

Greengard, Inc.

Customer Success Story

AutoCAD® Civil 3D®

Autodesk® Storm and Sanitary
Analysis Extension

The Autodesk® Storm and Sanitary Analysis Extension is a comprehensive hydrology and hydraulic analysis application for planning and designing urban and highway drainage systems, storm sewers, and sanitary sewers. With this extension, engineers and planners using AutoCAD® Civil 3D® and/or AutoCAD® Map 3D software can analyze a variety of network elements including:

- Inlets and catch basins
- Detention ponds and outlet structures
- Interconnected ponds
- Flow dividers, standpipes, weirs, and orifices
- Pumps and lift stations
- Manholes and junctions
- Channels, streams, and ditches
- Culverts and bridges

Optimize stormwater design.

Greengard cuts design time and lowers construction costs by 15 percent.



The Pond at Liberty Lakes. Image courtesy of Greengard, Inc.

Overview

Greengard, Inc. is a full-service civil engineering, surveying, and land planning firm that focuses on residential, commercial, and industrial land development. Since 1952, the firm's dedicated professionals have sought to provide high-quality, cost-effective engineering solutions to public- and private-sector clients in the suburban Chicago metropolitan area. In particular, the firm specializes in the design of transportation projects and commercial and industrial projects that incorporate advanced engineering and planning concepts. To help achieve these goals, the firm adopted Autodesk® Storm and Sanitary Analysis Extension. This fully-dynamic hydrology and hydraulic modeling tool works well with the firm's existing design applications, AutoCAD® Civil 3D® software and AutoCAD®. Used in conjunction with these applications, this extension has helped Greengard engineers better meet their clients' design and financial goals by facilitating fast and efficient modeling and analysis of complex stormwater systems.

The Challenge

Before adopting Autodesk Storm and Sanitary Analysis Extension, Greengard had evaluated numerous other stormwater modeling applications, but all lacked the combination of flexibility and power that the firm's engineers required. As a result, they decided to use the pipe slope methodology from the state Department of Transportation. But each project was still a time-consuming effort, was prone to error, and involved manual calculations and a series of Microsoft® Excel® spreadsheets.

"Everything was built into individual cells in Excel files, so we couldn't necessarily see the equation," says Douglas M. White, P.E., DECI, project manager at Greengard. "Because it was hard to see the big picture, we ran a greater risk of discovering—during construction—that we'd inadvertently undersized a pipe in the design phase." Ultimately, the difficulties associated with this approach led Greengard to initiate a search for a new, more versatile stormwater modeling application. At a minimum, the new software had to incorporate strong visualization capabilities, dynamic modeling, and hydraulic gradeline design.

Hydraulic gradeline design capabilities facilitated more efficient stormwater sewer network design.

The Solution

After a careful review, Greengard selected Autodesk Storm and Sanitary Analysis Extension. Its close integration with Civil 3D and other Autodesk technology helped address many of the challenges associated with more traditional workflows. “Autodesk Storm and Sanitary Analysis Extension is a lot more powerful than other modeling programs,” says White.

It is also easier to use. For example, to add manhole and pipe junctions to a design, engineers can import existing pipe network drawings from Civil 3D and make the necessary additions—helping to save considerable time. “We don’t have to draw pipes or manholes twice,” says White. “All the information from the pipe network in Civil 3D is there when we import it.”

If the engineers need to change the stormwater network while working in Civil 3D, they simply re-import the revised network to this extension, which dynamically updates all affected aspects of the model, such as elevations and pipe sizes.

The software’s powerful visualization capabilities help the engineers to see the impact of their changes more quickly. For example, they can watch real-time interactions between a detention pond and a storm sewer, a relationship that was previously difficult to synchronize. “It’s very helpful seeing how high the pond gets in relationship to the storm sewer,” says White.

Greengard also uses the software to help demonstrate design intent to clients, reviewing municipal engineers, and project managers, who previously had to rely on hard-to-follow spreadsheets and calculations. “It’s a lot easier to prove that a design

works,” says White. “Using Autodesk Storm and Sanitary Analysis Extension, review time is 30 seconds instead of two hours, enabling us to get the plans out—and the work done—more quickly.”

The Result

Recently, Greengard saw the impact of the new, more efficient modeling process on the design of a West-Chicago storm sewer system. Taking advantage of one-click switching between storm scenarios, the engineers switched back and forth between storm events, optimizing pipe sizes until they had saved the client as much money as possible and designed a system capable of handling a 100-year storm event. “We designed a storm sewer system with smaller pipe sizes. We could not do this with our previous, manual process,” says White.

More Affordable Designs

Greengard engineers estimate that use of Autodesk Storm and Sanitary Analysis Extension helps cut design revision time by approximately 50 percent, enabling Greengard to deliver projects to clients faster and reduce construction costs by approximately 15 percent. “The quicker we can finish the design, the sooner the client can start making money,” says White.

For more information, please visit <http://www.autodesk.com/storm-sanitary-analysis> and www.autodesk.com/civil3d.



Pond and Water feature at Brookwood Farm. Image courtesy of Greengard, Inc.



Storm sewer construction at Brookwood Farm. Image courtesy of Greengard, Inc.

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—Douglas M. White, P.E., DECI
Project Manager
Greengard, Inc.