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Sheet Pile Cofferdams

Project: Kelley Construction MPL #11041

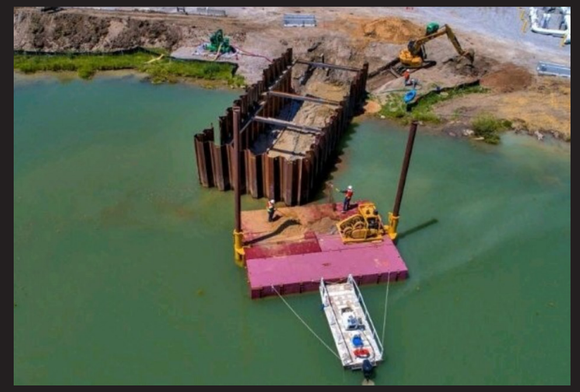
Engineer: Netemeyer Engineering Associates, Inc.

Location: Patoka Station, Illinois

With increased product capacity, the petroleum operator at Patoka Station needed to increase the fire protection readiness by constructing 2 new water drafting pits. This way, in the event of a fire, water could quickly be drawn out of the small, 'man-made' lake and used for fire suppression.

With various existing constraints, the only acceptable way to build the drafting pits was to construct 2 cofferdams, 1 on each side of the lake. This way, crews could work below the water surface to construct the necessary foundations, piping and bentonite layers required. This would provide each side of the lake with a catch basin out in the lake and a 17’ tall concrete drafting pit, connected to each other by a large 36” pipe.

Innovative Piering’s scope of work for Kelley Construction Inc. consisted of constructing the 2 sheet pile cofferdams. Average water depths were 14’ and while currents were minimal and it was a non-navigable waterway, the winds were a constant challenge.



The largest challenge of the project however, was the firm soils that the sheet piles needed to be driven in to. Required driven depths of each sheet was at least 4-6’ of embedment. The ‘firm’ and ‘very hard’ clays proved to be incredibly challenging to drive the ESZ85 sheets into.

In order to construct the 25’ wide and 80’ long cofferdams, a waler template frame was constructed on shore from W16 X 79# beams. Each frame was set on top of the falsework with the large crane. It was placed precisely onto the temporary supports. This frame would keep the cofferdam on layout and help combat the lateral loads put on the cofferdam from the water and soils.

A 44-50 variable moment vibrator was utilized to install the falsework and sheets. A 165T, lattice boom, crawler crane was used to drive the piles. Altogether, 370 LF of sheet pile was installed. Access to the sheet piles in the water was via aerial lift equipment or by barge. Once each cofferdam was complete, the interior of each cofferdam would be put into a lower pressure with a 6” pump, and sand-sealing operations would take place. The sand would seal the gaps and leaks, causing the cofferdams to retain the water and provide a drier working area.

As this was a major petroleum site, Innovative Piering had to comply with numerous safety and regulatory compliance measures to ensure a safe operations. Some of these safety measures included extensive safety gear and equipment, extensive crane lift plans and managing various equipment inspections. No one was injured and the project was considered a success by the Owner and Kelley Construction Inc.