RESILIENCY

Stantec–Jacobs to Design Gulf Coast Storm-Surge System

AFTER YEARS OF STUDY and planning, work is set to begin this spring on the estimated $1.9-billion Orange County Coastal Storm Risk Management Project, a nearly 27 mi long system of levees and floodwalls intended to reduce the risk of storm surge damage in Orange County, Texas. Located on the Texas–Louisiana border near the Gulf of Mexico, Orange County is part of the upper Texas coast that is no stranger to significant surge events. Most recently, Hurricane Rita in 2005 and Hurricane Ike in 2008 battered the region, which is home to many important energy-related facilities.

In December 2019, the Galveston District of the U.S. Army Corps of Engineers bestowed a single-award task-order contract for the design of Project Orange to the Galveston Coastal Services Joint Venture, which consists of the consulting firms Stantec, of Edmonton, Alberta, Canada, and Jacobs, of Dallas. The contract is not to exceed $228 million, says Eddie Irigoyen, the project manager for the Galveston District.

In February, the Corps issued its first task order to the joint venture, scheduling a kickoff meeting to review work done to date by the Corps on the project, discuss how best to proceed, and develop project planning documents. At press time in mid-March, the meeting was scheduled to occur at the end of the month. The Stantec–Jacobs joint venture cannot begin design work on the project until the Corps issues a task order to that effect. The order likely will be issued this summer, Irigoyen says.

To be implemented as part of seven design packages, Project Orange includes 15.6 mi of new levees, 10.7 mi of new concrete floodwalls and gates, seven new pump stations to relieve interior flooding during storm-surge events, the restoration of more than 450 acres of marsh, and the preservation of 560 acres of forested wetlands. The new levee will require various heights throughout the system and have a 10 ft crown and 3:1 (H:V) slopes. The floodwall will be designed as a reinforced-concrete T wall.

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Where it crosses two local waterways—Cow Bayou and Adams Bayou—the project will feature navigable gate structures. Currently, the facilities are "proposed as a sector gate with adjacent vertical lift floodgates," Irigoyen says. "The structures will be built to the height of the adjacent floodwall of the levee system."

The joint venture is responsible for designing the entire project, except for the Cow Bayou structure, which is being designed by the Corps's New Orleans District. Given its past experience rebuilding flood protection systems in the wake of Hurricane Katrina, the New Orleans District has "a lot of expertise in that area," Irigoyen says.

In addition to the sector gate, the Cow Bayou structure will include a large pump station, two vertical lift gates, a floodwall, and drainage structures. Construction of the sector gate is expected to take at least three years, while the pump station, with its capacity of 4 million gal./min, could require four to five years to construct.

The pump stations and other drainage structures are needed to facilitate the coastward flow of stormwater during significant wet-weather events. "We want to make sure we're not creating a bowl that's going to make things worse when there's rain flooding," Irigoyen says. To this end, the Orange project will be designed "to make sure the water flows properly and in the right direction and gets out of there as soon as possible," he notes.

In the face of climate change, the increasing frequency of high-intensity storms, and rising sea levels, "coastal communities are really under attack right now," says John Montgomery, P.E., M.ASCE, the water resources sector lead for Stantec. For the members of the joint venture, the "opportunity to help the government and the nonfederal sponsors deliver a flood-risk-reduction project like this to the local community … really gets us excited," Montgomery says. With more than 530 employees based in Texas, Stantec is looking forward to working on a project "that has a lot of meaning to the community we live in," he notes. "These type of infrastructure projects are incredibly important to us personally, and we take these assignments seriously."

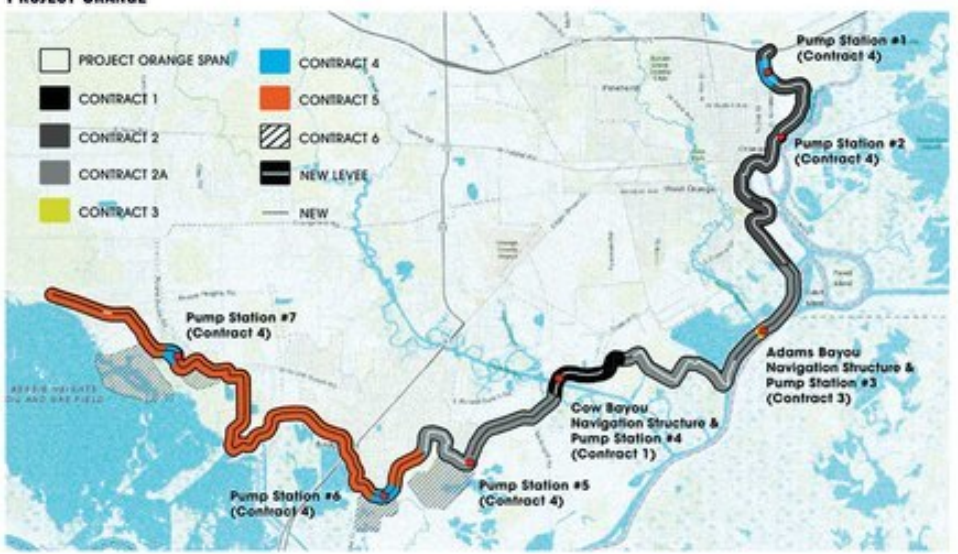
Design packages are expected to be completed in 18 to 24 months. Construction is scheduled to begin in 2022 and reach completion in 2026. With these time frames in mind, the joint venture is assessing how best to design and deliver the project on time. "We're looking to see what risks to the schedule we can identify and look for opportunities to mitigate those risks," Montgomery says. "Then, further, (we will) take a deep dive and see if there are opportunities to improve the design work flow and how the construction is going to be sequenced."

The Orange County project is one part of the larger $3.9-billion Sabine Pass to Galveston Bay, Texas, Coastal Storm Risk Management and Ecosystem Restoration project, which also calls for bolstering the existing hurricane flood-protection systems in the vicinity of Port Arthur, Texas, in Jefferson County, and in the vicinity of Freeport, Texas, in Brazoria County. The Port Arthur project will entail raising or reconstructing 11.6 mi of existing levees and floodwalls, while the Freeport project will raise or reconstruct 18.2 mi of existing levees and floodwalls. Both efforts will also include replacing vehicular gate closures, adding navigable surge gates, and installing erosion protection.

The feasibility report for the overall Sabine Pass to Galveston Bay project was signed in December 2017. Signed into law by President Donald Trump in February 2018, the Bipartisan Budget Act (P.L. 115-123) appropriated the full federal portion of the project funding. Nonfederal sponsors of the projects, which in the case of the Orange County project includes the county itself, are required to pay 35 percent of project costs. In 2019, the Texas legislature appropriated $200 million to the Texas General Land Office to be used to assist the nonfederal partners on the Sabine Pass to Galveston Bay project.

—JAY LANDERS

PROJECT ORANGE*



MAP COURTESY OF U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT

*Project is under design; contracts subject to change.