

BALLINA BYPASS INITIAL WORKS

MENARD VACUUM CONSOLIDATION



Sustainable Technology



Client: Roads & Traffic Authority
Consultant: Coffey Geotechnics

Specialist Contractor: Austress Menard Pty Ltd

THE PROJECT

The RTA engaged Austress Menard as a specialist contractor to participate in the Initial Works contract for the Ballina Bypass of the Pacific Highway in the north-east region of New South Wales. This project is the first of its kind in Australia to embrace the Menard Vacuum Consolidation technology and has shown to be highly successful in Ballina soft soil conditions.

AUSTRESS MENARD'S ROLE

The area (9,400m²) that has been chosen for the vacuum consolidation trial is the embankment at the southern abutment of the future bridge over Emigrant Creek North. The subsoil consists of an upper crust of clay (0.5m thick) with underlying very soft to firm saturated clay ($C_u=8kPa$ min) at a varying depth of 10m to 25m. Areas with similar soil characteristics have been treated in the past along the Ballina Bypass alignment using the conventional method of Wick Drains and surcharge, with unsatisfactory results regarding time of consolidation and potential risks of instability. The Menard Vacuum Consolidation technique is the ideal solution to produce the required consolidation within a reduced time with no risk of the embankment instability, additional project costs or delay in program.

The supply and installation of the Menard Vacuum System was carried out with an initial Detailed Design that had to take into account the extensive soil investigation and a platform design for the support of 80t plant and equipment.

The main works were carried out within the programmed three

month period in co-ordination with the RTA (Northern Roads Division) without any delays to the overall construction process. Since commissioning of the MVC system pressures of -80kPa (design -70kPa) and a settlement of 3m have been achieved within four months of operation. Embankment fill has been placed to a design height of 7.7m in one continuous activity mitigating any additional cost or delay in program to the client. As a direct comparison to traditional wick drains, there is an RTA wick area located immediately adjacent to the MVC system and surcharge placement was stopped at a height of 4.5m due to instability and to this date the hold point is still not released.

For the first Menard Vacuum Consolidation Project in Australia the results have been extremely promising and show that Australian grounds conditions, similar to that of Ballina, are ideal for the Menard Vacuum Consolidation Technique and potentially allow for treatment of areas that have been thought of in the past as untreatable.

As seen around the world, the Menard Vacuum Consolidation technique gives a unique solution to a unique problem with major cost and program benefits to the client in the uncertain world of geotechnical engineering.

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