

PORT OF BRISBANE MOTORWAY UPGRADE

Controlled Modulus Column Rigid Inclusions

AUSTRALIA



Owner

Port Connect

Engineer

N/A

General contractor

BMD and Seymour White JV

Period of works

March 2012-April 2012

Main figures

Controlled Modulus Columns
approx. 5600 CMC's



Project description

BMD & Seymour White JV engaged Menard as Ground Improvement Specialist to undertake for Port Connect the ground treatment works associated with the Port of Brisbane Motorway project.

The proposed route would create a direct connection from the existing gateway motorway to the Port of Brisbane, an essential upgrade due to the expansion of Brisbane Port to make it one of the leading ports in Australasia and the South Pacific.

Ground conditions

The site ground material varied dramatically throughout the job site. Different degrees of soft soil, sand and stiff soil existed throughout the project.

Menard decided that the main ground improvement technique to be used to treat the areas would be Controlled Modulus Columns (CMC) and the works would be carried out with the use of 3 no. Liebherr Piling rigs.

CMC is a method of displacement piling, a quick, cost effective and an environmentally friendly solution of improving the ground as it generates minimal spoil. CMC's are installed as rigid inclusions in the soil for the purpose of enhancing the global modulus of otherwise incompetent soil.

Solution

The design consisted of 6 separate abutments for 3 bridges along the route of the motorway, with approx. 5600 CMC's, totalling 56,000 linear meters of columns.

The design approach divides the embankments into two zones, namely the Structure Zone and Transition Zone. The Structure Zones commences immediately from the Bridge abutments and its extent depends on the loading from the abutments. The Transition Zone lengths again vary depending on the approach embankments to meet post settlement construction requirements.

The length of CMC's varied on the project between 3 and 32 meters, some of which were reinforced, to deal with the tensile forces transferred from the abutments.

Menard safely and successfully completed the works in April 2012 meeting all the technical challenges of the project.