Groundline Pty Ltd - Observations

Site Visit 1: Scoping & Initial Investigation

Monday 15 January 2007

Project: "Data Calibration Project – Initial Investigation

Client: xxxxxxxxxxxxxxx

Purchase Order: xxxxxxxxxxxxxxx

Line: xxxxxxxxxxxxxxx

Site visit Date: Monday 15 Jan

Background

This site visit was conducted as a scoping exercise to investigate the foundation condition at two sites previously identified by non-destructive testing as requiring further review.

Full background details are included in the "full project plan", which is currently under development for presentation to xxxxxxx for consideration.

Location

Sites are located along the xxxxxxxxxxxx line **.** Tower Foundations reviewed are ***358D*** and ***299A*** *(As identified in previous Groundline report AU xxxx, June 05)*. Locations are approximately xxkm south of xxxxx along the xxxx Highway.

Attending Parties

- Ian Flatley – Senior Lines Engineer, Groundline
- Jason Swanson – Instrumentation Engineer, Groundline
- Xxxxxxx xxxxxx – Senior Engineer xxx
- Xxx xxxxxxx – Construction Manager xxx
- Xxxxx xxxxxxx – Engineer
- Xxxxx xxxxxx – specialist concrete repairer
- Xxxxx xxxxx – Excavation Subcontractor for xxx

Works Management

Details of the on site management are found in the Groundline Project plan & xxx Work Safe plan.

Investigative Works undertaken

Pre-commencement

- Initial verification of site locations (day prior)
- Works purpose and background briefing
- Review and adoption of xxx Work Safe Plan & JSA Sign-on

Works detail

Each tower foundation had been previously repaired using 2 driven 150mm diameter steel piles simplifying the requirements for the re-instatement method and eliminating the need for additional security arrangements during the investigation.

1. Select the footing for excavation and site preparation for commencement.
2. Safety review and Wind speed assessment.

   Local conditions assessed as – light variable winds from south/west approx 30-35 degrees during investigation works – no concerns.

3. Position the backhoe as per site diagrams
4. Excavation to required depth, with observer located to ensure the no foundations damaged by the backhoe.
5. Assess soil stability
6. Removal of Cement Stabilised soil in the foundations immediate vicinity using "kanga" electric jackhammer.
7. Cleaning (brushes) and visually check of the foundation condition
8. Collect photographic records and site measurements
9. Backfill the excavation in layers
   - 358 site using roadbase backfill compacting in layers
   - Site 299 wet soil with compaction of layers
10. Tidy of site

Site Observations

Soils and Earthworks method

The soils encountered were easily excavated by the 8-ton backhoe. Approximately 1 to 1.5 cubic meters of soil was excavated at each site.

Tower 358D, soil maintained good cohesion, clay sand mix. Excavated to 1200mm depth. Cement stabilised soil encountered at 1m.

Tower 299A, soils at this location were more predominantly sand, requiring more soil removal to increase batter. Excavated to 1500mm depth. Cement stabilised soil encountered at 1.3m.

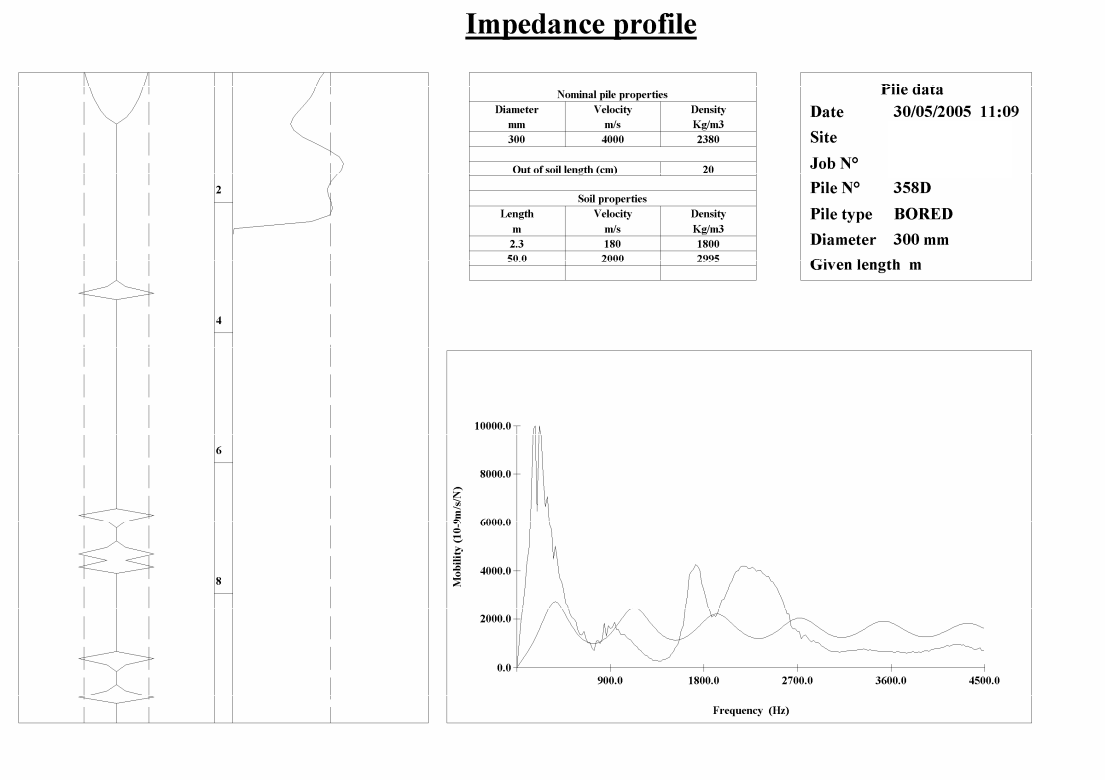
Soil stabilisation

Cement stabilised soils located at both sites, was removed effectively by electric jackhammer. Pick attachment on backhoe could be used to assist with this work in future.

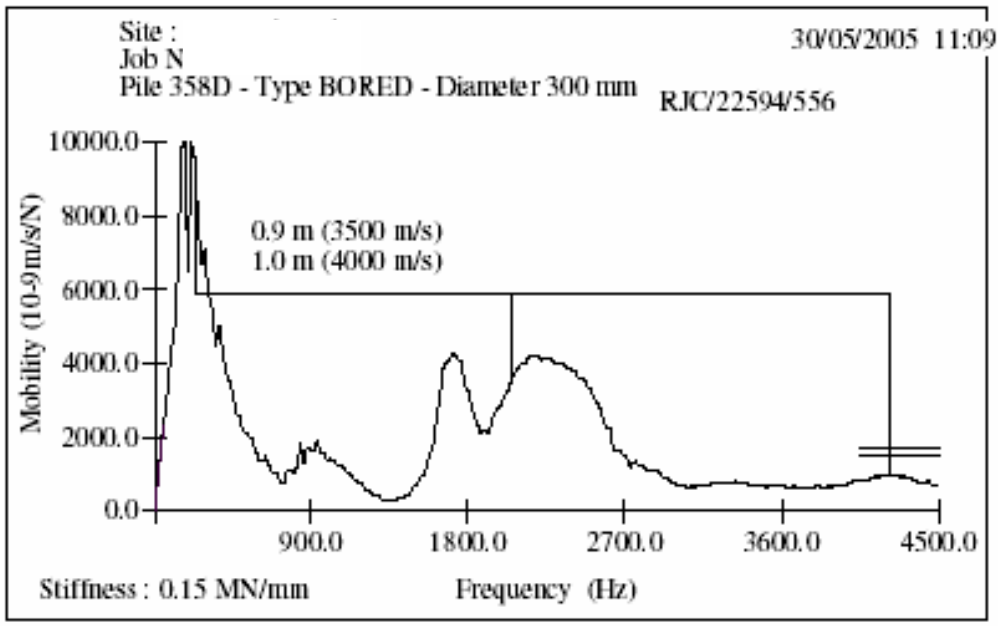
TDR Profiles from initial NDT Review

Tower 358 Leg D

Impedance Profile

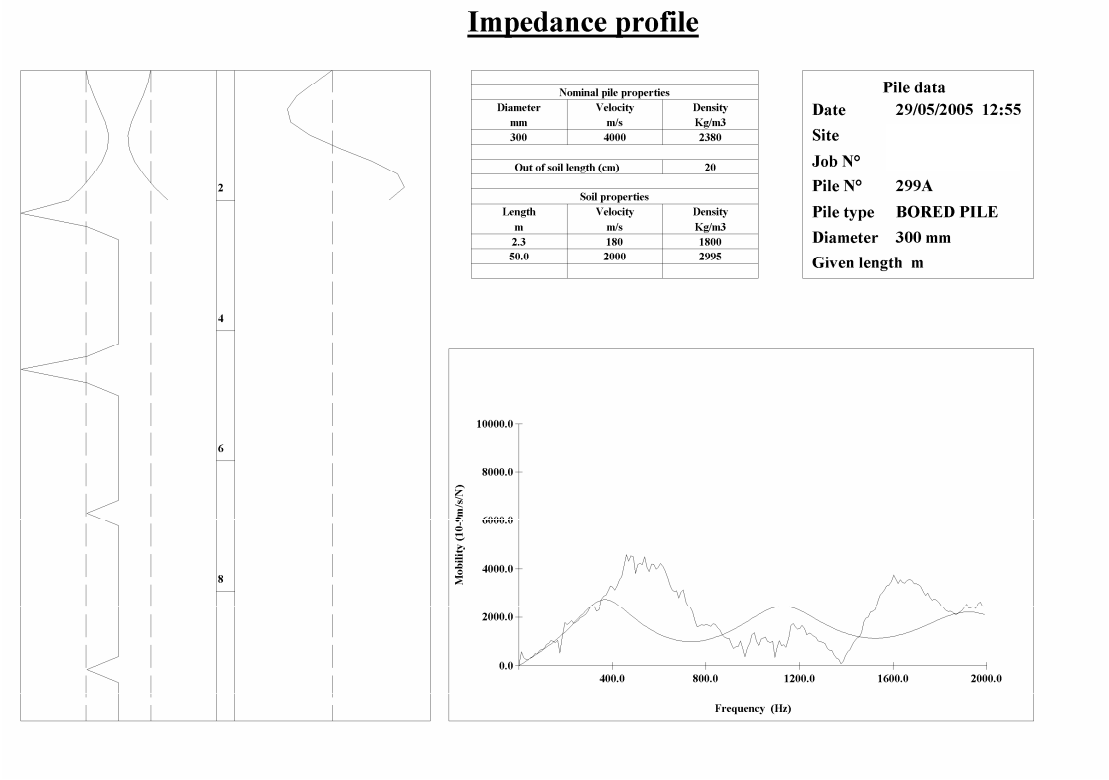


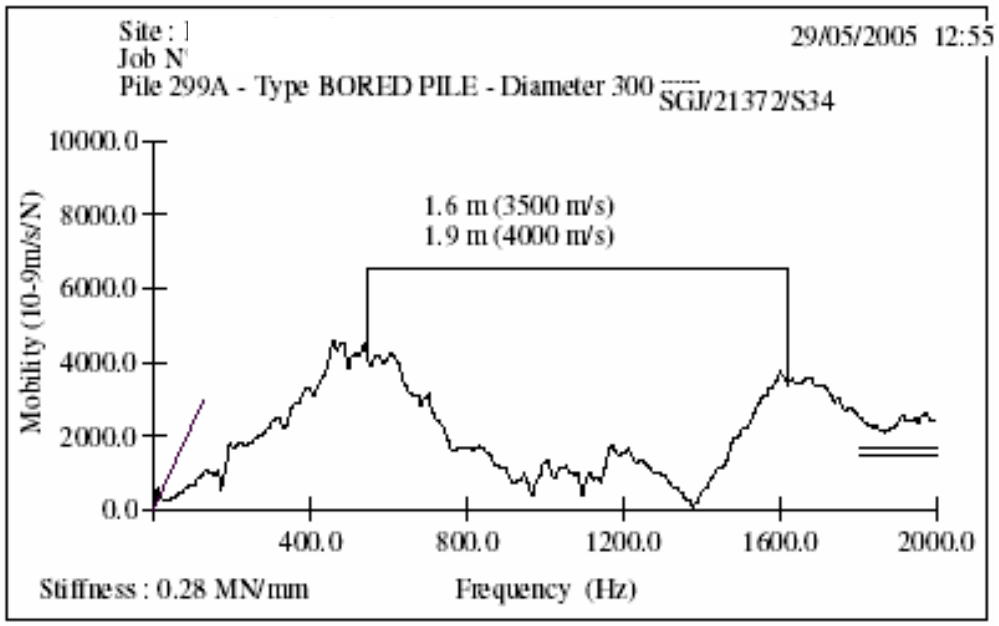
Mobility Plot



299A

Impedance Profile
Mobility Plot





Foundation Observations

Tower 358 Leg D

Foundation section badly deteriorated at 1m from pile-cap. Significant loss of concrete was observed with complete corrosive loss of reinforcement steel. The tower leg is visible in the above pictures.

On further close review, a quick chip at a section above the immediately visible defects uncovered further hidden damage.

Tower 299 Leg A

Foundation shows deterioration of concrete at 1200mm below pile cap resulting in significant loss of steel cover. The four visible reinforcing rods have been corroded through. Concrete quality at the 1200mm to 1400mm level is of poor quality.

Concrete Samples

Concrete samples were taken at each site that provided the typical state of the concrete in the areas of the defects. These samples will be assessed by a materials scientist.

Appendix A – Site Locations

Xxxxx

xxxxx