



19/10/2016

**CLIENT:** Summit Group

**JOB DESCRIPTION:** Provide limited site investigation & site classification for the allotment.

**PROJECT:** Lot 14 Lexington Place, Hamilton Valley

**JOB NO.:** 43458-7

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**REPORT SUMMARY:**

The site classification is '**M-D' Moderately Reactive in the Dry Temperate Zone**, provided load bearing footings are founded beyond filling.

**1.0 SITE DESCRIPTION:**

**1.1** The allotment is part of the "Sienna Ridge Estate" Hamilton Valley, Stages 1 and 2. At the time of the investigation there was a patchy cover of vegetation across the surface and there was a newly planted tree (approx. 1.5m in height) growing in the front nature strip along the western boundary. The area allocated for the house has good fall across the block, sloping towards the northern boundary. The land slope of the building footprint is the order of 1 in 15. To provide a level building pad, cut and fill earthworks may have to be undertaken. Site drainage should be further enhanced with landscaping works at the completion of construction.



**Existing site conditions for proposed dwelling.**

1.2 Geological Survey Maps for Victoria (Sheet SJ 55-2) of 1:250,000 scale show that the area is within Recent Quaternary fine grained alluvium of the Shepparton Formation. These are deposits of varying clay, silt and sand content laid down in discontinuous lens-like structures. There can be varying combinations and layer thicknesses of these soil types across small areas.

## 2.0 SITE INVESTIGATION:

2.1 Boreholes of 3000mm and 2000mm were mechanically drilled using 100mm diameter continuous flight auger at two locations across the site. Their locations and logs are shown on the attached borehole log sheet.

2.2 **Borehole Description:** There is **uncontrolled** brown clayey sand / sandy clay **filling** to depth between 200mm to 250mm. After the filling, there is light brown sand continuing down to 500mm. Sandy clay, fine silty clay, clayey sand and silty clay soils varying in colour extend to the end of the boreholes. Soils were observed in the field to be uniform over the depth of the profile. Soils were slightly moist in the upper layers and become dry in the lower layers. Ground water was not encountered in the boreholes.

2.3 Selected filling has been spread over the site as part of the subdivisional earthworks. Testing for density and moisture content during construction has been performed across random layers of the allotments. The surface filling is not considered as controlled fill and has been assessed as rolled fill in accordance with AS 2870 - 2011. Load bearing elements of the footing systems must be founded through this filling and into undisturbed natural soils.

2.4 The underlying natural soils are of low to medium plasticity and there is potential for seasonal ground movement between 20mm and 40mm. Consideration should be given to clause 3.6 of this report when positioning the house due to the proximity of the tree located in the front nature strip.

2.5 The natural soils, located immediately below the filling (i.e. 250mm below the surface), have an estimated bearing capacity of at least **120kpa**. Soil bearing capacities have been estimated for the underlying soils and these values are listed below:

Depth	Allowable Bearing Capacity
250mm	120 kPa
1000mm	150 kPa
1500mm	180 kPa

2.6 The site classification is 'M-D' in accordance with AS 2870 - 2011 with conditions regarding the filling.

## 3.0 FOOTING DESIGN RECOMMENDATIONS:

The recommended footing system is designed for at least an 'M-D' site with all external and internal beams of the footing system extending through the filling using additional concrete. Design and construction should comply with AS 2870 – 2011 and AS 3600.

**3.1** The construction envelope is to have the surface stripped and cleared nominally 50mm to 100mm of all grass, vegetation and any top soil across the surface. Proof roll prior to construction and prepare the site as per section 6 of AS 2870 – 2011. (Proof rolling refers to thorough trafficking of the area by the earthmoving equipment until there are no indentations left by the wheel tracks)

**3.2** It is recommended the design engineer be contacted should soft spots or areas of undetected fill be encountered during footing excavation. If site conditions are altered in the course of construction then this report may require review.

**3.3** Both the edge beams and internal beams will be required to be increased in depth to found through the filling or alternatively blinding is to be used to backfill any over-excavation.

**3.4** The use of brickwork articulation joints to TN61 is recommended throughout.

**3.5** The following are recommended founding levels for articulated masonry veneer construction below cleared surface:

<u>Stiffened Raft Load Bearing Beams:</u>	Nominally 200mm – 250mm below stripped surface i.e. Through filling or disturbed ground and into light brown sand.
<u>Internal Beams:</u>	Maybe founded on stripped and proof rolled surface.
<u>Waffle Raft:</u>	Waffle slab to be setup on the 50mm to 100mm stripped and proof rolled surface. Edge beams founded a <b>minimum of 250mm.</b>
<u>Strip Footings:</u>	650mm minimum and at least 300mm into natural underlying soils.
<u>Stump - Pad Footings:</u>	800mm minimum and at least 200mm into natural underlying soils.

*Note: Where cut/fill earthworks are carried out to form a level platform, extend beams through filling and found in natural ground or support beams in filled zone on bored concrete piers, founded through the imported filling and extending a minimum depth of 400mm into natural ground.*

**3.6** The planting of trees close to the building should be avoided. Minimum distance from the building should be at least three quarters of the mature height. Where the building is to be positioned such that trees are planted or any existing trees located at an offset distance that is less than three quarters of the mature height, the design engineer will need to consider additional measures to protect the footing system from trees impacting the stability of the soils within the zone of influence.

#### **4.0 LIMITATIONS OF REPORT:**

The frequency of borehole sites and the intensity of the testing program have been formulated to reflect the significance of the proposed structure. The testing and reporting is considered reasonable and comprehensive for this project and results correlate to other testing carried out by this company in the region. It is possible that there may be variations in the geotechnical conditions from those described in this report, as no geotechnical investigation can be considered exhaustive. The results and

recommendations are therefore a reasonable platform upon which to base subsequent design decisions with flexibility to change course should there be variations in the conditions at the time of construction.

## **5.0 SITE MAINTENANCE:**

In addition to the following, reference should be made to the CSIRO information sheet “Guide to Home Owners On Foundation Maintenance and Performance.”

**5.1** During the works, provide a drainage system as soon as the footings are constructed. It must prevent ponding against, near or beneath the footings in order to maintain stable moisture content within the foundation. Grading the surfaces (1 in 20 for at least 2.0 metres) away from footings and their excavations to collection points will be necessary.

At the completion of the construction the drainage system must also prevent ponding against, near or beneath the finished building. Interception of moisture flow paths toward and under the building is critical.

**5.2** Preferably pave or grade the natural surface away from the building at a slope of 50mm in 1.0m.

**5.3** Plumbing trenches should be sloped away from the building. The first 1.5m of trench from the building should be backfilled with clay in the top 300mm.

**5.4** Subsurface drains near footings should be avoided. If they are necessary, the trench must be capable of providing drainage if blockage occurs.

**5.5** Plumbing problems that could cause changes to foundation’s moisture content should be rectified immediately.

**5.6** The planting of trees close to the building should be avoided. Minimum distance from the building should be equal to three quarters of their mature height.



Anthony Kruse



**B.M.**  
CIVIL ENGINEERS

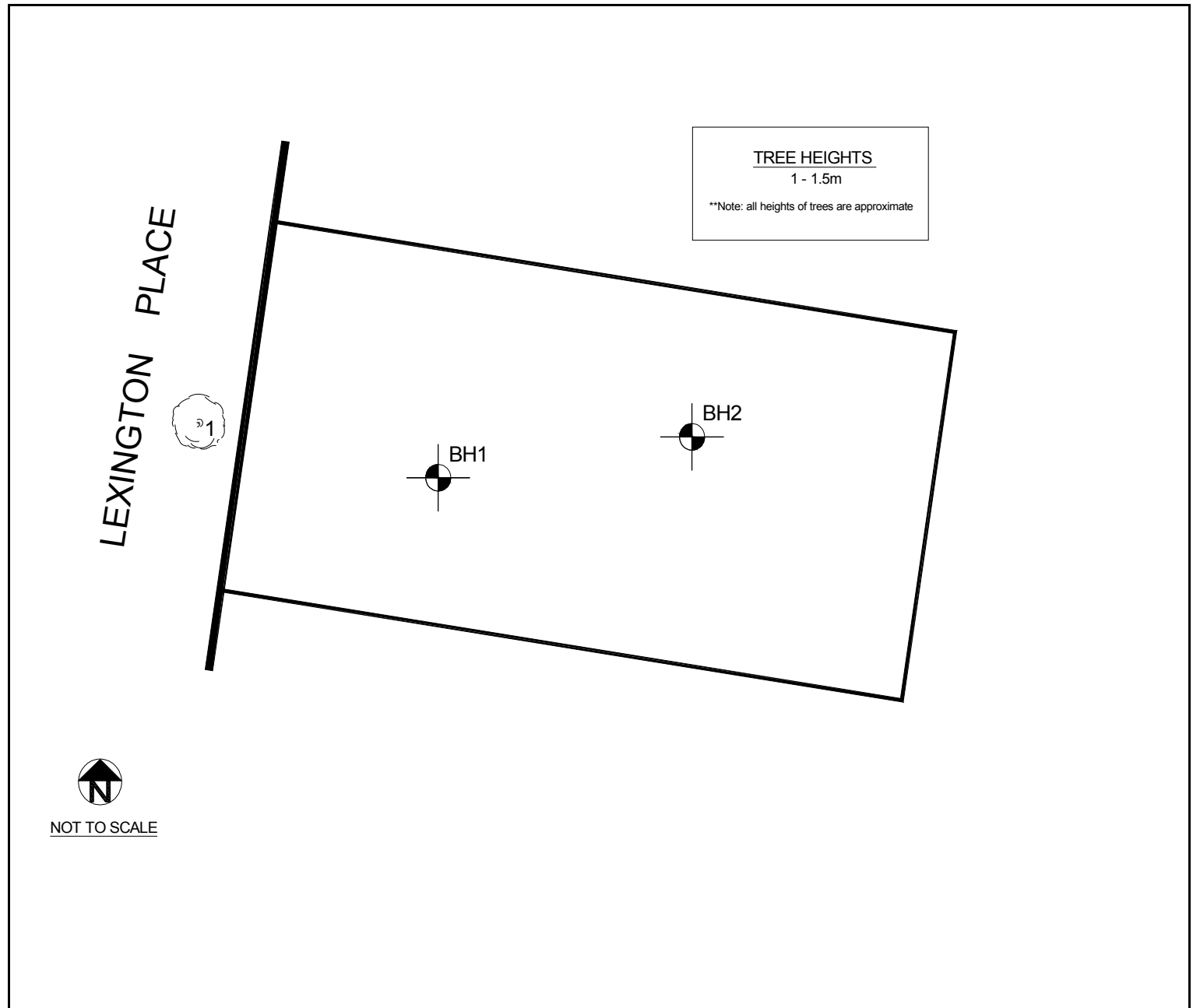
**Date:** 19/10/2016

**Location:** Lot 14 Lexington Place,  
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SITE  
INVESTIGATION  
BORELOG  
LOCATION  
PLAN





**Job No.:** 43458-7  
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**Date:** 19/10/2016  
**Borehole No.:** **1**

Depth	Description	Plasticity	Cohesion Density	Moisture	
100	<b>FILLING</b> brown clayey sand / sandy clay mix				
200					
300					
400	light brown SAND	LP	MD	D	
500					
600	yellow light brown fine silty CLAY	LP - MP	F	D	
700					
800					
900					
1000					
1100	light brown clayey SAND	LP	MD	D	
1200					
1300					
1400					
1500					
1600	brown clayey SAND	LP	MD	D	
1700					
1800					
1900					
2000	brown silty CLAY	MP	F	D	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000	EOB				
3100					
3200					
<b>PLASTICITY</b>		LP- LOW	MP- MEDIUM	HP- HIGH	
<b>CONSISTENCY</b>		COHESIVE SOILS VS- very soft S-soft F-firm ST - stiff VST - very stiff H-hard			
		NON COHESIVE SOILS VL very loose L- loose MD-medium dense DS-dense VD-very dense			
<b>MOISTURE CONDITION</b>		D-dry M- moist W-wet SA-saturated			
<b>DRILLING METHOD</b>		continuous flight auger	<input checked="" type="checkbox"/>	hand auger	<input type="checkbox"/>



**Job No.:** 43458-7  
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**Date:** 19/10/2016  
**Borehole No.:** **2**

Depth	Description	Plasticity	Cohesion Density	Moisture
100	<b>FILLING</b> brown clayey sand / sandy clay mix			
200				
300	light brown <b>SAND</b>	LP	MD	D
400				
500				
600	orange <b>sandy CLAY</b>	LP - MP	F	D - M
700				
800	light orange <b>silty CLAY</b>	LP - MP	F	D
900				
1000				
1100				
1200	light brown <b>silty CLAY</b>	LP - MP	F	D
1300				
1400				
1500				
1600				
1700				
1800				
1900				
2000				
2100				
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
<b>PLASTICITY</b>		LP- LOW	MP- MEDIUM	HP- HIGH
<b>CONSISTENCY</b>		COHESIVE SOILS VS- very soft S-soft F-firm ST - stiff VST - very stiff H-hard		
		NON COHESIVE SOILS VL very loose L- loose MD-medium dense DS-dense VD-very dense		
<b>MOISTURE CONDITION</b>		D-dry M- moist W-wet SA-saturated		
<b>DRILLING METHOD</b>		continuous flight auger	<input checked="" type="checkbox"/>	hand auger <input type="checkbox"/>