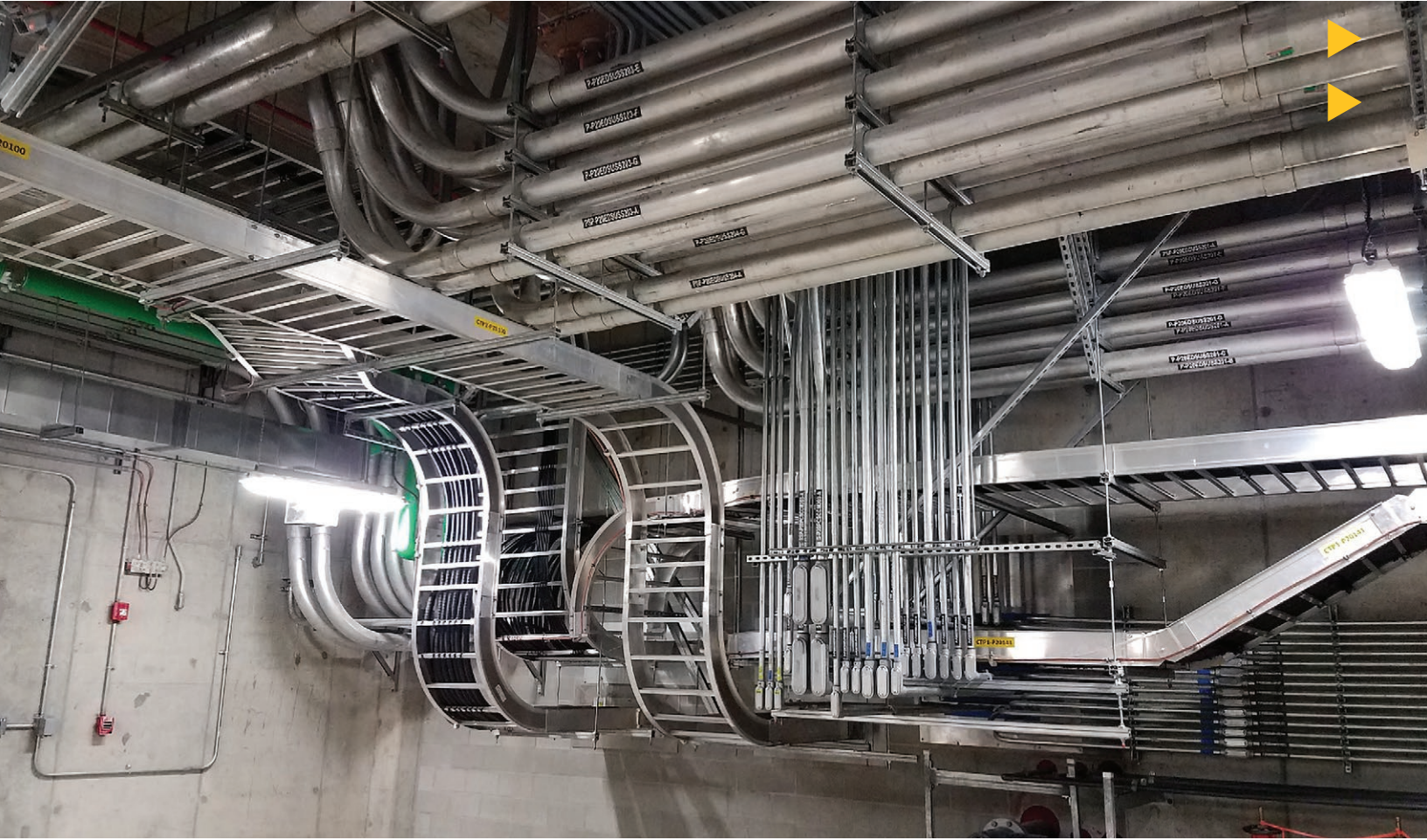


CUSTOMER EXPERIENCE

EC Electric, Chambers Creek Wastewater Treatment Facility Project

USING TRIMBLE TX6 SCANNER & REALWORKS OFFICE



EC Electric saves 90% in labor by investing in Trimble 3D scanning and modeling

Northwest-based electrical contractor captures pre-construction as-builts and building 3D models with Trimble TX6 3D Laser Scanner and Trimble RealWorks scanning software

Solution

TX6 3D laser scanner

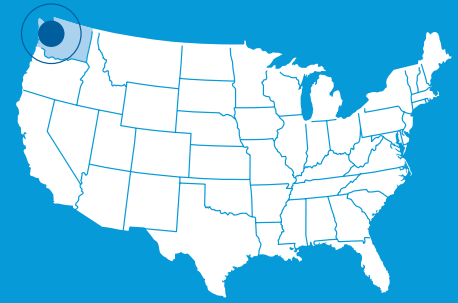
Trimble® RealWorks® office software

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<https://mep.trimble.com>

profile

EC Electric is a leading electrical contractor with operations throughout the Pacific Northwest. EC's portfolio includes commercial construction, technical systems, energy solutions, traffic management, and service. EC often collaborates with general contractors and owners for preconstruction work including design-assist and design-build where EC's in-house estimating, engineering, BIM, and prefabrication services can influence project design, cost, and schedule.



Location
Chambers Creek
SEATTLE,
WA, USA

BUSINESS CHALLENGE:

EC Electric completed a major expansion and renovation of Chambers Creek, a wastewater treatment plant near Seattle, WA. EC's electrical scope of work included creating a virtual model of the facility using Building Information Modeling (BIM) and 3D as-builts as part of the project closeout. An accelerated schedule prompted EC to consider alternatives for reducing labor, and improving modeling speed and accuracy. EC turned to Trimble.

SOLUTION:

Trimble TX6 3D Laser Scanner and RealWorks office software.

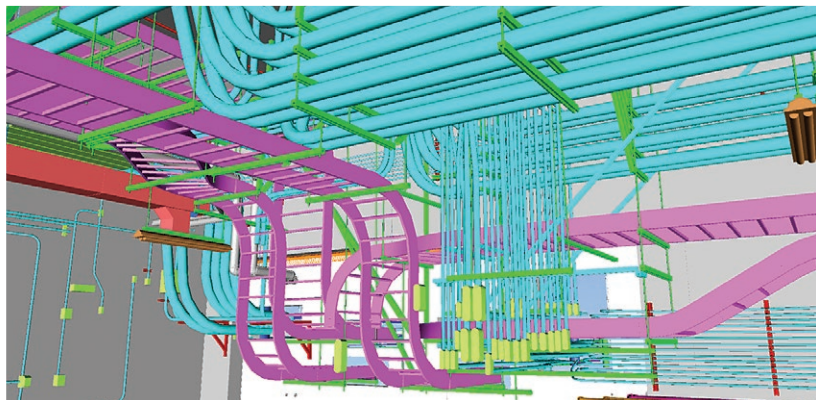
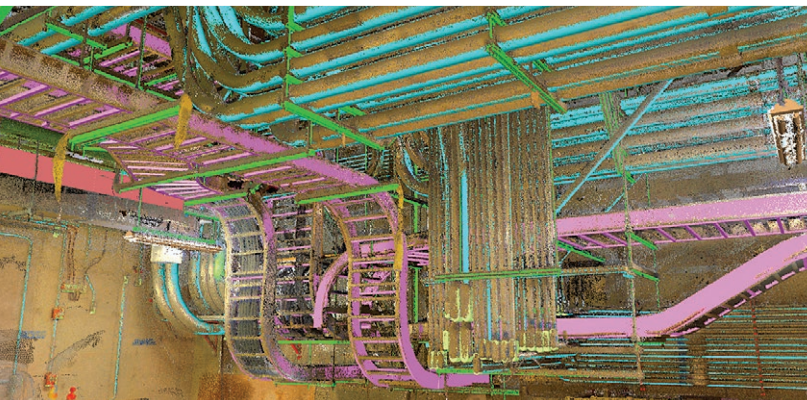
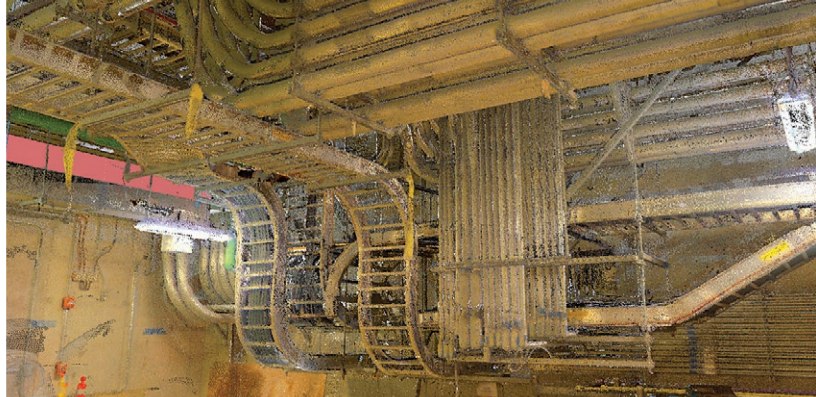
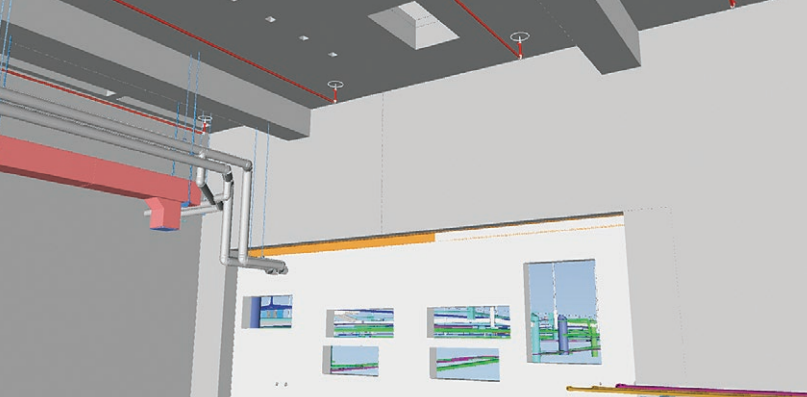
RESULTS:

- **90% labor savings in field work** – EC Electric identified a test area for manual data collection to define the complete as-built modeling scope. That process took four electricians two weeks to complete. Based on that test, EC estimated 3,000 manhours of labor for 3D modeling the entire project. By implementing the Trimble TX6 3D system, the EC team completed scanning the entire scope in 300 hours, a 90% reduction in labor from the original estimate.
- **Improved safety on the jobsite with innovative retrieval methods** – The Trimble system eliminated the need for electricians to work in confined spaces or challenging environments. This reduced safety risk while accelerating modeling data collection.

Chambers Creek Wastewater Construction

In 2012, EC Electric was awarded the electrical contract for a major expansion of Pierce County, Washington's Chambers Creek Regional Wastewater Treatment Plant. The \$342 million expansion and improvements included increasing daily sewer capacity from 28.7 million to 45 million gallons and repairing and replacing aging infrastructure. The plant expansion required a substantial new electrical package including designing and installing new systems and controls and upgrading power distribution. The scope also included several redundant fail-safe power configurations to offset a catastrophic power outage.

Because the project was so large, as-built modeling for closeout was going to be a significant undertaking. Nick Snow, detailer and BIM coordinator for EC Electric explains. "We were facing an accelerated schedule and a cost of \$250k for data capture alone so we started to consider other possibilities. We knew that purchasing the right 3D scanner could help us save significant labor costs on this project, and it would pay for itself pretty quickly."



Capturing As-built Conditions

Already familiar with Trimble AccuBid and Trimble robotic stations, EC Electric adopted Trimble 3D scanning and modeling technologies for the Chambers Creek project. EC purchased a Trimble TX6 3D laser scanner because it offered the right combination of speed, range, and accuracy to capture precise 3D spatial data. They also opted for Trimble RealWorks scanning software to quickly and efficiently create 3D deliverables.

Trimble's TX6 3D scanner delivers superior scanning speed and includes built-in Wi-Fi that enables remote control of the scanner via a mobile phone, tablet, or a computer when access to the integrated touch screen is not possible. A typical scan is completed in about three minutes and the scanner can measure one million points per second. It also captures data over its full measurement range of 360 degrees x 317 degrees.

By using the TX6 scanner, EC Electric sent one field worker instead of four to collect site data. Over the course of 25 days, EC Electric ran 60 to 70 scans per day, capturing close to two terabytes of data. With its speed and accuracy of 500,000 points per second and less than a 2mm precision variable over the full measurement range, the scanner dramatically increased productivity by significantly cutting the time it took to capture spatial data of the facility.

"The TX6 is impressive because of the high level of accuracy it delivers and the extreme flexibility it provides on the jobsite," said Snow. "I like the fact that we can gather spatial data more quickly from each setup, and the long-range capacity reduces the number of setups needed. We saved about 90% in labor costs, and that was just on this first pilot project."

"Trimble and the TX6 scanner really stood out to us because the equipment is completely focused on the construction industry and is tailored to the results we need," said Snow. "Another benefit is the elevator Tripod which allows the scanner to safely access confined spaces. This was a huge time saver, not to mention a much safer data retrieval method."





Simplified management, processing, and analysis of large data sets

After scans were complete, EC Electric had a precise and complete 3D point cloud of data. Next, Snow used Trimble RealWorks software for point cloud processing and analysis. He was impressed with the software's ability to automate registering the 2,000 Chambers Creek TX6 scans. The RealWorks scanning software registers point cloud data by performing automatic registration with or without targets. It then automatically "stitches" the individual scans together into one composite 3D point cloud model.

Snow recalls he particularly liked the automatic classification options within RealWorks. That feature saved a significant amount of time because it identified all types of trees, foliage, and non-essential terrain, separating it into a different cloud. After fine tuning data, Snow exported the composite 3D point cloud model to Autodesk Revit to create intelligently modeled objects.

"The TX6 scanner and RealWorks software have some really great features that make modeling challenges more manageable and less time consuming," said Snow. "I can create accurate topographic maps, document site plans and plan excavation including where we're going to come down a trench and where we're going to build out."

Creating advanced 3D deliverables

Using Revit modeling software, Snow's team created an accurate as-built model of the Chambers Creek facility's existing condition and a 3D model of the treatment plant using TX6 and RealWorks registered data. EC Electric also came in under budget for the modeling costs for the second construction package because scans of the point cloud software helped them work much more quickly.

Looking ahead

Looking ahead, EC Electric plans to use the TX6 scanner frequently to quickly and accurately capture existing conditions on a project site. They see additional benefits using the scanner for safe data recording, clash detection, and creation of prefabrication and building layout drawings for the field. While 3D scanning is gaining significant popularity in AEC industries, Snow believes EC Electric is still ahead of the pack in terms of electrical contractors leveraging the technology. This gives his team a competitive advantage in serving customers today and winning new business going forward.

"It was a good investment," states Snow. "If we would have modeled the facility using only labor, that expenditure would have been gone for good." By purchasing the Trimble TX6, we lowered our overall cost and invested in the future. Now we have the TX6 for future work. We love providing our customers with a technologically advanced solution that also provides savings opportunities for scheduling and budget."

Bill Cameron,
BIM Manager for Arden Engineering Constructors



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