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CASE STUDY: REALITY CAPTURE FOR AS-BUILTS

TL Circle

THE CHALLENGE:
Optimize BIM modeling in Revit for complex construction projects, reduce time spent on measuring and creating as-builts

THE SOLUTION:
Matterport scanning 60% faster than hand measuring, point clouds speed up Revit modeling by 40%

THE RESULT:
Field to finish in 50% of the time, enables TL Circle to offer competitive pricing 30%-40% Below previous rate

"Matterport has helped cut my field to finish time in half. I'm excited to leverage this new tool to improve the BIM modeling process."

- *Aryn Bergman, Owner of TL Circle*

TL Circle cuts field to finish time by 50%, enhances BIM modeling process in Revit with Matterport point clouds and visuals

The Challenge

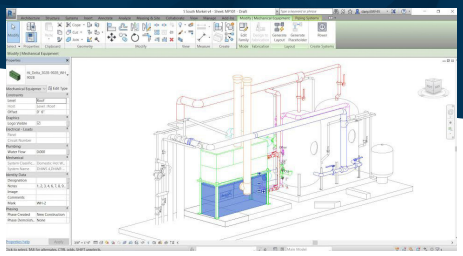
OPTIMIZE BIM MODELING IN REVIT FOR COMPLEX CONSTRUCTION PROJECTS, REDUCE TIME SPENT ON MEASURING AND CREATING AS-BUILTS

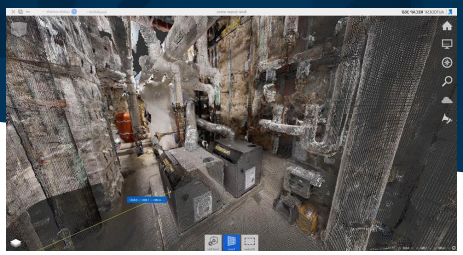
Aryn Bergman, lead engineer and founder of TL Circle, is frequently confronted with complex engineering projects requiring days of laborious, time-consuming BIM modeling in Revit, usually from hand-drawn measurements, notes and photographs. One project he recently completed involved a complicated MEP room of a high-rise apartment building in which the domestic water heater needed to be retrofit. Hand measuring the boiler room - from wall to pipe, from pipe to pipe, floor to ceiling, floor to pipe, etc. - would take 4-5 hours for a contractor to accomplish, and 4-5 days for an engineer to model in Revit, as well as potential additional follow on site-visits.

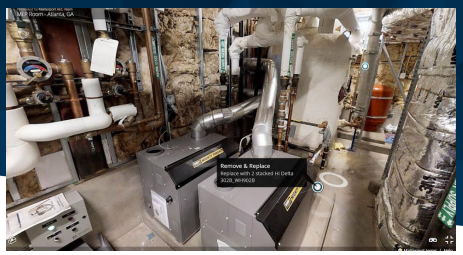
Bergman also knew traditional laser scanning (e.g. with a Leica system) in such a complicated and tight space would require a large number of scan positions. Laser scanning would also take longer than manual measurements in addition to the time required to register the point clouds and still require hand modeling. Finally, acquiring a laser scanner would add a significant unnecessary, expense to his budget. So he began searching for new tools which would make modeling the MEP room more efficient, without adding additional time or cost to the budget.

Key considerations:

- Manual measurements for modeling as builts represent a significant time expense per project
- New tool needed to simplify and expedite the modeling process
- New tool required to sync with current Revit/ReCap workflow







TL Circle

ABOUT

TL Circle is a mechanical engineering firm operating out of San Francisco, CA, which services the Bay Area. TL Circle's primary focus has been on commercial construction projects, specifically data centers. Their typical project size ranges from 10,000 sq ft to 600,000 sq ft. They have been in business for 10 years.

COMPANY PROFILE

- Energy Analysis
- BIM Consultancy
- Data Center Specialization
- Founded by Autodesk Building Industry
- Subject Matter Expert

TYPICAL PROJECT:

- 10,000 sq ft to 600,000 sq ft
- $10K-25k

The Solution

MATTERPORT SCANNING 60% FASTER THAN HAND MEASURING, POINT CLOUDS SPEED UP REVIT MODELING BY 40%

With the Matterport Pro 3D Camera, Bergman was able to capture a medium-density single registered point cloud (200 MB) of the MEP room in under an hour. Because he wanted to double check the accuracy of the point cloud, he still took the time to manually hand-measure the MEP room, which took him approximately 2-3 hours to accomplish. Once he had the point cloud, he was able to upload and index it in ReCap to view 3D model. He did this to retain the colorization of the point clouds, as importing Matterport point clouds directly into Revit can remove the colorization of the points.

From there, Bergman saved the ReCap file and imported it directly into Revit to model on top of the 3D structure. When he compared the point cloud data to his hand-taken measurements, he found they were accurate up to the centimeter. With similar projects, modeling in Revit with hand measurements would have taken 4-5 days to trace over the as built. With the point cloud, it took him 2. Due to the accuracy of the point cloud, measuring in the future will be minimized, cutting his time spent measuring by 60%. And since the point cloud is delivered from Matterport as a single, fully registered point cloud there is no time spent manually registering the data to get a final point cloud.

Modeling time in Revit was decreased by 40% which was also expedited by his 24/7 access to perfect, immersive visual references to the job site. This reference material is immediately at hand without having to manage any image files. And modeling with both an accurate point cloud and visuals is the key to modeling efficiency.

Bergman frequently will go back to the job site to visually confirm that the Revit model matches reality. With the Matterport 3D Showcase he no has a need to go back on site to confirm that the existing conditions were modeled correctly, removing as much as a day's travel from his schedule.

The Result

FIELD TO FINISH IN 50% OF THE TIME, ENABLES TL CIRCLE TO OFFER COMPETITIVE PRICING 30%-40% BELOW PREVIOUS RATE

The typical price for building a BIM model of a MEP boiler project like this would be approximately $10k, but with the optimized modeling process, the price drops to $5K-6K. Bergman estimates that the field to finish time for projects is cut in half when compared to projects done with manual or laser system. By expediting the process, Bergman is able to offer more competitive prices, which has opened him up to new markets as well as increase wages for his employees. Other projects completed without the Matterport system had approximately 70% more inconsistencies with their as builts. With Matterport, that number was reduced to nearly 0.

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