

NAMBUCCA HEADS TO URUNGA - PACIFIC HIGHWAY UPGRADE

Ground Reinforcement with CMC Rigid Inclusions

AUSTRALIA



Owner

Roads and Maritime Service (RMS)

Engineer

Sinclair Knight Mertz (SKM)

General contractor

Lendlease

Period of works

February 2014-May 2014

Main figures

Controlled Modulus Columns

1640 No. of CMC's installed

2.5m to 14m depth



Project description

The Warrell Creek to Urunga upgrade received project approval in July 2011. The 42-kilometre upgrade was delivered in two sections, from Warrell Creek to Nambucca Heads and from Nambucca Heads to Urunga, NSW.

Roads and Maritime Services engaged Lend Lease to design and build the Nambucca Heads to Urunga section. Upgrading this section involved building 22 kilometres of four-lane divided road (including two new interchanges north of Nambucca Heads and at Ballards Road) and upgrading the existing Waterfall Way interchange at Raleigh.

Ground conditions

The site ground material consisted of different soft to hard clays and as the ground improvement works were in close proximity to the rivers an environmentally friendly technique was required. Controlled Modulus Column (CMC) Rigid Inclusion is a method of displacement piling that generates minimal spoil which was well fitted to the environmental challenge at hand.

Solution

In February 2014, Menard took on the task of ground improvement for 2 new bridges to be built crossing the Kalang River and Deep Creek.

The design consisted of 4 separate bridge abutments. A total of 1640 numbers CMCs were installed over the 4 abutments. The CMC's were constructed with 2 rigs of depths ranging from 2.5m to 14m. Two diameters of CMC were installed, 360mm diameter CMC's were installed under the crown of the abutments, however a larger diameter of 450mm was required to cope with an increase in bending moment in the columns under the batter and also to limit lateral displacement.

Menard safely and successfully completed the works in May 2014 meeting all the technical challenges of the project.

