

## ACC GARAGE & CHILLER PLANT



**PROJECT**  
**INDUSTRY**  
**LOCATION**  
**PRODUCTS**

Austin Community College Parking Garage & Chiller Plant  
Transportation; Water Treatment & Storage; Educational  
Austin, Texas, USA  
PENETRON ADMIX SB, PENETRON, PENECRETE MORTAR

# ACC GARAGE & CHILLER PLANT

## CASE SUMMARY

The new parking garage and chiller plant at the Highland Campus of the Austin Community College were completed in 2020. PENETRON ADMIX SB was specified as the concrete waterproofing solution for both the seven-floor garage and the chiller plant's below-grade concrete structures.

The Austin Community College (ACC) is a public community college system serving the Austin, Texas metropolitan area and surrounding communities. The college maintains numerous campuses comprising about 100,000 students enrolled in academic and continuing education programs. The Highland Campus, previously the Highland Mall, opened in Fall 2014.

The Highland Campus parking garage is a new seven-story construction with 2,385 parking spaces for vehicles and an additional 200 bicycle parking spaces. Located in the southeast corner of the campus, the \$51 million parking garage project was designed by Barnes Gromatzky Kosarek Architects and is part of an ongoing expansion of the Highland campus. The design of the parking garage combines support structures of symmetrical vertical double angle beams of galvanized steel with the underlying cast-in-place concrete floors.

### Parking garage both above and below-grade

Because the Colorado River flows right through the heart of Austin – and is dammed in two different locations to form Lake Austin and Lady Bird Lake – any construction project on the southern Plains of West Texas faces considerable waterproofing challenges as a result of the high water table.

The engineers at Jacobs Engineering and the general contractor, Spaw Glass, were confronted with high water table issues at the construction site that needed to be resolved before any construction could begin. Built into a hillside, the bottom two floors of the seven-floor Highland Campus parking garage are actually below-grade; the remaining five floors are above-grade.

Familiar with the local water table challenges for below-grade and water retaining structures, Centex Materials, the ready-mix supplier, opted for PENETRON ADMIX SB over a competitive crystalline waterproofing admixture as the preferred waterproofing solution. Over 2,000 yd<sup>3</sup> (1,530 m<sup>3</sup>) of concrete were treated with PENETRON ADMIX SB and used for the cast-in-place concrete foundation slabs and basement retaining walls.

A combination of PENETRON, a crystalline waterproofing coating, and PENECRETE MORTAR, a crystalline waterproofing repair mortar, was used to fill the tie-holes in the basement retaining walls to ensure a watertight structure.



**Hydrostatic pressure challenge:** Plans called for the chiller plant to be built about 20-feet (6 m) below-grade, making a robust waterproofing solution an important part of the project specifications.



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ACC decided to follow a 'belt and suspenders' approach when it came to the waterproofing of the parking garage, incorporating the Penetron System as well as a traditional waterproofing membrane system. This clearly shows that the Penetron System is compatible with membranes, coatings and architectural finishes.

## Working 20-feet below-grade

The new chiller plant provides additional air conditioning capacity for the current HVAC system to cool the new buildings at the ACC Highland Campus. The \$24.4 million project comprised construction of below-grade concrete structures to house the 4,500-ton chiller plant, the cooling towers and tower platform, water pumps, air handlers, electrical equipment, fire protection equipment, thermal energy tank, controls system, and the chemical storage shed.

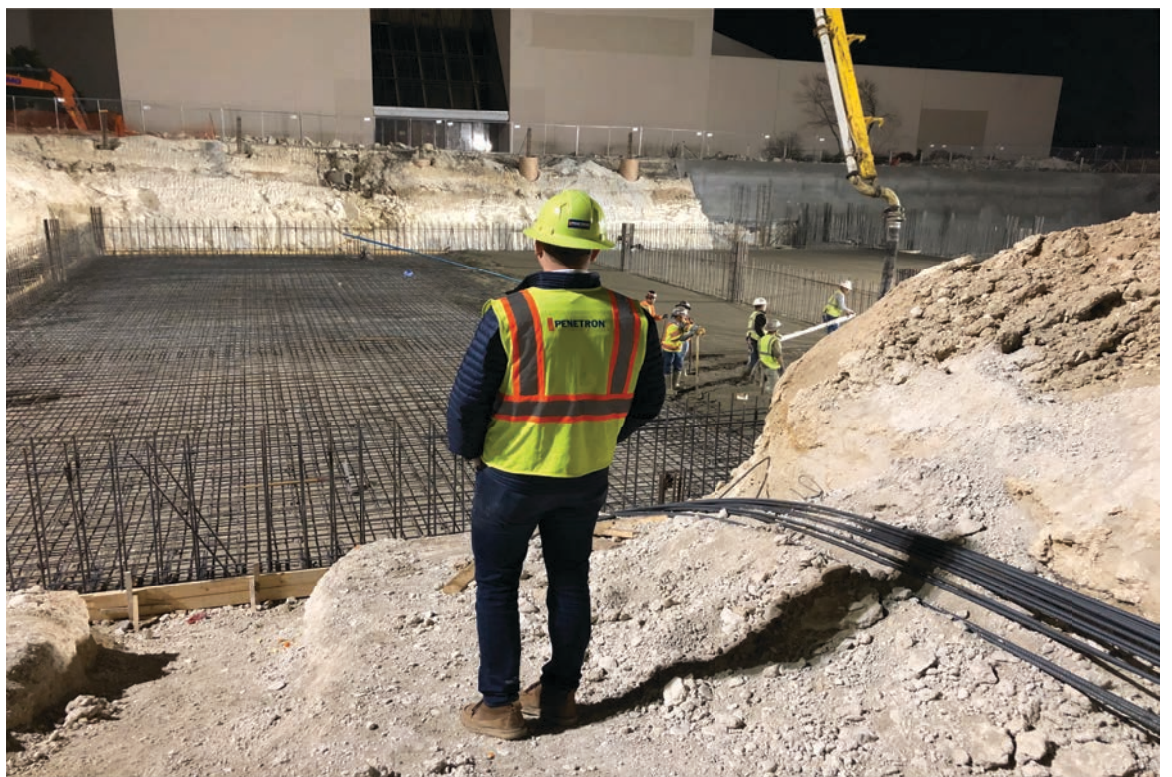
The high water table at the construction site was almost identical to the situation encountered with the ACC parking garage project, directly adjacent to the chiller building. Because the construction plans called for the chiller to be placed about 20-feet (6 m) below-grade, the structural engineers at JQ + Tsen in Austin had stringent requirements for a durable waterproofing solution. The local Penetron technician provided technical support that enabled Lauren Concrete, the ready-mix supplier, to supply a concrete mix that would meet the project requirements. About 1,250 yd<sup>3</sup> (955 m<sup>3</sup>) of concrete were treated with PENETRON ADMIX SB in pre-measured, soluble bags for easier dosing during batching.

A combination of PENETRON and PENEKRETE MORTAR was once again used to fill all the tie-holes in the walls to ensure watertight structures. Once completed, the contractor submitted both ACC projects for LEED Silver certification.

## Self-Healing concrete seals new microcracks

PENETRON ADMIX reacts with moisture and concrete minerals to form insoluble crystals within the concrete matrix. The resulting crystalline formation reduces shrinkage cracking, seals microcracks, and provides a self-healing capacity. When new cracks develop throughout the lifespan of the concrete, the presence of water flowing through the cracks reactivates the chemical reaction to self-heal the newly formed microcracks – waterproofing those cracks without the need for repairs. The concrete is now impermeable.

**“With significantly increased concrete durability and reduced permeability – and self-healing ability – recent test results have shown that PENETRON ADMIX can add up to 60+ years to the concrete lifespan in critical environments before the onset of corrosion.”**



**Applying an integral solution:** Spaw Glass project engineers specified PENETRON ADMIX to counter the groundwater issues at the ACC Highland campus construction site.