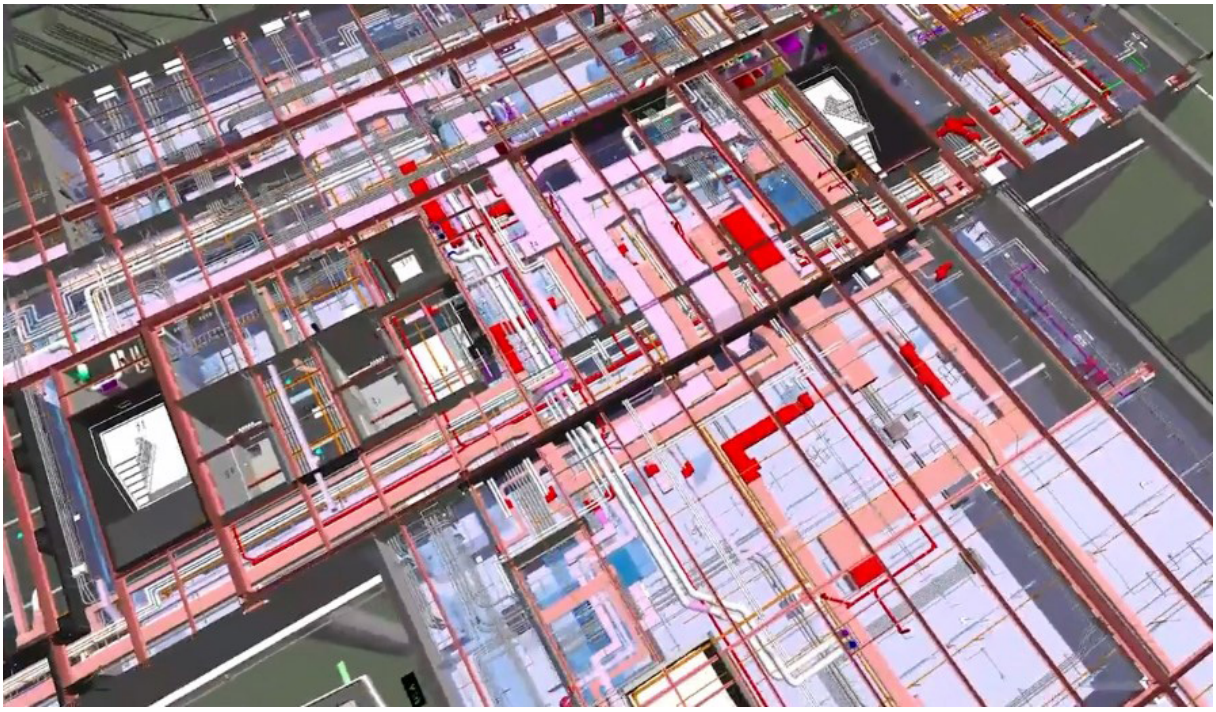

The final deliverable is a comprehensive and accurate model of as-built conditions for the entire building.

Heroes of the Erie Insurance Building Project

'*Complex*' understates the mechanical requirements. Fortunately, this contractor held a pair of aces.

Situation

The mechanical requirements for the new 346,000 square foot, $135 million Erie Insurance office building are, to put it gently, challenging.

The sprawling seven-story glass and brick structure is designed for 1,200 employees, helping support the insurer's rapid growth. The new structure links two existing company office buildings. In effect, the massive new building forms a bridge, creating an interconnected trio.

The scope of work for the mechanical system is particularly impressive. A partial list of the mechanical and plumbing requirements includes:

- 3 chillers
- 3 boilers
- 450+ variable air volume units
- 3 computer room dry coolers with 24 terminal units
- Snow melt and radiant heat system
- 23 pumps
- 200 drains
- 150 plumbing fixtures
- Miles of pipes and conduits

The task of designing, fabricating, and installing this elaborate infrastructure fell to Wm. T. Spaeder, a family-owned and operated western Pennsylvania mechanical contractor.

Challenge

"*Ten pounds in a five-pound bag.*"

The observation is Spaeder project manager Mike Skrekla's simple summary of the tall task before them.

To minimize field labor and time, the early decision was made to virtually build the mechanical and plumbing systems through BIM (building information modeling), then use BIM to prefabricate nearly everything off-site, down to the last bolt. Spaeder tradesmen would follow the model and snap everything up on-site. "No fabrication in the field if we could help it," Skrekla says.

Ground zero for the assembly process was actually two locations, the basement and the mechanical room penthouse. Virtual design allowed the team to choreograph complex arrangements in the field with speed and confidence ... with a proviso. "When you're building completely off the model being even off a fraction of an inch with a large diameter pipe can get you in trouble," say Skrekla.

The basement, for example, was "... very challenging," according to Skrekla. "They had three chillers and three boilers, along with all the associated piping like 14-inch pipes. It required heavy coordination."

Solution

Fortunately the Spaeder team had an ace up their sleeve: a pair of FARO® Focus Laser Scanners. Years earlier the company had determined the only way they could compete for complex jobs like the Erie Insurance project was a foolproof way to check as-built conditions on-the-fly with their own scanning capability.

Frankie Davis, Spaeder senior BIM coordinator, says laser scanning "... enables us to quickly ascertain if there is an issue in the field. What needs to move and what's the most efficient way to do it? That knowledge makes or breaks a project." Laser scanning is an integral part of the Spaeder workflow.

The Erie Insurance office building virtual model was designed on Autodesk® Revit®. That 3D model was the basis for spool drawings of the piping, which was then fabricated in Spaeder's off-site fab shop. Fabbed parts and pieces would then be delivered as needed to the jobsite for assembly. Spaeder laser scanning teams then scan as-built conditions.

Morgan says they performed scans at many different locations in order to create a comprehensive point cloud (a laser scanner generates millions of precise points of light to create images). "I bring an SD card back to the office and offload the data into one of two applications that we use, like FARO SCENE software. That's probably the most advanced application there is, as far as meshing all the scans together.

To accurately capture conditions at the Erie Insurance headquarters, mechanical contractor Wm. T. Spaeder turned to the FARO Laser Scanner.

"Once a scan is fully registered, we verify everything to make sure it's just-so and export it into a useable file like ReCap® from Autodesk®. We bump that reality capture up against the model and determine, 'That's exactly where we need to be' or 'We need to move this here.' Laser measurements are super- accurate," Morgan explains.

Because of Spaeder's scanning capabilities, the owner also requested a final deliverable: An extremely comprehensive imaging of all as-built conditions. In effect, a "point cloud data archive" that would serve as an immutable point of reference for any future structural work on the building. "Everything is scanned and documented down to the last bolt," says Morgan.

Results

The new Erie Insurance office building is expected to deliver in 2020 and has already emerged as a "... focal point for the city," reports Skrekla. "It's the centerpiece of downtown Erie."

As for Spaeder's contribution to the project, the team is pleased and delighted that their mechanical and plumbing systems fit like a charm.

"Laser scanning isn't an option anymore," concludes Skrekla. "It's essential, especially with the way buildings are built today and the coordination required. You really are able to build virtually and see what's in front of you and what you need to avoid. You save so much manpower and time being able to nail those fabbed connections."

For More Information

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