

MIDLAND WASTEWATER TREATMENT PLANT



PROJECT
INDUSTRY
LOCATION
PRODUCTS

Midland Wastewater Treatment Plant
Water Treatment & Storage
Midland, Texas, USA
PENETRON ADMIX® SB

MIDLAND WASTEWATER TREATMENT PLANT

CASE SUMMARY

The Midland, Texas, wastewater treatment plant is the result of an innovative public/private partnership that provided a benefit for both parties. PENETRON ADMIX SB was chosen to render the plant's concrete infrastructure permanently impermeable to the aggressive chemicals typically found in effluent.

The partnership saw the city of Midland agree to let Pioneer build a new municipal wastewater treatment plant in return for a long-term supply of reclaimed water from the plant for use in the company's oil and gas development activities in the region. In addition, Pioneer will pay the city up to \$2.5 million annually for the sale of treated water, which also reduces pressure on the town's freshwater resources.

Dangers of Chemical Attack and Concrete Deterioration

Concrete is a very hard and strong material but also contains porous networks of microscopic voids and cracks that allow chemicals, water, or any type of moisture to enter the matrix. During the design phase of the \$133.5-million-dollar project, the engineers at Jacobs Engineering and CH2M-Hill were aware of the need to protect the new plant's reinforced concrete structures from sulfates and other corrosive chemicals commonly found in sewage and industrial waste. Also, the soil in the Southern Plains of Western Texas showed a high level of sulfate, making a robust solution to mitigate the sulfates even more urgent.

During the early stages of the project, the engineers at Jacobs Engineering and CH2M consulted with the local Penetron specialist and Summit Materials/Troy Vines, the project's ready-mix supplier, to design a durable and waterproof concrete mix design with value added benefits.

Reducing Long-Term Repair and Maintenance Costs

Tests with PENETRON ADMIX-treated concrete and success with other wastewater treatment plant projects showed how PENETRON ADMIX-treated concrete reliably withstands water and waterborne chemicals from penetrating through the pores in the concrete. PENETRON ADMIX-treated concrete is also sulfate resistant, making it the ideal solution to protect the concrete against sulfate attack and related deterioration commonly found in sewage environments.

Adding PENETRON ADMIX, a crystalline waterproofing admixture, to concrete helps to significantly reduce permeability of the matrix by permanently self-healing and sealing microcracks, pores and capillaries throughout the entire matrix of the concrete for the lifetime of the concrete. The decreased permeability of PENETRON ADMIX-treated concrete mitigates corrosion of the embedded reinforcing steel by stopping water and other harmful elements from penetrating the concrete that would otherwise initiate the corrosion of the steel. Corrosion of embedded reinforcing steel causes internal pressures inside the concrete that ultimately cause the concrete to crack and spall.

PENETRON ADMIX-treated concrete is effective even under the constant hydrostatic pressure encountered in the Midland facility. PENETRON ADMIX also significantly reduces long-term repair and maintenance costs.

Luminous Green Tracer in Bleed Water

Summit Materials/Troy Vines treated over 25,000 cubic yards (19,100 m³) of concrete with PENETRON ADMIX SB, which was used in all the new plant's tanks, filters and headworks.

The general contractor, PLW Waterworks, noted the 'green tracer' in PENETRON ADMIX that presents itself as a luminous green tint in the bleed water during concrete placement and curing. This visual quality control tool provides construction and design teams with reliable proof that the concrete has been treated with Penetron's crystalline waterproof admixture.

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Protection against aggressive conditions: PENETRON ADMIX SB was added to over 25,000 cubic yards of concrete for the Midland, TX, wastewater treatment plant's tanks, filters and headworks.