ICHTHYS ONSHORE LNG FACILITIES - CRYOGENIC TANKS

Controlled Modulus Column (CMC) Rigid Inclusions

AUSTRALIA

Owner
JKC Australia LNG Pty Ltd

Engineer
Golder Associates Pty Ltd

General contractor
Laing O'Rourke

Period of works
September 2014-September 2014

Main figures
Controlled Modulus Columns
664 CMC's installed, ranging in depth from 3m to 6m

Project description
In 2012 Laing O’Rourke in partnership with global LNG tank specialist Kawasaki Heavy Industries were awarded the contract to deliver a network of four massive cryogenic tanks for the $34 billion Ichthys LNG Project at Blaydin Point, Darwin (NT).

Ground conditions
Menard was awarded the ground reinforcement contract works for one of the cryogenic tanks which was to be located in an area that consisted of soft sandy clay below a layer of 75mm engineered rock fill.

Solution
The best suited solution for this project was to install rigid inclusions named Controlled Modulus Columns (CMC’s). This method produces very little spoil during construction and was ideal for this project due to the presence of acid sulphate in the soil.

In order to increase the rate of production predrilling of CMC locations with a separate excavating auger was carried out. This penetrated the initial engineered rock fill to expose the soft clay below. Following the installation of the CMC’s they were cut back approx. 0.75 - 1.5m below the existing level. Menard achieved this by post drilling CMC’s again with an excavating auger.

As part of the design scheme, concrete pile caps were situated on top of the CMC’s to laterally disperse the vertical loads to be applied on the CMC’s evenly by the Cryogenic Tank. Instead, Menard Oceania offered a more cost and time effective methodology by replacing the pile caps with the introduction of a cellular confinement system.

In September 2014, the construction of 664 CMC Rigid Inclusions ranging in depth from 3m to 6m was achieved.