

Zachry Group Awarded USD 10 Billion Contract to Add Liquefaction and Export Facilities to Existing World-class Import Terminal in Sabine, Texas

Going Digital with 4D Construction Modeling Transformed Project Workflows

- *Golden Pass LNG has a mission to supply clean energy from Texas to power the world.*
- *The company is adding liquefaction and export capabilities to its existing import terminal in Sabine Pass.*
- *As part of a joint venture, Zachry Group was awarded the engineering, procurement, and construction contract to build the USD 10 billion facility with an output capacity of 16 million metric tons per annum.*
- *Zachry's success was driven by empowering communication, collaboration, and decision-making through connected digital solutions.*

A Vision to Become North America's Premier LNG Export Company

With a mission to supply clean energy from Texas to power the world, Golden Pass LNG is transforming its existing import terminal in Sabine Pass, adding liquefaction and export capabilities, providing flexibility to import and export natural gas in response to market conditions. The USD 10 billion facility will have a total output capacity of 16 million metric tons of liquified natural gas (LNG) per year. Zachry Group, as part of an integral joint venture, was awarded the engineering, procurement, and construction contract to build the export facility.

The scope of work includes integrating and modifying existing state-of-the-art systems and equipment, as well as constructing three new liquefaction process trains and associated utilities and treatment infrastructure. The project demands 6,000 to 7,000 on-site professionals at peak times, installation of more than 1.9 million feet of pipeline, over 3,000 engineering work packages, and approximately 20,000 installation packages. Upon completion, the facility will generate billions of dollars in economic growth and connect natural resources with global markets, driving the client's vision of becoming the premier LNG export company in North America.

Collaboration Challenges, Site Constraints, and Unreliable Manual Processes

A truly global initiative, with an engineering team in Japan, fabrication occurring across 18 countries, and on-site construction in the U.S. Gulf Coast, the project presented coordination challenges, compounded by COVID-19 restrictions that significantly impacted travel and workflows. They had to coordinate thousands of team members and stakeholders. Additionally, millions of pieces of equipment and materials sourced from global suppliers needed to be meticulously managed and stored within limited on-site laydown space. The sheer magnitude of the project, combined with the site constraints, required collaborative and cost-effective solutions to manage data, people, and processes both safely and effectively amid a worldwide pandemic.

To facilitate successful delivery of this large-scale project, Zachry sought to improve construction planning and work packaging, streamline workflows among the geographically dispersed teams, and provide visibility into the timing of material and equipment delivery to the site. In the past, they had used Gantt charts, spreadsheets, and PowerPoint presentations to

manage and plan the construction processes and perform reviews. However, they realized that these manual, paper-laden methods were error-prone and lacked effective coordination and change management capabilities, often resulting in siloed information and schedule updates and status reports that were one to two weeks out of date. The project's success hinged on establishing a connected, cloud-based digital data and construction planning environment. "We would remove paper from the process and existing workflows where possible in order to improve productivity and enhance information transparency," explained Jim Kinter, project IT/IM manager at Zachry Group.

Digitalizing Construction Planning and Workflows

For over a decade, Zachry has used Bentley solutions and trusted their technology applications to deliver increased value throughout the design and construction lifecycle of their projects. "Our strategic drivers [in going digital] were addressed by a portfolio of Bentley solutions, including SYNCHRO Pro, ConstructSim, and SYNCHRO Perform," commented Kinter.

In the early stages of this project, Zachry completed a proof-of-concept for 4D planning using SYNCHRO Pro and integrated the 3D design model with the baseline schedule, providing a collaborative path of visual construction reviews for the entire team that proved invaluable. "4D planning fundamentally changed the way the project team interacted with the schedule," said Kinter. "What had taken months to prepare in a Gantt chart was validated and optimized in weeks [by] leveraging 4D planning."

They implemented advanced digital work packaging using SYNCHRO and ConstructSim to facilitate and automate the development of construction and installation work packages. Integrating flexible daily cost capture features helped further extend modeling and digitalization capabilities to generate a comprehensive construction digital twin accessible to the entire project team. Working in a digital, cloud-based platform, the team could view and interact with the 4D model, regardless of location, eliminating the need to travel and supporting iterative and real-time model reviews. Using the digital model to perform schedule animation and clash detection, as well as dynamically visualize the laydown space, allowed the team to view the work and identify and mitigate risks prior to performing work on site.

"With a global project team and due to COVID-19 travel restrictions, our leadership team recognizes the value in deploying digital solutions that connect our team members, regardless of location," explained Kinter. "Our team recognizes the value in leveraging 4D solutions to plan work activities in an optimized manner that reduces area congestion, and conduct work tasks that enable crews to identify and mitigate risks before stepping foot on site."

Connected Digital Solutions Empower Decision-making and Drive Savings

Leveraging Bentley's applications, Zachry established a connected data environment, ensuring accurate reporting and providing trusted sources of information for the entire team. Working with interconnected data using integrated digital solutions automated workflows and enabled the team to communicate, collaborate, and leverage data in a visual environment for better planning and improved decision-making. As a result, they reduced resource hours, increased productivity, saved costs, and ensured safety.

Through the automation of work packaging, the team reduced the total amount of time required to create installation work packages from eight hours each to two hours each, achieving a 75% reduction in work package development time. Over the course of the project, this saved Zachry 120,000 resource hours. By digitalizing prior manual data entry and paper-based processes, they saved an additional 63,500 resource hours, equivalent to an average of five full-time resources, and reduced report generation time by 10 resource hours per week.

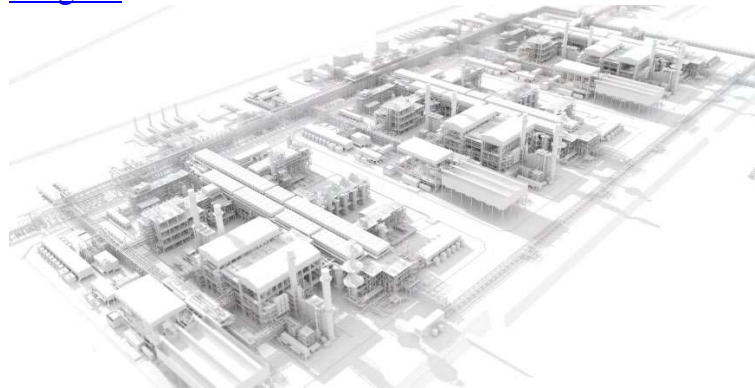
While many projects leverage 4D modeling solutions to support construction planning and execution, Zachry went a step further and established a construction digital twin during the design phase, demonstrating how Bentley solutions provide true value throughout the project lifecycle, from design through commissioning and facility start up. The solution improved coordination among stakeholders amid a global pandemic, optimized the project schedule, and mitigated risks to workers.

“With a project of this size and magnitude, the only way to achieve success is by empowering team members to communicate, collaborate, and leverage data to make the right decisions at the right time through the use of [connected] digital solutions. The future of construction is digital.”

For more information, contact Christine Byrne at christine.byrne@bentley.com, or +1 203-805-0432.

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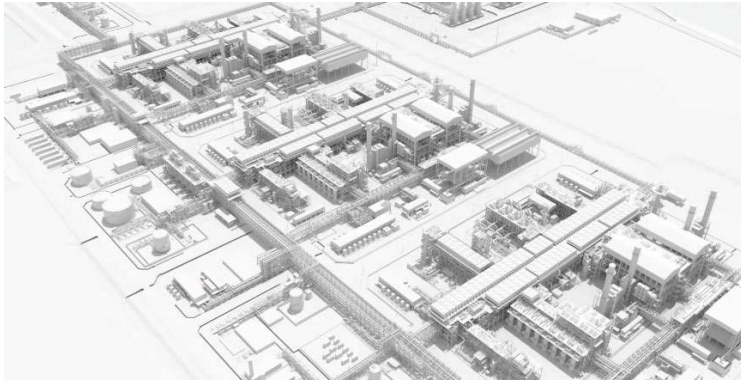
[Image 1:](#)



Caption: Golden Pass LNG is a USD 10 billion facility with a total output capacity of 16 million metric tons of liquified natural gas (LNG) per year. Zachry Group, as part of an integral joint venture, was awarded the engineering, procurement, and construction contract to build the export facility.

Image courtesy of Zachry Group

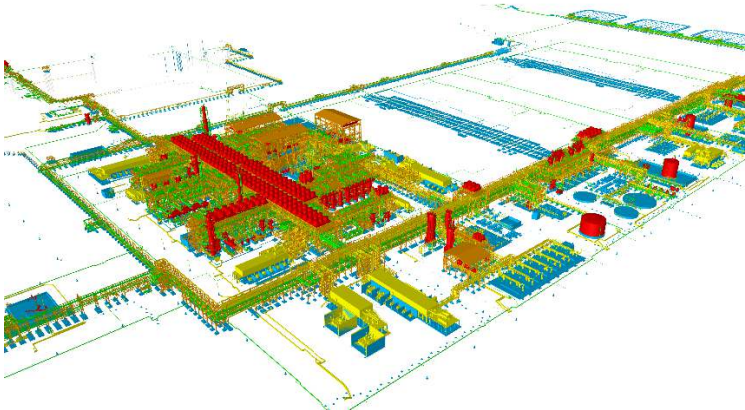
[Image 2:](#)



Caption: To facilitate successful delivery of this large-scale project, Zachry sought to improve construction planning and work packaging, streamline workflows among the geographically dispersed teams, and provide visibility into the timing of material and equipment delivery to the site.

Image courtesy of Zachry Group

[Image 3:](#)



Caption: Zachry Group established a connected data environment, which ensured accurate reporting and provided trusted sources of information for the entire team. The result was a reduction in resource hours, an increase in productivity, a savings in cost, and an improvement in safety conditions.

Image courtesy of Zachry Group

[Image 4:](#)

