

Nelson Point South Yard, Port Hedland

Stone Columns



Client: BHP

Specialist Contractor: GFWA

THE PROJECT

Located about 1,700 km north of Perth, Port Hedland is one of the major iron ore ports in Australia. It is an industrial centre totally committed to the extraction, processing and exporting of iron ore. Its key symbols are the huge iron ore crushing mill at Nelson Point, the port with its gigantic iron ore carriers and the seemingly endless iron ore trains, as long as three kilometres and with up to 300 wagons, which move backwards and forwards from the mines at Mount Newman.

The feature which dominates the landscape of Port Hedland is the BHP Iron Ore Nelson Point crushing and shipping area. The plants had a combined capacity of over 40,000,000 tonnes a year at the time of the project.

Crushed ore is stockpiled before being reclaimed and conveyed to the ore pier where two ship loaders feed the material into ore carriers of up to 200,000 tonnes dead weight destined for the steel mills of Australia and world markets including Japan, China, South Korea, Taiwan, Europe and elsewhere.

Poor ground conditions in the South Yard Ore Handling Facility required ground improvement to limit the differential settlement of rail supported equipment operating on dredged fill underlain by soft clay.

THE ROLE OF GFWA

GFWA was awarded the contract for the installation of more than 17,500 stone columns with a total length measuring approximately 102,000 linear metres over more than 60% of the two 50 m wide by 800 m long stockyard areas.

Stone columns were installed to strengthen the soft cohesive & silty material underlying the fill material and therefore reducing the ground's settlement and slip failure potential.

The sub strata consisted of 3 to 5 m of medium dense dredged non cohesive fill over up to 6 m of soft to firm cohesive silty clay material derived from the mangrove swamps. The fill material consisted of hard crushed igneous ferrous stone less than 50 mm passing size and sand fill in the upper layers. Nominal column diameter was 1.1 m. Column lengths were from 6 m to 9 m and grid spacing ranged from 2 to 3.5 m.

The work site had been subjected to preloading with approximately 100 kPa of iron ore for a period of 6 weeks prior to commencement of stone column installation.

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