VARVSBRON, INNOVATION IN BRIDGE DESIGN, ENGINEERING & ADVANCED SURFACE MODELLING

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The summary should consist of one section giving the objectives of the paper, a brief summary of the work presented and the more relevant conclusions. The maximum extension of this document has to be one page.

Summary

'Varvsbron', a pedestrian and cycle bridge is a key part of ambitious plans to revitalise the city of Helsingborg. It connects the main Public Transport hub, across the ferry link to Denmark and the existing harbour, to a new urban development of the docks called Oceanhamnen.

The full paper charts the development of the bridge's design with input from the bridge's architect and the engineering team responsible for design development and detail design.

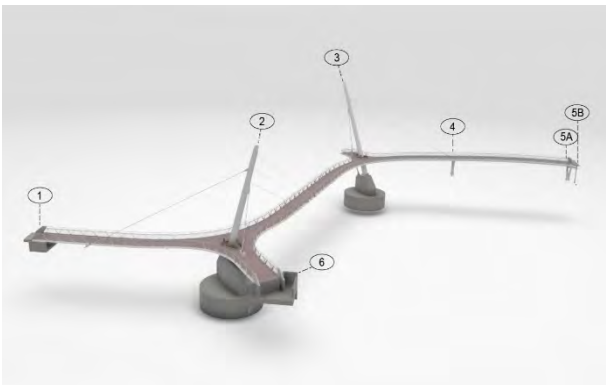

Fig. 1. a. initial concept sketch, b. aerial photograph of 'Varvsbron' with Oceanhamnen in background.

The bridge is a gently inclined, meandering form, an innovative variation on a cable-supported bridge, sharing characteristics with both suspension and cable-stayed structures. The sweeping alignment of the bridge deck is supported over the water by cables strung between two oppositely inclined pylons, which provide the main focal points for the bridge.

The bridge posed challenges in terms of planning and execution, which were successfully overcome by world class engineering, skilled project management and efficient collaboration between all those involved.

CAD-software traditionally used in the construction industry, while useful in early design stages to fine-tune the bridge form, did not provide the required level of detail or accuracy in the steelwork for taking it to production.

The paper focuses on how the team utilised CATIA parametric modelling software, primarily used in the aircraft and automotive industry, to simultaneously confirm the final aesthetic form, address complex structural and buildability issues, and ultimately make this distinctive bridge both structurally efficient and buildable.

The completed bridge represents state of the art design in a location that is rich in Industrial history. Our proposal took inventive design, sophisticated engineering, and contemporary technology for bridge analysis, documentation and machine fabrication and utilised them to create a unique form.

Situated in an area of great industrial heritage site, the bridge has become a focus for the regeneration of Oceanpiren and Helsingborg in general. Users have responded enthusiastically to the new bridge which epitomises a new confidence in engineering that is flowing from inclusive design and fast developing technologies.

Keywords: Innovation, Aesthetics, Parametric, Complexity, Buildability, Modelling, Efficiency

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