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## PLANT 3D MODELING BETTER QUALITY AND EFFICIENCY IN CONSTRUCTION DRAWINGS

Michigan communities are now reaping the benefits of new construction project drawings in three-dimensions.

The added dimension, using AutoCAD Plant 3D, adds three-dimensional (3D) models, including piping, equipment, and support structures.

The City of Mackinac Island is using 3D modeling on designs for a major wastewater treatment facility (WWTF) improvement project.

"In 3D, it is much easier to see things like the clearance of an overhead pipe, the clearances around equipment for maintenance access, and you get a feel for the functional space of a room," said Allen Burt, City of Mackinac Island's Department of Public Works director. "This heads off issues that may not be seen clearly by staff until construction is well underway."

### WHAT IS PLANT 3D AUTOCAD?

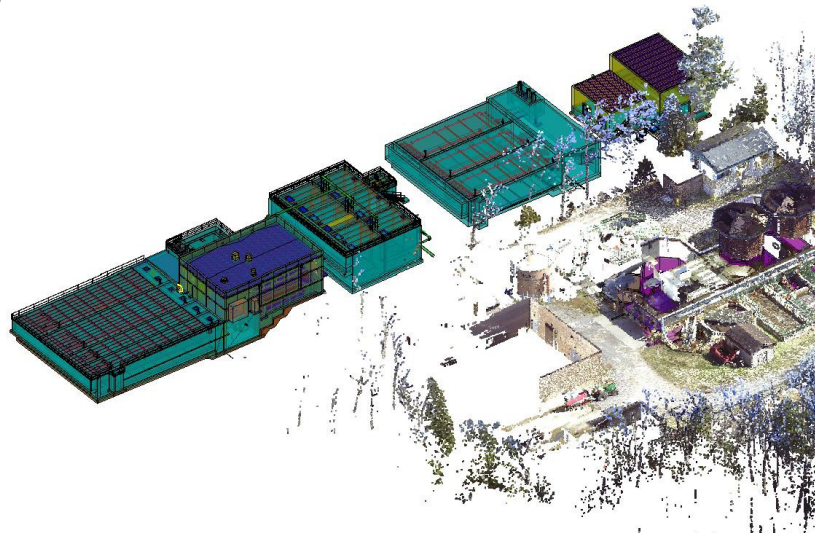
Plant 3D is an Autodesk software toolset targeted to the design and layout of process plant facilities. Using this tool designers can create and modify every detail of a product, part or assembly, and can streamline the placement of piping, equipment, support structures, and other design components.

Although 3D has been around for a while, it's relatively new to the civil and process engineering world. By building construction designs in 3D, designers can immediately see things that would not normally be noticed until the construction phase. City officials can also see the 360-view before construction and are able to have a deeper understanding of the proposed project.

Better quality and details in construction drawings can head off conflicts/issues before they occur in the field and can save communities time and money.

"A major benefit of 3D modeling is a greatly reduced need for on-site visits," Burt said. "Due to our remote location and very limited winter travel options, site visits can be difficult and sometimes impossible. This is the second project we have undertaken using LIDAR 3D scanning as a design aid method. It has proven to be successful and well worth the cost and effort."

LIDAR known as Light Detection and Ranging is a form of data collection from equipment using sensors that detect reflections of a pulsed laser beam. These reflections are collected and recorded as millions of individual points in a group file or Cloud. This file represents 3D positions of all recorded points.



LIDAR or Point Cloud surveying produces a 3D point model. Through these points, the Plant 3D or Civil 3D designer can produce precise locations of existing piping and structures, creating a more accurate base than produced from record drawings, potentially saving on production time as well.

F&V used 3D LIDAR scanning last year to complete a state and national award-winning American Council of Engineering Companies (ACEC) survey of Mackinac Island's treatment facility, and is finalizing Plant 3D designs for a new wastewater treatment facility.

"3D designs are of immense value to non-technical stakeholders like board or council members," Burt said. "For those not used to interpreting 2D schematics, standard design drawings can be a poor tool for project explanation.

"With a 3D scan, and the easily manipulated drawings that come from this technology, site maps and project details become more real to the people holding the purse strings and the regulatory agencies. This leads to better communication of needs and function, and a better final product for everyone."

What is put together in the 3D model is a major help in the understanding of the project and design intent for all members of the team.

If you would like to learn more about F&V's Plant 3D modeling designs and software programs, contact John Ensley at [jensley@fveng.com](mailto:jensley@fveng.com) or call 616.369.8165.

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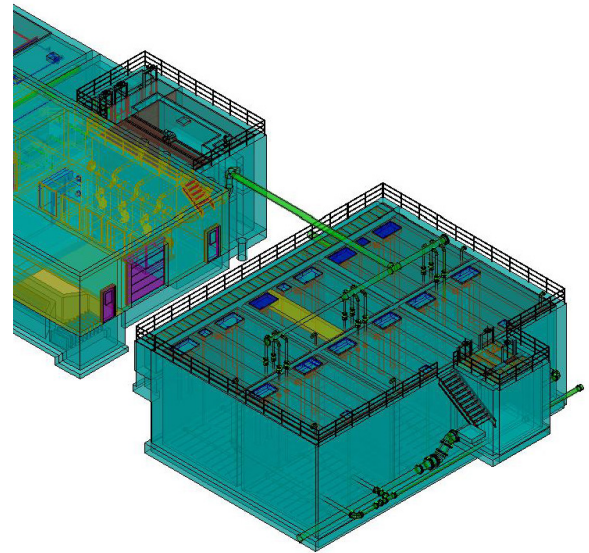
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– Allen Burt, City of Mackinac Island's Department of Public Works Director

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