



“Using Autodesk Civil 3D, we can improve our in-house designs, which we had previously outsourced for millions of yen, by creating designs of much higher quality.”

Ichiro Uchifuji  
Yachiyo Engineering Company  
Kyushu branch

# Autodesk Software Leads Successful Engineering Company Toward the Future

## Yachiyo Shortens Schedules and Delivers Higher-Quality Designs with Autodesk Civil 3D

### Project Summary

The Yachiyo Engineering Co., Ltd. (Yachiyo), a general engineering and construction consulting company based in Japan, is reaching its goal to lead the industry in 3D design. Founded in 1963, the company is now one of the largest firms of its kind, with more than 890 consulting engineers, planners, architects, and specialists throughout the world.

To improve its comprehensive geological analysis and structure planning, Yachiyo's Kyushu branch recently turned to Autodesk's civil engineering software. Using Autodesk Civil 3D, engineers at the Kyushu branch are able to:

- Reduce the time required for design from one week to one day
- Create higher-quality designs at every stage of the process
- Perform a complete geological analysis to prepare for the design of dams
- Determine the best route to transport materials to the construction site

### The Challenge

Today, Japanese citizens expect public projects to minimize social and environmental damage. The civil design industry is under pressure to improve its services and adapt to changing government regulations and social needs. Especially when building new structures, engineers and designers need tools to create high-quality simulations that withstand the close scrutiny of both experts and local residents.

These new challenges led Yachiyo to begin its migration to 3D and model-based civil design—a necessary step toward its mission to provide better-quality designs and services and lead the industry in 3D design.

In the autumn of 2004, Yachiyo's Kyushu branch used Autodesk Civil 3D software to perform a complete geological analysis in preparation for dam design. The task first called for the selection of appropriate mountain geology for builders to quarry the rock materials necessary for dam



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construction. The second task was to determine the best route to transport the rock materials to the construction site.

### The Solution

To select an appropriate quarry site, engineers assessed the quality of bedrock from soft to hard, using original boring survey data. They then narrowed the site selection choices based on the amount of applicable rock material suitable for construction.

The team needed more than 14 million cubic meters of rock for the construction of the dam. Engineers selected four nearby mountains as candidates, each with 20–50 percent more than the necessary amount of material. Designers analyzed two transportation routes from each mountain to the construction site. In mapping the routes, Yachiyo consultants considered the shortest distance as primary but also analyzed slope limits of 10 percent, the foundation of the route, and nearby homes and offices.

### Autodesk Civil 3D Demonstrates Its Power in Geological Analysis

In Autodesk Civil 3D, the company created a 3D data model by using topographical contours and elevations. After creating the 3D model, engineers were able to study the longitudinal and transverse cross sections to see if the routes met the necessary conditions. For diagrams of the study, engineers exported data to AutoCAD® software and plotted the results.

Autodesk Civil 3D impressed the Yachiyo management team with its multiple capabilities.

“We have used AutoCAD for 2D work for years,” says Ichiro Uchifuji, a member of the Yachiyo management team. “We chose to implement Civil 3D because its capabilities do not limit us to a particular field, such as highway design. We can use the technology for more diverse industry applications.”

Uchifuji adds, “Civil 3D is really the choice for road planning in the mountains, where topography contains difficult terrain and elevation changes. It demonstrates the power of the solution.”

A Comprehensive Tool for Plan Modifications  
Not only did Autodesk Civil 3D drastically reduce work schedules, the Kyushu branch cites the software's ability to analyze multiple variations and to produce high-quality simulations as equally crucial. These features help the company make changes based on new government regulations or client needs—without restarting the design process.

### The Result

With realistic, accurate 3D models of the construction site at their disposal, Yachiyo engineers can design more efficiently while improving the quality of their work. “What used to take about one week by outsourced CAD operators is now done in-house within one day by using Civil 3D,” says Uchifuji.

To learn more about how Autodesk Civil 3D is helping organizations around the world complete projects faster and more cost effectively, visit us on the web at [www.autodesk.com/civil3d](http://www.autodesk.com/civil3d).