

4Site, Inc.

Customer Success Story

AutoCAD® Civil 3D®

Autodesk® Storm and Sanitary
Analysis Software

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

Evaluate storm impacts in real time.

4Site improves accuracy and reduces engineering time.



Civil 3D and Storm and Sanitary Analysis helped to plan and size individual gardens more efficiently saving time. Image courtesy of 4Site, Incorporated.

Project Summary

Based in Huntsville, Alabama, 4Site, Inc. has served clients throughout the southeastern United States for more than 25 years, delivering master planning and land design solutions that balance creativity with the demands of science, technology, and business. At the heart of the firm's design philosophy is a desire to create sustainable solutions that also meet their client's financial objectives. That's why 4Site recently adopted Autodesk Storm and Sanitary Analysis Software (formerly StormNET), a fully dynamic hydrology and hydraulic modeling tool that is closely integrated with AutoCAD Civil 3D, the firm's design software. This Software helps civil engineers quickly test multiple design options and evaluate their impacts in real time—an approach that results in designs that are more sustainable and cost-effective, helping to provide a higher return on investment for the firm's clients. 4Site's first project with the Software was an 85,000-square-foot commercial development project in Madison, Alabama.

The Challenge

The owner hoped to achieve LEED® for Core and Shell certification on this project, which included two office buildings and associated site improvements. Before adopting Autodesk Storm and Sanitary Analysis Software, 4Site had utilized time-consuming, cumbersome, and error-prone approaches—such as the Rational Method and independent Fortran-based programs—to model stormwater projects. Designers initially defined projects in AutoCAD Civil 3D software, but had to alternate between Civil 3D, manual calculations, and non-integrated software until they discovered the optimum pipe sizes by trial and error.

“This approach did not effectively address low-impact development or sustainable design,” says Jerry Cargile, P.E., president of 4Site. “In fact, it really hampered productivity, especially on projects that involved complex stormwater networks and numerous integrated management practices such as bio-swales and rain gardens.” At a minimum, the designers at 4Site needed a solution that included the EPA Storm Water Management Model (EPA-SWMM), a dynamic rainfall-runoff simulation model that would enable them to consolidate all project modeling into Civil 3D.

Autodesk®

Efficiently test multiple design options and achieve more accurate stormwater runoff flow rates.

The Solution

After careful research, 4Site engineers selected the software for its ability to quickly model and analyze stormwater systems containing a variety of elements, including rain gardens, green roofs, retention ponds, and wetlands. “Autodesk Storm and Sanitary Analysis Software integrates easily with Civil 3D and has the broadest capabilities of any stormwater modeling tool out there,” says Cargile. “It truly is a leading-edge application capable of handling any situation we encounter.”

Model the Entire Project with One Application

On the LEED commercial office project, 4Site engineers designed in AutoCAD Civil 3D software and then exported data from the model into Autodesk Storm and Sanitary Analysis, where they performed a variety of tasks. They eliminated the need to develop a conventional storage detention pond and outflow structure, instead specifying the soil types contained in the underlying infiltration layer of the rain gardens, as well as the associated infiltration rates. This enabled them to better manage runoff and infiltration throughout the site and limit the size and cost of the associated stormwater infrastructure.

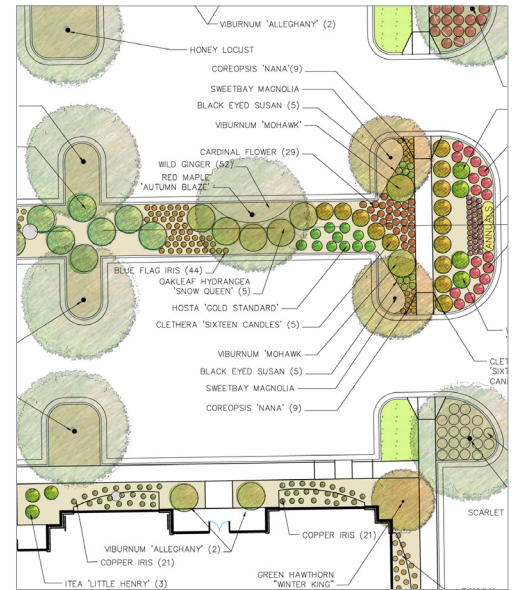
Throughout the design process, the engineers were able to adjust stormwater pipe sizes on the fly, see the impact that various storm events would have on the proposed system, and then make adjustments in real time. “With Autodesk Storm and Sanitary Analysis Software, we can model the entire project as a whole instead of in parts,” says Jackie Whitaker,

project manager at 4Site. “It handles flow calculations and hydraulic grade lines, and enables us to update pipe sizes—all within the Autodesk Storm and Sanitary Analysis, in a single step, and without lengthy manual calculations.”

The Result

The project achieved LEED Gold Certification, and at project’s end 4Site determined that Civil 3D and Autodesk Storm and Sanitary Analysis had helped its designers more efficiently and accurately model the stormwater runoff flow than was possible with any previous modeling approaches, while also providing the documentation necessary for validation of the LEED credits. “We see more accurate flows with Civil 3D and Autodesk Storm and Sanitary Analysis because the level of detail is much higher,” says Whitaker. The resulting designs are also more cost-effective and are completed faster. “We saved at least a day’s worth of time and had more time to pull our designs into a complete package.”

Ultimately, this approach increased efficiency and flexibility, as well as improving productivity and client satisfaction. “Autodesk Storm and Sanitary Analysis enables us to model more efficiently and greatly improves our QA/QC by limiting manual input and eliminating the use of non-integrated software,” says Cargile. “It provides a seamless transition from model to final construction documents, and makes sharing our designs with the client and local governing agencies easier and clearer.”



4Site illustration – eastern portion of central parking. Civil 3D and Storm and Sanitary Analysis helped to accurately model infiltration of rain water. Image courtesy of 4Site, Incorporated.

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

Image concentrates on the median gardens between the 2 buildings on the site. Image courtesy of 4Site, Incorporated.



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—Jackie Whitaker
Project Manager
4Site, Inc.