

KLJ IMPROVING FACILITIES DESIGN WITH SOLIDWORKS AND SMAP3D PLANT DESIGN SOFTWARE



With the combination of SOLIDWORKS design, analysis, and communication tools, and SOLIDWORKS Gold Partner Smap3D Plant Design software for piping and instrument diagramming (P&ID), routing of 3D piping, and generation of isometric drawings, KLJ has improved its ability to make design changes quickly and communicate effectively during the development of factories, plants, and facilities of various types.



Challenge:

Increase 3D modeling power, realism, and communication in the development of plants, factories, and facilities.

Solution:

Implement SOLIDWORKS Premium design and analysis, and SOLIDWORKS Composer technical communication software solutions in conjunction with SOLIDWORKS Certified Gold Partner Smap3D Plant Design software for P&ID, routing of 3D piping, and generation of isometric drawings.

Benefits:

- Improved realism of facility designs, clarity of documentation
- Automated generation of isometric drawings, renderings, and exploded views
- Shortened time required to make design changes
- Increased 3D modeling power for plant design

KLJ is a leading engineering and facilities planning company that brings multidisciplinary expertise to factory, plant, and facility projects of various types. Founded in 1938, KLJ has provided engineering-based services to local, regional, and national infrastructure projects. An employee-owned firm, KLJ is committed to developing lasting infrastructure that responds to the social, civic, and economic needs of its communities. KLJ clients achieve success through the firm's ability to envision, plan, engineer, and build infrastructure. The company's professionals—many of whom are experts in their fields—consistently deliver practical solutions.

Based in Bismarck, North Dakota, the KLJ Industrial Facilities Group works on various plant projects, including skid-type units for the Bakken oil field in North Dakota, as well as a range of other facility and community-related projects. Although it has many traditional facility development tools, the group recently began employing a more realistic, 3D approach to facility planning and design, according to Senior Project Manager/Engineer Gary Hager.

"When I joined KLJ in 2013, KLJ was utilizing SOLIDWORKS® 3D mechanical design software in a very limited manner for mechanical design work," Hager explains. "I convinced KLJ management that we would benefit from using SOLIDWORKS at a more advanced level on some of our projects because combining the graphically rich nature of the software with the power of modern hardware provides us with the ability to improve the realism of our facility designs and proposals. Because of my experience with SOLIDWORKS, I gained management's approval to train the team at KLJ to push SOLIDWORKS harder on bigger plant and equipment projects."

In addition to acquiring SOLIDWORKS Premium design and analysis, and SOLIDWORKS Composer™ technical communication software, KLJ added SOLIDWORKS Gold Partner Smap3D® Plant Design software for P&ID, routing of 3D piping, and generation of isometric drawings. The firm chose the joint SOLIDWORKS/Smap3D Plant Design solution because it is easy to use, fully integrated, and affordably priced.

WHAT WILL IT LOOK LIKE?

Since implementing SOLIDWORKS and Smap3D software, KLJ has expanded its use of the joint solution to encompass half of the group's projects. "I've long believed that the ability to quickly produce and generate designs for a facility that look real would improve our business," Hager says. "There's no substitute for showing a client what a skid or oil-field battery is physically going to look like in 3D."

"We spent so much time trying to communicate design intent in 2D drawings—time that is completely eliminated when you present a realistic 3D rendering of a concept using SOLIDWORKS," Hager adds. "Whether we're designing a grain elevator, an ethanol facility, or an anhydrous ammonia plant, SOLIDWORKS Premium and Smap3D software give us greater modeling power to design and document the plant, and SOLIDWORKS Composer software gives us the capability to automate the creation of renderings and exploded views, which further enhances understanding of the project."



"Between the customizable report-generation tools in Smap3D and SOLIDWORKS

eDrawings files, we can now more clearly and thoroughly communicate the need to make a design change, which facilitates customer comprehension and approval. The SOLIDWORKS/Smap3D solution improves the clarity and accuracy of documentation and communication throughout the entire process chain."

— Gary Hager, Senior Project Manager/Engineer

FAST, EASY CHANGES, BETTER COMMUNICATION

Using SOLIDWORKS and Smap3D design tools also provides the KLJ Industrial Facilities Group with greater flexibility for rapidly communicating, explaining, and making changes to a facility design. "We use the parametric ability of SOLIDWORKS software to reference a polyline in Smap3D to make changes automatically, but the ability to quickly make a design change and have it ripple through the design is just the first step," Hager stresses. "We also need to communicate these changes to customers in an effective way.

"Between the customizable report generation tools in Smap3D and SOLIDWORKS eDrawings files, we can now more clearly and thoroughly communicate the need to make a design change, which facilitates customer comprehension and approval," Hager adds. "The SOLIDWORKS/Smap3D solution improves the clarity and accuracy of documentation and communication throughout the entire process chain."

DESIGNING AND PIPING AN ASPHALT PRODUCTION PLANT

An example of a facility project for which KLJ leveraged SOLIDWORKS and Smap3D design tools was the retrofit of an old asphalt plant in Mandan, North Dakota, to increase the capacity of the facility. KLJ first captured the details of the old plant using point cloud data for the purpose of reverse engineering the site to create and document the new design in SOLIDWORKS and Smap3D—a process that took about two weeks—before beginning physical work on the plant.

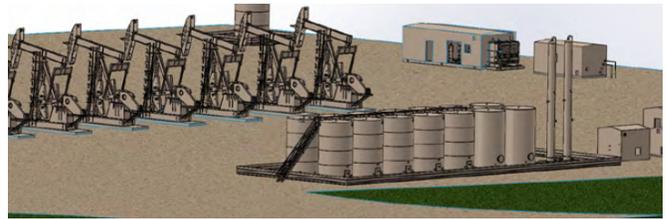
"Once we designed the new asphalt plant in SOLIDWORKS, and used Smap3D P&ID and Piping to lay out the piping runs, we utilized Smap3D Isometric to automatically generate 2D isometric drawings from the Smap3D Piping attributes," Hager recalls. "We also used SOLIDWORKS Composer software to automatically generate the renderings, drawings, and exploded views required to produce instruction tutorials for the client. The project was very successful and the automation provided by the SOLIDWORKS/Smap3D solution heavily contributed to its success."

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The graphically rich nature of SOLIDWORKS and Smap3D plant design tools enable KLJ to increase the realism of its facility designs and proposals, enhancing visualization and communication.

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