ROADS

TELEGRAPH ROAD OPEN LEVEL CROSSING ELIMINATION PROJECT

Soil Mixing

AUSTRALIA

Owner
Brisbane City Council
Engineer
Aurecon
General contractor
Bielby Hull Joint Venture
Period of works
September 2013-December 2013

Main figures

Ground improvement
13,200m3 of shallow soil mixing

Project description

The crossing is located at the intersection of Telegraph Road and Lacey Road in the northern Brisbane suburb of Bracken Ridge. (QLD) The works involved in the project consisted of pavement widening and realignment of the existing Telegraph Road as well as the construction of a road over Rail Bridge and associated high embankments.

Ground conditions

Mass soil mixing to the foundation material was required to improve the soil properties and reduce both settlement and differential settlement at the bridge abutments and bridge approaches.

Menard performed shallow soil mixing (SSM) of approximately 2,700m3 with an average depth of 2m in the structure zones and approximately 10,500m3 with an average depth of 1m in the transition zones.

Solution

The SSM was completed by mixing the site soils with water and then grout using a combination of excavator buckets and an excavator-mounted rotary blending system known as Backhoe Operated Soil Stabilisation (BOSS) system.

The main objective of the bucket mixing being to excavate and to overturn soil and break up any clumps, establish the depth of treatment, remove debris and carry out a preliminary mixing of the soil with the water and the grout. The duration of mixing was adjusted by the supervisor and vary during the process as a function of soil response was visually monitored throughout the mixing process.

After the initial bucket mixing phase was complete, the BOSS blending unit was then passed through the entire cell to ensure the soil/grout was blended into a homogeneous soil-mix material. The grout made of General Blend cement served as the stabilizing reagent.

In order to achieve the Design Unconfined Compressive Strength of 375kPa @ 28 days, Menard carried out an extensive laboratory testing campaign using different binder rate and W;C ratio. Field trial and an extensive production testing (1 core drilling for each 150 m2 of stabilized) was conducted as per project specification.