Case Study

Residential Development

Gold Coast, QLD

Market Sector

RESIDENTIAL

Application

DYNAMIC ACCELERATED CONSOLIDATION

Site Conditions

SATURATED COMPRESSIBLE SOILS

LANDPAC
INTELLIGENT GROUND ENGINEERING SOLUTIONS

Project

Residential development consisting of 110 free standing units on an area of 4.25Ha. The site was low lying and the development required the importation of approximately 90,000m³ to raise the levels by 2 metres. Ground Improvement of the highly variable sub-surface stratum was required to allow the construction on the placed 2m fill layer. Landpac was engaged as the principal contractor for the ground improvement works and the civil works which involved the importation and placement of the 2m fill layer, the construction of 275m of 2.4m high Rock Walling and the installation of site drainage.

Soil Conditions

The sub-surface soil profile consisted of 2.5 metres of very loose to loose in-situ un-engineered Sand and Clayey Sand Fill underlain with a saturated natural recent alluvium stratum consisting of 3-5 metres of loose Sands and soft to very soft Clays below this varying from a minimal thickness to 15m thick. The ground water level was approximately 0.5 metres below the surface.

Client: Villaworld

Principal Contractor: Landpac Technologies

Consultant: Black Geotechnical

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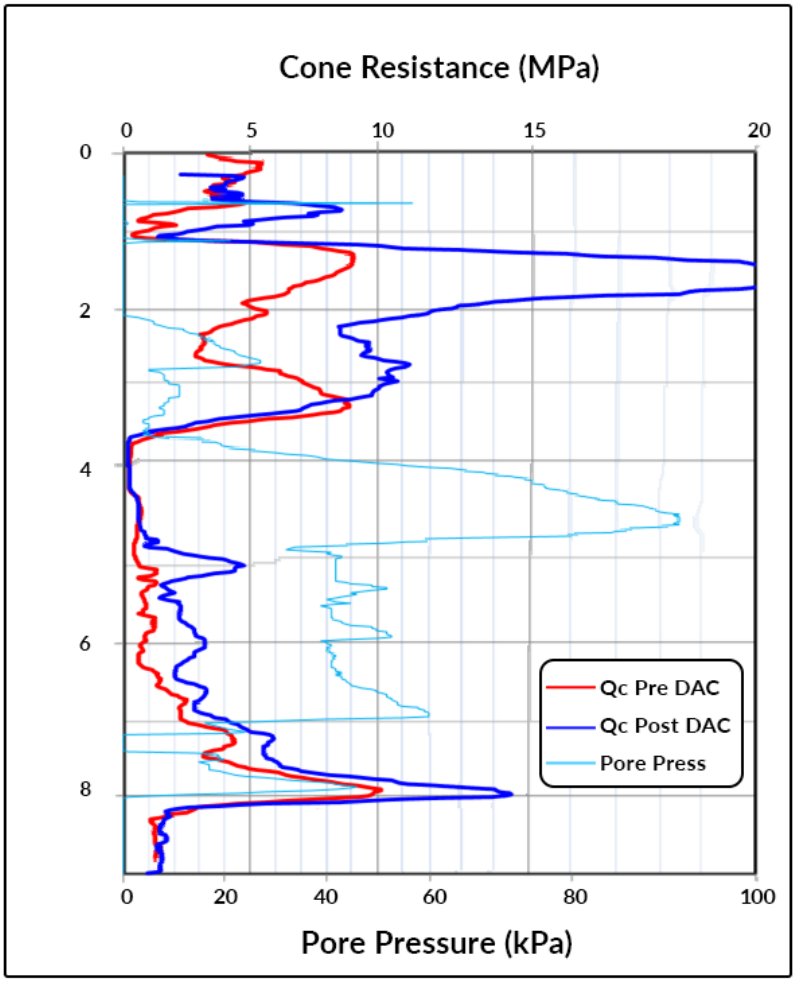
Cone Penetratin Test Results



Soft clays varied from a minimal thickness up to 15m thick

Geotechnical Solution

The original solution required the impact compaction of the un-engineered fill and placement across the site of 2-4 metres of surcharge over the 2m placed fill layer. This required the importation and disposal thereafter of significant volumes of surcharge material. Landpac devised a solution utilising

Dynamic Accelerated Consolidation (DAC) over the 75% of the site which had <2m of soft clay in the alluvium stratum and the surcharging of the remainder of the site area with wick drains installed on the areas with soft clays in excess of 8m thickness. The material imported for the 2m placed fill layer over the 75% area was utilised as surcharge material. The project was completed within the time frame with no disposal of material off site with significant cost savings for the project.

Monitoring & Verification/QA

The ground improvement works were monitored with Landpac's (CIS) soil response system during the use of Impact Compaction and with settlement plates during the Surcharging. The soil design parameters were verified with CPT (Cone Penetrometer), CSWS (Continuous Surface Wave) and MASW (Mutli Array Surface Wave) geotechnical testing.

The analysis of the testing confirmed that the expected post construction settlements were within the required ranges and Landpac provided certification for Class M slab footing construction .

Summary

- **90,000 m2 of fill imported**
- **Sub-surface had up to 15m thick soft clays**
- **DAC used on 75% of the site**
- **Achieved Class M slab footings**

Get in touch

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