COMPANY
4Site, Incorporated

LOCATION
Madison, Alabama

SOFTWARE
Autodesk® AutoCAD ® Civil 3D®
Autodesk® Storm and Sanitary Analysis

Evaluate storm impacts in real time

4Site improves accuracy and reduces engineering time

With Autodesk Storm and Sanitary Analysis, we can model the entire project as a whole instead of in parts. It handles flow calculations and hydraulic grade lines, and enables us to update pipe sizes—all within the software, in a single step, and without lengthy manual calculations.

—Jackie Whitaker
Project Manager
4Site, Inc.

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 tools (formerly StormNET), a fully dynamic hydrology and hydraulic modeling tool that is closely integrated with Autodesk® AutoCAD® Civil 3D® software, the firm's design choice. 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, 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 Civil 3D, 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.

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

The solution

After careful research, 4Site engineers selected the solution 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 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 Civil 3D 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, 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 Autodesk Storm and Sanitary Analysis, in a single step, and without lengthy manual calculations."

Median gardens between the two buildings on the site. Image courtesy of 4Site, Incorporated.

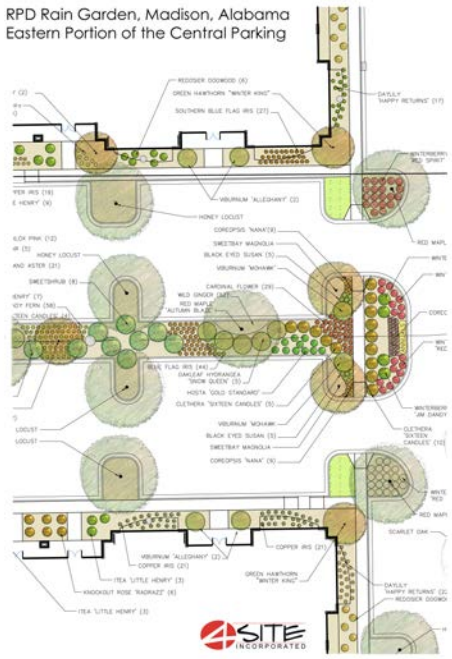
The result

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."

To learn more about BIM for Civil Infrastructure, visit, **www.autodesk.com/industry/civil-infrastructure or www.autodesk.com/civil3d.**

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. 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.

—Jerry Cargile, P.E.
President
4Site, Incorporated



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.

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