






PRELIMINARY ASSESSMENT: Acid Sulfate For Proposed Works at **1 James Wheeler Place, Wheeler Heights**

| <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 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. |
| <i>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.</i> | | |

1. Proposed Development

- 1.1** Demolish the existing driveway.
- 1.2** Construct new driveways and parking areas requiring minor levelling.
- 1.3** Various internal and external alterations and additions to the existing house.
- 1.4** Install a new pool at the S side of the existing house by excavating to a maximum depth of ~2.0m.
- 1.5** Retain but reduce the height of the existing pool shell, cap and use as an on-site water tank. Minor filling will be placed above the tank.
- 1.6** Construct a new outdoor eating area at the N side of the house and new pavilion with gym/studio adjacent to the existing tennis court.
- 1.7** Other minor external alterations and additions.

- 1.8** Details of the proposed development are shown on 23 drawings prepared by Synergy Construction Group, drawings numbered 0001, 0002, 0101 to 0110, 0201, 0202, 0211, 0212, 0221, 0222, 0401, 0402, 0501, 0901 and 1201, dated 9/7/25.

2. Site Description

The site was inspected on the 5th March, 2025.

The block is located on the gentle to moderately graded lower reaches and toe of a hillslope that falls to the near level council reserve beside Narrabeen Lagoon. The Sydney 1:100 000 Geological sheet indicates the site is underlain by Alluvial Stream and Estuarine Sediment (Qha), although the Narrabeen Group Rocks are shown close to the E side of the property and at a residential scale the map is not always accurate. Ground testing indicates the proposed works are underlain by the Newport Formation of the Narrabeen Group. This is described as interbedded laminite, shale, and quartz to lithic quartz sandstone.

The NSW Environment and Heritage mapping program (eSpade) maps the soil landscape of the property as 'Newport'. However, the soil materials across the area of the proposed works resemble the soil landscape 'Watagan'.

The ground tests indicate the upper ~0.3m to ~3.0m of soil is manmade fill (mf). This is underlain by a thin sandy topsoil (wn1). Their documentation indicates this soil ranges in pH from 5.0 to 6.0 and the pH of the fill varies markedly.

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

An excavation to a maximum depth of ~2.0m is required for the proposed pool. It will cover an area of ~63m². Additional earthworks include minor levelling and footing excavations for the proposed house additions, driveways, parking areas and pavilion. 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.

4. Water Table

No water table was encountered to the extent of the testing at ~RL4.3. The water table is expected in the vicinity of ~RL0.0 to ~RL2.0. It should be noted the water table fluctuates with the tide and climatic changes.

5. Field Testing

Five hand Auger Holes (AH) 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 (~RL13.9) – AH1 (Photo 1)

| Depth (m) | Material Encountered |
|------------|---|
| 0.0 to 1.2 | FILL , sandy soil and clay, with some rock fragments, dark brown, brown, orange, dry to moist, fine to coarse grained. |
| 1.2 to 1.4 | TOPSOIL , sandy soil, dark brown, dry, fine to medium grained. |
| 1.4 to 1.5 | CLAY , orange brown, firm to stiff, dry. |

End of Test @ 1.5m in firm to stiff clay. 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 |
| 0.5 | 6.3 | M | 6.1 | 0.2 | - |
| 1.0 | 6.7 | M | 6.6 | 0.1 | - |
| 1.5 | 5.2 | L | 4.6 | 0.6 | - |

AUGER HOLE 2 (~RL15.7) – AH2 (Photo 2)

| Depth (m) | Material Encountered |
|------------|---|
| 0.0 to 0.3 | FILL , sandy soil and clay, with some rock fragments, dark brown, brown, orange, dry to moist, fine to coarse grained. |
| 0.3 to 0.6 | TOPSOIL , sandy soil, dark brown, dry to moist, fine to medium grained. |
| 0.6 to 0.7 | CLAY , orange, firm to stiff, dry. |

End of Test @ 0.7m in firm to stiff clay. 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 |
| 0.4 | 6.3 | M | 5.9 | 0.4 | - |
| 0.7 | 6.1 | L | 5.9 | 0.2 | - |

AUGER HOLE 3 (~RL11.6) – AH3 (Photo 3)

| Depth (m) | Material Encountered |
|------------|---|
| 0.0 to 0.3 | FILL , sandy soil and clay, with some rock fragments, dark brown, brown, orange, dry to moist, fine to coarse grained. |
| 0.3 to 0.5 | TOPSOIL , sandy soil, dark brown, dry to moist, fine to medium grained. |
| 0.5 to 0.7 | CLAY , orange brown, firm to stiff, dry. |

End of Test @ 0.7m in firm to stiff clay. 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 |
| 0.3 | 6.0 | M | 5.6 | 0.4 | - |
| 0.6 | 6.2 | L | 5.8 | 0.4 | - |

AUGER HOLE 4 (~RL7.5) – AH4 (Photo 4)

| Depth (m) | Material Encountered |
|------------|---|
| 0.0 to 1.2 | FILL , sandy soil, clayey soil and sandy clay with some rock fragments, dark grey, dark brown, orange, damp, fine to coarse grained. |
| 1.2 to 1.4 | SANDY CLAY , orange, firm to stiff, dry. |

Refusal @ 1.4m, auger grinding on rock. 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 |
| 0.4 | 6.4 | M | 5.7 | 0.7 | 1%R |
| 0.8 | 6.2 | M | 5.4 | 0.8 | 1%R |
| 1.2 | 6.1 | M | 4.9 | 1.2 | 1%R |

AUGER HOLE 5 (~RL4.7) – AH4 (Photo 5)

| Depth (m) | Material Encountered |
|------------|---|
| 0.0 to 0.3 | CLAYEY SAND , orange, maroon, moist, fine to coarse grained. |
| 0.3 to 0.4 | SANDY CLAY , light grey, firm to stiff, moist. |

Refusal @ 0.4m, auger grinding on rock. 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 |
| 0.3 | 4.9 | L | 4.8 | 0.1 | - |

6. Conclusion

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

Ground testing performed on the site indicates the subsurface profile of the site at the location of the proposed works is derived from manmade fill over a thin sandy topsoil, clayey sand, residual clays and weathered rock of the Narrabeen Group Rocks. The Narrabeen Group Rocks and residual clays are Middle Triassic in age and are 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 fill, topsoil and sand were tested.

No Acid Sulfate Soils were identified in the test holes. The pH_F levels tested in all auger holes did not fall lower than 4.9. This is above a PH of 4 that is an indicator of acid sulfate soils. The measured pH_F levels varied from between 0.1 to 1.2 from the measured pH_{FOX} levels. A movement of 1 unit or more is an indicator of potential acid sulfate soils, however, only one of the test samples' pH levels varied by this amount and it is considered to be an outlier. In addition, the measured pH_{FOX} for all tests did not fall lower than 4.8. 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 low to medium 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.

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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.

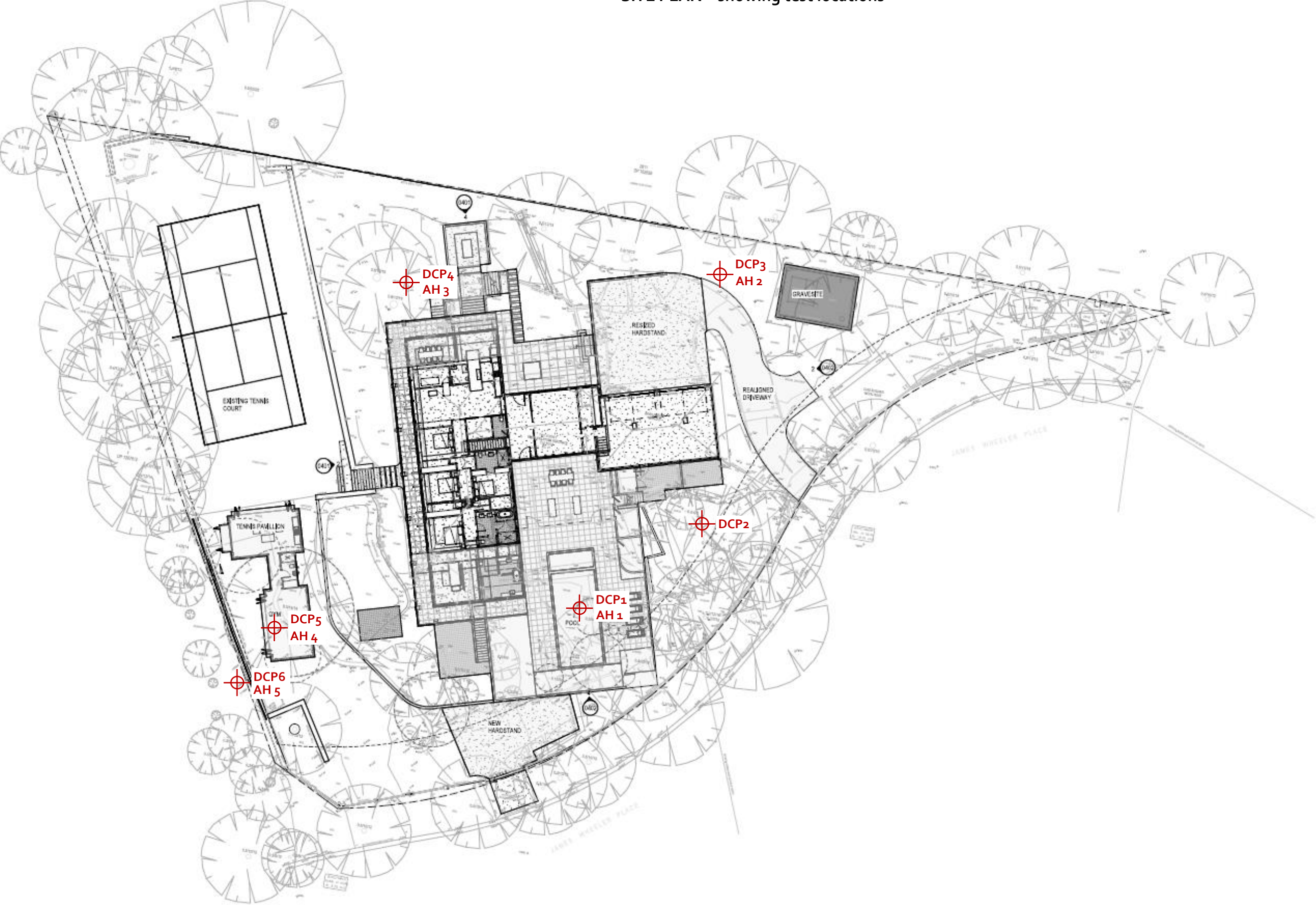


Photo 4: AH4 – Downhole is from top to bottom.



Photo 5: AH5 – Downhole is from top to bottom.

SITE PLAN – showing test locations



EXTENT OF NEW WORKS
HERITAGE ITEM

NOTE: WHERE NEW WORKS RELATE ONLY TO INTERNAL CONFIGURATION CHANGES, AREA OF WORKS MAY NOT BE SHADED

NOT FOR CONSTRUCTION