



OIL AND GAS

ICHTHYS LNG FACILITIES

Dynamic Replacement & Stone Columns

AUSTRALIA



Owner

INPEX

Engineer

JKC / Coffey

General contractor

Macmahon John Holland JV

Period of works

June 2012-July 2013

Main figures

Dynamic replacement

300,000 m² treated

Stone columns

area of approximately 25,000 m² treated



Flare pad calibration works - dynamic replacement



Stone columns

Project description

Macmahon John Holland Joint Venture (MJHJV), engaged Menard as leading Ground Improvement Specialist to carry out the design and construction of approximately 325,000 m² of ground improvement works for the development of a LNG Plant in the Northern Territory.

Ground conditions

The area is located 70kms outside Darwin and comprises of marsh land, surrounded with mangroves, with upto 8m difference between low and high tide. This job conditions were challenging, due to the site remote location, harsh climate and difficult ground / tidal conditions as well as the strict constraints of being an Oil and Gas Project.

Solution

Menard decided that the main ground improvement technique to be used to treat approximately 300,000 m² of poor soil / contaminated marine mud would be Dynamic Replacement (DR), and the works would be carried out with the use of 4 Cranes.

Dynamic Replacement is a method of ground improvement, whereby large inclusions are introduced into soft soils to relatively shallow depths (5-7 meters), in order to modify the global modulus of the soil and render it suitable for construction purpose. DR was chosen as a cost effective method of ground improvement and also to minimise the upheaval of the contaminated material which would be under a designed working platform of between 1.5 – 2.2m thick.

The second method of improvement works which was proposed was Stone Columns by the dry Bottom feed technique, which was performed using one crane improving an area of approximately 25,000 m². The purpose to these columns was to stabilise the ground / act as a founding layer for the construction of a Jetty into the ocean. This was then to be used as the Module Offloading Facility (MOF), for the ships which were to transport the materials to construct the LNG tanks to site.

Menard safely and successfully completed the works in July 2013 meeting all the technical challenges of the project.