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As part of the upper Peace River watershed in Polk County, Florida, the waters of Lake Hancock flow south down the Peace River, through Charlotte Harbor, and into the Gulf of Mexico. Years of pollution and stormwater runoff from the surrounding phosphate-rich soils of central Florida have made Lake Hancock one of the most polluted and nutrient-rich water bodies in the state. The poor quality of the water in Lake Hancock impacts the Peace River water quality and threatens Charlotte Harbor—one of the most productive estuaries in the state.

To improve water quality and protect the estuary and surrounding ecology, the Southwest Florida Water Management District established a plan to reclaim the settling area of a former phosphate mine and establish a 1,000-acre treatment wetland to reduce the amount of harmful nutrients from the water. This ultimately lowers nutrient levels in the water that passes through to the Peace River and effectively protects the estuary in Charlotte Harbor.
MORE THAN 750 FOOTBALL FIELDS OF WORK

The Lake Hancock project is enormous. With 1,000 acres of land to reclaim (more than 750 football fields), it covers an immense physical space; careful planning and coordination were required to ensure the work was accomplished safely and efficiently.

Because it was not possible to see the entirety of the site from a single location, a number of safety stations were established, with first-aid equipment and water for all employees and crews on-site. Numbered markers were installed around the perimeter to ensure workers would not get lost in the project’s vast expanse. In addition, the work areas were further broken down into a grid system of 30-acre blocks; each block could be monitored and tracked as its own smaller project, making it easier to fulfill time and budget commitments.

“This project is the largest of its kind undertaken by our district,” said Janie Hagberg, project manager, Southwest Florida Water Management District. “It addresses nutrients at the source and should have immediate benefits for the Peace River system.”
PINPOINT GRADING IN CHALLENGING SOIL COMPOSITION

In addition to the sheer size of the project, creating a wetland from an old mine-setting area presents its own challenges. Because the wetland water depths had to be carefully controlled to ensure wetland plant survivability, the bottom grade of the entire 1,000-acre wetland needed to have a differential of plus or minus three inches—leaving little to no room for error. To complicate matters, the soil in this area comprises largely waste phosphatic clay, a highly plastic material that is subject to shrinkage and expansion and, when wet, has the consistency of silly putty. With daily rainfall common in central Florida during the summer, work crews had to move to higher elevations and to areas with less of the waste material during the rainy season.

The consistency of the soil meant that fine grading activities using traditional earthwork equipment could not be sustained during Florida’s summer rainy season. After extensive research and planning, the team decided on the use of agricultural tractors using scraper pans, which use very low ground pressure and could effectively traverse the gooey material. The work was then subcontracted to a group with extensive experience in scraper pan grading, and the area was successfully graded to standard.
THE PROJECT

Having served over 17 million passengers in 2012 alone, San Diego International Airport is the busiest single-runway, commercial airport in the United States. The recent $900 million expansion—the largest in the airport’s history—adds to its notable legacy and marks a significant commitment to improving the experience for travelers using the airport.

Dubbed the Green Build, the expansion is a joint venture between PCL, Turner Construction, and Flatiron Construction focused on sustainability and leading-edge environmental practices at each step. These include incorporating 20,000 tons of recycled aggregate into 1.5 million square feet of taxiway and airport paving, and adopting energy conservation practices that resulted in energy savings of 30 percent over and above levels set by California’s stringent environmental laws.

PHOTO: Though the seams between the glass and the structure appear tight, the curtainwall system over Sunset Cove allows for seismic drift of 12 inches in either direction—up to 24 inches total— independent of the terminal.
BUILDING FEATURES THAT WILL STAND THE TEST OF TIME

The expansion features a signature, 16,500-square-foot curved and sloped glass curtain wall that offers dramatic views of the runway to travelers enjoying the airport’s new dining venue, Sunset Cove. As with any build, maintaining a dependable structure in the face of sometimes difficult natural conditions is paramount. The unique floor-to-ceiling windows of Sunset Cove posed a challenge to accommodating Southern California’s high probability for earthquakes.

To solve this engineering challenge, the project team made use of mock-ups and virtual models of the structure to ensure that the 99-ton curtain wall could withstand the required seismic activity. This step—essentially “constructing” virtual and miniature replicas before building the full-scale model—helped project engineers design the curtain wall with pins and rollers that can move up to 24 inches independently of the terminal while retaining structural integrity.

PHOTO: The curtain wall over Sunset Cove is made up of 350 individual windows that took over 30,000 manhours to install. Behind the stunning window, the expansion doubles the dining and shopping space previously available to travelers.

A CONSTRUCTION SITE OUT OF SIGHT

Because this project was an expansion of an existing airport rather than construction of an entirely new building, consideration had to be given to the many connections between the two structures. In addition to some 225 beam and column connections that had to fit seamlessly, the expansion had to tie into the existing baggage handling, piping, and electrical systems. To identify all the required connections, the project team undertook an extensive forensic analysis of the existing terminals, ensuring before construction began that the new structure could be built to function in harmony with the airport’s other terminals.

Construction on this scale can be noisy, dusty, and obstructive. When the site is also a working airport, passenger safety and inconvenience are additional concerns. Thanks to temporary partitions and walls separating construction from the passenger areas—sometimes by as little as a few inches—the 445,000-square-foot expansion was completed with little inconvenience to passengers. This meant that, for many, their only experience of the expansion was of the completed facilities rather than of a traveler-unfriendly construction site.

PHOTO: An average of 50,000 people pass through San Diego International Airport daily, making it one of the busiest airports of its kind in the world.
THE PROJECT

The Quinte Courthouse, located in Belleville, Ontario, brings together four courthouse locations under one roof. The new courthouse increases the number of available courtrooms to eleven, serving both Ontario and Superior courts. The facility also provides better security and improves access for people with disabilities.

The 173,000-square-foot building is targeting LEED® Silver certification and features a ceremonial plaza and open atrium lobby that offer exceptional views of downtown Belleville and Lake Ontario. With the exterior displaying copper canopies, curtain wall, and limestone, and the interior showcasing extensive millwork paneling and terrazzo floors, the building’s high-end finishes make this project a distinguished landmark in the city of Belleville.
FLOOD PLAIN REQUIRES WATER MANAGEMENT

Only meters from the shore of Lake Ontario and the banks of the Moira River, the Quinte Courthouse is situated in a 100-year flood zone. Prior to construction, each site in the area undergoes rigorous surveying; even so, the reports generated are only a snapshot of the earth’s composition. Once construction begins, the true composition is unveiled.

The high water table meant the building required a higher level of foundation waterproofing. The team needed to excavate the site and install the mud slab, followed by a waterproofing membrane and a top mud slab, before commencing the foundation formwork. This was done to provide extra waterproofing to create a barrier between the groundwater and the building. Waterproofing materials are typically used only on the exterior of the foundation; in this case the team had to encapsulate the entire building to prevent water from seeping in. This type of structure takes more than double the usual amount of time and a builder who can adapt quickly to changes in the construction process.

ACHIEVING PROJECT MILESTONES THROUGH OPEN COMMUNICATION

Every project sets milestones throughout both the design and construction phases. The Quinte Courthouse had a rigorous 24-month schedule. To maintain the schedule and achieve signoff on each of the contractual milestones, the PCL team along with the owner Infrastructure Ontario maintained open communication and shared feedback for the duration of the project.

During each stage of design development and construction development, the team provided the client with tender packages so that approvals would take place between the various contractual milestone dates. The ongoing collaboration between the client and construction team was instrumental in the approval process, as both parties had the opportunity to discuss and agree on the terms prior to the actual deadline dates. This two-way communication allowed the project to move forward without delay.

The project was completed in August and occupants were able to move into the facility on schedule. PCL is very proud to be associated with this new landmark project in the Belleville area.

“The staff of the Quinte Courthouse are proud to work in this spacious, light-filled modern building that is the culmination of years of planning and collaboration. The new building really reflects the dignity and professionalism of the justice system.”

Bonnie Gryce – Manager Court Operations, Court Services Division, Ministry of the Attorney General

PHOTO: Situated in a 100-year flood zone, the Quinte Courthouse is meters from Lake Ontario and Moira River.

PHOTO: The facility is targeting LEED Silver certification through a focus on energy efficiency and green housekeeping practices.
The PCL family of companies is a group of independent construction companies which carry out diverse operations in the civil infrastructure, heavy industrial, and buildings markets.