

**GEOTECHNICAL SITE INVESTIGATION  
FOR RESIDENTIAL SLABS AND FOOTINGS****REPORT NUMBER:** 1120351**CLIENT:****SITE ADDRESS:** 32 Black Avenue  
VENUS BAY**PROPOSED STRUCTURE:** Double storey split level clad dwelling**SITE GEOLOGY:** Quaternary Aeolian - SANDS**SITE CLASSIFICATION:** CLASS A**IMPORTANT NOTE:**

*The site classification given in this report is based on the latest version of AS2870-2011. However this latest standard is not yet deemed to comply with the BUILDING CODE OF AUSTRALIA (BCA) therefore the old version of AS2870-1996 is still valid in this regard. The classification and any recommendations given in this report have been given on the basis that AS2870-2011 is believed to be state of the art and will provide greater serviceability to the structure than those given in AS2870-1996.*

*If it is required, or desired, to use AS2870-1996 then the design parameters of that version can be used on this site. In this case, this site would be classified as CLASS A as per AS2870-1996. Footing details in this case can be found in Section 3 of AS2870-1996 and in particular, in Figures 3.1, 3.2, 3.3, 3.4, 3.5 and 3.6. The foundation material nominated and the allowable bearing pressures given in this report are still valid for AS2870-1996 proportioned slab and/or footings.*

**SUMMARY OF FOUNDING DEPTHS:**

FOUNDATION DETAILS	Type	Bearing Capacity	Actual Founding depth*
Slab (Stiffened)	Class A	80 kPa	up to 500mm
Slab (Waffle)	Class A	50 kPa	On natural ground and/or Controlled Fill
Strip footings	Class A	140 kPa	up to 500mm
Stumps	Class A	140 kPa	up to 500mm

*\*Actual founding depths from the existing surface level at the time of the geotechnical site investigation.*

**Note:**

This summary should be read in conjunction with the full report.

**1. COMMISSION:**

Investigation for site classification in accordance with Section 2 Clause 2.2.2 (a) of Australian Standard 2870-2011 - Residential Slabs and Footings with reference to Clause 2.2.2 (b) and 2.3.2 (c) iii, recommend a founding depth and / or foundation treatment where appropriate, as per Clause 1.3.1 – Performance of Footing Systems (AS2870–2011).

**2. SITE GEOLOGY:**

The field investigation suggests that the site is in a geological area of Quaternary Aeolian - SANDS. Geological maps of the area confirmed this.

**3. SITE TOPOGRAPHY:**

The site is undulating. The ground cover comprises of natural grasses, native trees and introduced trees.

**4. INVESTIGATION:**

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

Soil strengths of the cohesive soils were tested (if considered appropriate) by using a shear vane apparatus and observed densities of non-cohesive soils were noted.

The logs of each borehole are attached showing the soil descriptions and depths along with any cohesive strengths measured and observed densities on non-cohesive soils.

## 5. FINDINGS:

The boreholes revealed that the existing soil profile consisted of brown SAND FILL overlying the naturally occurring brown SAND.

## 6. SITE CLASSIFICATION:

After considering the area geology, the soil profile encountered in the bores, the proposed superstructure and the climatic zone of the area, this site has been classified as CLASS A with respect to foundation construction (Australian Standard 2870-2011 Residential Slabs and Footings). It is anticipated that there will be no seasonal surface movement at this site .

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).

## 7. RECOMMENDED FOUNDATION FOR SLABS:

### 7.1 Stiffened Raft Slab:

#### 7.1.1 Edge Beams:

It is recommended that a CLASS A (Refer AS2870 – 2011) slab on ground should be used at this site with edge beams founded not less than 200mm below the finished surface level surrounding the structure.

However, the founding depth must be at least 100mm into any of the naturally occurring soils after the removal of any organic and deleterious matter as described in the logs of boring which from the site investigation can be assumed to have an allowable bearing capacity of 80kPa at this depth.

As a guide to the actual site founding depths with regard to the above along with information obtained from the bores, the actual founding depth at this site will be up to 500mm in relationship to the existing surface where this surface is to be the finished surface level.

#### 7.1.2 Slab and or Stiffening Beams:

Any organic and deleterious matter should be removed from under the proposed slab area to a depth of not less than 50mm and replaced where necessary with levelling fill (See 7.1.3 below) under the slab and internal beams. This excavated surface can be assumed to have an allowable bearing pressure of at least 50kPa.

### 7.1.3 Levelling Fill:

Up to 400mm of CLAY FILL or 800mm of SAND FILL, imported or site derived, including existing FILL material, if any, may be placed under the slab and internal beams providing that this filling is placed in 150mm thick layers and compacted in a moist condition using a light weight vibratory roller or vibratory plate tamper or similar to form a dense layer. Based on the likely condition of this levelling fill, an allowable bearing pressure of at least 50kPa can be assumed to exist beneath the slab and any internal beams founded in or on this filling.

If more than 400mm of CLAY FILL or 800mm of SAND FILL, imported or site derived, including existing FILL material, is required, then the slab must be designed as a suspended slab and supported by a grid of beams founded through any fill material in accordance with the above edge beam recommendations (or see 9.4 below).

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 Waffle Raft Slab:

Waffle raft slabs for this site can be designed for a CLASS A following AS2870 and detailed as per Clauses 6.4 (in particular Clause 6.4.3) of Section 6 of AS2870. For the purposes of design, the surface of the natural soils at this site as described in the engineering logs will have an allowable bearing pressure of at least 50kPa. Alternatively, fill placed in accordance with clause 9.4.2 of this report can be used as a foundation with a bearing pressure of at least 50kPa.

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. RECOMMENDED FOUNDATION STRIP FOOTINGS AND / OR STUMPS:

### 8.1 Isolated Footings:

The use of CLASS A (AS2870-2011) proportioned strip footings and stumps founded at minimum depths of 375mm and 400mm respectively, below the finished surface level surrounding the structure is recommended. However, the founding depth must be at least 100mm into any of the naturally occurring SAND soils for strip footings and / or stumps as described in the logs of boring, which from the site investigation can be assumed to have an allowable bearing capacity of 140kPa at this depth.

As a guide to the actual site founding depths with regard to the above along with information obtained from the bores, the actual founding depths at this site will be up to 500mm for strip footings and up to 500mm for stumps in relationship to the existing surface where this surface is to be the finished surface level.

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.

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

### **9.1 Foundations Adjacent to Easements:**

It is recommended that where any footings are to be constructed next to existing underground services (sewers, etc.) and / or excavations, then these footings or edge beams should be founded at a depth below 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.

### **9.2 Review of the recommendations:**

The recommendations made in this report may need to be reviewed by Civiltest Pty Ltd should any of the following occur:

- 9.2.1 Where any site works disturb any soil 300mm below the founding depth of any footing system as defined in AS2870 Clause 1.8.25.
- 9.2.2 Where any individual foundation depth exceeds the investigation depth.
- 9.2.3 Where any earthworks lower the building area by 0.5 metres or more.

### **9.3 Founding soils and depths:**

Since the soil horizons and layers can vary in depth and thickness over the site, the depths and bearing pressures given in this report 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.

### **9.4 Use of FILL materials:**

Where any filling is to be placed (other than under the floor slab, refer to 7.1.3 above), the footing founding depths recommended in this report will need to be increased accordingly by the depth of that fill unless one of the following occurs:-

- 9.4.1 The base of the footing is founded in the founding soil recommended in 7.1.1.
- 9.4.2 The fill has been placed under controlled conditions and compacted to a minimum of 95% of AS1289, 5.1.1 (Standard Compaction) throughout. In this case, the footings may be placed in this fill depending on the findings of further site investigations and the revision of the recommendations made in this report.

**9.5 Soil descriptions:**

The descriptions of the soils found in the boreholes closely follow those outlined in AS1726 -1993 (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.

**9.6 Amendment of the report:**

This report has been compiled and recommendations made based on information supplied in the brief to Civiltest Pty Ltd and from the field investigations 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 considerably during construction to those described in this report, then the comments and recommendations made in this report may need to be amended by Civiltest Pty Ltd.

**9.7 Foundation design:**

The recommendations in this report are not based on a design by engineering principles as defined in Section 4, AS2870 – 2011.

**9.8 Long term maintenance and performance:**

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 [<http://www.publish.csiro.au/pid/3612.htm>], "Foundation Maintenance and Footing Performance: A homeowners guide". This information sheet forms an integral part of this report.

**9.9 Abnormal moisture conditions:**

The recommendations made in this report are based on current findings and investigations. Civiltest Pty Ltd cannot be held responsible for any financial loss and / or hardship in relation to the construction of the structure and future performance of the footing system if relevant historical information has not been supplied in writing by the client to Civiltest Pty Ltd. (For example, the recent removal of trees or buildings or any other activity that is likely to have created abnormal moisture conditions as defined in AS2870 prior to Civiltest being commissioned for the investigation reported herein.)

**9.10 Building cost estimation:**

The limitations of this report should be closely observed when carrying out detailed costings of the proposed structure.

9.11 The information and any recommendations given in this report are limited to the client named herein.

9.12 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.

9.13 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 ten pages including one site plan.



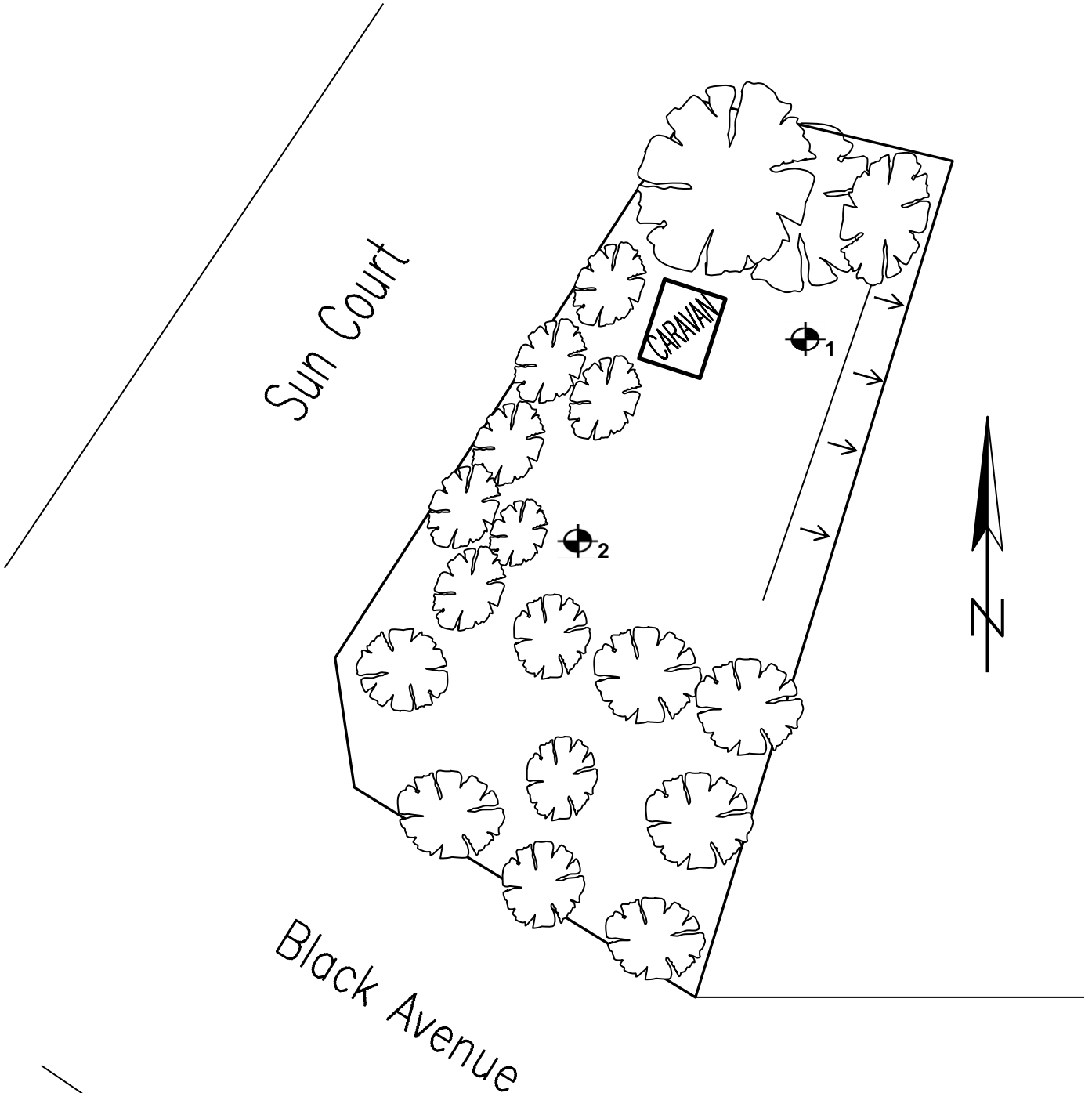
**S D BUFFINTON**  
**CIVILTEST PTY LTD**

REF: EJ/JSP/al

30 March 2012

**LOCATION OF TEST SITES**

**32 BLACK AVENUE VENUS BAY**





 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



Test Hole No 1 Depth (m)	Classification	Shear Vane Strength kPa	<b>Engineering Log</b>
0.250	. . . . . . . . . . . . . . .		Brown SAND FILL Medium dense Moist Gravels throughout  
3.000	. .		Brown SAND Medium dense Dry  Pales with depth  Moist at 1.200  Pales with depth
END OF BORE (29/03/12)			

Test Hole No 2 Depth (m)	Classification	Shear Vane Strength kPa	<b>Engineering Log</b>
0.400	. . . . . . . . . . . . . . .		Brown SAND FILL Medium dense Moist Gravels throughout  
3.000	. .		Brown SAND Medium dense Dry  Pales with depth
END OF BORE (29/03/12)			