Bentley
Advancing Infrastructure

DPR Triples Production of Investigative Alzheimer's Drug

SYNCHRO™ 4D Digitalizes Construction Monitoring to Reduce Project Delivery Time by Six Days Amid COVID-19 Pandemic

Project Summary

Organization
DPR Construction

Solution
4D Construction Modeling

Location
Durham, North Carolina, United States

Project Objectives

- To digitalize workflows, which will increase drug plant manufacturing capacity for life-changing neurological therapies.
- To simulate construction progress to better control schedules and meet client deadlines, providing accurate asset tracking and improved project coordination.

Project Playbook
SYNCHRO 4D

Fast Facts

- DPR was the chosen contractor for the manufacturing upgrade of a drug plant producing innovative treatments for Alzheimer's patients.
- The project required a three-month plant shutdown to implement works to increase drug manufacturing capacity.
- DPR simulated construction planning and digital asset tracking that optimized change management, enabling the client to quickly resume operations per the planned schedule.

ROI

- SYNCHRO 4D provided accurate representation of all new-work factory piping and current state of assets, eliminating guesswork.
- Careful scripting prevented the need to assign over 27,000 model objects to 950 resources, saving two weeks of work.
- With SYNCHRO 4D's visualization, DPR completed the 14-week project six days early amid COVID-19.

Enhancing Potential for Life-changing Neurological Treatment

A leading neuroscience research and development company initiated a USD 32 million project to upgrade their drug production plant in Durham, North Carolina, to increase manufacturing capacity of an innovative drug that furthers Alzheimer's disease therapies. To allow for renovations and equipment installation that would accommodate simultaneous filtration cycles of the new drug, the firm needed to implement a three-month plant shutdown. They hired DPR Construction as the contractor for the biopharmaceutical, manufacturing project, which included debottlenecking one of the plant's purification suites and creating additional upstream modifications.

The project was complicated, requiring over 7,000 linear feet of stainless-steel piping, 11 miles of new power and data cabling, and over 40 tons of steel platform work, all needing to fit within the facility footprint. The scope of work also mandated additional filtration equipment and larger material vessels, resulting in the removal of 24 vessels and seven existing skids to make space for larger vessels and new skids. These updates were implemented to increase production of the potentially life-changing drug, as well as help manufacture other drugs for partners.

DPR needed to place more than 7,000 linear feet of stainless-steel piping all within a tight footprint.

Tight Timelines, Confined Space, Unreliable Processes

With the plant shut down to accommodate construction, DPR was under tremendous pressure to ensure that the project stayed on schedule to meet the client's commissioning timeline and enable them to resume operations as quickly as possible. In addition to the tight timeframe, DPR faced site challenges when integrating new and existing assets, including adding filtration equipment and larger material vessels within the confined space. Furthermore, over the years, the client had frequently modified their 20-year drug plant, burying previous pipes under new works and making it extremely difficult to locate assets.

They desired a digital solution that provided a quantitative, visual representation of asset tracking and construction monitoring, and recognized that achieving it required integrating accurate 3D models from multiple modeling applications. Historically, manual visual tracking of assets and piping production resulted in inaccurate and unreliable data and representation. DPR knew that these traditional processes would not suffice. They needed to find an effective method to track assets during construction and collaboratively manage construction schedules to help their client plan for future manufacturing line commissioning.

Realizing the Potential of Virtual Construction Planning

DPR chose SYNCHRO 4D to achieve their digital asset tracking and virtual construction planning. They knew that conceptually, Bentley's application could provide accurate representation of all piping in the factory and current state of assets throughout all stages of construction, eliminating guesswork of manual and visual inspections. "Use of SYNCRHO 4D was not an afterthought," said Amol Soman, senior project engineer at DPR. "The team planned on using it from the get-go." DPR needed to integrate their 3D models created from various modeling applications and establish the digital workflows and processes. They coordinated with their BIM team to ensure quality modeling that would serve as the foundation for their successful implementation of SYNCHRO.

"The percent complete script ... saved me, personally, at least two weeks of grueling work assigning over 27,000 model elements and objects to 950 resources."

– Amol Soman, Senior Project Engineer, DPR Construction

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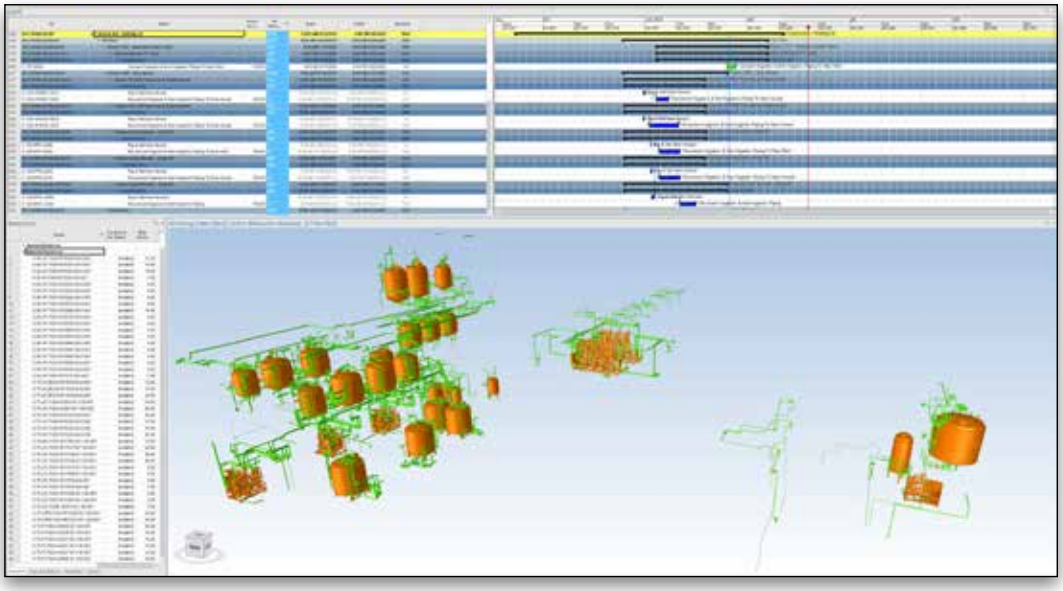
Bentley's interoperable technology provided a flexible environment, enabling seamless integration with third-party design software to import their 3D models and point clouds.

As the project scope changed, the modifications were also modeled and subsequently updated in SYNCHRO, providing accurate data to run scripts that helped coordinate crews and labor requirements, as well as enabled accurate data-driven discussions with the client. Using the software, DPR established an integrated digital construction and scheduling environment, modeling progress updates in real-time and importing milestone dates, labor, materials, and asset location information with ease. Including this data improved planning, predictability, and quality. With task and model-based data accessible to all stakeholders through shared dashboards, DPR established collaborative digital workflows that streamlined communication and drove informed decision-making to keep the project moving forward. "SYNCHRO helped us put our finger on the pulse of really where we were in the field," explained Soman. Bentley's application enabled all stakeholders to see where they were and accordingly schedule their respective activities, adding a tremendous level of control, as well as transparency and visibility, with the client.

Industrializing Delivery of a Cutting-edge Drug Plant

By using SYNCHRO 4D, DPR simulated construction monitoring and asset tracking, streamlining workflows and scheduling that enabled the client to meet their own commissioning timelines and run simultaneous filtration cycles, tripling drug manufacturing capacity. DPR was meticulous in their tracking, even tracking construction progress down to the individual welds. The digital data and information helped coordinate labor resources and promoted data-driven, informed decisions. Using Bentley's interoperable technology, DPR imported 3D models from various modeling applications, providing accurate visualization of all factory piping and real-time asset status throughout construction. Working in a virtual, simulated environment helped them understand where the project stood at any given moment to accurately predict duration of works and efficiently govern project hours and resources. Through advanced construction planning and collaboration, DPR completed the 14-week project six days ahead of schedule amid a global pandemic.

SYNCHRO provided model-based production tracking and real-time progress monitoring. Yet, Soman said, "The percent complete script was at the base of it all. Conservatively speaking, this saved me, personally, at least two weeks of grueling work assigning over 27,000 model elements and objects to 950 resources." Through careful, automated scripting, DPR completed the task in only 15 minutes, which proved extremely beneficial, especially when dealing with changes to the project scope. Using SYNCHRO to establish digital workflows and perform advanced work packaging, DPR industrialized delivery of the cutting-edge drug manufacturing facility. From the project outset, they drove innovative digital processes, not just upgrading a facility for today, but one that is set to stand the test of time, dedicated to neurological breakthroughs, producing innovative treatment for Alzheimer's disease patients.



With SYNCHRO 4D's visualization capabilities, DPR completed the 14-week project six days early amid COVID-19.

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