

Trimble MEP

CASE STUDY



Midwestern Electrical Contractor Leverages BIM for Underground Connections

When Vallourec, a manufacturer of tubular solutions for the energy market, rolled out plans to construct its \$650 million steel-rolling pipe mill, it asked its project team to take full advantage of today's advanced collaborative technologies to facilitate efficient design, construction and lifecycle mill operations and maintenance.

Little did Vallourec realize how significant its request would prove to be as construction was about to begin.

On the eve of groundbreaking, the project team determined that the nearly 200,000 feet of underground embedded conduit needed to be redesigned and re-routed for greater efficiency. Mascaro, the general contractor on the foundations for the pipe mill project, called in Valley Electrical Consolidated, Inc. (VEC), an electrical contractor (Youngstown, Ohio), to drive the last minute change.

VEC had begun its transition to building information modeling (BIM) tools and techniques for the office and in the field several years prior--and quickly found a way to leverage its expertise to keep the pipe mill project on track.

Digital edge

VEC is among the first electrical contractors in the Midwest to make the shift to BIM for electrical design and construction. The firm began its transition in mid-2009 with the purchase of Autodesk Revit MEP Suite. As part of that shift, the firm also looked into other BIM-enabled solutions.

Several members of VEC's executive team were attending a National Electrical Contractors Association (NECA) conference in 2009 and had an opportunity to see a Trimble MEP layout solution demonstration by Trimble. It seemed to VEC that mechanical and plumbing contractors and some electrical contractors were gaining great value in using the Trimble MEP layout solution to drive BIM to the field. In fact, many mechanical and plumbing contractors rely on the MEP Layout Solution to transfer design data to the field to locate pipe and duct hangers, sleeves and other apparatus.

An electrical engineer's field activities are similar in terms of the need to eliminate the traditionally manual activity of locating points for activities such as positioning stub ups quickly and accurately.

The VEC vice president brought back a unit (Trimble MEP) and challenged his Virtual Systems Coordinator Adam S. Davis, to incorporate the system into the firm's ongoing BIM initiative.

Davis says, "Turns out, the Trimble MEP layout solution is a natural fit to the BIM process, and would prove invaluable on the mill project."

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Conduit connections

For Vallourec's mill project, VEC was provided PDF drawings of the site. Davis completed the partial redesign of the underground system in Revit MEP. Once the design was complete, Davis transferred the 3D geometry to AutoCAD, added the conduit points and then downloaded those points to the Trimble MEP layout software.

Davis explains, "Typically, we'd have had to use the traditional method of string lines and tape measures for this job instead of the Trimble MEP layout solution. That would not have worked effectively in most areas of this project due to the congestion on site and the span that the strings would have to run (60-ft - 90-ft). Also, much of the embedded conduit was deeper than 10-ft below rough grade and plumb bobs would have been used as an additional layout tool."

With the Trimble MEP layout solution, Davis was able to locate and paint excavation ditches for the conduits. Once the crews finished digging the ditches, he would return to the site and spot the conduits.

"Each template might have 20 conduits, and I need to spot four points for each template," says Davis. "The field unit sped this process up considerably. I've virtually eliminated the tedious manual process of string and line. We were able to layout between 80-90 points in a good day for a total of approximately 2,500 points on the project thus far."



In addition, the availability of the Trimble unit allowed VEC to use a one-person crew, rather than two or more, to layout and verify all conduits regardless of elevation/position.

"The ability to keep areas we were working in open to other trades also allowed the project to move along more smoothly," he adds.

The embedded conduit is about 90% complete for the "Pipe Mill" area. Additional contracts for the "Finishing Mill" will be released for bid soon.



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Since the Vallourec mill project began, VEC has used the Trimble MEP layout solution on several other projects including Southington Schools and multiple commercial facilities. Adam concludes, "Internally, we've developed a speedy and accurate BIM driven process that will continue to provide value to our clients. We continue to look for greater connections between our digital design data and the rest of the project team, in the form of coordination, clash detection and lifecycle facility management. We believe those connections will continue to emerge as the overall industry realizes the advantages derived from advanced collaborative tools."

Adam S. Davis is the Virtual Systems Coordinator for VEC. With a background in precast/mechanical systems design, he coordinates all digital systems for the company. He represents NECA with the buildingSMART Alliance, a council of the National Institute of Building Sciences and serves on the National BIM Standard (NBIMS) planning committee.