Warringah Council

Acid Sulphate Soil Management Plan

Installation of Floodlighting at Nolans Reserve, North Manly

Prepared by Parks Reserves and Foreshores Section

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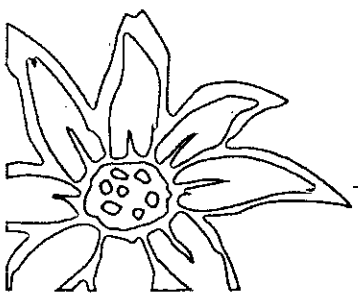

Contents

1.0 Introduction

The subject site is predisposed to high risk occurrence of acid sulphate soils as identified in the Warringah LEP 2000. Accordingly any proposed works involving excavations below natural ground surface trigger a need to undertake an Acid Sulphate Soil Assessment. Accordingly the applicant has undertaken Acid Sulphate Soil Preliminary Site Investigation (ASSPSI) as part of a previous geotechnical investigation for Nolans and Passmore Reserves prepared by GHD Pty Ltd in 2005.

The ASSPSI undertaken by GHD determined that the saturated loose sands and clayey sands underlying the site are not Potential Acid Sulfate Soils (PASS). Despite these findings the site is ideally located for PASS conditions to occur and it is suggested that proposed excavation and exposure of these soils be minimised as far as possible. Where proposed construction activities are likely to result in the exposure and possible oxidation of the site soils, it is recommended that proposed works continue under the guidance of a site specific Acid Sulphate Soil Management Plan (ASSMP).

This ASSMP has been prepared to assist Council and nominated contractors in the implementation of appropriate environmental management measures during the proposed works phase involving excavation and management of excavated materials determined to be PASS.

Where there may be conflict between the provisions of this ASSMP and any contractor obligations under respective contracts, regulatory and statutory requirements, the contract and statutory requirements are to take precedence. In the case of any real or perceived ambiguity between elements of this ASSMP and any contract or statutory requirements the contractor shall first gain clarification from Council's representative prior to implementing that element of this ASSMP over which the ambiguity is identified.

The remainder of this ASSMP is structured as follows:

2. Acid Sulphate Soils
3. Acid Sulphate Soil Management
4. Site Description
5. Project Description
6. Preliminary Site Investigation
7. Site Specific Management
8. Contingency Measures
9. Reporting

2.0 Acid Sulphate Soils

Estuarine sediments of coastal NSW from the Holocene geological age may contain iron pyrite, the main constituent of ASS. These sediments are generally found below 5 metres (m) Australian Height Datum (AHD), typically in coastal and floodplain areas. Pyritic sediments can be divided into classes based on their oxidised state. If the pyritic material is being oxidised it will generally have a pH of less than 4.0 and is called actual acid sulphate soil (AASS). If the pyrite material is below the water table and has not been oxidised, it is termed potential acid sulphate soil (PASS) and generally has a pH of greater than 4.0. The pH has the potential to become much lower when the PASS is exposed to oxygen. Sediment which, after the addition of hydrogen peroxide, has a pH of less than 2.5 strongly indicates the presence of ASS (ASSMAC, 1998).

Disturbance or poor management and use of ASS can generate sulphuric acid and salts. ASS can lower soil and water pH and increase salinity, reducing or precluding vegetation growth and producing soil conditions which may be detrimental to concrete and steel components of structures.
The release of sulphuric acid from ASS often mobilises metals such as aluminium, iron and magnesium from otherwise stable soil matrices. Elevated concentrations of such elements in site runoff may result in changes which are potentially detrimental to receiving water bodies and associated aquatic organisms.

2.1 Acid Sulphate Soils in Warringah

High risk areas of acid sulphate soils in Warringah are identified in estuarine sediments forming the foreshores and lower catchments of Narrabeen, Dee Why, Curl Curl and Manly Lagoons and Manly Dam. Lower risk areas are also identified adjoining high risk areas of the foreshore and lower lagoon catchments and along coastal areas from Queenscliff to Narrabeen.

The subject area is classified Risk Category 2 on the WLEP 2000 – Acid Sulphate Soil Hazard Map.

3.0 Acid Sulphate Soil Management

This ASSMP has been developed in accordance with the guidance provided in the *Acid Sulfate Soil Manual* (ASSMAC, 1998)

3.1 Site Description

Nolans Reserve is located off Pittwater Road and Kentwell Parade, North Manly. It is adjacent to Manly Creek as shown in Figure 1 below.

FIGURE 1: LOCATION PLAN NOLANS RESERVE

Reference to the 1:100,000 Geological map for Sydney shows that the site is underlain by quaternary deposits, comprising silty to peaty quartz sand, silt and clay, with ferruginous and humic cementation in places and common shell layers. The site is located on the Warriewood soil landscape group as defined in the *Soil Conservation Service of NSW Soil Landscapes of the Sydney Region Series Sheet 9130.* This group is characterised by gently undulating swales, depressions and in-filled lagoons on Quaternary sands.

The general stratigraphy encountered at Nolans Reserve is that of topsoil and alluvial sand fill overlaying soft organic clay (peat) and saturated loose medium sand.

3.2 Project Description

The proposed works involve the installation of floodlighting towers and associated infrastructure including trenching for electrical reticulation.

The works include excavation of footings for installation of steel columns. In total there are 15 footings to be excavated. Five footings will be to a depth 4.0m and 10 will be to a depth of 3.6m.

3.3 Preliminary Site Investigation

GHD were commissioned by Council to undertake geotechnical investigation which included preliminary site investigation to determine acid sulphate soil risk associated with excavation on site.

GHD reported that the saturated loose sands and clayey sands underlying the site had a range of pH (1:5 - H_20) of 7.6 – 8.1 and therefore not Potential Acid Sulfate Soils (PASS). The site however, is ideally located for the PASS conditions to occur at the site for proposed excavation below existing ground level. Accordingly

is recommended that any works proceed under guidance of a site specific ASSMP with excavated material and water identified for offsite disposal undergo waste classification according to *Waste Classification Guidelines* (DECC 2008)

3.4 Site Specific Management

Having established the potential for disturbance of PASS at this site in association with the proposed works the purpose of a site specific management plan is to minimise the disturbance of these soils and to mitigate any impacts of disturbance as required.

The proposed works identified in the works specification associated with the installation of 15 floodlighting towers at this site will require excavation and management of an expected 26 m^3 of disturbed soil. It is proposed that in advance of approved construction works additional testing be undertaken specific to the siting of the proposed lighting towers to confirm PASS at these locations. Undertake PASS Management and environmental controls in accordance with the following table:

Activity:	Excavation associated with the installation of floodlighting towers and associated works

PASS - Environmental Risk Statement	Significance			PASS - Environmental Controls
	Likelihood	Consequence	Risk	
The proposed works site has been identified as having Potential Acid Sulphate Soils below natural ground surface, there is potential for this material to become more acidic when exposed to air and is oxidised. There is a an environmental risk from: • Run-off of ASS and associated sediments in the event of rain from stockpiles and excavation that may enter waterways or impact on existing vegetation	4	4	Very High	1. Install and maintain Erosion and Sediment Control Measures in accordance with the Erosion and Sediment Control Plan 2. Minimise pedestrian and vehicular movement over site to minimise soil disturbance and distribution 3. All excavated material is to be placed in metal skip bins contained within an Erosion and Sediment Control Area 4. In accordance with PASS findings testing neutralise as required material within the bin(s) using agricultural lime at a rate in accordance with Acid Sulfate Soil Manual (ASSMAC, 1998) 5. Arrange for testing of bin material or other stockpiles to enable waste classification for disposal 6. Remove bins and dispose of contents and other material as required in accordance with waste classification
• Contamination of landfill as a result of disposal of PASS material	4	4	Very High	

Person(s) Responsible for Supervising/Controlling Works	Person Responsible for Approving Environmental Controls
Person(s) responsible for supervising the work, inspecting and approving work methods, environmental controls, plant equipment and materials Name: Position: Signature: Date:	Name Position Signature Date

Table 1 – PASS Management and environmental controls

3.6 Contingency Measures

As detailed in Section 3.4, final validation sampling of excavation materials will be conducted prior to the material being removed from the site for treatment at a licensed facility.

If validation sampling determines that any neutralisation using lime is ineffective, Council will investigate alternative treatment technologies, including (but not limited to) the management strategies included in the *Acid Sulfate Soil Manual* (ASSMAC, 1998).

3.7 Reporting

At the completion of works and following testing and disposal of excavated material the supervising project officer is to prepare a report identifying the control measures used and waste disposal classification and actions undertaken in disposing of the excavated materials. This report should be retained in the project files for future reference.

References

1. Acid Sulfate Soil Management Advisory Committee (ASSMAC) (1998) *Acid Sulfate Soil Manual*
2. Warringah Council (2000) *Local Environmental Plan-Hazard Map 1 Acid Sulphate Soils*
3. GHD (2005) Nolans and Passmore Reserves – Netball Development, Geotechnical Investigation