

INDUSTRIAL WORK

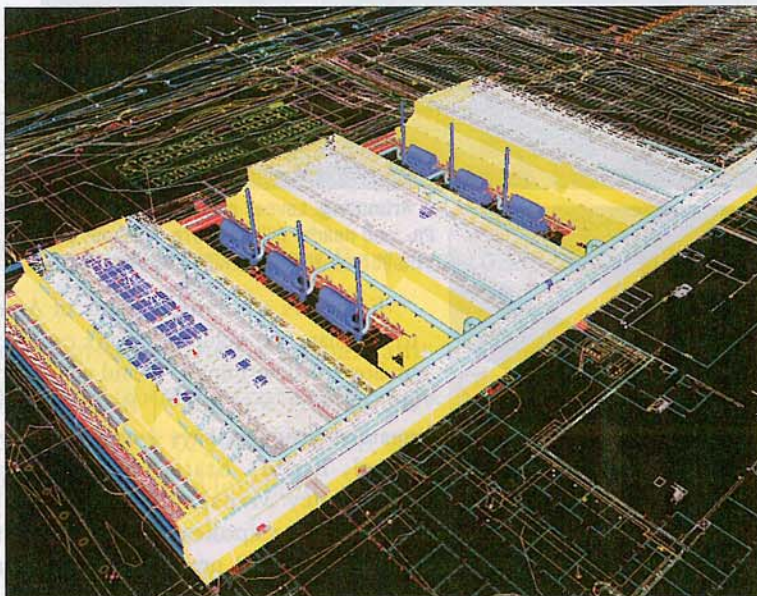
Automotive Giant Commits New Projects to 3D Modeling

After a period of step-by-step developments, General Motors Corp. announced June 28 that it is committed to using 3D collaborative design and construction coordination for all facilities renovation and construction.

"Designing and building facilities this way allows GM to be more flexible in adjusting to the ever-changing vehicle market," explains Jim Wiemels, vice president and general manager for GM Manufacturing and Engineering. He says the approach has proven itself by helping the company build faster, better and safer and with less cost and risk. August Olivier, director of capital projects, adds, "We're going to do all of our work in 3D from now on."

The Detroit-based company did not release construction budget information, but it manufactures vehicles in 34 countries at 170 facilities. The road to 3D has been a studied one. GM has been preparing for the shift to what it calls "math-modeling design" for several years. It considers it an extension of the process by which it moved product design and engineering, then production process engineering, into 3D collaborative design.

GM's first 3D plant design and construction project was the design-build, 1.7-million-sq-ft Lansing Delta Township plant, completed last year. "We were working on 3D before LDT," says John Hallman, director of the manufacturing construction management group. "We called it 'virtual factory' at the time." The plan was to build the plant virtually, in



▲ **Lab.** Drive train lab in Pontiac, Mich., is one of six new 3D projects that GM has under way.

3D and resolve all interferences in the design of the structure and mechanical, electrical and plumbing systems before construction. In the end, 11,000 conflicts were resolved. Alberici Group, Livonia, Mich., was the contractor and GHAFARI Associates LLC, Dearborn Mich., was Alberici's 3D modeling partner.

Before LDT was finished, GM started a fresh design-build project, a 435,000-sq-ft engine plant in Flint, Mich., building on the LDT experience. The contractor, Ideal Group, Detroit, partnered with GHAFARI as architect-engineer and construction coordinator. Again, the plant was first built virtually, and 4,000 interferences were resolved.

Building on those two projects, GM says it has six 3D collaborations under way, with two contracting arrangements. Three projects are design-build with Ideal and GHAFARI.

In Fort Wayne, Ind., the team is finishing a 287,000-sq-ft addition to an assembly center. In Pontiac, Mich., GM is

adding 40,000 sq ft to an assembly center. It will be completed this month.

The third project is mobilizing. It is a mixed, 750,000-sq-ft project to add production at the Powertrain Toledo transmission plant. About 475,000 sq ft is new and 275,000 sq ft is renovation. Completion is expected by August 2007. On June 28, GM construction executives met with GHAFARI to move the Toledo model to 4D by adding scheduling to the mix.

Two more projects are using 3D collaboration in a design-bid-build business structure. One is renovation of 100,000 sq ft at the Powertrain Warren transmission plant in Michigan. The multiple-stage project will be completed over several

years. The first two phases were planned and executed conventionally, but the third phase, bidding now, is going with 3D and collaboration. For this project, GM has engaged Giffels Inc., Southfield, Mich., as the architect-engineer responsible for managing the collaboration with contractors. The project should be completed by June 2007.

The other design-bid-build project is at the Fairfax Assembly Center in Kansas—a 150,000-sq-ft addition to the body shop. Completion is scheduled for April 2007. The general contractor is locally based Commercial Contracting Corp., teamed with architect-engineer FES Group LLC, Detroit. With distributed partners, the project will test bed for communications and collaboration tools.

GM's sixth 3D project is a Powertrain Test Lab Consolidation project in Pontiac, Mich., which is a consolidation of powertrain test facilities. It involves 75,000 sq ft of renovation and 625,000 sq ft of new construction. It is scheduled for completion in the second quarter, 2008. ■

By Tom Sawyer in Detroit