

COMPANY

Norconsult

LOCATION

Norway

CURRENT PHASE

Construction

COMPLETION DATE

November 2021

SOFTWARE

Autodesk® AEC Collection, Autodesk® 3ds Max®, Autodesk® AutoCAD®, Autodesk® BIM 360® Design, Autodesk® Civil 3D®, Autodesk® InfraWorks®, Autodesk® Navisworks®, Autodesk® ReCap™, Autodesk® Revit®, Autodesk® Forge

Route E39 – Coastal Highway

“The demands and rewards of BIM Level 3 require you to think in new, innovative ways for the design, model, and information management.”

– **Gjermund Dahl**
BIM Strategist Infrastructure,
Norconsult



Image courtesy of Norconsult and Baezeni

Challenges

Roads, tunnels, and bridges are more than just infrastructure projects in Norway—they are strategic investments in the future. Connecting the entire country is paramount to its social and economic goals for growth.

A new Norwegian road authority with an eye on emerging technologies and sophisticated BIM techniques tapped Norconsult and AF Gruppen for the design and construction of Route E39, a 15-mile stretch of the 680-mile Coastal Highway project. This \$490 million project for the four-lane highway includes five road tunnels, several large interchanges,

and bridges—including Trysfjord Bridge, the world’s largest, balanced concrete cantilever bridge of its kind.

The road authority attached an ambitious goal to the project: reduce the project’s carbon emissions associated with construction by 20%. Not only that, strict criteria were set for the model-based project’s digitalization with BIM Level 3 and BIM as a single source of information on the web for 2,000 project participants. Contractor AF Gruppen assigned Norconsult’s subsidiary, NoIS (Norconsult Informasjonssystemer), for the software development.

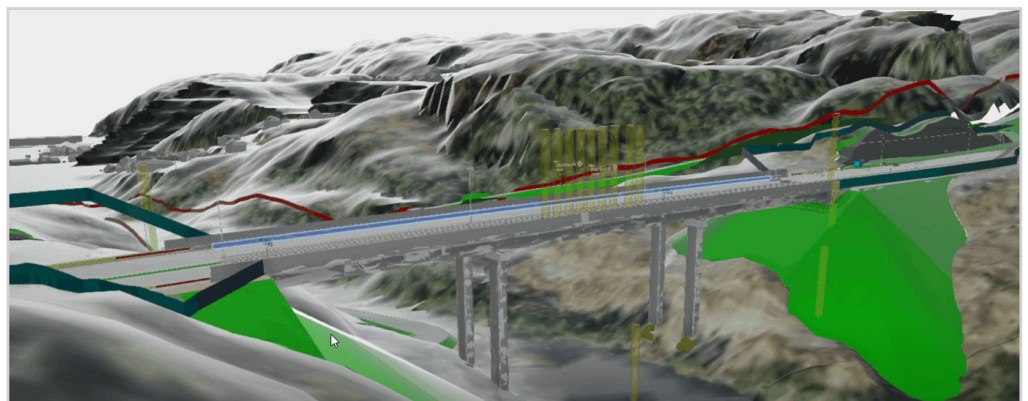


Image courtesy of Norconsult

“Autodesk Forge enabled our development team to create innovative, custom data integrations. We could now federate and visualize all the data across multiple platforms and provide consistent, up-to-date information to all project participants from a single source available on the web.”

– **Frode Tørresdal**
Head of Development -
BIM and Structural Engineering,
NoIS

“For the E39 project, we needed the confidence to take a huge digital leap. Knowing we had the support and collaboration with Autodesk and with NoIS, we could meet all the customer demands—not only for this particular project, but for the entire AEC industry.”

– **Gjermund Dahl**
BIM Strategist Infrastructure,
Norconsult

Solutions

For NoIS, Autodesk Forge delivered the perfect solution for building a new, web-based project collaboration tool with an integrated BIM viewer that eliminates any need for printing.

Named the ISY Project, this viewer makes it possible to access very large 3D models in a web browser. It also increases coordination between different disciplines and provides the ability for contractors and the client to access the designs anywhere and at any time—even if they are offline or on-site in a tunnel where service isn’t available. Seamless connection to data and the potentially 300,000 documents will be available through the integrations of 600 models, Sharepoint, a GIS engine, and health and safety information.

In order to meet the ambitious 20% carbon emission reduction goal, Norconsult turned to both Forge and generative design to reduce materials and waste and improve constructability. Detailed parametric design enabled a 15% reduction of CO2 emissions for the Trysfjord bridge alone. This is equivalent to the energy Norconsult as a company uses in an entire year.

Key Insights

- The team has reduced clashes and increased accuracy, while completely automating close to 70% of design updates when changes occur.
- The project has reduced over 90% of traditional drawings normally printed and produced for construction on a similar scale. The team has also increased model-based certifications that were only paper-based in the past.
- With Revit and Dynamo scripts, the team can design more details with more information in a shorter amount of time, resulting in design delivery close to 70% faster than before. For example, Dynamo scripts for the tunnels allow both the design team and the contractor to optimize the design closer to the beginning of construction.