

# FISHERMAN ISLANDS

## STONE COLUMNS & WICK DRAIN GROUND IMPROVEMENT



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

**Specialist Contractor:** Menard Bachy Pty Ltd

### THE PROJECT

Port of Brisbane Corporation has engaged Menard Bachy through the Menard Bachy & Civdec Constructions Joint Venture to complete the Rockwall and General Surcharging Contract as part of the construction of the new Port of Brisbane General Purpose Berth located on the Brisbane River at Fisherman Islands.

The project involves the reclamation of the Brisbane River with the construction of a rockwall, filling, installation of stone columns and wick drains, and surcharging. The ground conditions are predominantly marine muds overlaid by imported and consolidated river sands. The site also contains potential acid sulphate soils.

### MENARD BACHY'S ROLE

Menard Bachy was awarded the project in March 2007 as a specialist contractor to carry out the installation of Stone Columns and Wick Drains.

Stone Columns are been installed along the length of the rockwall to a treatment zone 15m wide over 360m of the reclaimed river. Columns are been installed to an average depth of 15m, and a maximum depth of 21m, some 16.5m below the water table. In total 1450 columns are to be installed over a 13 week period.

Menard Bachy mobilised two top feed wet method vibroflots to complete the works. The technique involves the use of a vibroflot, comprising a hydraulic powered eccentric weight assembly enclosed in heavy tubular steel casing. The

vibroflot is suspended from a crawler crane. The basic length of the vibroflot assembly is 8m. The vibroflot diameter is 310mm. It is powered by a 130kw portable diesel powerpack generating high centrifugal forces in the horizontal plane at a frequency of 50 cycles per second. The nose of the vibroflot is tampered to aid penetration of the ground, whilst vertical fins prevent the vibroflot rotating during penetration.

The vibroflot with its suspension device is brought by means of the supporting gear over the position of the compacting point. After the motor of the vibrator is switched on, the vibrator is lowered, emitting water from its bottom jet to the required depth. The upward flow of water flushes out the soil particles within an area which is dependant on the type of soil and the volume of water.

On reaching the required depth of penetration the water flow is diminished such that the annular space around the vibrator and its extension remains open. The granular material is then fed into the hole. The compaction process is carried by withdrawing the vibrator slowly and gradually with alternating up and down movements.

The compacted column is formed composed of imported crushed rock mixed with the original soil. The fill material is simultaneously pressed into the surrounding soil and compacted in 0.3m to 0.5m lifts until the stone column is formed to the surface.