

Stantec

Customer Success Story

AutoCAD® Civil 3D®

Autodesk® Revit® Architecture

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People are starting to understand that BIM can really help with the spatial analysis of infrastructure projects. BIM and Civil 3D have definitely given us a competitive advantage. They are the future.

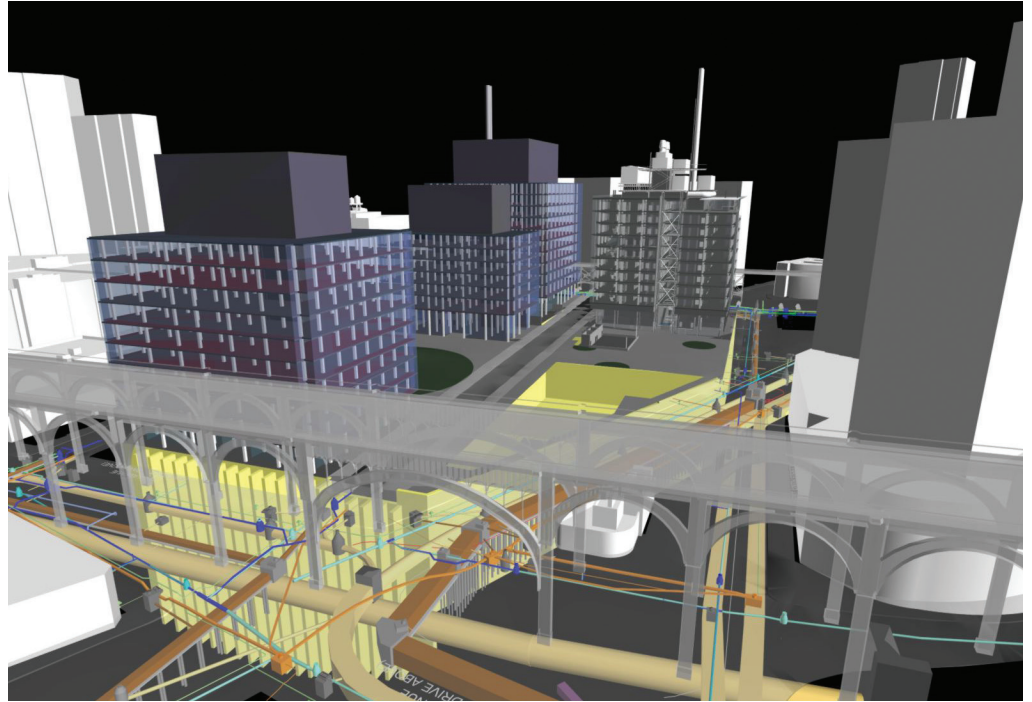
—Eric Smith
Project Manager
Stantec, New York

The AEC industry is finally beginning to realize that the civil design portion of BIM has been essentially overlooked, focusing mainly on architecture and building design. Now there is an increasing need to incorporate transportation, site, and infrastructure design into a total BIM package.

—Robert Spinale
BIM Coordinator
Stantec, New York

Underground Advantage.

With help from Autodesk BIM for Infrastructure, Stantec gains deep competitive advantage.



Project view looking towards 12th avenue and 125th street.
Image courtesy of Stantec.

Project Summary

In 2007, Columbia University initiated work on the Columbia Manhattanville project, a 17-acre mixed-use center in the Manhattanville manufacturing zone of West Harlem in New York City. When complete, the proposed project will encompass more than 6.8 million square feet of space for teaching, research, recreation, and the arts, as well as underground parking, waterfront parks, and new facilities for civic, cultural, and commercial activity. One of the design firms selected by Columbia was Stantec. “We were tasked with infrastructure design, approvals, and coordination in support of the project’s parks, public spaces, and below- and above-grade facilities,” says Eric Smith, project manager at the Stantec New York office. One of the firm’s most important tasks was the creation of a 3D model illustrating the project’s existing and proposed below-grade facilities. To overcome challenges related to this task, Stantec felt it was important to use Building Information Modeling (BIM)—an intelligent 3D model-based process—and turned to AutoCAD® Civil 3D® and Autodesk® Navisworks® Manage software for help creating the model, as well as improving collaboration and coordination.

The Challenge

The Manhattanville project is tremendously complex, with numerous challenges, including a multidecade delivery schedule, widely varying site elevation, and a labyrinth of below-grade pedestrian hallways, mechanical spaces, and classrooms that require precise coordination. Although Stantec had used BIM on previous projects, the firm’s New York office had never used BIM on an infrastructure project, let alone one of this magnitude.

Columbia initially tasked Stantec with the design of two large infrastructure components, both of which had to be completed before other work could proceed. The first involved relocating a complex sewer system beyond the site’s limits. The second, now under construction, involved separating the University’s sanitary and storm systems. Once these projects were underway, Stantec also began design work for the grading, first-phase buildings, park entrances, public crossings, and esplanades. Deliverables included both 2D design documents and intelligent 3D models.

Autodesk®

With help from Navisworks, the project team integrated information from all disciplines into a single, integrated model.

The Solution

Stantec used AutoCAD® software to create 2D design documents for the two initial infrastructure projects, as well as for the subsequent phase-one design effort. These 2D designs were then used as the basis for the Civil 3D model. “We also incorporated utility company record drawings, a standard survey, and a laser scan of most of the project’s perimeter,” says Smith. For help getting up to speed with Civil 3D and Navisworks, Stantec consulted Microsoft Resources, an Autodesk Gold Partner and Authorized Reseller.

AutoCAD Civil 3D software proved highly valuable as a modeling tool. “From an infrastructure point of view, almost nothing below-grade was standard,” says Tom Sergi, CAD manager at Stantec. “We had to build a whole library of parts for every single below-grade structure, including all pipes and conduits, chambers, and valves. That was quite a challenge.” Using the Parts Builder functionality in Civil 3D, Stantec created all necessary components and integrated them into the model. “The results were thoroughly impressive.”

Project team members used a variety of model-based solutions, including Autodesk® Revit® Architecture, Autodesk® Revit® MEP, and Autodesk® Revit® Structure software. With help from Navisworks Manage, the team combined all the models into a single, integrated project model,

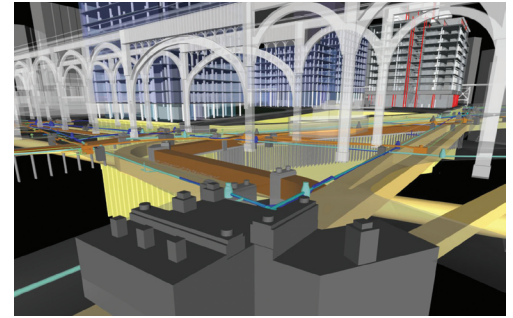
which was useful to help visualize the entire project and for clash detection. “In the integrated 3D model, it is easier to discover areas that could have been problematic during construction,” says Sergi. “That helps us deliver a better-quality design, because we can more clearly see how everything connects before construction starts.”

The Result

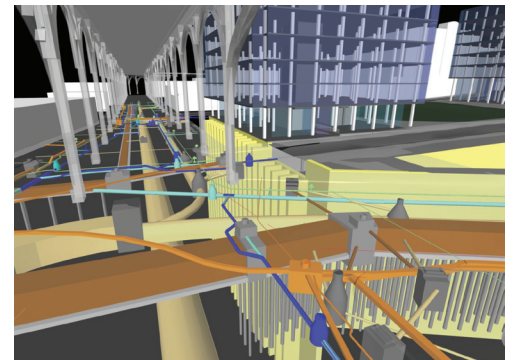
“We’ve achieved our goals on the project so far,” says Smith. “But the model is a work in progress that will continue to grow until the end of the project.” Going forward, Stantec hopes to create a comprehensive parts database that will enable all team members to work from the same library and help accelerate project completion on future projects.

Before adopting Civil 3D, Stantec typically delivered 2D plans for these types of infrastructure projects. “Now we can show our clients the complexities of a project in three dimensions,” says Smith. The firm’s success on the Columbia Manhattanville project has attracted a number of inquiries from potential civil engineering clients. “People are starting to understand that BIM can really help with the spatial analysis of infrastructure projects. BIM and Civil 3D have definitely given us a competitive advantage. They are the future.”

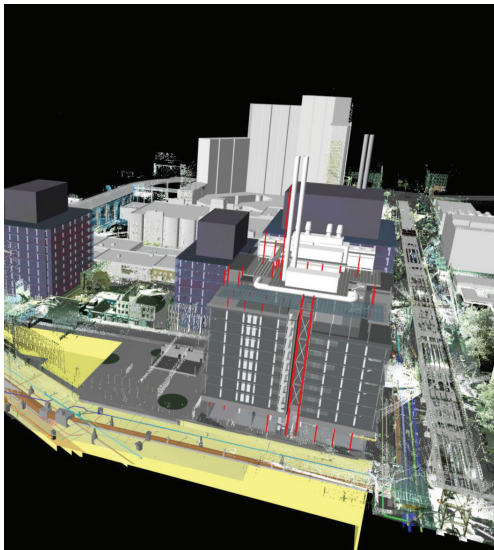
For more information, visit www.autodesk.com/civil3D and www.autodesk.com/bim.



Complex regulator chamber created in Civil 3D Part Builder. Image courtesy of Stantec.



View showing the complexities of subgrade utilities. Image courtesy of Stantec.



Overall project view including laser survey points. Image courtesy of Stantec.

In the integrated 3D model, it is easier to discover areas that could have been problematic during construction. Anyone can understand it—especially people who have no idea at all how to interpret a 2D drawing.

—Tom Sergi
CAD Manager
Stantec, New York