Case Study

Port Botany Container Terminal Sydney, NSW

Market Sector

INFRASTRUCTURE

Application

DEEP IMPACT COMPACTION

Site Conditions

DREDGED SANDS

LANDPAC
INTELLIGENT GROUND ENGINEERING SOLUTIONS

Project

The project consisted of the reclamation of 63Ha with 8 million m^3 of dredged Sand. The project infrastructure includes a new container terminal and almost 2km of extra berth length. The new berth structures will require the construction of blockwork and conterfort walls up to 21m high. The project also includes the reclamation of a 2Ha area for a public boat ramp and car parking area.

Soil Conditions

The borrow areas consisted of fine to medium grained marine Sands with lenses containing organic and clay. The specification for the dredged Sands used for the reclamation required less than 10% fines passing the 75µm sieve. The project specification called for compaction to 75% Density Index to 2m below the reclamation level and 70% Density Index from 2-3m depth in the new terminal areas. For reclamation material below the Mean Low Water Neaps and 4 metres below the existing in-situ surface levels in the new terminal areas and boat ramp area a CPT cone resistance value (Qc) greater than 5MPa for a minimum of 90% of the cone profile was specified.

Client: Sydney Ports

Principal Contractor: Baulderstone-Jan de Nul

Ground Improvement Contractor (Top 3 metres): Landpac

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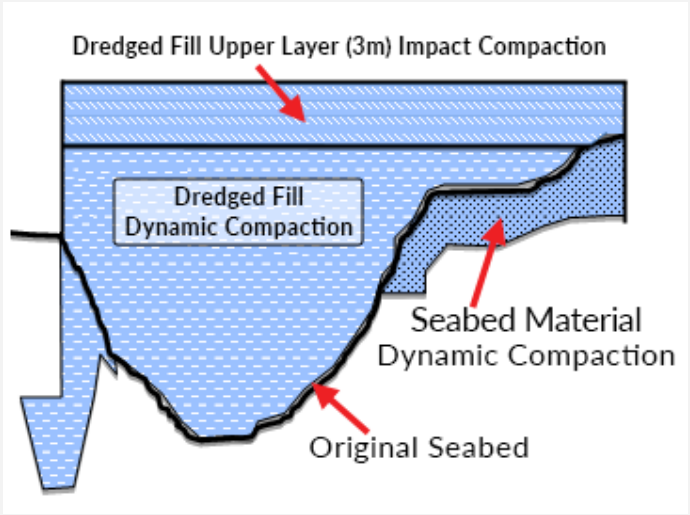
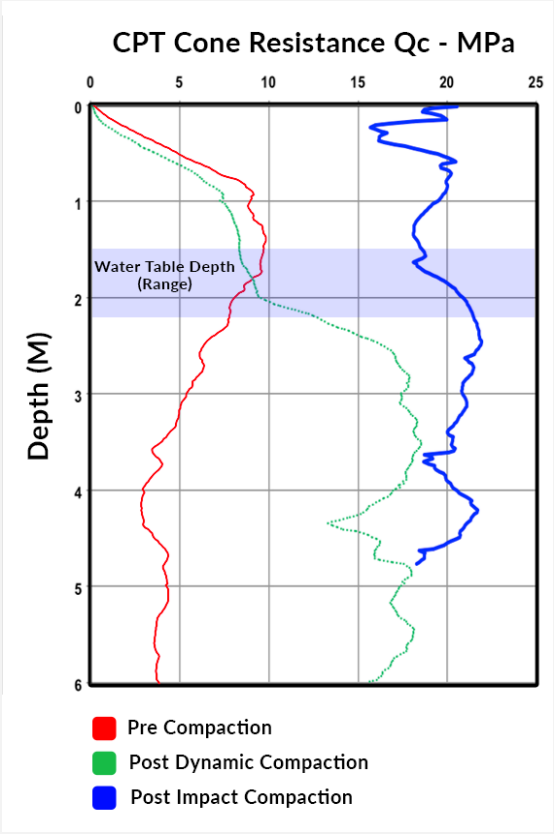
Geotechnical Solutions

To achieve the required compaction in the hydraulically placed dredged fill to 16m depth or so Dynamic Compaction or Vibro-Floatation was used. The upper 3m of the soil profile with the use of Dynamic Compaction or Vibro-floatation techniques on a non-cohesive soil tend to be loose. Impact Compaction provided an economical means of compacting the upper loose soil profile to the required compaction levels after the Dynamic Compaction or Vibro-floatation had been applied.





Monitoring & Verification/QA

The impact compaction works were monitored with Landpac's (CIR) soil response and (CIS) continuous induced settlement monitoring systems. The compaction levels were verified with Density testing to 1.8m depth and CPT (Cone Penetrometer) geotechnical testing. The CIR and geotechnical test results have shown that the sub-grade was uniform and that the required compaction specification was achieved consistently.

Summary

- 63Ha with 8 million m³ of dredged Sand
- Less than 10% fines passing the 75µm sieve
- Density testing to 1.8m depth and CPT
- Impact Compaction provided an ecconomical method for compaction

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