

A project profile from geoengineers.com

L'Auberge Casino Hotel Development

Floating casino project presents unique geotechnical challenges



The completed floating L'Auberge casino, hotel and parking areas.
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Overview

L'Auberge Casino Hotel is a 575-acre tract that Pinnacle Entertainment developed adjacent to the Mississippi River in Baton Rouge, Louisiana. Designed to capture the feel of a Southern river lodge, the development includes a 74,000 square-foot gaming facility that floats in a man-made lake next to the river channel, a 12-story hotel with 206 guest rooms and a rooftop swimming pool. The complex has a 1,600-car parking lot and an 800-car parking garage.

Louisiana gambling laws restrict land-based casinos to tribes, but allow non-tribal owners to build and operate riverboat or dockside casinos. For this reason, Pinnacle's design called for placing the floating casino building on the Mississippi River *batture*, a strip of land between the levee and main channel that is subject to annual flooding.

Pinnacle had worked with GeoEngineers in the past and knew of the company's reputation for levee permitting work with the US Corps of Engineers (USACE). For this high-profile Baton Rouge casino project, Pinnacle asked their engineering firm, ABMB, to engage GeoEngineers to provide geotechnical site investigation and engineering services, as well as USACE permitting assistance.

This unusual building site required engineering solutions that would work over the site's soft soil, meet regulations governing building on a levee and include geotechnical engineering solutions for the floating casino barges and lake.

Given the project complexities and critical importance of maintaining the integrity of the Mississippi River levee, GeoEngineers provided detailed construction monitoring and documentation for piling and earth and concrete work over the levee. This step proved important to securing USACE approval and enabled GeoEngineers staff to be available during construction to answer questions and resolve construction issues.

L'Auberge Casino Hotel met USACE's engineering and safety requirements and opened in the fall of 2012.

Approach

As lead geotechnical engineers on the project, GeoEngineers' team worked closely with Pinnacle, ABMB (now Stantec), contractors, levee board, Louisiana Office of Coastal Protection and Restoration (OCPR), USACE and other regulatory agencies.

To develop design parameters for the casino, hotel and entrance road that suited the site's geological conditions, our geotechnical specialists conducted test borings in and on either side of the levee. The team's evaluations included slope stability, settlement, seepage, bearing, pile capacity and impact of site activities on river revetment (the concrete block 'mattresses' used for erosion protection).

The design specified building the casino on three barges that would float in a man-made lake excavated next to the 20-foot tall, 200-foot wide levee. Plans also called for an elevated concrete road over the levee, which placed additional load on the earthen structure. The combination of additional load on the levee and excavating a lake right next to the levee required careful evaluation to make sure that the levee didn't collapse into the lake, especially under critical river conditions.

EXPERTISE

- Geotechnical
- Permitting

MARKET

- Development

LOCATION

- East Baton Rouge Parish, Louisiana

The USACE required an elaborate real-time, 24/7 monitoring program accessible through a secure website to check the movement of the levee during and after construction as it settles and adjusts to the new loadings. GeoEngineers developed, installed and set up the monitoring program for below-grade soil (to a depth of 100 feet below grade) and the structures on the levee, using both traditional manual and electronic remote monitoring techniques.

GeoEngineers provided experienced technicians to monitor construction and installation of the many unusual structural features, including:

- Constructing the earthen containment basin in the batture
- Driving 135-foot-long, 42-inch-diameter steel pipe piles
- Installing hundreds of 18-inch-diameter auger-cast piles on the batture and on the protected side of the levee for the hotel, 800 car parking garage, facilities adjacent to the floating casino and utility/support facilities
- Driving H-piles for a T-wall along the river side of the basin
- Constructing a ground-supported, concrete, circular access ramp over the levee



Innovation

The access road and ramp to the main casino hotel entrance crossed the levee in an area where pile-driving was prohibited. GeoEngineers created an unusual ground-supported design for the ramp that minimized costs by reducing the structure size to the footprint required for the ramp. Our team considered the three-dimensional effects of the asymmetrical ramp loading at numerous locations to evaluate stability to USACE satisfaction.

Results

- L'Auberge Casino Hotel met stringent regulatory requirements. It was completed in the fall of 2012 and the casino and hotel are open for business.
- GeoEngineers shepherded the project through a demanding permitting process, bringing to bear its strong technical expertise and excellent working relationship with USACE.
- The design was engineered in a manner that met USACE standards, despite the site's difficult soft soil conditions. The one-of-a-kind design included basin excavation next to a levee and a ground-supported, elevated, six-lane, concrete roadway bearing on the levee adjacent to the basin.

Aerial photos provided courtesy of Aero Photo.



Piles anchoring barges were driven with large pile-driving equipment.



Aerial view of barges during high water before the casino was built atop them.
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The casino was built on top of the floating barges.
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Constructing the elevated roadway over the levee



L'Auberge Casino Hotel opened in fall 2012.
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