Energy - Oil and Gas

Magellan Tanks 521, 522, 523

UNITED STATES

Galena Park, TX

Owner
Magellan Midstream Partners, L.P.

Engineer
Terracon Consultants, Inc.

General contractor
Menard USA/GR Birdwell (sub)

Dates of work
February 2017 April 2017

Main figures

Stone columns
1,298 EA.

Description

Magellan Midstream Partners wanted to construct three new storage tanks as part of an expansion to their Galena Park, Texas terminal located along the Houston Ship Channel. A geotechnical report determined that the soils were inadequate to support the ring wall foundations of the proposed tanks, numbers 521, 522, and 523. Menard proposed a ground improvement solution of Stone Columns to support the tanks and reduce maximum long-term differential settlements to two inches or less.

Menard acted as general contractor for the ground improvement and subcontracted GR Birdwell to carry out the site preparation and working platform construction. By bidding the ground improvement and working platform as a package, we offered the client significant cost savings.

Ground conditions

The site is relatively homogenous in the upper 15 to 20 ft with soils consisting of clayey fills and lean clay with sand. Beneath this layer, the soils beneath tanks 521 and 522 are similar with alternating layers of fat and lean clays at 20 to 40 ft. Tank 523 is underlain by a thick silt deposit from 20 to 40 ft below grade.

Solution

There were several challenges towards the beginning of Stone Column installation. During the first few weeks of production, heavy rains deteriorated the working pad and flooded the area where Menard rigs were staged to be assembled.

When Stone Column installation began, large steel plates were encountered on the site for Tank 522, approximately 3 to 5 ft below the working surface. The Menard predrill rig could not penetrate these plates, so the client brought in an earthwork contractor to remove the plates by excavating out 4 to 5 ft of material. The site was then back filled and brought back to grade by the client.

After the ground improvement installation completed, GR Birdwell constructed the ringwall and foundation under contract with Magellan. A total of 1,298 Stone Columns were installed to an average depth of 24 ft and maximum depth of 33 ft.

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