CUSTOMER STORY

Trimble Helps Mortenson/Scull Streamline Workflows and Improve Quality Assurance

Improve work efficiency and safety by visualizing conflicts between planned and installed conditions in real time with Trimble X7 3D Laser Scanner and Trimble FieldLink™

overview

Located in Minneapolis and grounded in the community for 60 years, Mortenson is known as a construction organization built on strong values. After years of relying on a combination of manual methods and laser scanning to capture measurements in the field, Mortenson purchased a Trimble X7 3D laser scanner powered by Trimble FieldLink construction layout and scanning software. Mortenson partnered with Scull Construction to build The Monument, a new 250,000 square-foot indoor arena in Rapid City, South Dakota. The combined entity, Mortenson/Scull, used Trimble's field hardware and software solutions to accelerate and streamline the workflow to allow field workers to visualize conflicts between planned and installed conditions in real time. Teams are now able to work more safely, more efficiently and avoid additional processing time in the office.

Location: Rapid City
South Dakota, USA

CHALLENGE

Over the last 30 years, Mortenson has constructed many of the facilities that make up the United States' sports and entertainment landscape. Its team of sports construction experts specialize in building these unique venues, bringing an unmatched skillset and understanding of well-designed and constructed facilities that positively influence revenue generation, building operations, and the fan experience. Recently named the top sports builder in the U.S. by ENR, Mortenson has a solid reputation for safely and consistently completing projects on time and within budget.

Mortenson goes to great lengths to plan and coordinate work prior to the start of installation. It can be very time consuming and challenging to ensure the work being installed in the field precisely matches that of the coordinated/original plan.

For years, the company relied on a combination of manual methods and laser scanning to capture measurements in the field. This required a surveyor to travel to the site, capture the measurements and then transfer the point clouds from the laser scanner to the office for processing, registration, analyzing and documentation. The process spanned several days to complete and was further derailed when measurements were not what was needed or missing, requiring the surveyor to go back to the site and repeat the same process.

"The inability to register point clouds and compare them to coordination models on the jobsite was slowing down our workflows," said Lucas Manos, Senior Integrated Construction Coordinator at Mortenson Sports + Entertainment.

"Because our teams couldn't view the scans in the field, they didn't know if the measurements were usable until they made their way back to the office."

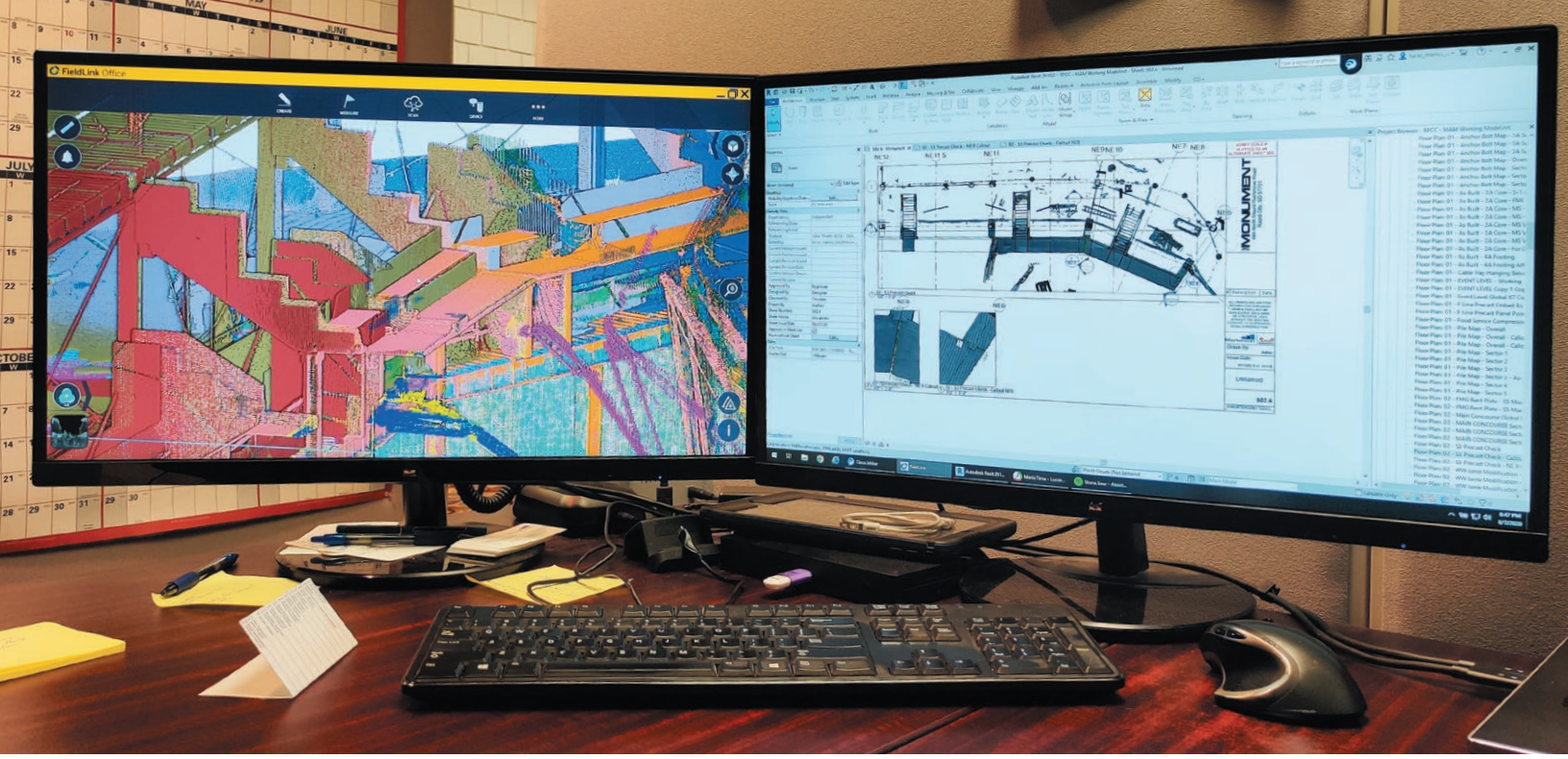
SOLUTION

3D Laser Scanning Accelerates QA Inspections

Working with BuildingPoint Great Plains, a Trimble reseller, Mortenson purchased a Trimble X7 3D laser scanner powered by Trimble FieldLink construction layout and scanning software. BuildingPoint Great Plains provided training to Mortenson to get them quickly up-to-speed on the new technology.

Mortenson partnered with Scull Construction to build The Monument, a new 250,000 square-foot indoor arena in Rapid City, South Dakota. The combined entity, Mortenson/Scull, used Trimble's field hardware and software solutions to accelerate and streamline their quality assurance (QA) inspection process and to obtain a precise review of installed versus planned locations.

Instead of using manual methods for back-checking planned sleeves and deck devices, the X7 3D laser scanner allowed workers in the field to utilize in-field registration of the scan data on a tablet and overlay a fully registered and photo-colorized point cloud on the coordination model to visualize conflicts between planned and installed conditions in real time. With this workflow, teams were able to work more efficiently and avoid additional processing time in the office.



By streamlining their workflow with the X7, Mortenson/Scull can efficiently scan every slab on metal deck (SLOM) and slab on grade (SOG) before placing concrete, ensuring with 99% certainty that the embedded components are in the planned location.

> "The Trimble X7 and FieldLink are the first products we've seen that **truly deliver an instantaneous answer to the question**, 'are we installing in the field what we're planning on installing?' without requiring a four-day turnaround to get from performing the scan to documentation. Without a doubt, **the ability to compare the point cloud to the model in the field is bringing tremendous value** to The Monument project."

Lucas Manos, Senior Integrated Construction Coordinator at Mortenson Sports + Entertainment

Intelligent Technology Makes Laser Scanning Accessible to All

With the X7's self-calibrating and leveling features, project team members with only limited scanning experience were able to capture precise data and produce high-quality deliverables. "We utilized other laser scanners in the past, but the X7's ease of use made the QA inspection process accessible to our entire project team," said Manos. "Previously, only certain team members had the experience and access to the hardware required to perform this level of check, which would often involve extensive scheduling and travel. Being able to deploy the X7 to project teams who can register and stitch point clouds in the field and provide instant results is unlike anything we were able to do before and allows us to provide a level of assurance that is exponentially greater."

Mortenson/Scull is also able to ensure the safety of their team members by using the X7 to perform scans that would have been difficult to navigate with traditional methods and devices. Their team members were able to check measurements without moving on-site equipment, getting on a scissor lift or wearing a harness. The X7 also expanded the range of what they were able to measure because they could capture measurements with an integrated laser pointer and visualize the points without putting a team member in the path of overhead work. They had the ability to measure elements, such as the tolerance of bent plate for slab on metal deck and precast stadia bearing seats 50 - 70 feet away from the floor, which would otherwise have been inaccessible due to overhead hazards and steelwork in progress.

RESULTS

Looking Ahead

Although Mortenson/Scull initially used the X7 to perform a variety of tasks on The Monument project, from pre-pour inspections and validating structural steel install tolerance, to existing condition capture, precast joint tolerance review and concrete flatness, they have big plans for expanding their use of laser scanning in the future. "We plan on using the X7 for above ceiling and in-wall inspection and documentation, which are incredibly time intensive and impossible to complete thoroughly utilizing a tape measure," said Manos.

For Mortenson, the investment in the X7 has already paid off.

"The correction of just a few misalignments in deck devices or sleeve locations quickly offset the hardware cost of the device," said Manos. "Trimble has a winner on its hands. The combination of the X7 and FieldLink was well worth the wait. It will replace the tape measure and allow anyone on your team, within a minute and a half, to measure anything from the safety of the ground. You'll never have to put your teams on a lift or revisit an area multiple times because a critical measurement was forgotten."

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