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Hyun-bo Shin
Assistant Manager, Special Business R&D Team
Sekwang Engineering Consultants Company

Faster, more effective harbor design.

Using AutoCAD® Civil 3D® software, the Sekwang Engineering Consultants Company increases productivity, streamlines data analysis, and cuts overall construction time by 20 percent on the South Incheon Port project.

Project Summary

Sekwang Engineering Consultants Company is a mid-sized South Korean engineering and design company specializing in harbor design consulting. Since 1967, the firm's professionals have successfully carried out the planning, design, and construction of numerous major harbors and regional industrial complexes throughout the Korean peninsula. They have also taken a leading role in modernizing South Korea's harbor engineering industry. In fact, Sekwang set up a coastal R&D center that researches, develops, and refines the construction processes and technologies used in and around harbor and marine facilities, soil improvement projects, and coastal environments. As part of the firm's goal of streamlining the harbor design process and increasing productivity, Sekwang recently evaluated AutoCAD Civil 3D software, a comprehensive product for the design, drafting, and management of a wide range of civil engineering project types—including challenging harbor engineering projects.

The Challenge

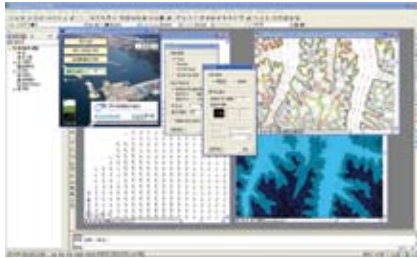
"The ocean is an enormous natural environment," says Shin-joong Kang, Assistant Manager at Sekwang. "In designing and constructing banks, breakwaters, quays, and wharves, almost every kind of engineering is involved, in areas such as soil foundation, water supply, sewage systems, structures, electrical, construction, and mechanical engineering."

Ever-Changing Natural Environment

"Harbor and coastal engineering is not an easy field for automated planning—even when using planning software," continues Kang. Because the ocean is so difficult to control, the technologies used in this field have often fallen behind those used in other construction engineering fields.

Software Chaos

Lack of a clear standard has led the engineers at Sekwang to use a wide variety of 2D software and other tools for the design, planning, and analysis of marine harbors. However, that approach can result in redundancies, manual workarounds, and errors throughout the project lifecycle. "It also makes it hard to set a solid working process," says Kang.



With AutoCAD Civil 3D, civil engineers can meet even the most complicated road, site, and pipe design challenges much more efficiently—using existing resources. With Civil 3D organizations can

- Streamline field-to-office processes from survey all the way to production drafting
- Take advantage of automated capabilities to complete production drafting tasks faster
- Enforce standards and help ensure consistency using the styles-based drafting environment
- Provide local and remote team members with parallel, controlled access to up-to-date project data
- Evaluate more design alternatives in less time
- Take advantage of their existing AutoCAD® knowledge base

The Solution

To confirm the usability of AutoCAD Civil 3D and determine its efficiency and practicality in real-world projects, Sekwang teamed up with Autodesk Korea and several other companies on a test project to design the water breakers on a multipurpose, 30,000-ton-class wharf at South Incheon Port. They used Civil 3D to create a set of plans for comparison with those created using the firm's traditional 2D tools.

Maximize Automation

They saw immediate results. A vital aspect of harbor design is determining the proper sea route for incoming and outgoing vessels. Using traditional tools and methods, this can involve time-consuming proposals, data research, and calculations to determine how much and where to dredge. Using Civil 3D, Sekwang automated this process, enabling the engineers to spend more time on engineering analysis.

Minimize Repetitive Work

"Using our old 2D software, we had to input data, analyze it manually, and then process it with another program to create a cross section," says Hyun-bo Shin, Assistant Manager at Sekwang. "AutoCAD Civil 3D allows us to do all of that automatically—reducing both repetitive work and significant processing time."

Streamline Data Analysis

For example, before Sekwang engineers could proceed with any business planning, they first needed to conduct a seawater analysis that examined wave height, tidal currents, and water calmness. Using traditional 2D methods and an array of custom-built, small programs, the

engineers had to perform many inefficient and complicated transformations on the data before they could generate the necessary isogrid map. Now, all they need is Civil 3D. Sekwang believes that Civil 3D and its automation capabilities reduced the time required to complete the data analysis process by 90 percent.

Easily Make Changes

And because Civil 3D relies on an industry-proven, dynamic engineering model that intelligently links design and production drafting, implementing design changes or evaluating multiple what-if scenarios is much simpler. "Before, we would have to start over from the beginning, but now we can just start from where we need to make the modification," says Kang.

The Result

Using Civil 3D, Sekwang was able to successfully complete the Incheon project in three months. "We proceeded with this test project as if it were a real project and directly confirmed—to our great advantage—an increase in productivity using Civil 3D," says Kang.

Significant Improvement

By adopting AutoCAD Civil 3D, Sekwang has significantly reduced repetitive manual work and thus saves a lot of planning time. "As a result," says Shin, "we expect a 50–80 percent improvement from the engineers' perspective and up to a 20 percent improvement for the entire construction process."

To learn more about AutoCAD Civil 3D, visit www.autodesk.com/civil3d.