Modification of Footbridge F03B under London Olympic Park Development Scheme

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Summary

A key access to the Olympic park venues within the Queen Elizabeth Olympic Park in London, United Kingdom, is the permanent footbridge F03 over the River Lea. A temporary footbridge TF03 was built adjacent to permanent footbridge F03 to handle the Games-time pedestrian volume. Once the 2012 Olympics concluded, the London Legacy Development Corporation (LLDC) planned to run significant events across the park. Options studies by Atkins led to the final proposal of supplementing the capacity of Bridge F03 by retaining and transforming the wider Bridge TF03 to a reduced width permanent footbridge F03B.

The temporary to permanent transformation had to match the permanent bridge in terms of architectural aesthetics and elegance. It also had to gel with the overall landscape development visualised by the architect. There were many architectural and structural challenges faced by the architect – engineer team. This paper illustrates how coordinated efforts of engineers and architects have created an elegant structure that fits within the overall development scheme of the park.

Keywords: Architect-structural engineer interaction, footbridge, Olympics, aesthetics, cladding, gabion, bracing, shadow gap, parapet, deck edge beam.

1. Introduction

Following its role of an engineering design expert of the infrastructure works for the London 2012 Olympic and Paralympic Games, Atkins is currently working with the LLDC to oversee the transformation of the Queen Elizabeth Olympic Park into an exciting tourist destination and community park.

Prior to the development of the Lower Lee Valley site for the Olympics, it was a region fairly inhospitable to pedestrians. Today, the park gives a completely different picture and the repertoire of footbridges provides spectacular access to tourists and the public. This was possible due to the fact that all the different stakeholders - the owner client, designers, architects and contractors worked in tandem to realise this.

In one such work scope, as lead designer to the permanent bridge F03, Atkins was commissioned to carry out tender design for modification of the temporary footbridge TF03. The modified footbridge had to be in line with the adjacent Bridge F03, the longest pedestrian footbridge within the Park. Atkins worked with the landscape architect and the bridge architect together to give advice on the proposed modification of the temporary bridge.

2. Background and objectives

The Bridge F03 is noted for its aesthetic features such as its artistic surface and its use of glass blocks to give lighting effects without glare. To cope with the Games-time demand, a 26-metre-wide temporary Bridge TF03 was constructed alongside the 4m wide permanent bridge. Post the Games, Atkins performed an options study and proposed to retain the permanent bridge and reduce the width of the temporary bridge to 12,5m between parapets and modify it to permanent Bridge F03B.

In continuation with the above background, the larger objective of the client in undertaking this work was to develop the surrounding landscape and cater to the legacy phase requirements. This was evident in choosing a landscape architect and a bridge architect to help the client in creating a landscape where the modified bridge sits completely in harmony within the developed area adjacent to the existing permanent bridge.

3. Architects and Engineers: Together as a team

The project was an epitome of fruitful collaboration between the structural engineers and the architects. This was evident especially in the areas such as steelwork paint, deck surfacing, optimisation of bracing, gabion cladding and lighting, shadow gap and flashing, metal cladding, parapet and edge beam, and pedestrian parapets between temporary and permanent bridge.

The designers worked closely with the architect to develop the design. The challenge for the engineers lay in translating the architect's visualization into reality. This was successfully achieved by frequent liaison between the two parties. It is worth mentioning that the collaborative approach ensured that any pertinent issues were identified quickly and nipped in the bud. Very often, the interaction would help in identifying any site constraints, and the subsequent discussions ensured buildable, robust and aesthetically pleasing solutions. The architect-engineer team together were thoughtful to the smallest details which helped the bidders at tender stage to understand the scope and bid and the preferred bidder later to plan and execute into reality the vision of the client.

4. Conclusion

Successful implementation of any infrastructure work requires close collaboration of all the stake holders. The efforts of the architect and engineers were directed towards the end goal where the modified bridge sits perfectly within the developed landscape, and yet it is in line with the existing adjacent permanent bridge.

The authors firmly believe that aesthetics in structures and robust buildable solutions can always go hand in hand. It just takes an understanding client with a vision to engage services from both architects and engineers together to achieve this. And if the architect-engineer team, in turn, takes steps together, then it results in a visually appealing yet robust structure. This has surely been achieved in this piece of work and it clearly demonstrates how a successful architect-engineer team can work out bespoke solutions to challenges.