

# FISHERMAN ISLANDS, BRISBANE

## VACUUM CONSOLIDATION AND WICKDRAIN GROUND IMPROVEMENT TRIALS



Sustainable Technology



**Client:** Port of Brisbane  
**Consultant:** Coffey Geotechnics

**Specialist Contractor:** Austress Menard Pty Ltd

### THE PROJECT

Port of Brisbane Corporation has engaged Austress Menard as a specialist contractor to participate in a series of ground improvement trials for the consolidation of the existing reclaimed areas at Fisherman Islands Paddock S3A.

The existing subsurface ground conditions within the reclamation area are significantly different from existing developed areas due to the presence of a high water table, insitu compressible clays over 30m thick, a layer of dredged river mud varying in thickness of between 7 to 10m over the top of the reclamation with an additional sand capping layer.

#### AUSTRESS MENARD'S ROLE

Austress Menard was awarded the project in November 2006 as a specialist contractor to carry out works which included the design, construction and ongoing monitoring of the following range of consolidation techniques:

**Menard Vacuum Consolidation (MVC)** - An area totalling 16,500m<sup>2</sup> has been selected for treatment with MVC which is located parallel to the external containment bunds allowing for consolidation and surcharge placement to the full extent of the treatment area without any risk of instability or time delay due to failure. Due to the presence of sand pockets and a water table at 6m depth from the platform a soil-bentonite cut-off wall has been installed, to an average depth of 16m, to fully enclose the MVC system around its perimeter. This activity in itself was a great geotechnical challenge due to the ground conditions which consisted of hydraulic placed sand and low strength dredged river mud.

**Traditional Wick Drains and Surcharge** - The remaining area of the S3A paddock has been treated using traditional Wick Drain and surcharge with the whole area being divided into six individual trial areas by adopting three different Wick Drain products and a variety of design parameters.

The initial stages of planning involved a detailed testing and inspection plan which involved an extensive geotechnical investigation of the existing ground conditions for both platform stability and identification of insitu materials for construction of the soil-bentonite cut-off wall. All of the initial geotechnical information was correlated into a platform design with extensive platform stability works undertaken prior to any heavy plant or equipment being brought to site.

The main works were carried out in unison with two Wick Drain machines, longreach excavator and soil-bentonite mixing plant all working together to complete the works within the 3 month program period specified at tender stage. Since commissioning of the MVC system pressures of -80kPa (design -70kPa) have been achieved and surcharge placement within the Wick Drain areas has been placed within the target placement dates. With over 806,000lm of Wick Drain and an MVC area of 16,500m<sup>2</sup> installed it is the largest project of this kind Austress Menard have carried out within Australia to date.

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