

Lane Construction Constructs Storage Reservoir for Everglades Restoration

SYNCHRO Streamlines Project Management and Analysis, Creating Template for Future Projects

RESTORING THE EVERGLADES WITH SAND EMBANKMENT DAM

The Lane Construction Corporation, in a joint venture with its parent company Webuild Group, is taking on an Everglades restoration project to provide clean water to South Florida.

One of America's leading construction companies, specializing in large and complex civil infrastructure for over 130 years, Lane has helped develop transportation systems throughout the United States, specializing in mobility, tunneling, and water resources to address sustainable development and climate change challenges. Their past projects include the LYNX Blue Line Extension in North Carolina; the Anacostia River Tunnel in Washington, D.C.; and the I-395 Express Lanes Extension in Virginia.

One of their key current projects is the Caloosahatchee (C-43) West Basin Storage Reservoir in LaBelle, Florida. The reservoir's function is to add storage capacity to the Caloosahatchee River (Canal-43) basin, which increases capacity of the overall South Florida Water Management District's system. Florida gets a lot of rain that

physically cannot go south because of capacity constraints on the system of canals and water control structures. The system was designed decades ago for flood control and to primarily release water east and west to the coasts instead of south to the Everglades. The St. Lucie River and Caloosahatchee River are the respective east and west connections to tide water through which stormwater is discharged out of the system. The USD 524 million project includes the construction of a sand embankment dam with a perimeter of approximately 16.3 miles and a 2.8-mile-long separator dam. The project is one storage management solution of the overall Comprehensive Everglades Restoration Plan (CERP). It is adding 170,000 acre-feet of off-river storage to the water management system of South Florida; a system comprised of other reservoirs, constructed wetlands known as Stormwater Treatment Areas (STAs), designated Water Conservation Areas of the remnant Everglades, and numerous canals and lakes – the largest, Lake Okeechobee.

The Lane team is responsible for constructing the two-cell, 10,500-acre reservoir, with 170,000 acre-feet of storage and a dam height of 27 to 38 feet. They are also tasked with building 18 water control structures, 14.7 miles of perimeter canal, discharge piping for an already-constructed pump station, and a nearby local and site access bridge. Due to the scope of the project, the team struggled to identify specific quantities of project elements for this complex site, especially given the size of the larger elements. "It becomes more complicated when large project elements and quantities must be further split and segregated to better quantify and identify an accurate bid, schedule, work plan, and as-built," explained Matt Blake, VDC/BIM director for Lane. These complexities made the project more difficult to manage than their previous work.



Lane was responsible for construction of the C-43 West Basin Storage Reservoir project, an Everglades restoration effort.

PROJECT SUMMARY

ORGANIZATION

C-43 Water Management Builders, a joint venture of The Lane Construction Corporation and its parent company Webuild Group

SOLUTION

4D Construction Modeling

LOCATION

LaBelle, Florida, United States

PROJECT OBJECTIVES

- ◆ To construct a sand embankment dam and separator dam.
- ◆ To identify specific quantities of project elements for the construction site.

PROJECT PLAYBOOK

SYNCHRO™ 4D, SYNCHRO Control, SYNCHRO Field, ProjectWise®

FAST FACTS

- ◆ Lane used SYNCHRO Field and SYNCHRO Control to split design models for quantity take-off, estimating, and scheduling project work activities and scope.
 - ◆ They also are, in a joint venture with Webuild, responsible for constructing the USD 524 million C-43 West Basin Storage Reservoir project.
 - ◆ By connecting design files directly through SYNCHRO Control and ProjectWise, they had a live 3D model for project management and development.
- ### ROI
- ◆ By using SYNCHRO applications, they provided their client with a mechanism that better refines cost, schedule, and risk on their project.
 - ◆ The C-43 project will promote a healthy biological system through the capture and controlled release of water.
 - ◆ SYNCHRO facilitated collaboration and overall project management and development.



SYNCHRO applications made it easier for us to plan the project, as well as mitigate risk, before the construction team arrived on the site, providing a safe environment to explore new methods and deal with project challenges.

– Matt Blake, VDC/BIM Director, The Lane Construction Corporation

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SEARCHING FOR ALL-ENCOMPASSING PROJECT MANAGEMENT SOFTWARE

To better manage this vast and complex project, the team wanted to use a project management software that they could seamlessly integrate with their existing practices and procedures. This integration would allow them to have a clear understanding of how they could improve their workflows to be more efficient. They sought software with both functionality and ease of use.

However, as they researched various software solutions, they struggled to find software with the right functionality needed for this project. The team searched for a solution that would allow them to analyze the project through a 3D model, quantify the model, assign standard coding structures to model elements, and manage the project development process in a visual manner. By having everything in a highly visual platform, the team would be able to facilitate transparency, accuracy, and collaboration on this complex, multifaceted project. “Our field supervision was already familiar with using iPads to communicate with the office via email,” explained Nick Chrono, project engineer for Lane. “By downloading the SYNCHRO Field application and channeling our communication through it, we have been able to seamlessly capture and manage information in real time – and all in one platform alongside the model.”

ANALYZING PRE-BID SCENARIOS WITH SYNCHRO

Already familiar with Bentley applications for the design process, Lane trusted SYNCHRO's solutions to meet their project needs. They started by using SYNCHRO Field and SYNCHRO Control full time for the construction of the C-43 West Basin Storage Reservoir as part of a pilot project. “Our expectation was to use it as a proof of concept and see how it could be further integrated with Lane practices and procedures,” said Blake. They began by using the applications to develop a 3D model to provide more detailed analysis of quantity take-off, schedule management, and overall project management. As the project progresses, they will transform CAD files and models into a file format that is compatible with SYNCHRO 4D, which possesses modeling capabilities. “The dam is built in segments throughout the whole basin's perimeter. These segments are all bound to construction constraints such as settlement waiting periods,” explained Maurizio Scire, senior project engineer at Lane. “By leveraging the seamless 4D simulation with SYNCHRO, the team was able to understand what the critical path was and then ‘leapfrog’ from one segment to another – and confirm the logic and practicality of the sequence.” By connecting design files directly through ProjectWise, the team has a live 3D model view and approach to project management and development.

With SYNCHRO, Lane can split design models for more refined quantity take-offs, estimating, and scheduling project work activities and scope. By splitting models multiple times and in different manners, contractors have the flexibility to perform several analysis scenarios pre-bid and throughout the life of the project, driving them to the most efficient, safe, and economical solution. This process had traditionally required asking a designer to modify 3D model elements. Now, contractors can easily do the work themselves to

best facilitate project analysis during the pre-bid phase. It also reduces risk and will provide greater assurance to all project team members involved, which includes about 20 office-based users and over a hundred field personnel.

PROMOTING A HEALTHY BIOLOGICAL SYSTEM WHILE SAVING TIME AND COST

In October 2019, the team began groundbreaking activities for the C-43 West Basin Storage Reservoir. By using SYNCHRO applications, they provided a mechanism to their client that better refines cost, schedule, and risk on their project. “We realized true savings and efficiencies by first building digitally and then analyzing the project in a more detailed manner before starting construction,” said Blake. “SYNCHRO applications facilitated a simpler process for us to plan the project and mitigate risk, all before the construction team arrived on the site. It provided a safe environment to explore new methods and deal with project challenges.” Once completed, the C-43 West Basin Storage Reservoir will promote a healthy biological system through the capture and controlled release of water. During wet periods, it will reduce the amount of freshwater flow to the estuary from basin runoff and harmful discharges from nearby Lake Okeechobee. During dry periods, it will help maintain a desirable minimum flow of fresh water to the estuary and use stored water to positively contribute to the surrounding area's irrigation.

“Our goal is to have a more robust adoption of the SYNCHRO platform for the C-43 project by Q3 of 2021,” said Blake. “Then, we can further realize the benefits of SYNCHRO before the end of the year.” Currently, Lane is working to further develop workflows and processes across the company that it will consider and accommodate for the future integration of SYNCHRO software. This effort is part of the organization's overall plan to streamline its approach and integration of digital workflows. They are looking to incorporate SYNCHRO applications from the beginning of their future projects to embed these practices into their normal workflows. “The introduction of SYNCHRO capabilities in a project like C-43 could really open the way to a new era of construction,” said Massimo Bugliosi, project director at Lane. “A model development is not only useful for clash detections or proper work planning, but it could also be extremely important to start the process of equipment control and automation.” Moving forward, they plan to integrate SYNCHRO as an additional capability to facilitate international collaboration, planning, and overall management and development.



Lane plans to integrate other SYNCHRO applications on future projects to facilitate collaboration and overall management and development.

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1.800.BENTLEY (1.800.236.8539) | Outside the US +1.610.458.5000 | **GLOBAL OFFICE LISTINGS** [bentley.com/contact](https://www.bentley.com/contact)