Trysfjord bridge, parametric analysis and modelling for drawingless construction of a concrete balanced cantilever bridge.

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Abstract

The Trysfjord bridge is a concrete balanced cantilever bridge with a main span of 260m, being built at the present time and will, when finished, be among the largest bridges within its type. The bridge is part of the E39 highway under construction between Kristiansand and Mandal in the southern part of Norway. The concurrent design and construction process are being done with parametric analysis and modelling (PAM) as well as building information modelling in x dimensions (4D, 5D, xD, BIMxD).

This design and building project utilize the underlying power of computers not directly accessible through commercial software, by programming our own adapters and pre-/postprocessing algorithms in Dynamo, Python, and C#. This is creating new connections between the profession of computer programmers and civil engineers. Different layers in the architecture from calculations to modelling is also coupled.

Keywords: BIMxD; PAM; parametric design; cantilever bridge; Trysfjord bridge; python; dynamo; Revit; computer programming;

Figure 1, The Trysfjord bridge. Illustration: Norconsult AS.