

## Case Study

# Warehouse and Office Development

## Port Melbourne, VIC

### Market Sector

COMMERCIAL / INDUSTRIAL



### Application

UN-ENGINEERED FILL



### Site Conditions

IN-SITU SAND



# LANDPAC

INTELLIGENT GROUND ENGINEERING SOLUTIONS

### Project

The proposed development consists of the construction of a warehouse and offices. The ground treatment works covered an area of 1.75 Ha.

### Soil Conditions

The sub-surface material consisted of 0.3-2.1m of un-engineered fill, Port Melbourne Sands to 5.5m, approximately 3m thick Coode Island Silt from 5 to 7m depth and Fishermen's Bend Silt at 8-30m depth. Ground water was reported at 1.5 to 2.0m depth. The in-situ fill in its existing state was considered unsuitable for the support of commercial/industrial structures and for pavements and services.

### Geotechnical Solution

Dynamic compaction was not feasible due to close-by structures either side of the proposed development. It was also considered that replacing and compacting the site conventionally was too costly due to the volumes and shallow water table. It was decided, to enable satisfactory compaction of the in-situ fill and Port Melbourne SAND to 5m or so depth or to within 0.5-1.0m of the Coode Island silt Landpac's 3-sided Impact Compactor (135kJ Kinetic Energy) would be sufficient enough to provide upper level footings. The specification called for a bearing capacity of 250kPa at a maximum depth of 1m and slab on ground construction for proposed UDL's.

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## Monitoring & Verification/QA

Landpac used Intelligent Compaction Measurement (ICM) technology that identified softer material and measured spatial variation in sub-grades which alleviated the risk of excessive differential settlement from the compacted heterogeneous materials. Any non-uniformity in the in-situ Fills and upper Port Melbourne Sands were identified and assessed with respect to foundation performance.

Post compaction testing consisted of MASW (Multi-channel Analysis of Surface Waves) testing, CPT testing and plate load testing. MASW was also selected so as to; a) provide realistic elastic modulus values of the sub-surface, and b) provide a stiffness profile over continuous lines rather than at discrete locations.

Consistent vibration monitoring integrated with sound alarms were used to ensure the integrity of the adjacent structures either side of the impact compacted area was maintained. Using the test data post construction settlements were calculated for the use of upper level footings for a proportioned bearing capacity of 250kPa.

### Plate Load Testing



## MASW Testing



### Summary

- ✓ **1.75Ha Ground Treatment**
- ✓ **Water was reported at 1.5 to 2.0m depth.**
- ✓ **250kPa at maximum depth of 1m**
- ✓ **Upper level footing for slab on ground**

### Get in touch

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