



Lagan Weir Footbridge, Belfast

'Safe and sustainable' access to Belfast

£5m

/ Project value

December 2014

/ The project commenced

June 2015

/ The project was completed

Winner of the RICS NI "Infrastructure" Award and the "Best Public Space" at the Royal Society of Ulster Architects (RUSA) Awards, the multi award-winning Lagan Weir Footbridge is a five span structure across the River Lagan Weir along Belfast's waterfront. Developed as part of a wider regeneration project for the city, it is 120m in length, installed between abutments and features additional ramp lengths of approximately 27m and 29m. Its deck width varies from 4m to 10m at its widest. Designed around the principle of "elegant simplicity", the Lagan Weir Footbridge provides safe and sustainable access into Belfast for cyclists as well as pedestrians. Contributing to the ongoing transformation of the city, it replaced a 2m-wide footbridge that was too narrow to accommodate rising numbers.

The brief

Our team was responsible for the design and construction of the support structures on both the Donegal Quay and Queens Quay as well as the approach ramps. Additionally, we undertook the refurbishment of the weir lighting, incorporating the replacement of existing halogen lights with new energy efficient lighting.



"We would like to express our sincere thanks again to the entire team at GRAHAM for all the hard work involved in getting this project constructed successfully to such a high quality standard."

Alan Lavery
AECOM Architects

"Challenging survey, design and co-ordination were required in order for the bridge to be supported from the existing 'Pier Houses' that were part of Lagan Weir. The complex fabrication and erection of the support "trees" and bridge deck were superbly executed. This beautifully finished and important bridge links the city centre and the Arena/Titanic area on the other side of the Lagan."

Structural Steel Design Awards Judges

The challenges

One of the main challenges on this project was the requirement for a crane with the capacity to lift 25 tonne sections of the bridge deck at a reach of 70m. This resulted in the use of a 1,000 tonne crane for the manipulation of the main bridge deck lifts. There were nine unique deck sections, the largest being 17m long. The main framing of the deck sections was made from a combination of 610 x 229 x 101 UBs for the internal beams and 500 x 300 x 16 RHSs for the perimeter beams. Due to the size of the crane, it was necessary to erect all of the bridge sections as far as the halfway point from the first side before moving to the other side, and repeating the process.

The solution

With 16,000 people using the bridge each week, the Lagan Weir Footbridge is a "pivotal" part of a more sustainable approach to travelling around Belfast. Interestingly, on its first day, more than 160,000 people crossed it – more people than those who collectively visit Disney parks in a day in the US, Japan or Paris. The new bridge is a sleek, shiny high-tech design with an 8m wide walkway and stainless steel railings, and it features a multi-coloured illumination system. The bridge is supported on the existing weir buttresses using an innovative strut design that allows it to "float" above the river a few metres away from the Weir. The vertical profile is a continuous curved profile with ramps at a gradient of 1:20 while the horizontal alignment is also curved with a degree of a-symmetry. The new footbridge consists of structural steel, enveloped in aluminium cladding with a glass parapet on the east elevation and a stainless steel post and wire system on the west parapet. This high quality bridge project was completed in just six months to meet a deadline for the 2015 Tall Ships event.

Outputs & Benefits

/ **CCS:** Silver - Considerate Constructors Scheme Awards (2016)

/ **Accolades:** Winner – RICS NI Awards 2016 "Infrastructure"; Shortlisted – RICS NI Awards 2016 "Design through Innovation"; Shortlisted – 2016 ICE People's Choice Award (winner announced Jan 2017); Winner – "Best Public Space" Royal Society of Ulster Architects (RUSA) Awards

/ **Strengthening:** We strengthened the existing pier structures with 2 x 78mm Daver bars, over 7m long down into the Lagan Weir structure. In addition, casting of an in-situ concrete anchor block within the Weir structure, with concrete pumped through a 10" diameter cored access point

/ **Finishes:** In-situ concrete ramps on both approaches, with aluminium rainscreen, sandstone cladding, granite paving and architectural lighting



For more information on how we're delivering lasting impact:

 +44 (0) 28 9268 9500

 info@graham.co.uk

 graham.co.uk

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