This encompassed the main span, the mast and support system for an access ramp, a lift tower and the full balustrade system.

The narrow time frame allowed for bridge installation posed an exceptional challenge. To minimise disruption to the railway line, Network Rail allotted a single, night-time 'possession' for installation work. The night of 11 April 2015 was set in advance for the temporary line closure. Missing the time slot was not an option.

"The key to the success of projects such as this is meticulous planning and attention to detail. We only had a window of less than six hours in which to put the bridge in place and allow Network Rail to re-open the line." Tim Burton, Sales and Marketing Manager at SH Structures.

The solution

Designs were produced for a stunning tubular steel bridge spanning 56 metres. Sweeping overhead arches rise to a height of seven metres above the deck. The arches, deck edge members and access ramp components utilise circular hollow section ranging in size from 219.1mm x 10mm to 506mm x 12.5mm.

Tata Steel's Celsius® 355 structural hollow section met the specification for high-strength, hot-finished section. Stress-relieved and with a minimum strength of 355 MPa, it enables material cost savings and lighter structures.

SH Structures fabricated elements of the bridge at its workshop in North Yorkshire. Typically, the company does as much work as possible off-site, but the scale of the footbridge meant it had to be assembled in a construction compound adjacent to the railway line in Dundee. The Tekla model was used extensively during site operations – from detailing the temporary works design to centre of gravity calculations for each lift. Rigorous planning ahead of the bridge installation included production of lifting plans and the construction method statement.

To minimise carrying out work over the railway line, the bridge was installed as a complete single span with all the finishes in place including the glazed balustrade system and lighting. The installation was successfully completed during the allotted night-time closure of the railway line.

Seabraes footbridge opened in June 2015 following completion of access works. The local media reported a very positive response from the public to both the bridge structure and the new link it had created.

"We procured Celsius® 355 for the Seabraes project because we know it's a product we can trust. It's fully traceable and it's manufactured and tested with all the appropriate certification, enabling us to fully CE-mark the work. Installing structures such as this 70-tonne bridge is inevitably a challenge. Working to such a tight schedule adds even more pressure. But the close working relationship we developed with Morgan Sindall and their very professional approach have resulted in a very successful project." Tim Burton, Sales and Marketing Manager at SH Structures.

Tata Steel products:

Celsius® 355 is a hot-finished hollow section suitable for all construction and mechanical applications – performing reliably in even the most arduous conditions. With a minimum strength of 355 MPa, it allows the highest fabrication factors and enables material cost savings and lighter structures. Available in a wide range of circular, square, rectangular and elliptical hollow sections, Celsius® 355 offers dimensional consistency, high levels of formability and excellent weldability.

Celsius® 355 products are traceable, CE-marked and fully compliant with the Construction Products Directive. Celsius® 355 is the first structural hollow section to be certified to BES 6001, allowing British projects to maximise credits under the 'Responsible Sourcing of Materials' sections of BREEAM.

"Aesthetics are an important aspect of projects such as Seabraes Footbridge where the steelwork is very visible. With Celsius® section, we are working continuously to improve our processes to provide high surface quality along with all the additional advantages of a true hot-finished structural section."
Steve Whitfield, Customer Technical Services Manager at Tata Steel

For technical advice on the application of Celsius® 355 for your project, please contact our Customer Technical Services Team:
T: +44 (0) 1536 404561
E: technicalmarketing@tatasteel.com
W: www.tatasteelconstruction.com

www.tatasteelconstruction.com

Tata Steel
Shotton Works, Deeside
Flintshire CH5 2NH

T: +44 (0) 1244 892199
F: +44 (0) 1244 892121