



LEED SILVER CRITERIA

NAS AVIATION RESCUE SWIMMING TRAINING FACILITY

- Project Type:** Military—training facility
Location: Pensacola, Fla.
Owner: U.S. Navy
Architect: C.H. Guernsey & Co., Oklahoma City, Okla.
Structural Engineer: Zahl Ford Inc., Oklahoma City, Okla.
Contractor: Dick Corp., Pittsburgh, Pa
Precaster: Gate Precast Co., Monroeville, Ala., Gate Concrete Products Co., Jacksonville, Fla., and Gate Concrete, Pearland, Tex.



OVERVIEW

The 34,844-square-ft Daniel Rex Biddle Training Center Rescue Swimmer School at the Naval Air Station in Pensacola is named after Aviation Electronics Technician 2nd Class Daniel Rex Biddle, who lost his life in 1995 answering a distress call from a pleasure boat. The only Aviation Rescue Swimmer School (ARSS) in the Navy, the structure was built to replace facilities destroyed by Hurricane Ivan in 2004.

The facility is designed to train rescue swimmers to perform search-and-rescue missions in the water using helicopters and rafts, and to administer emergency medical assistance. Some 400 students a year will attend the 5-week training course.

A nearby, 53,377-square-ft Physical Fitness Center includes basketball/volleyball courts, a fitness and aerobic area, racquetball and handball courts, martial arts area, and a multipurpose room. Also nearby is a two-building Visitor's Quarters, including a two-story and a three-story structure.

The 82-ft-by-168-ft pool in the swimmer training facility holds 750,000 gallons of water and contains state-of-the-art equipment to simulate conditions on the open seas, including a wave generation system, two 9H1 helicopter simulator towers equipped with large spray heads to mimic rotor wash, two open parachutes, and a hydraulic bridge to support training operations. In addition, the training facility can accommodate nighttime training at all hours with the use of blackout shades.

C. H. Guernsey & Co. served as both civil engineer and electrical engineer. Mechanical/plumbing engineer was Newcomb & Boyd, Atlanta, Ga., and the pool engineer was Aquatic Design Consultants Inc., Louisburg, Kan. Precast specialty engineer was PTAC Consulting Engineers, Pensacola, Fla.

A total precast concrete system was selected for the swimmer training facility because it could provide structural durability to handle extreme Florida weather conditions, withstand hurricane-strength winds, offer substantial sustainability benefits, provide protection from indoor pool moisture, and meet antiterrorism/force protection (AT/FP) requirements.

This total-precast system incorporates insulated architectural precast walls, a double-tee roof system and hollow-core floors. The architectural precast walls serve multiple roles within the building system. The 31-ft-tall, precast concrete panels are designed to carry the loads from the double-tee roof system and provide hurricane protection. A recessed slot was cast in the back of the panels to support the stems of the doubles-tees which rest on the corbels. Roof framing consists of precast double-tees over the pool and a standing seam metal roof elsewhere.

31 FEET

Height of architectural precast concrete wall panels

103 FEET

Length of double-tees used to span the large training pool

13 R-VALUE

Thermal resistance of the insulated precast concrete wall panels

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Project enclosed a 750,000-gallon swimmer training pool.

Photo: Gate Precast Co.



The total-precast system included double-tees resting on brick-inlaid wall panels.

Photo: Gate Precast Co.



A 150-ton crane erected four precast concrete double-tees per day.

Photo: Gate Precast Co.

The lateral load resisting system consists of precast concrete wall panels utilized as shear walls. The roof top double-tees and steel roof deck serve as horizontal diaphragms and distribute the lateral loads to the vertical shear walls. The flanges of the double-tees are intermittently connected to serve as a diaphragm. Shear walls transfer the load to the foundation, which consists of spread footings and a 5-in.-thick concrete slab.

The walls use an inlaid thin brick system which has allowed the designer enhanced architectural expression using brick quoin corners. Precast concrete double-tees, each 103 feet long, were used to span the large training pool.

The project utilized 56,451 sq. ft. of architectural precast concrete and 16,999 sq. ft. of structural precast components, including columns, beams, hollow core, and 48-in.-deep double-tees. The total precast system met the architectural requirements as well as AT/FP and structural-durability needs for building in Florida weather conditions.

A 150-ton crane was used to erect the first 101 brick-inlaid architectural panels around the pool's perimeter, including 58 insulated panels. Four double-tees were erected per day once the wall panels were erected and braced.

Similar structural systems were used for the other buildings in the complex, including insulated, load-bearing precast concrete wall panels, precast hollow-core panels, and metal framed roofs. AT/FP progressive collapse design requirements for the three-story visitor center were accomplished by connecting each vertical precast wall panel to its adjacent panels.

Architectural precast erection took just 1 month, as did structural precast erection, even though the discovery of a fifteenth-century Spanish shipwreck during excavation caused an initial delay in construction. The Spanish ship was preserved.

The project won a PCI Design Award in 2009 for its use of a total-precast concrete structural system to meet key design challenges. At the time, award judges offered this comment: "The 100-ft clear span utilizing the double-tees and the insulated wall panels was an ideal precast solution for this project. A pool environment requires durability and un-cracked concrete. It requires a good thermal envelope. This was provided with very durable double-tees for a roof, and insulated wall panels for the moisture resistance and [to handle] the humidity that you experience in a pool building."

PRECAST CONCRETE'S CONTRIBUTION TO SUSTAINABLE CONSTRUCTION PRACTICES

The project was designed to meet LEED Silver criteria.

Sustainable Sites:

The project utilized erosion and sedimentation control techniques, as well as storm-water management and treatment systems.

Alternative transportation facilities are available and the project includes bicycle storage areas, changing rooms, and parking for low-emitting vehicles and carpooling.

Actions were also taken to reduce site disturbance and light pollution.

Energy & Atmosphere:

The project achieved a LEED-Silver-level standard for energy performance and solar heat gain coefficient for all exterior windows and openings.

Thermal comfort systems comply with ASHRAE 55-1992.

The 10-in.-thick, brick-inlay panels contain 2 in. of Isocast-R polyisocyanurate insulation, which provides an R-value of 13. A vapor barrier is built into the facer, eliminating the risk of condensation forming on the building's interior. Electrical conduits and boxes were cast into the panels in the plant.

Materials & Resources:

Load-bearing, precast wall panels eliminated the need for steel beam-and-column framing at the outside walls.

A minimum of 20% of all materials were manufactured locally, and materials used contained a minimum of 10% recycled content. More than 50% of construction waste was diverted from the landfill.

Indoor Environmental Quality:

The insulated, precast concrete wall panels feature a built-in vapor barrier to provide thermal comfort and reduce condensation from pool moisture that could cause mold.

Precast panels do not emit any VOCs. Low-emitting adhesives, sealants, paints, carpeting, composite wood, and agrifibers were used throughout.

In all, 75% of interior spaces are provided with daylighting.

The project meets standards for IAQ performance, tobacco smoke control, and indoor chemical and pollutant source control.

Innovation & Design Process

Innovative techniques included micro climate monitoring during construction.



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