






PRELIMINARY ASSESSMENT: Acid Sulfate For Proposed Works at **120 Prince Alfred Parade, Newport**

<i>Class of land as shown on Acid Sulfate Soils Planning Maps</i>		<i>Type of Works</i>
	1	Any works
	2	Works below the natural ground surface. Works by which the water table is likely to be lowered.
	3	Works beyond 1m below the natural ground surface. Works by which the water table is likely to be lowered beyond 1m below the natural ground surface.
	4	Works beyond 2m below the natural ground surface. Works by which the water table is likely to be lowered beyond 2m below the natural ground surface.
	5	Works on land below 5m AHD and within 500m of adjacent Class 1, 2, 3 or 4 land which are likely to lower the watertable below 1m AHD on adjacent Class 1, 2, 3 or 4 land.

The class of the site is highlighted in red, it should be noted that the classification does not mean acid sulfate soils are present on site but that there is a risk they could be present.

1. Proposed Development

- 1.1** Subdivide the property.
- 1.2** Construct a part three storey house with garage for 120 Prince Alfred Pde and a two storey house with garage for 120A Prince Alfred Pde. These works require an excavation to a maximum depth of ~4.5m.
- 1.3** Construct a new suspended driveway for 120 Prince Alfred Pde. Construct a new driveway for 120A and suspended walkway.
- 1.4** Construct new lower terraces and install new pools for both properties requiring excavations to maximum depths of ~1.4m for 120 and ~1.7m for 120A.
- 1.5** Details of the proposed development are shown on 7 drawings prepared by Corben Architects, job number NEWP, drawings numbered DA01 to DA03 and DA05 to DA08, Revision B - WIP, dated work in progress.

2. Site Description

The site was inspected on the 13th January, 2022.

The block is located on the gentle to moderately graded lower reaches and toe of a hillslope that falls to Old Mangrove Bay. The surface varies between ~RL0.1 and ~RL8.0. The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group Rocks. But deep sediments underlie the lower half of the property.

The NSW Environment and Heritage mapping program (eSpade) maps the soil landscape of the property as 'Watagan'. The soil materials at the uphill portion of the property resemble this soil landscape. As the downhill portion of the property is located at a mangrove area of a tidal zone the soil materials more closely resemble the soil landscape 'Mangrove Creek'. The ground tests indicate manmade fill, dark brown sandy loam (wn1), dark brown organic silty loam (mc1) and grey sand (mc2) was encountered. Their documentation indicates the sediments range in pH from 5.0 to 9.0 and the pH of the fill varies markedly.

Ground testing indicates that sediments extend to a depth of at least ~3.6m. The sediments are Holocene in age (spanning in time from present to ~10 000 years ago).

No visible signs of acid sulfate soils such as corrosion on man-made surfaces, or unusually clear, milky, or iron-stained surface water were observed on the property.

3. Earthworks

Excavations to maximum depths of ~1.7m and ~1.4m are required for the proposed pools. They will cover areas of ~34m² and ~36m² respectively. Additional earthworks include footing excavations for the proposed houses, driveways and terraces. The excavations are only a risk in regards to potential acid sulfate soils while they are open. On completion of the footings, they will be sealed with the foundation, preventing access of oxygen to the soil and therefore greatly reducing the potential for acid generation.

Another excavation to a maximum depth of ~4.5m is required to construct the proposed new houses. It will cover an area of around 300m². This deeper excavation is through the higher elevation part of the block, where the geology is not conducive to Acid Sulfate conditions.

4. Watertable

The watertable was encountered at depths from between ~0.9m to ~1.3m (~RL0.6 to ~RL0.8) below the current surface. It should be noted the watertable fluctuates with the tide and climatic changes.

5. Field Testing

Four hand auger holes were put down in the locations shown on the site plan attached. Field pH and pH_{FOX} testing was carried out on samples taken from the auger holes at regular intervals. The logs of the auger holes and the test results are as follows. The soil reaction rating scale for the pH_{FOX} test is shown in Appendix 1.

AUGER HOLE 1 (~RL1.8) – AH1

Depth (m)	Material Encountered
0.0 to 1.0	FILL , sandy soil, dark brown, dry to moist, fine to medium grained.
1.0 to 2.0	SANDY SOIL , with some clay, dark brown/grey, damp to very wet, fine to medium grained.

End of hole @ 2.0m in very wet sandy soil. Watertable encountered @ ~1.2m.

TEST: AH1	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH _F	30% Peroxide reaction	pH _{FOX}	pH _F - pH _{FOX}	SS=Shell J=Jarosite R=Roots
0.5	7.6	L	7.6	0	-
1.0	7.4	L	7.3	0.1	-
1.5	6.8	L	6.8	0	-
2.0	6.7	No Reaction	6.7	0	-

AUGER HOLE 2 (~RL1.7) – AH2

Depth (m)	Material Encountered
0.0 to 0.8	FILL , sandy soil, dark brown, dry to moist, fine to medium grained.
0.8 to 1.7	SAND , grey, damp to very wet, fine to medium grained.

End of hole @ 1.7m in very wet sand. Watertable encountered @ ~0.9m.

TEST: AH2	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH _F	30% Peroxide reaction	pH _{FOX}	pH _F - pH _{FOX}	SS=Shell J=Jarosite R=Roots
0.4	6.3	L	6.3	0	-
1.0	6.3	L	6.3	0	-
1.7	5.6	L	5.6	0	-

AUGER HOLE 3 (~RL1.9) – AH3

Depth (m)	Material Encountered
0.0 to 1.1	FILL , sandy soil, dark brown, dry to moist, fine to medium grained.
1.1 to 2.0	SANDY SOIL , dark brown/grey, damp to very wet, fine to medium grained.

End of hole @ 2.0m in very wet sandy soil. Watertable encountered @ ~1.3m.

TEST: AH3	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH _F	30% Peroxide reaction	pH _{FOX}	pH _F - pH _{FOX}	SS=Shell J=Jarosite R=Roots
0.5	6.4	L	5.8	0.6	-
1.0	6.3	L	6.1	0.2	-
1.5	6.6	L	6.5	0	-
2.0	6.5	L	6.6	0	-

AUGER HOLE 4 (~RL5.2) – AH4

Depth (m)	Material Encountered
0.0 to 0.5	TOPSOIL , sandy soil, dark brown, dry to moist, fine to medium grained.
0.5 to 1.0	CLAY , orange/brown, firm to stiff, dry to moist.

End of Hole @ 1.0m in firm to stiff clay. No watertable encountered.

TEST: AH4	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH _F	30% Peroxide reaction	pH _{FOX}	pH _F - pH _{FOX}	SS=Shell J=Jarosite R=Roots
0.5	5.9	No Reaction	5.9	0	-

6. Conclusions

This report was carried out in accordance with the Field pH and Peroxide Test guidelines (ASSMAC, 1998).

Ground testing performed in the location of the uphill side of the proposed houses (AH4) indicates the subsurface profile below the topsoil is derived from the Newport formation of the Narrabeen Group Rocks. This formation is Middle Triassic in age and is much older than the Holocene sediments from which acid sulphates are generally derived from on the east coast. Additionally, the Narrabeen Group Rocks do not contain high concentrations of sulphides which can provide the required iron concentrations for acid generation in older bedrock. As such, only the overlying topsoil was tested at this location as its origin is unknown.

No Acid Sulfate Soils were identified in the test holes. The pH_F levels tested in all auger holes did not fall lower than 5.6. This is above a PH of 4 that is an indicator of acid sulfate soils. No Potential Acid Sulfate Soils were identified in the test holes. The measured pH_F levels varied up to 0.6 from the measured pH_{FOX} levels. A movement of 1 unit or more is an indicator of potential acid sulfate soils. In addition, the measured pH_{FOX} for all tests did not fall lower than

5.6. A $\text{pH}_{\text{FOX}} < 3$ is a strong indicator of potential acid sulfate soils. No observable colour change or sulphurous odours were identified during the peroxide testing. It is likely the low reactions to peroxide testing were due to inclusions in the soil other than sulphides.

This preliminary assessment indicates that an Acid Sulfate Soils management plan is not required for the proposed works.

White Geotechnical Group Pty Ltd.



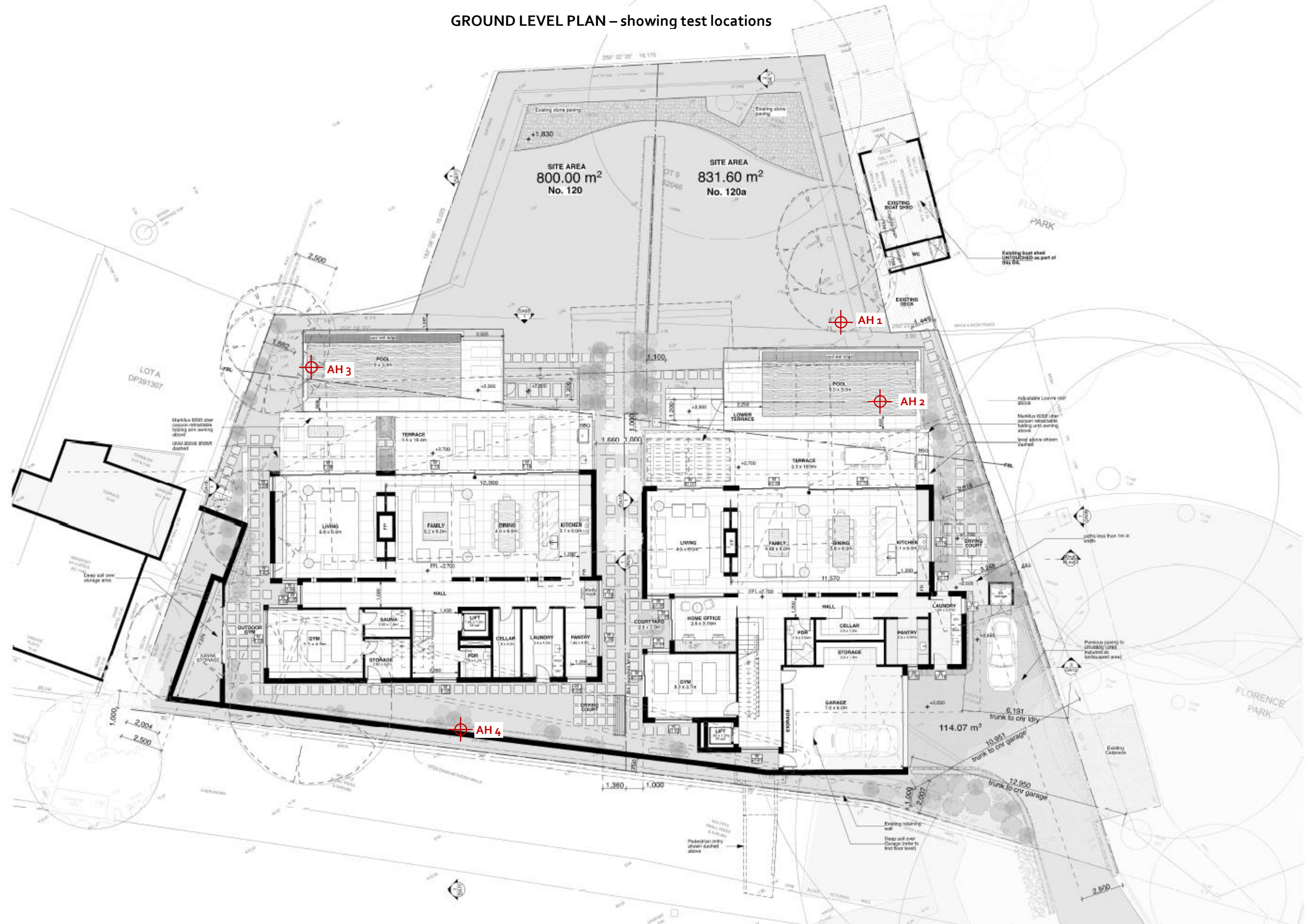
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Appendix 1: Soil Reaction Rating Scale

Rate of Reaction	Reaction Scale
Low	L
Medium	M
High	H
Extreme	X
Volcanic	V

Source: DER (2015a)

GROUND LEVEL PLAN – showing test locations



Any discrepancies to be brought to Architect's at...
 Use figure dimensions in preference to scaling...
 Only scale under direction from Architect...
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NO.	DATE	DESCRIPTION
A	28/10/21	Pre-DA Submission
B	11/11/21	Development Application

NOTES

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title Ground Level Plan
issue Development Application

job no. NEWP
drawn JM
checked PC, JM
scale 1:100 @A1

dwg no. DA05
revision B - WIP