CASE STUDY

Mercury Engineering improves design and construction efficiency by integrating CAD and as-built point cloud data

Key facts:

Company: Mercury Engineering

Website: www.mercuryeng.com

Industry: Engineering Services (EPCs)

Country: Ireland

Octave products used: Forte 3DWorx *(CADWorx Plant Professional),* Forte Isogen *(Isogen),* Leica CloudWorx

Key benefits:

- Schedule certainty due to ability to track progress better
- Ability to design and build Right First Time due to access to accurate as-built data
- Reduced labor onsite due to the ability to generate trusted high-quality isometrics

Mercury Engineering is a leading European contractor specializing in the provision of mechanical, electrical, fire protection and technology services to a range of sectors including commercial, data centers, manufacturing, infrastructure and healthcare. Mercury has a reputation for getting the job completed on time, within budget and to the highest quality, making it a contractor of choice for industry leaders for 40 years.

Identifying goals

Mercury Engineering was contracted to upgrade an existing process plant located near Groningen, the Netherlands.

The project scope was the design of a new process plant with product pipelines that needed to connect into an existing facility. To achieve this, it was necessary to route the new pipelines along an existing pipe bridge, and across the roof of the existing structure and into a new building.

The main goal of the project was to shorten the project schedule by maximizing the amount of piping pre-fabrication that could be completed off-site before piping installation was performed on-site. To meet this goal and ensure that the new piping would fit when erected, Mercury Engineering needed as-built information of the existing facility.

Overcoming challenges

Unfortunately, existing as-built information was lacking, therefore the initial challenge was how to capture the as-built situation quickly and accurately. To ensure successful on-time project delivery, Mercury Engineering determined that it would be necessary to laser scan the existing building, roof space and pipe bridge. This would provide an accurate design basis for the new pipe routes and tie-ins that had to be designed. Having this information available would also help to ensure and guarantee that the new piping would fit on the pipe bridge and could be constructed inside the existing building without clashing.

Particular attention was paid to the tie-in points, and extra scans were done in these areas to ensure that enough detail was captured to accurately design the tie-ins.

After this, Leica CloudWorx in combination with Forte 3DWorx was used to manipulate the piping route to match the scanned as-built positions of the new tie-ins and to accurately design them. Visualization of the pipe bridge inside the CAD system helped to identify space for the new pipelines, enabling them to be routed easily alongside other existing services, which made connecting the old and new building seamless.

"Using Forte 3DWorx tools enabled us to get started immediately – we were able to produce fabrication isometrics immediately after completing our coordination process."

Ciaran McCreary
3D BIM Engineer,
Mercury Engineering

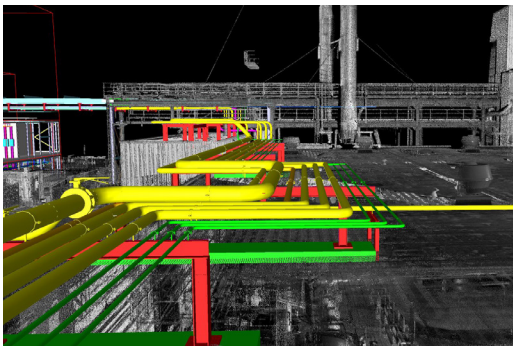
The pipework installation was detailed before the new building was constructed. As the building was being erected and took shape, it was laser scanned, and the new point clouds were integrated with Forte 3DWorx

Using CloudWorx in combination with Forte 3DWorx, Mercury Engineering was able to make minor modifications to the pipework as the project was on-going, to align the routings and to make changes to the overall design to reflect the changing as-built condition of the new building.

This additional site-check increased confidence in the accuracy of the isometrics issued to the fabrication workshop, which were auto-generated via Forte Isogen directly from the Forte 3DWorx design model. In doing so, Mercury Engineering ensured that the piping would fit first time, and avoided unnecessary fabrication rework on-site, helping to keep the project schedule on-track.

Realizing results

For this project, Mercury Engineering needed a solution that was able to detail mechanical, electrical and HVAC (heating, ventilation and air conditioning) design as well as produce trusted, high-quality, industry standard piping isometrics. The company selected Intergraph Forte 3DWorx due to this breadth of modelling capabilities, cost-effectiveness and its ability to produce 2D deliverables in DWG formats. Another key reason was the short learning curve and ease of use – Mercury's staff new to the product required only three days of training before they were productive. In addition, Mercury Engineering was already familiar with the ease-of-use of Forte 3DWorx solutions as the company's BIM (Building Information Modelling) group has successfully used the solution for over seven years.



Additionally, Mercury had previously developed industry-specific Forte 3DWorx format catalog and specification content for other projects, which included its SAP p art coding.

Due to this, Mercury were also able to accelerate its procurement process and take delivery of materials for the project using the material control (BOM) reports produced by Forte Isogen.

Mercury Engineering received significant benefits from using Forte 3DWorx solution on its project:

- Schedule certainty due to ability to track progress better
- Ability to design and build Right First Time due to access to accurate as-built data inside the CAD environment
- Reduced labor onsite due to the ability to generate high-quality isometrics, which helped to avoid the need for on-site fabrication

Ciaran McCreary, 3D BIM Engineer at Mercury Engineering, commented on the company's experience of Forte 3DWorx tools from Octave: "We were very happy with the Octave staff who performed our training and implementation services. Using Forte 3DWorx tools enabled us to get started immediately – we were able to produce fabrication isometrics immediately after completing our coordination process."

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property and assets – for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.