

## Verity Helps Beck Keep the Water Flowing at Hospital by Finding Pipe Installs Improperly Documented

**BECK**

### Verity Updates As-Built Documents for Plant Room

The Beck Group ensured that the owners of a renovated hospital received accurate as-built documents by using new construction verification software from ClearEdge3D to find pipes that hadn't been installed according to the design plan. Beck used the new Verity construction verification software to analyze laser scans of the plant after renovation in order to provide more accurate as-builts of the renovated space.

### The Project: Central Utility Plant at a Texas Hospital

The Beck Group, an interdisciplinary architecture and construction firm based in Dallas, was wrapping up a major MEP renovation at a central utility plant (CUP) in a Texas hospital. More than 1,000 mechanical, electrical and plumbing (MEP) elements had been installed during the project. At the end of the project, Beck decided to compare the as-built conditions in the plant to the design model to flag any deviations. The firm's Virtual Design & Construction (VDC) team was called in to scan and analyze the data.

#### The Challenge:

##### Limited Time in a Densely Packed MEP Space

The plant included 10,000 square feet of floor space tightly packed with conduit and pipe runs serving the hospital floors above. Beck spot checked the as-built locations and

positions of the major features with TotalStation and tape measures but found that workflow to be time

consuming. The firm opted to perform additional 3D laser scanning in the space as a proactive measure to verify all the CUP elements.

#### The Solution

##### Verity Construction Verification Software

Beck had been working with ClearEdge3D as a beta tester of a new automated construction verification software called Verity and decided to deploy it on the hospital CUP. Verity analyzes laser scan point clouds of recently constructed work and compares them against the design or fabrication models

to determine the accuracy of the as-built elements. Out-of-tolerance work is highlighted including specific

*"We went into this as a beta demonstration not expecting any actionable information, but Verity helped ensure we turned over good information to the hospital owner to maintain and operate the building."*

- Kelly Cone, Director of VDC  
The Beck Group

details on installation variances, rotation errors, twist, and sag.

## The Workflow:

### Laser Scan Point Cloud and Verity

Beck's VDC team collected 13 scans in two hours inside the CUP, even as workers completed renovations. The scans were registered and loaded into Navisworks along with the design model. Verity pulled more than 1,000 MEP elements from the Navisworks model and analyzed them to a tolerance of one inch.



*Verity's "stop light" variance classification gave Beck a quick overview of construction quality.*

Verity found that many of the water pipes smaller than six inches were not installed within the location parameters of the coordinated model. Beck's VDC teams investigated and discovered the pipes were often installed several feet from their locations in the design plans and as-built drawings. This was not a mistake; the pipe installers had found a more efficient way to

route the pipes and install the valves once they were onsite. However, the subcontractor hadn't marked the changes on as-built drawings and Verity was able to provide a more accurate as-built of the renovation.

## The Results:

### Verity Helped Beck Deliver 100% Accurate As-Built to their Owner

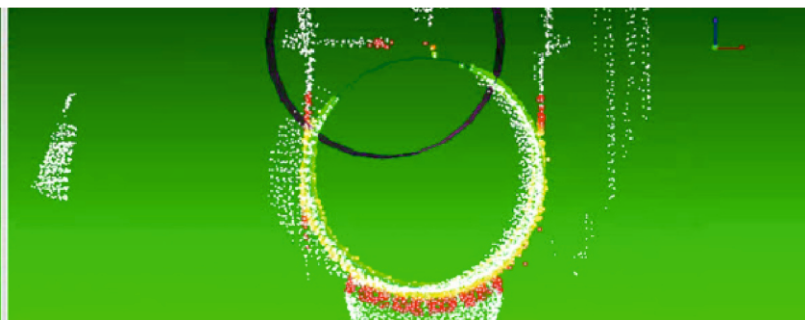
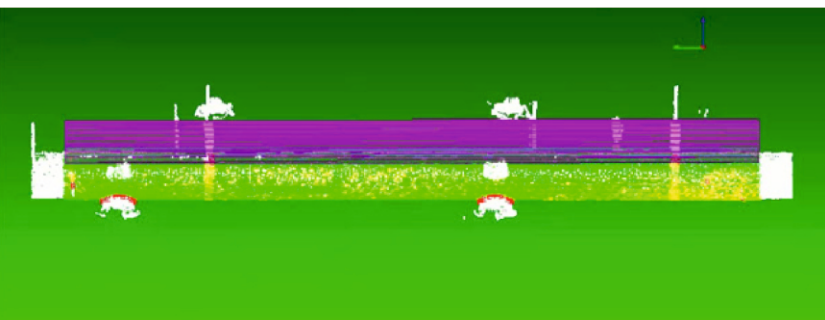
In addition to a written tabular report showing element deviations, Verity generated a color-coded schematic of the site in Navisworks. Beck queried each feature in the report and found that most steel, HVAC and sprinkler members were within the designed location tolerance.



## The Conclusion:

### Verity Helped the Hospital Owner Get 100% Correct As-Built Drawings

As with many as-built spot checks, the work focused on a small percentage of the larger pipes, which were within reasonable tolerances to design. Verity, however, examined the locations of every element in the central utility plant, finding that the smaller water pipes were not located where they were shown on the as-builts. Beck required subcontractors on the project to create new as-built drawings and submit them to the general contractor and the owner at no additional charge.



*Verity works on all scopes of work including MEP, steel, concrete, walls, and more.*



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