

PRELIMINARY ASSESSMENT: Acid Sulfate

For Alterations and Additions at **139 Lagoon St, Narrabeen**

<i>Class of land as shown on Acid Sulfate Soils Planning Maps</i>		<i>Type of Works</i>
<input type="checkbox"/>	1	Any works
<input type="checkbox"/>	2	Works below the natural ground surface. Works by which the water table is likely to be lowered.
<input type="checkbox"/>	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.
<input checked="" type="checkbox"/>	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.
<input type="checkbox"/>	5	Works on land below 5m AHD and within 500m of adjacent Class1, 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** Construct a new driveway, garage, and entryway on the W side of the property by excavating to a maximum depth of ~2.9m.
- 1.2** Details of the proposed development are shown on 9 drawings prepared by MHDP Architects, project number 2122. Drawings numbered A001 to A004, A100, A101, A201 and A211 are Revision A, dated 16/1/24. Drawing number SK10 is Revision A/P1, dated 18/12/23.

2. Site Description

The site was inspected on the 20th November, 2023.

This residential property is on the high side of the road and is located on gently graded terrain. The surface varies between RL6.6 and RL8.3. The Sydney 1:100 000 Geological Sheet indicates the contact of Alluvial Stream and Estuarine Sediment (Qha) and marine sand (Qhf) of the

foredune is at the E side of the property. Sandy fill and sand was encountered to the extent of the ground tests.

The NSW Environment and Heritage mapping program (eSpade) maps the soil landscape of the property as 'Warriewood'. The ground tests indicate that below the fill, the upper ~0.2 to ~1.0m of soil is a loose, speckled, dark grey loamy sand (wa1). These are underlain by bleached massive sand (wa2). Their documentation indicates these soils range in pH from 4.5 to 7.0. Ground testing indicates that sand sediments extend to a depth of at least ~5.1m. The sand sediments are Holocene in age (spanning in time from present to ~10 000 years ago). No visible signs of acid sulfate soils such as bare low-lying areas, corrosion on man-made surfaces, or unusually clear, milky, or iron-stained surface water were observed on the property.

3. Earthworks

An excavation to a maximum depth of ~2.9m will be required for the proposed garage. The excavations will cover a combined area of ~120m². The excavations are only a risk in regards to potential acid sulfate soils while they are open. On completion of the garage, driveway, and entryway excavations, they will be sealed with concrete, preventing access of oxygen to the soil and therefore greatly reducing the potential for acid generation.

4. Water table

The water table was not encountered to the extent of testing at ~4.4m below the current surface. As such, the water table is not likely to impact on the proposed development.

5. Field Testing

Four hand Auger Holes (AH) were put down in the locations shown on the site plan attached. Field pH and peroxide 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 pHFOX test is shown in Appendix 1.

AUGER HOLE 1 (~RL7.9) – AH1 (Photo 1)

Depth (m)	Material Encountered
0.0 to 0.2	SANDY FILL , dark brown, medium dense, dry, fine to coarse grained, rock fragments and fine organic material (roots) present.
0.2 to 0.5	LOAMY SAND , brown, medium dense, dry, medium grained, fine organic material (roots) present.
0.5 to 4.4	SAND , orange, orange brown, yellow brown, medium dense, dry to moist, medium grained.

End of hole @ 4.4m in Sand. No water table encountered.

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
0.2	7.4	M	7.1	0.3	R
0.5	7.4	M	7.1	0.3	R
1.0	7.3	M	7.1	0.2	-
1.5	7.3	M	7.1	0.2	-
2.0	7.3	M	7.2	0.1	-
2.5	7.3	M	7.3	0	-
3.0	7.4	M	7.3	0.1	-
3.5	7.5	M	7.4	0.1	-
4.0	7.7	M	7.6	0.1	-
4.4	7.9	M	7.9	0	-

AUGER HOLE 2 (~RL8.0) – AH2 (Photo 2)

Depth (m)	Material Encountered
0.0 to 0.3	SANDY FILL , dark brown, medium dense, dry, fine to coarse grained, rock fragments and fine organic material (roots) present.
0.3 to 0.7	LOAMY SAND , brown, medium dense, dry, medium grained, fine organic material (roots) present.
0.7 to 4.4	SAND , orange, orange brown, yellow brown, medium dense, dry to moist, medium grained.

End of hole @ 4.0m in Sand. No water table encountered.

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
0.2	7.8	M	7.7	0.1	R
0.5	7.8	M	7.7	0.1	R
1.0	7.7	M	7.6	0.1	-
1.5	7.7	M	7.6	0.1	-
2.0	7.7	M	7.6	0.1	-
2.5	7.8	M	7.8	0	-
3.0	7.8	M	7.8	0	-
3.5	7.8	M	7.7	0.1	-
4.0	8.0	M	7.9	0.1	-

AUGER HOLE 3 (~RL7.8) – AH3 (Photo 3)

Depth (m)	Material Encountered
0.0 to 0.6	SANDY FILL , dark brown, medium dense, dry, fine to coarse grained, rock fragments and fine organic material (roots) present.
0.6 to 1.0	LOAMY SAND , brown, medium dense, dry, medium grained, fine organic material (roots) present.

End of hole @ 1.0m in Loamy Sand. No water table encountered.

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	H	6.3	0.1	R
1.0	7.0	M	6.9	0.1	R

AUGER HOLE 4 (~RL7.9) – AH4 (Photo 4)

Depth (m)	Material Encountered
0.0 to 0.3	SANDY FILL , dark brown, medium dense, dry, fine to coarse grained, rock fragments and fine organic material (roots) present.
0.3 to 1.0	LOAMY SAND , brown, medium dense, dry, medium grained, fine organic material (roots) present.
1.0 to 1.5	SAND , orange, orange brown, yellow brown, medium dense, dry to moist, medium grained.

End of hole @ 1.5m in Sand. No water table 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
0.2	7.2	M	7.2	0	R
0.7	7.3	M	7.3	0	-
1.2	7.4	M	7.4	0	-

6. Conclusions

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

No Acid Sulfate Soils were identified in the test holes. The pH_F levels tested in all auger holes did not fall lower than 6.4. 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 0.3 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} did not fall lower than 6.3. A pH_{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 varying weak reactions to peroxide testing were due to inclusions in the soil other than sulphides as, where the reaction was strongest, pH_{FOX} changed little from pH_F as it did in most tests.

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

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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)



Photo 1: AH1 – Downhole is from top to bottom



Photo 2: AH2 – Downhole is from top to bottom



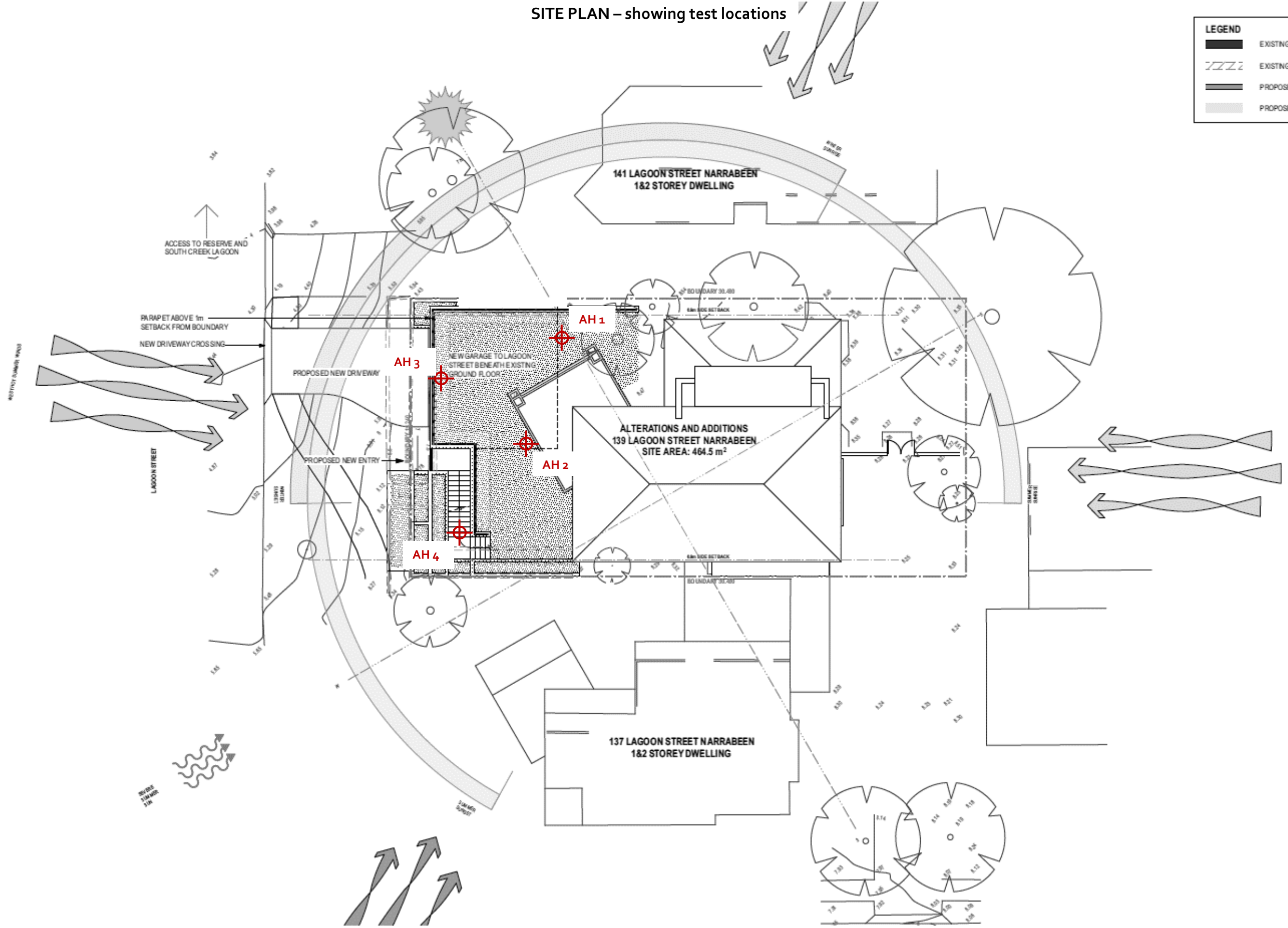
Photo 3: AH3 – Downhole is from top to bottom



Photo 4: AH4 – Downhole is from top to bottom

SITE PLAN – showing test locations

LEGEND	
	EXISTING WALLS
	EXISTING WALLS TO BE DEMOLISHED
	PROPOSED WALLS
	PROPOSED NEWWORKS



FOR DEVELOPMENT APPLICATION ONLY

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ALTERATIONS AND ADDITIONS
 139 LAGOON STREET NARRABEEN

SITE PLAN AND SITE ANALYSIS
 1:200 @ A3

2122 A001 A
 NOVEMBER 2023

MHDP
 ARCHITECTS