



The First Step Towards BIM Models in Major Bridge Design

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Abstract

The design of the world record 1915 Çanakkale Bridge is an example of the first steps towards using a BIM for a major bridge design. The model developed by COWI has been used to create 2D drawings and bar bending schedules, to manage interfaces and to check constructability, as well as health and safety related checks for working in congested space. Furthermore, it has proved to be an effective tool in communication with the project's stakeholders.

This paper describes where BIM has been applied in the design of the 1915 Çanakkale Bridge. Here special focus is on the construction of the plinth of the tower foundations where the contractor prefabricated the reinforcement cage for each plinth onshore, including all cast-in items and the steel form work and then lifted the whole assembly (18m in diameter) into place off-shore using a floating crane.

Keywords: Çanakkale Bridge; BrIM; BIM.

1 Introduction

In the design of buildings, coordination between many different parties and disciplines is required (e.g. owner, architects, structural design, facade installation, plumbing, heating, sanitation etc.). Building information modelling (BIM) has been commonly used in the building industry during the past decade. BIM collects information about the building relevant before, during and after construction. BIM has proven to:

- Improve constructability
- Lower the construction risks
- Help in communication between the parties involved

In bridge engineering the counterpart to BIM is called "BrIM" (Bridge Information Modelling). However most often people use the term "BIM"

also for bridges, tunnels etc. and hence this paper will use the term "BIM".

For major bridges it is not common to apply BIM in design yet. The main reason is that it has not been requested by contractors and bridge owners. One reason could be that the advantages with BIM do not counterbalance the cost in time and money to establish the model for a major bridge design. Another reason could be that for a bridge fewer disciplines and interfaces need to be coordinated compared to a complex building and for that reason does not need this level of detailing. Finally, it is also a question of what requirements there should be for such a model. For instance, for reinforced concrete structures, the ideal world would be a reinforcement model without any clashes. As it is explained later in this paper, this is not always practical. What is needed for a BIM model is an agreement between the involved parties about the level of detail.