

30 November 2020
Our ref: AB/S1225

Luke Taggart

Via email: abraham@nemcodesign.com.au

Proposed Extension – 39 Cumberland Avenue, Collaroy, NSW

Site Classification Report

1 Introduction

At the request of Luke Taggart, Fortify Geotech Pty Ltd carried out a site classification in accordance with AS2870 “Residential Slabs & Footings”, for a proposed extension at 39 Cumberland Avenue, in Collaroy. The site is located on Cumberland Avenue. Figure 1 is a plan showing the site locality.

To establish the site subsurface conditions, a handheld hydraulic push-tube was used to excavate one borehole on the property. Borehole 1A was drilled in the backyard, towards the location of the proposed extension. The subsurface profile was logged in accordance with the Unified Soil Classification System (USCS) and the log is attached. Figure 2 is an aerial photograph showing the borehole location.

2 Investigation Results

2.1 SUBSURFACE CONDITIONS

The 1:100,000 Sydney Geology map indicates the area to be underlain by Quaternary age, silty to peaty quartz sand, silt and clay; ferruginous and humic cementation in places; common shell layers.

Geological Profile	Depth Interval	Description
TOPSOIL FILL	0m to 0.15m	SANDY SILT; fine to coarse grained sand, black, some roots, dry, loose.
FILL	0.15m to 0.35m	GRAVELLY SILTY SAND; fine to coarse grained sand, sub angular gravels to 10mm size, dark grey, some rounded river gravels to 15mm size, dry to moist, loose.
MARINE & ALLUVIUM	0.35m to 1.6m	SAND, SANDY CLAY/CLAYEY SAND; fine to medium grained sand, fine to coarse grained sand, low to medium plasticity clay, medium plasticity clay, pale grey, grey to brown, orange to brown, some red, trace grey, trace roots, dry, dry to moist, loose to medium dense, stiff/medium dense to dense, very stiff to hard.

2.2 GROUNDWATER

Groundwater was not encountered in the investigation boreholes, however, temporary, perched seepages could be encountered at shallower depths following rainfall within the more pervious soils.

3 Site Classification

The lower (medium plasticity) soils generally are moderately reactive in terms of potential shrink-swell movements that may occur due to seasonal ground moisture changes. The characteristic ground surface movement “ Y_s ”, as defined by AS2870 for the range of extreme dry to extreme wet moisture conditions is estimated to be below 20mm. The site is therefore Class “S” (slightly reactive).

4 House Footings

AS2870 provides “deemed-to-comply” footing/slab designs, which for a class “S” site includes stiffened rafts, stiffened footing slabs, waffle rafts, and strip and/or pad footings with above ground floors. Footings and slabs should be in accordance with the principles of AS2870.

Footings including thickened sections of slabs forming footings should be taken below the topsoil, fill and any loose to medium dense marine/alluvial material and founded in the stiff alluvial soils. A footing depth of up to ~0.7m depth below existing surface levels may be required. Alternatively, bored piers founded in the very stiff to hard alluvial soils could be used.

Recommended allowable end-bearing pressures and shaft adhesion values for various footing systems and likely foundation materials are provided in Table 1.

Table 1 – Recommended Allowable End-Bearing Pressures for Footings

Foundation Material Type	Depth Below Existing Surface Level	Allowable End-Bearing Pressure			Allowable Shaft Adhesion on Bored Piers and Anchors	
		Strips	Pads	Bored Piers	Downward Loading	Uplift
Newly Placed Controlled Fill	-	100kPa	125kPa	N.A	N.A	N.A
Stiff/Medium Dense Alluvial Soils	~0.7m	100kPa	125kPa	150kPa	15kPa	7kPa
Very Stiff to Hard Alluvial Soils	~1.1m	150kPa	175kPa	200kPa	20kPa	10kPa

It is recommended that footings are inspected by a geotechnical engineer prior to the pouring of concrete to ensure that footings are founded in adequate material.

5 Excavation Conditions & Use of Excavated Material

Excavations to 1.6m depth will be through topsoil, fill and marine/alluvial soils. The topsoil, fill and alluvial material is readily diggable by backhoe and medium sized excavator to at least 1.6m depth.

Any low/medium plasticity alluvial soils can be used in controlled fill construction of building platforms. Topsoil and existing uncontrolled fill material should not be used in controlled fill construction, however, it can be used for landscaping.

If imported fill is required, a suitable select fill material would include a low or medium plasticity soil such as clayey sand or gravelly clayey sand, containing between 25% and 50% fines less than 0.075mm size (silt and clay), and no particles greater than 75mm size.

6 Site Drainage

Groundwater was not encountered during the investigation. The permanent groundwater table is expected to be below the proposed excavations, although temporary perched seepages may be present following rain, but should be readily controllable through the use of pumps during construction.

Suitable surface drainage should be provided to ensure rainfall run-off or other surface water cannot pond against buildings or pavements. Drainage should be provided behind all retaining walls, and subsoil drains should be installed along the upslope sides of access roads and car parks.

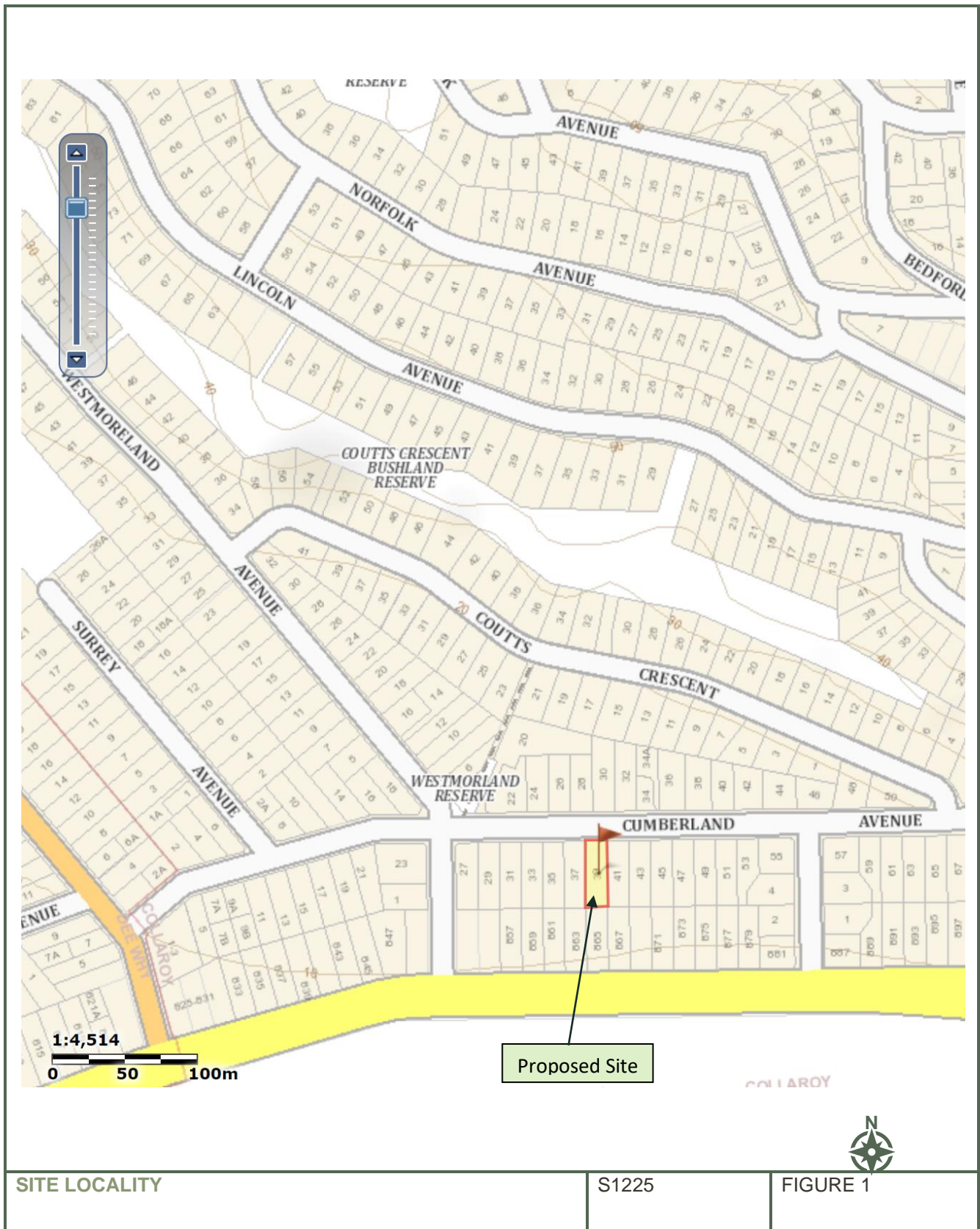
Should you require any further information, please contact our office.

Yours faithfully,

Fortify Geotech Pty Ltd



Allison Baillie
Geotechnical Engineer





1:564

0 5 10m

LEGEND:

Borehole Location - ⊗



AERIAL PHOTOGRAPH AND BOREHOLE LOCATION

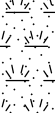






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FIGURE 2

Borehole Log

Borehole No.	1A
Sheet	1 of 1
Job No.	S1225
Location :	Collar Level : Not Known Angle From Vertical : 0° Bearing : N.A.

CLIENT: Luke Taggart
PROJECT Proposed Extension 39 Cumberland Avenue, Collaroy, NSW
Equipment Type : Handheld Pushtube Hole Diameter : 50mm

Samples	Water	Casing	Depth Metres	Graphic Log	U.S.C.S.	Material Description, Structure <small>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure</small>	Consistency or Relative Density	Field Test Results	Geological Profile
					SM	SANDY SILT; fine to coarse grained sand, black, some roots, dry	Loose		TOPSOIL FILL
			0.15		SM	GRAVELLY SILTY SAND; fine to coarse grained sand, sub angular gravels to 10mm size, dark grey, some rounded river gravels to 15mm size, dry to moist	Loose		FILL
			0.35		SP	SAND; fine to medium grained sand, pale grey, dry to moist	Loose to Medium Dense		MARINE
			0.7		CL	SANDY CLAY/CLAYEY SAND; low to medium plasticity clay, fine to coarse grained sand, grey to brown, trace roots, dry	Stiff/Medium Dense to Dense		ALLUVIUM
			1.0						
			1.1		CL	SANDY CLAY; medium plasticity clay, fine to coarse grained sand, orange to brown, some red, trace grey, dry	Very Stiff to Hard		
			1.6						
			1.7			BOREHOLE TERMINATED AT 1.6m At Target			

Logged By : AB

Date : 27/11/20

Checked By :

Date :

BOREHOLE/EXCAVATION LOG S1225.GPJ ACT GEO.GDT 30/11/20