

**REPORT No.** : 2200166-1

**CLIENT** : Fisher and Fisher Consulting Engineers  
9/94 Abbot Road  
HALLAM VIC 3803

**PROJECT** : Racecourse Road  
ALTONA

**PROPOSAL** : It is proposed to develop this site with a culvert on a strip footing, pad footing or piers.

**1. COMMISSION:**

Carry out relevant insitu soil tests, log test bores and recommend suitable bearing pressures and founding depths for the proposed structure.

All testing and observations carried out are to follow the relevant provisions of AS 1726:2017 (Geotechnical Site Investigations).

**2. SITE GEOLOGY:**

Geological maps show that this site is in an area of Quaternary Alluvium - SANDS, SILTS and CLAYS overlying Quaternary Basalt - CLAYS. The site investigation confirmed this.

**3. SITE TOPOGRAPHY:**

The site is undulating and the ground cover comprises of natural grasses, concrete and asphalt.

**4. INVESTIGATION:**

Four boreholes were drilled by mechanical auger at the approximate locations shown on the attached plan.

## **5. FINDINGS:**

The boreholes revealed that the existing soil profile consisted of sandy SILT trace gravel FILL overlying silty CLAY FILL followed by the naturally occurring silty CLAY.

Local knowledge of the area indicates that deep excavations could prove difficult due to the presence of BASALT FLOATERS. Blasting may even be required in some instances.

## **6. SITE CLASSIFICATION:**

Based on the site investigation and the geology of the area, this site would be classified as CLASS P (due to depth of FILL) with respect to Australian Standard 2870-2011 (Residential Slabs and Footings). However, this classification is technically not correct for the proposed type of structure, therefore is given as a guide only. It is anticipated that the seasonal surface movement at this site will not exceed 60mm.

It must be emphasised that the heave mentioned and recommendations referred to in this report are based solely on the observed soil profile at the time of the investigation for this report without taking into account the effects of any abnormal moisture conditions that may develop after construction as defined in Clause 1.3.3 (A) (B) (C) (D) (E).

The recommendations given in this report have been based largely on the soil conditions encountered at the time of the field investigation. Under inclement weather or prolonged wet weather conditions, the soil conditions noted and reported in this report could vary. It is advisable to undertake construction during and following good weather conditions - i.e., dry weather conditions - not during or following inclement weather or prolonged wet weather conditions.

## **7. RECOMMENDATIONS:**

### **7.1 For Load Bearing Pad and/or Strip Footing Foundations:**

Taking into consideration the area geology, the information obtained from the bore holes and the proposed superstructure, it is recommended that a founding depth of not less than 1000mm below the finished surface level surrounding the structure should be adopted. However, the depth must be at least 100mm into any of the naturally occurring silty CLAY soils as described in the Logs of Boring attached.

This is in order to be below the zone of significant seasonal moisture movement which may otherwise result in damage to the structure. Based on the site investigation and any measured shear strength values of the soils found in the bores, an allowable bearing pressure of at least 100kPa will exist beneath the footings at the above mentioned depth.

As a guide, with reference to the information obtained from the bores, the minimum founding depth mentioned above will be 1000mm in relationship to the existing surface where this surface is to be the finished surface level surrounding the structure.

In accordance with Appendix D of AS2870–2011, the soil profile and site conditions should be inspected at footing excavation stage by CIVILTEST PTY LTD to confirm the soil profile and site classification.

## **7.2 Paving Slab Foundations:**

### **7.2.1 Paving Slabs:**

The slab and any stiffening beams may be placed on or in the existing site surface soils. This is providing that all the vegetation and any soil containing deleterious matter has been removed and any soft areas have been well compacted with the soil in a moist condition with a small vibratory roller or vibratory plate compactor. This surface material will provide a subgrade for the slab and based on the field observations and tests can be assumed to have a modulus of subgrade reaction of 30kPa/mm.

### **7.2.2 Levelling Fill:**

Where levelling fill is used the slab and any stiffening beams required may be placed on or in levelling fill provided that not more than 400mm of site derived clayey or 800mm of site derived sandy or imported granular fill is used (excluding existing fill), provided that the fill is placed in 150mm thick layers and densely compacted in a moist condition with a small vibratory roller or vibratory plate compactor. After allowing for the likely wetting up under the slab and the condition of the fill after compaction, this surface can be assumed to have a modulus of subgrade reaction of 45kPa/mm for SAND fill and 30kPa/mm for CLAY fill.

## **7.3 Piers:**

If piers are used they should be founded not less than 100mm into silty CLAY / weathered ROCK as described in the logs of boring, which from the site investigation can be assumed to have an allowable bearing capacity of 100kPa at this depth.

A skin friction of 10kPa will exist between the piers and the silty CLAY / weathered ROCK except for the soil within 1500mm of the surface and FILL soils, where no skin friction should be assumed.

In the design of bored piers or driven piles, consideration should be given to the possibility of adverse lateral loading on the piers/piles induced by foundation movements as a result of permanent moisture changes in the foundation material after construction or by variable moisture changes in the foundation material due to seasonal influences. The above is of particular importance at the edge of fill batters and adjacent to service trenches. Changes in moisture contents of the foundation material due to seasonal variation are more prevalent at the edges of the proposed building and in particular, where piers/piles are used to protect the building from the influence of existing trees.

## **8. CONDITIONS OF THE RECOMMENDATIONS:**

- 8.1** The recommendations made in this report may need to be reviewed should any site works disturb any soil 300mm below the founding depth of the structure.
- 8.2** Since the soil horizons and layers can vary in depth and in thickness over the site, the depths and bearing pressures given above are given as a guide only. If the footings are founded at the minimum depth, as stated and are in the soil as described in the logs of boring for this site, then the requirements of this report have been met.
- 8.3** Where any filling is to be placed (other than under the slab, refer to 7.2 above) the footing founding depths recommended in this report will need to be increased accordingly by the depth of that fill, unless:
  - 8.3.1** The base of the footing is founded in the founding soil recommended in 7.1.
- 8.4** It is recommended that where any footings are to be constructed next to existing underground services (sewers etc.), then these footings or edge beams should be founded at a depth above the invert of the service at an angle of repose of 45° for CLAYS and 30° for SANDS, unless special consideration has been given to the founding material.
- 8.5** The descriptions of the soils found in the boreholes closely follow those outlined in AS 1726:2017 (Geotechnical Site Investigations). Colour descriptions can vary with soil moisture content. It should be noted therefore, colour and shade descriptions mentioned in this report are made when the soil is in a moist condition.

In accordance with Appendix D of AS2870–2011, the soil profile and site conditions should be inspected at footing excavation stage by CIVILTEST PTY LTD to confirm the soil profile and site classification.

- 8.6** This report has been compiled and recommendations made based on information supplied in the brief to Civiltest Pty Ltd and from the field investigation and observations made including the extent of, if any, site filling. Every care has been taken within the terms of the brief to ensure that the field investigation is representative of the site. Therefore, if it is found that for any reason information received by Civiltest Pty Ltd is incorrect or conditions on site vary from those described in this report then the comments and recommendations made in this report may need to be amended.
- 8.7** The recommendations given in this report have been based largely on the soil conditions encountered at the time of the field investigation. Under inclement weather or prolonged wet weather conditions, the soil conditions noted and reported in this report could vary. It is advisable to undertake construction during and following good weather conditions - i.e., dry weather conditions - not during or following inclement weather or prolonged wet weather conditions.
- 8.8** To ensure acceptable long term performance of the footing systems recommended in this report, care should be taken that the fundamental building, landscaping and long term maintenance procedures are adhered to as set out in the CSIRO Division of Building, Construction and Engineering: Building Technology File 18-2011, "Foundation Maintenance and Footing Performance: A homeowners guide" which is available on the CSIRO website <http://www.publish.csiro.au/home.htm> . This information sheet forms an integral part of this report.
- 8.9** The information and any recommendations given in this report are limited to the client named herein.
- 8.10** Whilst CIVILTEST PTY LTD has accepted the commission for the work reported herein, the ownership of the report and any liabilities associated with it, remain with CIVILTEST PTY LTD until all relevant accounts have been paid.
- 8.11** Finally, no responsibility will be taken for this report if it is altered in any way or not reproduced in full.

This report consists of six pages including one site plan, Appendix A Engineering Logs is attached.



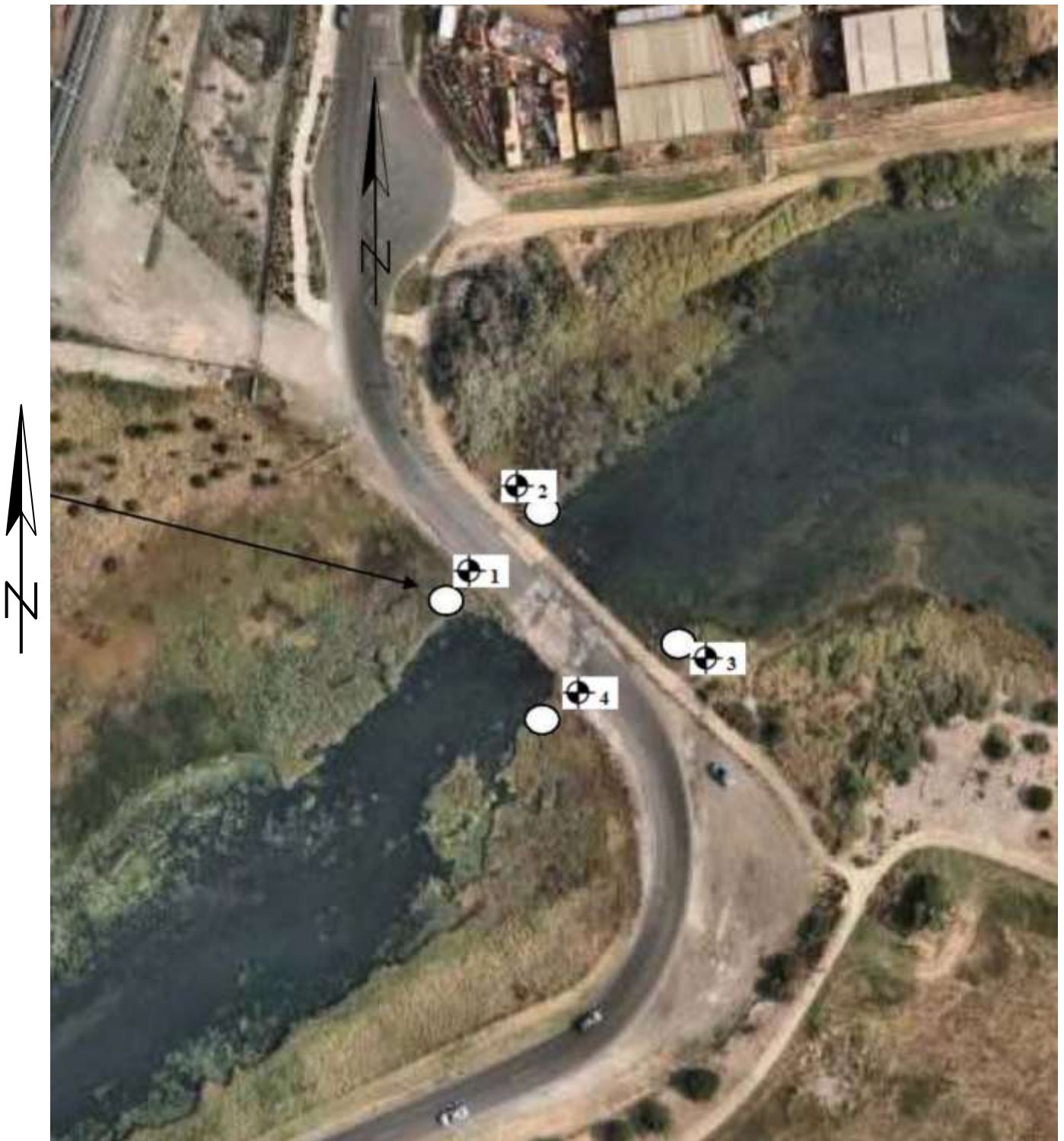
**Steve Hennig**  
**CIVILTEST PTY LTD**

**REF:** SH/mg

19 March 2020

CIV. DOC. 004-020 Reissued 29-06-99

**LOCATION OF TEST SITES**  
**RACECOURSE ROAD ALTONA**



⊕ Denotes Test Holes

**NOT TO SCALE**

THIS SKETCH IS NOT INTENDED TO BE AN  
ACCURATE DEPICTION OF THE NUMBER, SIZE  
OR LOCATION OF TREES AND/OR SHRUBS

**APPENDIX A**

**ENGINEERING LOGS**

# ENGINEERING LOG

**REPORT NO. 2200166**  
**FIELD TECHNICIAN: SH**

**BOREHOLE NO. 1**  
**DATE: 16-MAR-2020**

[illegible]



# ENGINEERING LOG

**REPORT NO. 2200166**  
**FIELD TECHNICIAN: SH**

**BOREHOLE NO. 2**  
**DATE: 16-MAR-2020**

[illegible]

# ENGINEERING LOG

**REPORT NO. 2200166**  
**FIELD TECHNICIAN: SH**

**BOREHOLE NO. 3**  
**DATE: 16-MAR-2020**

[illegible]

# ENGINEERING LOG

**REPORT NO. 2200166**  
**FIELD TECHNICIAN: SH**

**BOREHOLE NO. 4**  
**DATE: 16-MAR-2020**

[illegible]