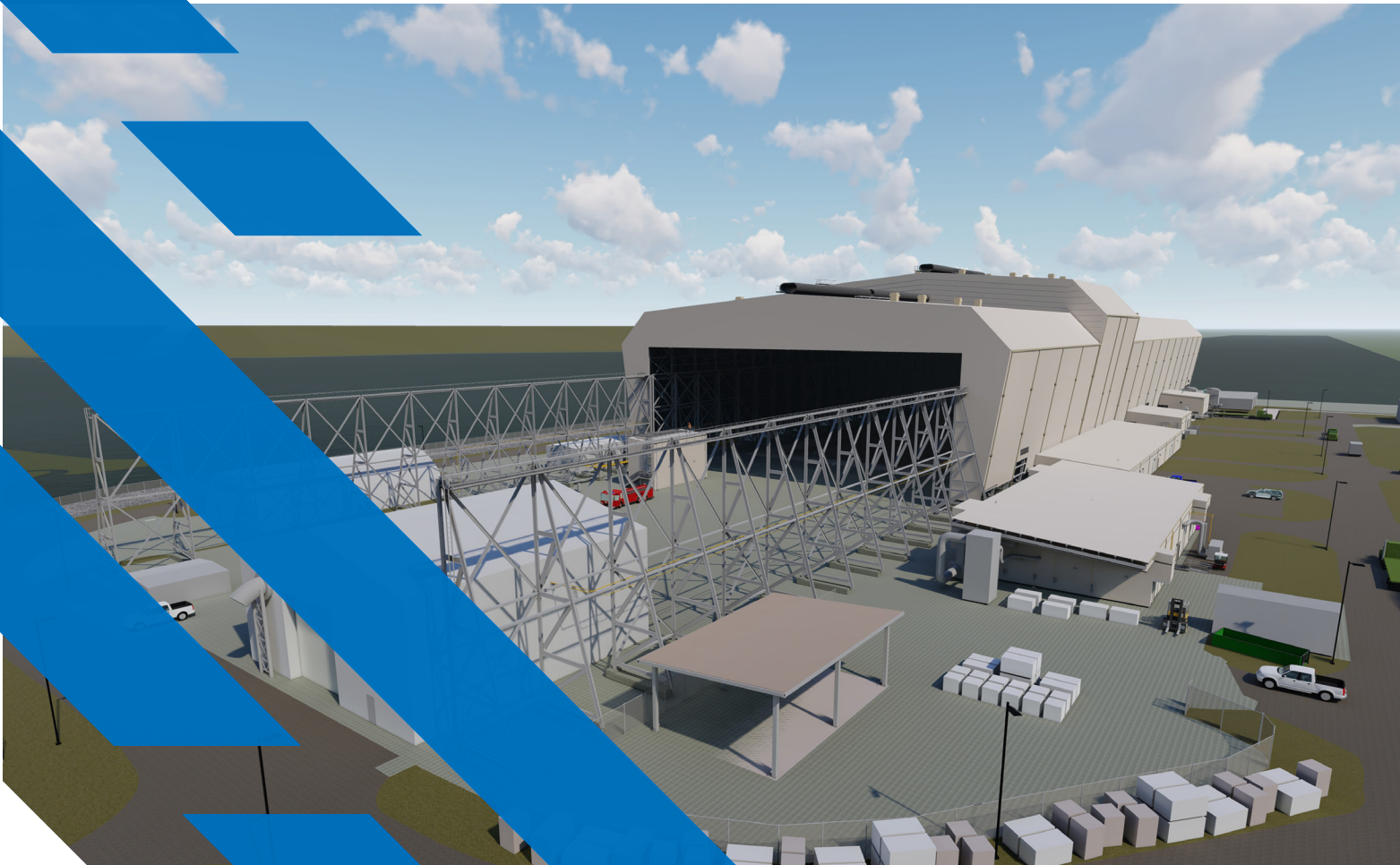


CASE STUDY / NAVAL BASE RETROFIT DESIGN

# PROVIDING COMPLEX OVERHAUL DESIGN FOR A NAVAL BASE

Since its opening nearly 30 years ago, the Trident Refit Facility Dry Dock at Naval Submarine Base Kings Bay had remained unchanged. A retrofit design was needed to provide crucial updates to the facility to meet mission requirements.



# DELIVERING COMPREHENSIVE DESIGN SERVICES

Retrofitting and overhauling an active naval dry dock required a design solution that allowed for modernization of structures and systems with minimal downtime at this mission-critical facility.

## PROJECT STATS

### CLIENT

Naval Facilities Engineering Command, Southeast (NAVFAC SE)

### LOCATION

Naval Submarine Base Kings Bay, Georgia

### CONSTRUCTION START DATE

July 2020

## CHALLENGE

The Trident Refit Facility Dry Dock at Naval Submarine Base (NSB) Kings Bay was constructed in the late 1980s and placed into service in the early 1990s. Composed of a reinforced concrete dry dock with a steel frame cover and roof, three bridge cranes, various support buildings and other miscellaneous equipment, the facility had not undergone any significant repair or update since beginning operations.

After more than 25 years of service, much of the existing equipment at the base has surpassed its useful life. In some instances, parts for maintenance and repair are no longer available, requiring replacement to meet and future mission requirements.

A complete overhaul would be required to modernize the equipment and functionality of the facility, redesigning and replacing complex systems such as electrical and power generation systems; compressed air production; mechanical utility distribution; communications; sanitary sewer and pump stations; potable and process water systems; and storm drainage systems.

## SOLUTION

To begin the process of repairing and modernizing the facilities and equipment at the dry dock, our team was awarded the contract to provide the majority of design disciplines as the prime architecture and engineering firm for the design-bid-build project.

# 12

SUPPORT BUILDINGS  
UPDATED

900K+

SQUARE FEET  
3D LASER-SCANNED

A detailed study was conducted to develop the scope of the design project. The study included a description of each dry dock deficiency, including recommended corrective action and associated cost. The study scope also included 3D laser-scanning over 900,000 square feet of facility, including the superstructure roof, dry dock basin, utility tunnels, wet wells and other areas of the dry dock.

Using Revit design software, we developed complete construction documents and cost estimates for civil, structural, mechanical, plumbing, electrical, telecommunications and fire protection engineering solutions. Repairs for the dry dock project included its cover, infrastructure systems, utilities, steel and concrete caissons, and 12 support buildings.

To support dry dock personnel during construction, performance specifications were also developed for temporary facilities including office and locker spaces, tool storage, clean room, towers and fixed fighting positions.

Additionally, the work included utility evaluation and select design accommodations to support the future Columbia class of submarines. This forward thinking aims to minimize future dry dock downtime while preparing for Columbia class at NSB Kings Bay.

## **RESULTS**

The final design documents incorporate various critical repairs and updates for the facility, including blast repairs and recoating structural steel; metal panel replacement;

overhaul of electrical and mechanical systems, including substations, switchgear and pumping systems; provisions for new auxiliary seawater system with chemical treatment; steel and concrete caisson repairs; bridge crane repairs; environmental permitting; cybersecurity design; and various repairs to support buildings.

As the project moved into the construction phase, we provided on-site engineers to act as construction administration support for the project. In the coming months, as construction continues, we will bring on additional on-site engineers in an ongoing effort to support NSB Kings Bay and NAVFAC SE as it updates its facility and prepares to continue delivering on its mission.

