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Our Ref: PSM5378-007L REV3
Client Ref: Rev B SSDA Amendment

22 May 2025

Project Administrator
Goodman
The Hayesbery
1-11 Hayes Road
Rosebery NSW 2018
Athena.Vercoe@goodman.com

Attention: Athena Vercoe

Dear Athena

RE: PROJECT DUKE - 2 - 22 KENT ROAD & 685 GARDENERS ROAD, MASCOT NSW SALINITY MANAGEMENT PLAN

1. Introduction

This letter presents a Salinity Management Plan (SMP) for the proposed development at 2 to 22 Kent Road and 685 Gardeners Road , Mascot NSW herein referred to as Project Duke (the Site). The aim of the SMP is to effectively manage site salinity, minimise the effect of the proposed development on salinity processes and to protect the proposed development from salinity damage.

The work was undertaken in accordance with our fee proposal PSM5378-001L REV1, dated 22 May 2024.

To assist with the preparation of the SMP, we have been provided with the following documents:

- Architectural Drawings by Grimshaw Architects (ref. SSDA-A01-01-01 to SSDA-A90-99-08 REV5 dated 14 April 2025, Description: 120MVA FROZEN SET FOR SSDA).
- Civil Drawings by TTW (ref. DUKE-CIV-DRG-0101-00001 to DUKE-CIV-DRG-0101-09212 dated 10 April 2025).

Based on the documents above, PSM understands the following regarding the Site and proposed development:

- The site currently operates as a commercial warehouse unit with hardstand areas for parking and loading,
- The development will have earthworks with cut depths up to 1.6 m and fill depths up to 0.8 m
- No basement structures are proposed for the development,
- Based on the configuration of the proposed development, it is likely that pile foundations will be utilised as the foundation system for the development,
- Detailed structural design of the proposed development is not known to PSM at this stage.

Figure 1 presents a locality plan of the site.

2. Salinity Assessment

PSM conducted a round of site investigations during May 2024 (reported in PSM5378-005R REV4, dated 14 May 2025).

During in the investigation, four (4) soil samples were recovered and sent to a NATA accredited analytical laboratory for the following testing:

- Cation Exchange Capacity (CEC) of calcium, magnesium, potassium and sodium,
- Exchange sodium percentage,
- Salinity ($EC_{1:5}$, one part soil to five parts water),
- Soil PH,
- Chlorides,
- Sulphates,
- Resistivity.

Table 1 represents a summary of the results of the analytical soil testing undertaken. Laboratory test reports are included in Appendix A.

Table 1 - Summary of Aggressivity and Salinity Testing Results

Sample ID (Depth)	Exchangeable Cations [meq/100g]					Exchange Sodium [%]	pH	Electrical Conductivity [µS/cm]	Sulfate [mg/kg]	Chloride [mg/kg]	Resistivity [ohm cm]
	Ca	Mg	K	Na	CEC						
BH01 (0.5 m)	7.5	4.1	<0.2	0.6	12.1	4.8	8.3	255	480	<10	3920
BH01 (2.0 m)	0.6	<0.2	<0.2	<0.2	0.6	<0.2	8.1	73	30	20	13700
BH02 (1.0 m)	1.2	<0.2	<0.2	<0.2	1.2	<0.2	9.3	92	20	10	10900
BH03 (0.5 m)	3.1	<0.2	<0.2	<0.2	3.1	<0.2	9.5	114	100	<10	8770

2.1 Salinity

Site Investigations for Urban Salinity (DLWC 2002) classify soil salinity based on electrical conductivity (EC_e). The method of conversion from $EC_{1:5}$ to EC_e (electrical conductivity of saturated extract) is based on DLWC (2002) and given by $EC_e = EC_{1:5} \times M$, where M is the multiplication factor based on "Soil Texture Group".

The "Soil Texture Group" of the samples tested were assessed during our investigation. The salinity classification for the soil samples that were tested are presented in Table 2.

Table 2 – Salinity Classification

SAMPLE ID	$EC_{1:5}$ (dS/m)	SOIL TYPE	M	EC_e (dS/m)	SALINITY CLASS
BH01 (0.5 m)	0.255	Sands	17	4.335	Slightly saline
BH01 (2.0 m)	0.073	Sands	17	1.241	Non-saline
BH02 (1.0 m)	0.092	Sands	17	1.564	Non-saline
BH03 (0.5 m)	0.114	Sands	17	1.938	Non-saline

It is assessed that the soils on site are classified as "non-saline" to "slightly saline".

We have referred to Clause 4.8.2 of Australian Standard AS3600-2018 "Concrete Structures" and note that the assessed soil electrical conductivity (EC_e) is within the "A2" exposure classification.

2.2 Corrosivity/ Aggressivity

Table 4.8.1 of AS3600-2018 "Concrete Structures" provides criteria for exposure classification for concrete in sulphate soils based on sulphates in soil and groundwater, and pH of soil. On the basis of the sulphate and pH testing completed we assess the exposure classification for concrete in sulphate soils to be "A2".

Table 6.4.2(C) of Australian Standard AS2159:2009, Piling – Design and Installation provides criteria for exposure classification for concrete piles based on sulfates in the soil and groundwater, soil and groundwater pH, and chlorides in groundwater. On the basis of the soil sulfates and pH testing completed we assess the exposure classification for concrete piles in the soil to be mild.

Table 6.5.2(C) of Australian Standard AS2159:2009, Piling – Design and Installation provides criteria for exposure classification for steel piles based on resistivity, soil and groundwater pH, and chlorides in soil and groundwater. On the basis of the soil chlorides and pH testing completed we assess the exposure classification for steel piles in the soil to be non-aggressive to mild.

2.3 Sodicity

Sodicity provides a measure of the likely dispersion on wetting and to shrink/swell properties of a soil. Soil sodicity is classified based on the Exchangeable Sodium Percentage (ESP) which is the amount of exchangeable sodium as a percentage of the Cation Exchange Capacity (DLWC, 2002).

The Exchangeable Sodium Percentages calculated from these laboratory results range between <0.2% and 4.8% indicating that the soils on site are non-sodic when compared to criteria listed in DLWC (2002).

3. Salinity Management Plan

3.1 Development Components

This SMP addresses the components of the proposed development for Project Duke at the construction stage. Recommendations regarding the following development components are provided in the subsequent sections:

- Earthworks,
- Imported soils,
- Gardens and landscaped areas,
- Roads, footpaths, and hardstand areas,
- Surface water, stormwater, and drainage,
- Durability of concrete structures in contact with the ground.

3.2 Earthworks

Based on the provided documents, we understand earthworks will occur, with fill/cuts depths up to 1.6 m. The design and construction of the earthworks should consider the following recommendations:

- Importation of soil as per Section 3.3 of this letter,
- Vegetation cover should be established and maintained on permanent batters upon completion to control erosion,
- The final surface of all areas of the development should be graded to prevent the ponding of surface water,
- Erosion control of temporary batters, stockpiles and disturbed areas should be planned prior to undertaking the earthworks and implemented during the earthworks. Consideration should be given to:
  - Grading and partially sealing completed surfaces,
  - Installation of clearly visible fencing and traffic control measures to prevent unnecessary trafficking of areas and preventing site disturbance,
  - Establishing set vehicular access points and roads,
  - Protecting stockpiles (temporary vegetation or mulching) where these are to be left in place for long durations,
- Sediment control shall be implemented by means of sediment traps and silt fencing where considered necessary.

3.3 Importation of Soil

It may be required to import topsoil or other soil onto site. Materials to be imported to site should be addressed for suitability for the intended use. Highly saline or contaminated soils should not be imported to site.

3.4 Gardens and Landscaped Areas

Based on the provided drawings, we understand the proposed development will include new garden and landscaped areas. The design and construction of the gardens and landscaped areas should consider the following recommendations:

- Selection of plant species should consider the soil conditions, including slightly saline soils with relatively poor fertility and clayey low permeability soil profiles. The promotion of successful revegetation is likely to require the use of nutrient-rich topsoil. Saline topsoils should not be imported to site.
- Potential for waterlogging should be minimised by:
  - Adopting plant species with minimal watering requirements,
  - Adopting ‘waterwise’ gardening principles,
  - Minimising the use of potable water in landscaped areas,
  - Properly designed and implemented irrigation systems,
  - Establishment of perennial species and deep-rooted trees.

3.5 Roads, Footpaths and Hardstand Areas

As stated, PSM understands the proposed development will include new roads, footpaths, and hardstand areas. The design and construction of roads, footpaths and hardstand areas should consider the following recommendations:

- Roads, footpaths and hardstand surfaces should be graded, and the grades maintained at all times to prevent ponding of surface water at locations where this can result in infiltration into the underlying soils (e.g. pavement joints).
- Connections between the roads, footpath and hardstand surfaces and the surface water and stormwater drainage infrastructure should be designed, constructed and maintained to restrict infiltration into underlying soils.
- Services that are to be located below the roads, footpath and hardstand surfaces should be installed, where practical, at the time of construction.
- Provision for a damp-proof course or membrane beneath slabs should be considered by the slab designer.

3.6 Surface Water, Stormwater and Drainage

Surface water, stormwater and drainage design should aim at restricting infiltration into the ground resulting in groundwater recharge. The design and construction of surface water, stormwater and drainage measures should thus consider the following recommendations.

- Disturbance of natural drainage patterns should be reduced. Where these are disturbed or altered appropriate artificial drainage should be installed.
- Stormwater and surface water should be managed to restrict infiltration.
- Temporary water retaining structures used during construction should be managed to restrict infiltration.
- Stormwater and surface water infrastructure should be redesigned and constructed to minimise the likelihood of leakage.
- Guttering and down pipes should be connected and maintained.
- Surface water runoff should be directed around all exposed surfaces, temporary stockpiles and landscaped areas.

3.7 Durability of Concrete Structures in Contact with the Ground

In designing structural concrete elements in contact with the ground the design should consider the results of the salinity assessment and the durability requirements in AS2159:2009 “Piling Design and Installation” and AS3600:2018 “Concrete Structures”.

Both these standards provide guidance on minimum concrete grade/strength and minimum cover requirements.

Based on the salinity and resistivity test results from the conducted testing, it is recommended that

1. The design of structural concrete members (excluding piles) in contact with natural soils adopt a “A2” exposure classification, as defined in AS3600:2018.
2. The design of structural concrete members (excluding piles) in contact with fill adopt a “A2” exposure classification, as defined in AS3600:2018.
3. The design of concrete case in situ piles adopt a “mild” classification as defined in AS2159:2009.

4. Conclusion

We recommend the designer(s) and contractor(s) responsible for the various development components give appropriate consideration to the recommendations in this SMP.

The designer and contractors should contact PSM during the works if they have any queries with regards to the requirements in the SMP or if conditions significantly differ from those described.

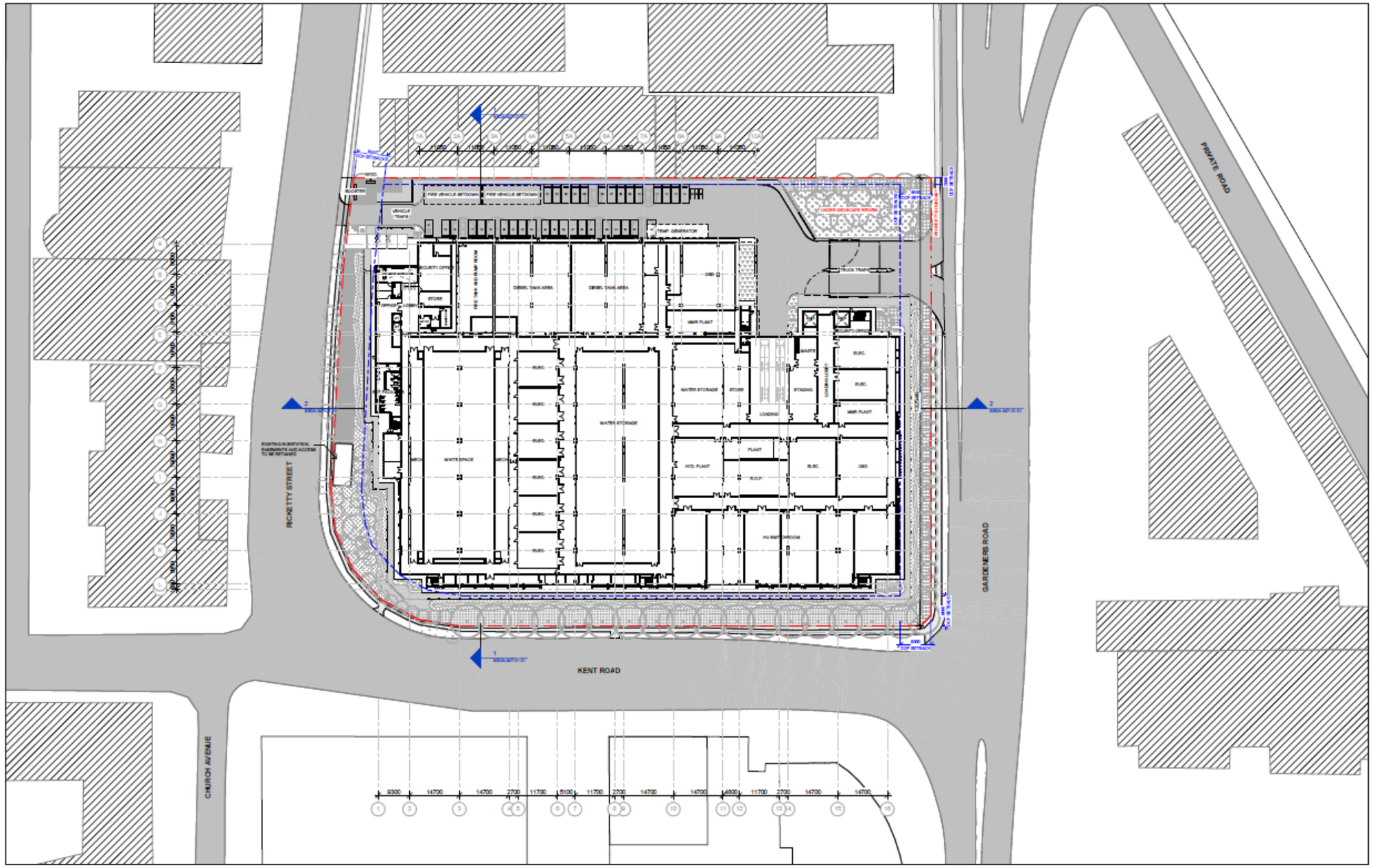
Yours Sincerely

KEN TONG LEE
GEOTECHNICAL ENGINEER

MOHAMMAD POURNAGHIAZAR
PRINCIPAL GEOTECHNICAL ENGINEER

Enc.

Figure 1	Locality Plan
Appendix A	Aggressivity and Salinity Test Results



Legend

Approximate Site Boundaries

Notes

1. Site plan extracted from Grimshaw Architect drawing SSDA-A03-00-01

Scale 1:1,000

N

0 10 20 30 40 50 m

Map Projection:
GDA2020 / MGA zone 56
EPSG:7856

Created By: KTL	Revision: 3	Goodman Project Duke 2 to 22 Kent Road, Mascot NSW	
Date: 22 May 2025	Paper Size: A3	LOCALITY PLAN	
PSM5378-007L REV3	Figure 1		

Appendix A
Aggressivity and Salinity Test Results

CERTIFICATE OF ANALYSIS

Work Order	: **ES2418176**	Page	: 1 of 3
Amendment	: **1**		
Client	: **PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Ken Tong Lee	Contact	: Customer Services ES
Address	: G3, 56 DELHI ROAD NORTH RYDE NSW, AUSTRALIA 2113	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: PSM5378	Date Samples Received	: 03-Jun-2024 14:38
Order number	: ----	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: ----	Issue Date	: 20-Jun-2024 15:23
Sampler	: Ken Tong Lee		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- Corrosion assessment for Concrete and Steel piles in soil per Australian Standard AS2159-2009 uses a combination of soil and groundwater data (Tables 6.4.2 C & 6.5.2 C). In the absence of groundwater data, assessment has been made against soil criteria only. Refer to AS2159-2009 section 6.4 for further interpretation of corrosion assessment. ALS is not NATA accredited for Corrosion Assessment comments
- EA167: Soil Condition A – High permeability soils (e.g. sands and gravels) which are in groundwater
- EA167: Soil Condition B – Low permeability soils (e.g. silts and clays) or all soils above groundwater
- Amendment (20/06/2024): This report has been amended as a result of a request to change sample identification (ID) received from Ken on 19/06/2024 for sample 4 – BH4 to BH3. All analysis results are as per the previous report.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH01 @ 0.5m	BH01 @ 2.0m	BH02 @ 1.0m	BH03 @ 0.5m	----
			Sampling date / time	31-May-2024 00:00	31-May-2024 00:00	28-May-2024 00:00	29-May-2024 00:00	----
Compound	CAS Number	LOR	Unit	ES2418176-001	ES2418176-002	ES2418176-003	ES2418176-004	--------
				Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**8.3**	**8.1**	**9.3**	**9.5**	**----**
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**255**	**73**	**92**	**114**	**----**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**4.8**	**20.4**	**8.8**	**10.7**	**----**
EA080: Resistivity								
Resistivity at 25°C	----	1	ohm cm	**3920**	**13700**	**10900**	**8770**	**----**
EA167: Corrosion Classification (per AS2159-2009)								
ø Exposure Classification - Concrete Piles Soil Condition A	----	-	-	**Mild**	**Mild**	**Mild**	**Mild**	**----**
ø Exposure Classification - Concrete Piles Soil Condition B	----	-	-	**Non Aggressive**	**Non Aggressive**	**Non Aggressive**	**Non Aggressive**	**----**
ø Exposure Classification - Steel Piles Soil Condition A	----	-	-	**Mild**	**Non Aggressive**	**Non Aggressive**	**Non Aggressive**	**----**
ø Exposure Classification - Steel Piles Soil Condition B	----	-	-	**Non Aggressive**	**Non Aggressive**	**Non Aggressive**	**Non Aggressive**	**----**
ED006: Exchangeable Cations on Alkaline Soils								
ø Exchangeable Calcium	----	0.2	meq/100g	**7.5**	**0.6**	**1.2**	**3.1**	**----**
ø Exchangeable Magnesium	----	0.2	meq/100g	**4.1**	<0.2	<0.2	<0.2	**----**
ø Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	<0.2	<0.2	**----**
ø Exchangeable Sodium	----	0.2	meq/100g	**0.6**	<0.2	<0.2	<0.2	**----**
ø Cation Exchange Capacity	----	0.2	meq/100g	**12.1**	**0.6**	**1.2**	**3.1**	**----**
ø Exchangeable Sodium Percent	----	0.2	%	**4.8**	<0.2	<0.2	<0.2	**----**
ED040S: Soluble Major Anions								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	**480**	**30**	**20**	**100**	**----**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	<10	**20**	**10**	<10	**----**