

Bolton & Menk, Inc.

Customer Success Story

Client: The City of Ramsey, Minnesota

AutoCAD® Civil 3D®

Autodesk® Storm and Sanitary
Analysis Extension

AutoCAD®

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 design.

Ramsey designs storm water and sanitary sewer networks 50% faster.



Typical commercial detention basin and development in Ramsey. Image courtesy of Bolton & Menk, Inc.

Bolton & Menk, Inc. meets aggressive 5 week deadline on citywide storm water management plan with Autodesk Storm and Sanitary Analysis Extension by completing modeling in half the time.

Project Summary

Established in 1949, Bolton & Menk, Inc. provides professional engineering, land development, and surveying services to public clients in the Upper Midwest and to private clients throughout the world. Today, the firm is owned exclusively by its staff of engineers, surveyors, and support personnel, all of whom have a stake in providing the best possible service in the most efficient manner. That's why Bolton & Menk recently adopted Autodesk® Storm and Sanitary Analysis Extension to be their stormwater modeling software of choice. This fully-dynamic hydrology and hydraulic modeling tool enables users of AutoCAD® Civil 3D® software to quickly model and analyze the performance of storm water management plans; sanitary sewer and drainage systems; detention ponds and outlet structures; and more. The firm's first project with the new software was the creation of a storm water management plan for the City of Ramsey, Minnesota, located just northwest of the Minneapolis-St. Paul metropolitan area.

The Challenge

Located at the nexus of two major river systems, the City of Ramsey possessed storm sewer systems capable of handling no more than a five-year storm event. "Most storm sewer networks in Minnesota are undersized relative to the storms that are coming now," says William Douglass, P.E., water resources manager at Bolton & Menk. "Most were designed with no consideration for 100-year flooding."

Upgrading its storm water management plan to accommodate a 100-year event and control water pollution was an ambitious venture, the largest engineering project undertaken by the city in decades. To complete the project, Bolton & Menk had to overcome numerous challenges, including relatively flat terrain, a high water table, and a complex network of existing storm sewer lines, wetlands, ponds, streams, and drainage ditch systems. The firm also had to resolve competing stakeholder demands, and comply with an array of city, county, state, and federal environmental standards.

Autodesk®

Engineers completed modeling in half the time with Autodesk Storm and Sewer Analysis Extension.

Using traditional methods, the engineers would have had to use multiple modeling applications, requiring frequent manual updates whenever they switched applications. “We had one program for ponds and culverts and another for the pipe network and storm sewers,” says Douglass. Additionally, these applications were incapable of exporting data to ArcGIS®, the suite of GIS products the firm used for presentations.

The Solution

After careful evaluation, Bolton & Menk selected the Autodesk Storm and Sanitary Analysis Extension, both for its improved integration with the firm’s design software and its compatibility with numerous hydrology methods, including the EPA’s Storm Water Management Model. “Autodesk Storm and Sanitary Analysis Extension is much more user-friendly, flexible, and powerful than other programs out there,” says Douglass. “It can handle everything from pipe and ditch networks to ponds and wetlands.”

Bolton & Menk imported AutoCAD drawings into this extension, and then separated the city into multiple watersheds, simultaneously modeling scenarios for both 10- and 100-year storm events and creating compelling graphic presentations, such as color-coding the ponds to illustrate risk to local structures.

The extension greatly increased team efficiency on the large 5,000-node project. For example, when the engineers changed an element in one location, all other connected elements adjusted automatically, eliminating the need for time-consuming manual updates in other programs. “It’s a one-stop shop,” says Douglass.

When they completed a project phase, the engineers exported shapefiles directly into ArcGIS for graphical presentation to the extended team and city engineers. “File transfer was seamless,” says Tim Olson, M.S., E.I.T, design engineer at Bolton & Menk. It was also quick, requiring mere hours—compared to weeks using traditional methods. Autodesk Storm and Sanitary Analysis Extension further facilitated collaboration by enabling the city engineers—who acquired a license—to quickly validate and update Bolton & Menk’s work.

The Result

Storm and Sanitary Analysis Extension added substantial value to the project, particularly in helping the team meet the project’s aggressive deadlines. Bolton & Menk modeled the entire citywide storm water management plan in just under five weeks—roughly half the time it would have taken using traditional methods. Both Bolton & Menk and the City of Ramsey plan to use this extension on future projects. “Autodesk Storm and Sanitary Analysis Extension clearly gives us a competitive advantage on most projects,” says Douglass.

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



Storm sewer catch basin intake structure (Neevah casting). Image courtesy of Bolton & Menk, Inc.



Natural classified wetland in Ramsey. Image courtesy of Bolton & Menk, Inc.

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—William Douglass, P.E.
Water Resources Manager
Bolton & Menk, Inc.