PRELIMINARY ASSESSMENT: Acid Sulfate

For proposed development at **1186 Barrenjoey Road, Palm Beach**

Class of land as shown on Acid Sulfate Soils Planning Maps		***Type of Works***
☐	**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.
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

2.1 Demolish the existing shop and construct a new house and pool.

2.2 Details of the proposed development are shown on 7 drawings prepared by Beecraft that are not numbered or dated.

2. Site Description

The site was inspected and testing carried out on the 24th August, 2016.

The property is located on the flat, low lying area to the E of Pittwater. The surface varies from ~RL 2.6 to ~RL 3.0. The Sydney 1:100 000 Geological sheet indicates the site is located on the contact point of the marine sands (Qhf/Qhb) which were encountered in the testing and the Newport Formation of the Narrabeen Group (Rnn). The marine sands are described as medium to fine grained "marine' sand with podsols and coarse quartz sand with varying amounts of shell fragments. Rnn is described as interbedded laminite, shale and quartz to lithic quartz sandstone. The Geological sheet indicates the underlying sands 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 ~1.4m will be required to install the proposed pool. It will cover an area of ~ 26m^2. Footings may also be dug as part of the proposed house. The footing system and depth will be nominated by the structural engineer. The excavations are only a risk in regards to potential acid sulfate soils while they are open. On completion of the pool and footing (depending on the footing system used) excavations they will be sealed with concrete, preventing access of oxygen to the soil and therefore greatly reducing the potential for acid generation.

4. Watertable

The watertable was not encountered in the tests that reached a maximum depth of 2.4m below the current surface (~RL 0.6). The water table varies with the climatic changes and the tide. The proposed pool excavation will reach the lowest elevation of ~ RL 1.6 and it is expected to have little impact on the watertable.

5. Field Testing

Four hand auger holes were put down in the location 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.

AUGER HOLE 1 (~RL 3.0).

Depth	**Material Encountered**
0.0 to 0.7	**FILL,** sandy soil with rock fragments throughout, wet.
0.7 to 2.4	**SAND,** yellow, medium to fine grained, well sorted, with some gravel throughout, dry to moist downhole.

End of hole in sand @ 2.4m.
Comments: No watertable encountered.

SEE THE TEST RESULTS OVER THE PAGE

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	7.1	No reaction	7.1	0.0	-
1.0	7.4	Very weak effervescence	7.3	0.1	-
1.5	7.4	Very weak effervescence	7.4	0.0	-
2.0	7.3	Very weak effervescence	7.2	0.1	-
2.4	7.4	Very weak effervescence	7.3	0.1	-

AUGER HOLE 2 (~RL 2.8).

Depth	**Material Encountered**
0.0 to 0.8	**FILL,** mixture of gravel, soil and clay, wet.
0.8 to 1.5	**PEATY SAND,** black, fine grained, well sorted, dry.

End of hole in peaty sand @ 1.5m.
Comments: No watertable 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**
0.5	7.0	No reaction	6.9	0.1	-
1.0	7.4	Very weak effervescence	7.2	0.2	-
1.5	7.4	Very weak effervescence	7.3	0.1	-

AUGER HOLE 3 (~RL 2.6).

Depth	**Material Encountered**
0.0 to 0.8	**FILL,** mixture of gravel, soil and clay, wet.
0.8 to 1.2	**PEATY SAND,** black, fine grained, well sorted, dry.
1.2 to 1.5	**SAND,** yellow, medium to fine grained, well sorted, with some gravel throughout, dry.

End of hole in sand @ 1.5m.
Comments: No watertable 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	7.1	No reaction	7.1	0.0	-
1.0	7.4	Very weak effervescence	7.2	0.2	-
1.5	7.5	Very weak effervescence	7.3	0.2	-

AUGER HOLE 4 (~RL 2.8).

Depth	**Material Encountered**
0.0 to 0.8	**FILL,** mixture of gravel, soil and clay, wet.
0.8 to 1.5	**PEATY SAND,** black, fine grained, well sorted, dry.

End of hole in peaty sand @ 1.5m.
Comments: 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	7.0	No reaction	7.0	0.0	-
1.0	7.2	Very weak effervescence	7.1	0.1	-
1.5	7.3	No reaction	7.1	0.2	-

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 7.0. This is well 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 little from the measured pH_{FOX} levels (up to 0.2). 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 6.9. 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 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 all tests.

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

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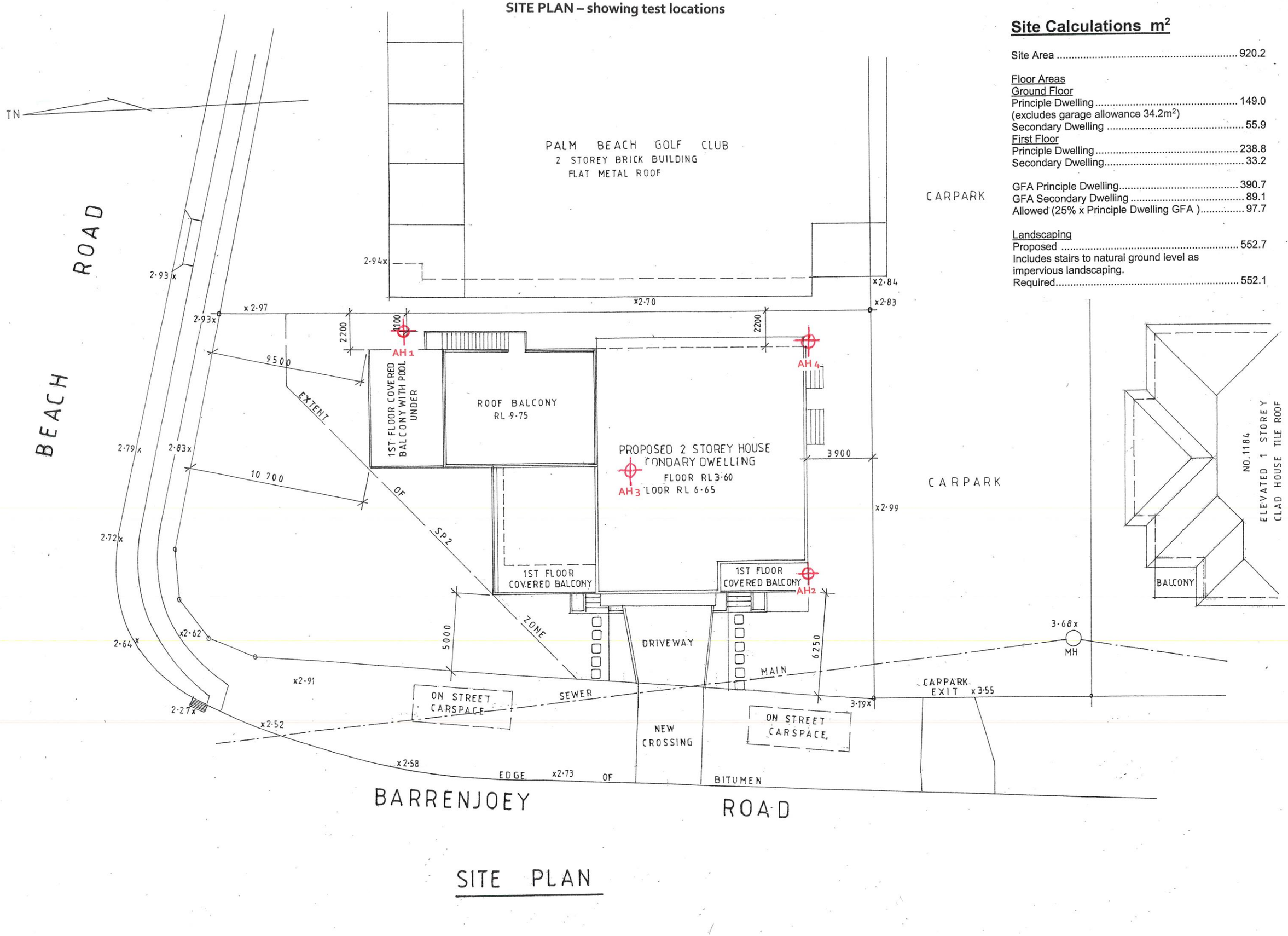
SITE PLAN – showing test locations



Site Calculations m²

Site Area	920.2
Floor Areas	
Ground Floor	
Principle Dwelling (excludes garage allowance 34.2m²)	149.0
Secondary Dwelling	55.9
First Floor	
Principle Dwelling	238.8
Secondary Dwelling	33.2
GFA Principle Dwelling	390.7
GFA Secondary Dwelling	89.1
Allowed (25% x Principle Dwelling GFA)	97.7
Landscaping	
Proposed	552.7
Includes stairs to natural ground level as impervious landscaping.	
Required	552.1

SITE PLAN