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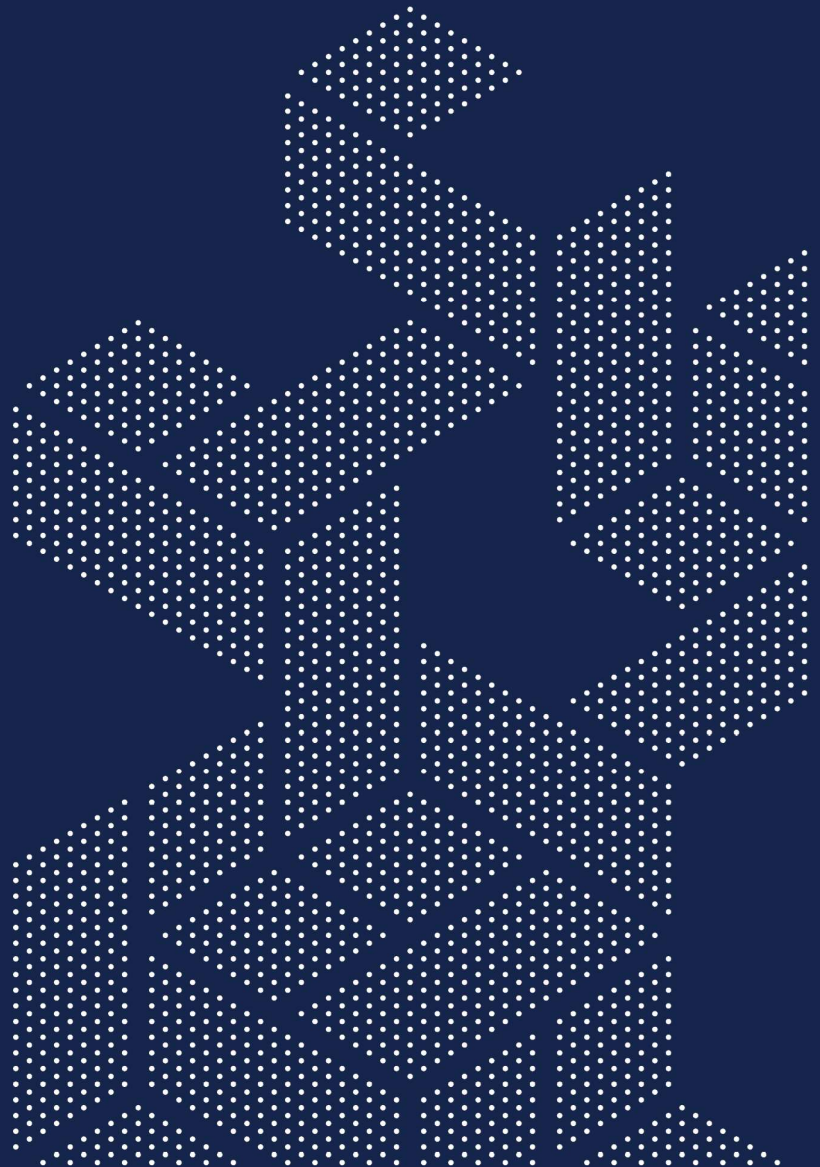
Pelican Point Substation Bay 5

STORMWATER MANAGEMENT PLAN

WGA250500

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Revision History

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1 INTRODUCTION

1.1 Background

Wallbridge Gilbert Aztec (WGA) has been engaged to prepare a Stormwater Management Plan (SMP) for the proposed Bay 5 works at the Pelican Point Substation in the Port of Adelaide Enfield Local Government Area (approximately 28km from Adelaide, SA).

This SMP is based on the Pelican Point Substation Bay 5 works as shown in Figure 1 below. The plan outlines the stormwater management for the proposed site to support ElectraNet's Development Application (DA) document package.

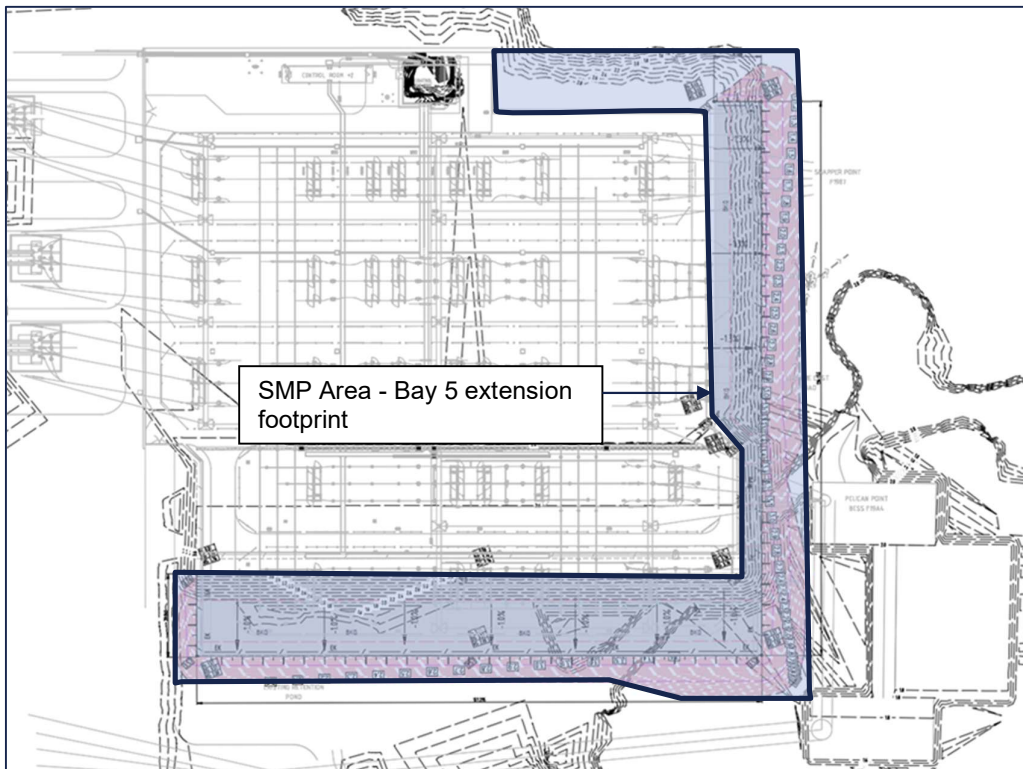


Figure 1 Substation Bay 5 Extension Site Footprint

1.2 Scope of Work

The Stormwater Management Plan (SMP) outlines the strategies for managing stormwater runoff volume, flow and quality at the proposed development site in accordance with requirements.

This report intends to provide the functional basis of the management of stormwater for the development based on the following:

- Review the proposed civil design and develop a stormwater management plan.
- Assess pre- and post-development to determine detention and water quality needs.
- Conduct a desktop analysis of site tide levels using previous project experience with reference to The South Australian Property and Planning Atlas (SAPPA) for minimum Finished Floor Levels (FFLs).
- Discuss climate change risks for 2050 and 2100.
- Provide initial construction Sediment and Erosion Management Plan (SEDMP) guidance.

- Prepare a Stormwater Management Plan Report to support the Development Application.

The SMP presented in this report is intended to demonstrate responsive performance outcomes. This is supported by calculations and modelling.

1.3 Project Description

Pelican Point Power Station is situated on a Strategic Employment zone Lot 28 at Pelican Point, about 28 km from central Adelaide, South Australia, on the Lefevre Peninsula (Refer Figure 2). The 28.2ha site is bordered by Pelican Point Drive to the west and south, Snapper Point Power Station to the north, and Area 3 of the Nuclear-Powered Submarine Construction Yard to the east. The facility includes a powerhouse, a substation, and a Battery Energy Storage System (BESS) located to the south, where construction is currently underway.

The stormwater management plan addresses the proposed Bay 5 works, with a footprint of approximately 1 hectare.



Figure 2 Site Locality Plan (Extracted from NearMap)

The Bay 5 project involves extending the bench at the existing Substation to accommodate a new connection bay. The concept design for Bay 5 is provided at Appendix A.

This Stormwater Management Plan references the following requirements (Refer Section 2 for further detail):

- Port Adelaide Enfield Council
- Coastal Protection Board
- Environment Protection Authority
- The broader Port Adelaide Enfield Lefevre Peninsula Stormwater Management Plan

1.4 Regional Catchment Overview

The site is in Outer Harbor, within the Port Adelaide Enfield Council area, Lefevre Peninsula Catchment. There is no existing Council drainage network shown on the Council mapping within the area; instead, private stormwater systems serve the industrial zone and are managed by landowners and site operators.

1.4.1 Tidal Interaction

Several parts of the Lefevre Peninsula are low-lying, located below the recorded high tide mark and are unprotected for sea level rises. The Lefevre Peninsula Stormwater Management Plan shows that portions of the existing site are low-lying. The results of the modelling completed as part of the plan show that areas would be inundated by high tides. Areas of the Site that are below recorded high tide levels, under existing conditions, are shown in Figure 3.



Figure 3 Area Below Astronomical & Observed Tide Levels (Extract Lefevre Peninsula SMP)

The performance of the site stormwater drainage network may be affected by tide levels as gravity drainage systems allow for water to freely discharge when tide levels are below the invert level of the gravity outfall.

The Port Adelaide Seawater Stormwater Flooding Study (Tonkin Consulting, 2005) reported that there is no reliable link between intense rainfall and storm tide occurrences. Therefore, it is highly improbable that a significant rainfall event with a 1% Annual Exceedance Probability would coincide with a major storm tide event of equal probability.

1.4.2 Site Geology

As part of the Lefevre Stormwater Management Plan, existing drilling logs from groundwater wells throughout the Lefevre Peninsula were reviewed. The analysis revealed that the area's soils are generally made up of Quaternary sands that extend to depths over 10 meters.

1.4.3 Previous Reporting

The documents listed below pertain to the Lefevre Catchment and have been cited in the preparation of the SMP within the subsequent subsections.

1.4.4 Northern Lefevre Peninsula Industry and Open Space Development Plan Amendment (2009)

The report determines that the practicality and cost of designing a free-draining gravity drainage systems with discharge to the Port Adelaide River is considered very difficult, requiring significant quantities of fill to be introduced across future development areas.

The use of linear detention basins is therefore proposed in the area. The detention basins can be constructed at a flatter grade than road and pipe drainage systems and provide the secondary benefit of water quality treatment. There are not existing basins that is currently used to manage runoffs. These proposed basins can be used to provide a dual benefit of water quality treatment and flood mitigation for a 100-year ARI (Average Recurrence Interval) 72-hour storm events.

1.4.5 Snapper Point Power Station Stormwater Management Plan (2020)

This report was completed for the similar adjacent site to the east of the proposed Pelican Point Bay 5 development. The stormwater management outcome for the site was determined to be retention and of stormwater using a storage basin with capacity to retain up to the 1% Annual Exceedance Probability (AEP) event. Treatment of runoff from 'dirty' parts of the catchment was proposed using a sediment basin and oil/water separator.

2 STANDARD AND REFERENCES

2.1 General

This section lists the relevant projects documents, Standards and Guidelines, and reference investigations and assessments that have been adopted to inform the development of this SMP.

2.2 Australian Standards

Table 1 Australian Standards

Title	Reference	Date
South Australia's Planning and Design Code	SA Department for Trade and Investment (DTI)	2024
South Australian Property and Planning Atlas (SAPPA)	Plan SA	-
Australian Rainfall and Runoff	ARR	2019
Water for Good	SA Department for Environment and Water (DEW)	2009
Coast Protection Board Policy	SA Department for Environment and Water (DEW)	2022

2.3 Council Reference Documentation

Table 2 Council Reference Documentation

DOCUMENT NAME	DATE
City of Port Adelaide Enfield Lefevre Peninsula Stormwater Management Plan	2018
Northern Lefevre Peninsula Industry and Open Space Development Plan Amendment	2009
City of Port Adelaide Enfield's Development Guide: Engineering Siteworks Plans	2021
City of Port Adelaide Enfield's Asset Management Plan: Stormwater	2021

2.4 Previous Study References

Document Name	Author	Date
Pelican Point Substation: Tender Design Drawings (WGA253076-SK-CV-0001 to 0006)	WGA	11/25
Snapper Point Power Station Geotechnical Investigation Report	CMW Geosciences	2020
Snapper Point Power Station SMP	Emanden Technical Solutions	2020

Document Name	Author	Date
Substation Expansion Pelican Point: Detail and Level Survey	Alexander Symonds	2025

2.5 Objectives

The key stormwater management objectives that have been applied in the development of this SMP are set out below:

Goal	Objective	Reference
Quality Targets	Water quality targets are as follows (most conservative authority requirement shown below): - Gross Pollutants (GP): 90% removal of particles greater than 50mm - Total Suspended Solid (TSS): 80% removal - Total Phosphorus (TP): 60% removal - Total Nitrogen (TN): 50% removal	Council, EPA, DEW
Flood Protection	Development levels in coastal areas should be set above a 1% AEP design flood level, taken as the greater of: - the 1% AEP extreme tide, in combination with wave effects and stormwater runoff from the development; or - the 1% AEP overland flow event, with due allowance for the effect of tidal surge. Buildings floor levels should be set a further 300 mm above the greater of these design flood levels.	DTI, Council
Flooding impacts To prevent the development from adversely impacting flooding on adjoining / nearby properties.	The development must not cause unacceptable flood impacts on nearby properties by the diversion of flood waters or an increase in flood velocity or flood level. Increases in flood levels must be contained to the development site. Any flood level afflux outside of the development site must be contained to +/- 20 mm.	DTI
Climate change Ensure the development is protected against future climate conditions.	Performance of the drainage network and flood protection measures should be assessed under the full range of climate change effects, including but not limited to increased rainfall and sea level rise.	Council
Drainage capacity	Aspire to achieve the following minimum service standards for the minor (pit and pipe) and major (overland flow) drainage networks: Minor: 0.2 Exceedances per Year (EY) or 18.13% Annual Exceedance Probability (AEP)	Council

Goal	Objective	Reference
Provide an acceptable level of service for stormwater drainage infrastructure to protect people and important infrastructure from local runoff.	Major: 1% AEP	
Discharge quantity To manage flood risk, by limiting the rate of discharge into downstream stormwater systems.	Implement detention systems to ensure that post-development peak discharge rates do not exceed pre-development rates in both the 0.2 EY and 1% AEP storm events.	Council

2.5.1 EPA Requirements

The following Environmental Protection Authority (EPA) requirements also relate to the site:

- Stormwater drains must only carry stormwater runoff, and not wastewater or washdown water, rubbish, litter or any other contaminant that can be reasonably prevented from the system.
- Minimise the discharge of all forms of pollutants from the stormwater before the discharge into sensitive areas. This includes, but not necessarily limited to, the removal of excess nutrients, silts, organic matter containing pest species and litter.

2.5.2 Coastal Protection Board Requirements

The Coastal Protection Board require the following:

- The Board's minimum site level and the finished floor level is a height determined by adding 1.25m to the 100-year ARI water level and making adjustment (if appropriate) for land subsidence or uplift to the year 2050.
- Any mechanical and electrical equipment associated with the development is to be made safe from the water ingress or raised in accordance with the Board's recommended minimum finished floor level.
- Any chemical storage shall be above the recommended minimum finished floor level or protected by a permanent bund surrounding the chemicals, with a crest level of the minimum finished floor level.
- All stormwater design and construction shall be in accordance with recognised engineering best practice to ensure that run-off does not adversely affect the surrounding coastal or marine environment.
- All imported substrate material or engineered fill to be used shall be free of weeds and pathogens to ensure that noxious weed or contamination sources are not introduced into the nearby coastal environment. Fill should be compacted to reduce the risk of scour and contain less than 1% of 'fine'.

2.5.3 Council Requirements

Based on Council advice for surrounding sites in the area, the following options have typically been acceptable for stormwater management in the area:

- Manage stormwater on-site
- Confirm capacity of downstream drainage system and use existing underground connection if appropriate.

3 STORMWATER INFRASTRUCTURE

3.1 Existing Site Conditions

The existing overarching Pelican Point Power Station site includes minimal stormwater management infrastructure. Generally, runoff from the existing sub-station pavement flows overland to trapped low points on the site, where it is retained and disbursed via infiltration and evaporation.

There is an existing stormwater basin, understood to be part of the BESS portion of the site development, with pumped inlet and outlets, out-letting to a low-lying swale section to the east with no identified outlet. The basin is located within the proposed development area for Bay 5, however this is proposed to be relocated prior to the Bay 5 development (as part of a prior development stage), outside of the Bay 5 development area.

The existing development area consists of a sparsely vegetated undeveloped pervious open space, grading generally to the east and southeast. The catchments are shown in Figure 5. Runoff from the northern catchment (Catchment 1) flows overland to the northeast and the remaining catchment (Catchment 2) is directed to the low-lying area in the southeastern corner of the site via overland sheet flow.



Figure 4 Existing Stormwater Infrastructure

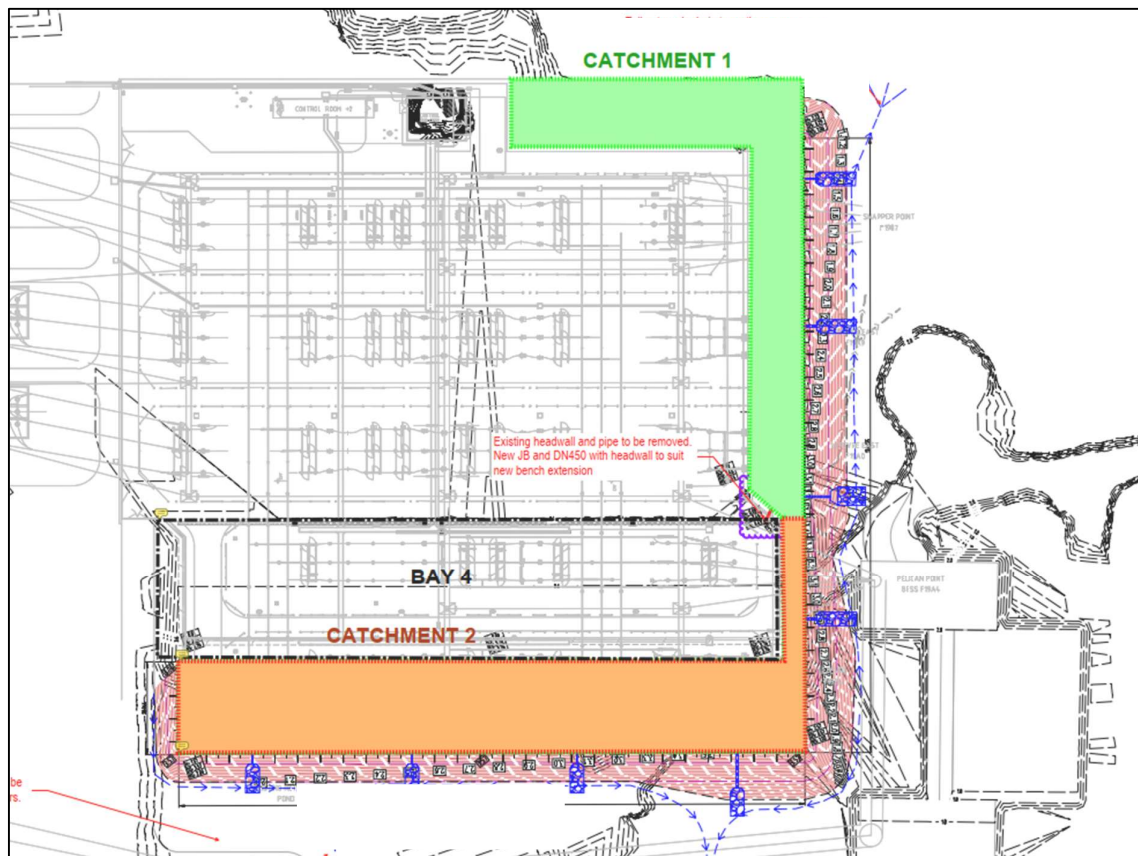


Figure 5 Catchment Delineation

3.2 Geotechnical Site Conditions

A geotechnical investigation was completed previously on the adjacent Snapper Point Site. The report found that:

- Based on the site's location, Marine Sandy Facies are likely to be prevalent
- The general soil profile across the site is relatively consistent, comprising fill over St Kilda Formation (Generally permeable)
- Groundwater was encountered at each BH location between 1.5 and 3.1mbgl during the investigation. Based on information in regional groundwater maps (SARIG 2019), groundwater is expected within 2 to 5 metres below ground level for this site.
- WGA have assumed that in the long term (i.e. developed scenario), the proposed basins is expected to silt up. Permeability value of $k=10^{-8}$ m/s is proposed (e.g. sandy clay) to model the silted-up base of the basin.

3.3 Site Inspection

A site inspection was undertaken on the 31st of March 2026 by WGA and Downer Contractor staff representatives.

The following key items were an outcome of the site inspection:

- Key site infrastructure including swales and basin was checked and verified.
- Existing site conditions and topography were observed as follows (Refer to figures 6, 7, and 8 for site inspection photos):
 - The large undeveloped area within the site proposed for the Bay 5 development is sparsely vegetated and undulating.

- No standing water was observed within the proposed development area, and it is expected that the localised internal catchment is trapped in low points on the site and disbursed through evaporation and infiltration.
- Existing sub-station pavement grades to the south, where there are breaks in the existing kerb to direct runoff into the undeveloped area to the south. Sediment was observed on the pavement at the low points adjacent the kerb, suggesting ponding.



Figure 6 Site Inspection Photo: Sub-station existing kerb outlet



Figure 7 Site Inspection Photo: Existing Stormwater Basin



Figure 8 Site Inspection Photo: Low-Lying Ponding Area

3.4 Proposed Development

The project involves expanding the existing sub-station pavement area, generally at the level and grading of the existing sub-station (1% pavement grade, 3.76m to 3.3m AHD).

The additional expanded Bay 5 area (Catchment 1& 2) is 7,250m² and consists of:

- New pavement area (4,660m²), impervious.
- New batter to existing (2,590m²), pervious landscaping and erosion protection.

Figure 9 shows the proposed development area concept design.

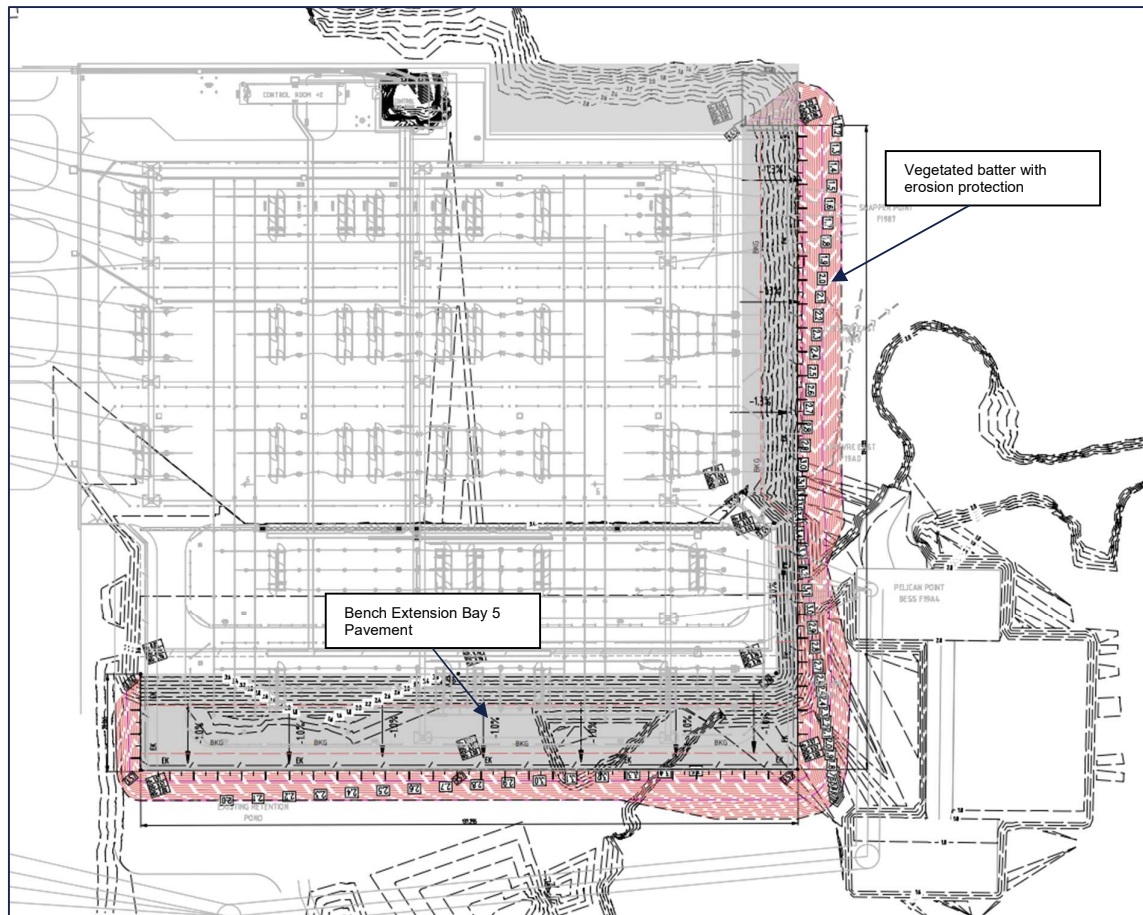


Figure 9 Proposed Bay 5 Extension Concept

4 CATCHMENT HYDROLOGY

An assessment of the pre- and post-development catchments has been undertaken in accordance with the proposed development. These changes are expected to result in variations in peak runoff rates between the pre-development and post-development scenarios.

4.1 Pre-Development

The existing site characteristics are described in Section 3.1. The existing catchment is pervious, contributing overland flow to the vegetated low-lying areas to the east and south-east respectively. The catchment is summarised in Table 3 below.

4.2 Post-Development

A portion of the pervious catchment areas for both catchments will be developed into pavement (100% impervious) post development. As the remainder of the catchments will be retained as pervious (i.e. batter slope), the change in impervious areas (i.e. pavement area) has been used to calculate the required site stormwater storage.

Refer to Table 3 for the Pre and Post development scenarios.

Table 3 Pre and Post Development Catchment Comparison

CATCHMENT TYPE	Area (m2)	PRE DEVELOPMENT (% OF TOTAL)	POST DEVELOPMENT (% OF TOTAL)	RUNOFF COEFFICIENT*
Pervious Area	4,660	100%	0%	0.35
Impervious Area	4,660	0%	100%	0.9

*Runoff coefficients determined in accordance with Port Adelaide Enfield Council development guide requirements.

5 STORMWATER MANAGEMENT

5.1 Stormwater Volumetric Runoff Assessment

The stormwater quantity portion of this management plan details how the stormwater runoff volume is proposed to be managed on the site. All design and modelling activities are based on the survey levels from 20A1126 Detail (0)-20G from Alexander Symonds Surveying Consultants.

The stormwater volumetric runoff assessment includes the following:

- Development of a DRAINS model for the pre and post development scenarios to determine stormwater storage capacity for large storm events
- Water balance continuous simulation calculations undertaken to analyse the proposed stormwater storage capacity for continuous rainfall over a representative time period.

Stormwater is proposed to be managed on the site, including runoff capture into storage. Discharge is proposed to be via infiltration and evaporation only.

5.1.1 Hydraulic Model

Peak flow rates for the subject site for the pre-development and post-development scenarios have been modelled using DRAINS software and Australian Rainfall and Run-off (ARR 2019) using the following methodology:

- Model pre-development catchment peak flows
- Model post-development catchment peak flows considering the change in the pervious area.
- Compare results to determine the impact of the change to the peak runoff.

5.1.2 Model Input Parameter

Stormwater runoff was modelled using the following inputs:

- Intensity Frequency Duration (IFD, 2016) Design Rainfall Intensity data (mm/h) was obtained from the Bureau of Meteorology (BoM) website for the project site located at Latitude -34.7625 (S) and Longitude 138.5125 (E).
- Initial and continuing loss information was obtained for the project site from the ARR Data hub:
 - Impervious
 - Initial Loss – 1mm
 - Continuing Loss – 0mm/hr
 - Pervious
 - Initial Loss – 29mm
 - Continuing Loss – 4mm/hr
- The design incorporates climate projections to 2100 based on the SPP2-4.5 “Middle of the Road” scenario (Shared Socio-economic Pathways), which assumes a global temperature increase of approximately 2.1-3.5C, in accordance with the Australian Rainfall and Runoff (ARR) 2019 Guidelines.
- Time of concentration was calculated using the ARR Overland Flow Method.

5.1.3 Hydraulic Model Results

The peak flows were modelled for various Annual Exceedance Probability (AEP) storm events under pre and post development conditions. Results were generated using the DRAINS hydrological model, incorporating climate change adjustment factors to reflect future weather variability. The results including the proposed basin storage volumes (post development) for each modelled storm event are summarised in Table 4 and Table 5 for each catchment.

Table 4 Summary of pre and post development peak flow for Catchment 1

STORM EVENT	PRE DEVELOPMENT PEAK FLOW (M ³ /S)	POST DEVELOPMENT PEAK FLOW (M ³ /S)	CHANGE FROM PRE DEVELOPMENT	BASIN STORAGE VOLUME (M ³) POST DEVELOPMENT
	Peak Catchment Runoff			
2% AEP	0.014	0.042	+0.028	200
1% AEP	0.019	0.051	+0.032	230
0.2 AEP (1 in 500-year event)	0.026	0.066	+0.04	300
0.1 AEP (1 in 1000-year event)	0.029	0.074	+0.045	330

Table 5 Summary of pre and post development peak flow for Catchment 2

STORM EVENT	PRE DEVELOPMENT PEAK FLOW (M ³ /S)	POST DEVELOPMENT PEAK FLOW (M ³ /S)	CHANGE FROM PRE DEVELOPMENT	BASIN STORAGE VOLUME (M ³) POST DEVELOPMENT
	Peak Catchment Runoff			
2% AEP	0.022	0.068	+0.046	310
1% AEP	0.029	0.080	+0.051	350
0.2 AEP (1 in 500-year event)	0.040	0.103	+0.063	455
0.1 AEP (1 in 1000-year event)	0.045	0.114	+0.069	500

The results of modelling show an increase in peak flows post development.

The result of the modelling show that for the two basins to fully contain the runoff volume up to and including the 1% AEP storm event for a design climate projection of 2100, 230m³ and 350m³ of storage is required respectively.

Additional modelling was undertaken for extreme storm events to identify the relative additional runoff volume for these types of events. In the case of an extreme storm, the basins would overtop into the surrounding low-lying area.

5.1.4 Water Balance Assessment

A water balance using continuous rainfall (daily) over a 20-year period has been undertaken to assess the proposed storage basins capacity over continuous typical seasonal rainfall.

5.1.4.1 Model Input Parameters

The water balance has used the following data inputs:

- Continuous daily rainfall data from Parafield Airport South Australia (Guage no. 023013) over a 20-year period from 2006 to 2026.
- Evaporation monthly data extracted from BOM Climate Statistic - Edinburgh RAAF (Guage no. 023083), 1995.
- Results of the site inspection
- Site infiltration rate interpolated from geotechnical information:
 - Natural Clay / Basin: 1×10^{-8} m/s (0.864mm/day)
- Storage basin max. depth to be 1m (i.e. above groundwater levels)
- The basin is assumed to be empty (0 mm) at the start of the water balance model assessment period (i.e. January 2006). The basin water level data will normalise over the 20-year water balance assessment period.
- The evaporation data obtained from the Bureau of Meteorology (BOM) has been assumed to remain constant over the 20-year assessment period.
- No Basin outlet.

5.1.4.2 Calculation Formulas

The water balance was calculated using the following equation:

- Change in Storage = Catchment Runoff Inflow – Evaporation – Infiltration
- The weighted runoff coefficient was determined by considering the proportion of pervious and impervious surfaces within the catchment.

5.1.4.3 Water Balance Model Results

A summary of results from the water balance is shown in Table 6 below. The results of the water balance show that typically the proposed basin is emptied over each 12-month period.

Table 6 and Table 7 shows the basin volume required matched to the capacity required for the 1% AEP storage (i.e. Table 4 230m³ and Table 5 350m³) and the capacity required to limit the number of spills to very wet years only.

Table 6 Summary of Storage Basin Spill Volume for Catchment 1

PARAMETER	1% AEP CAPACITY BASIN	MINIMISE SPILL
Volume (m ³)	228	400
Depth (m)	0.57	0.57
Side Slopes	1:4	1:4
Average Annual Discharge Events	7	1
Average Spill Volume (m ³)	70	46

Table 7 Summary of Storage Basin Spill Volume for Catchment 2

PARAMETER	1% AEP CAPACITY BASIN	MINIMISE SPILL
Volume (m ³)	350	650
Depth (m)	0.6	0.6
Side Slopes	1:4	1:4

PARAMETER	1% AEP CAPACITY BASIN	MINIMISE SPILL
Average Annual Discharge Events	8	1
Average Spill Volume (m3)	28	35

Figure 10 and Figure 11 below shows the basin volume over the water balance assessment period.

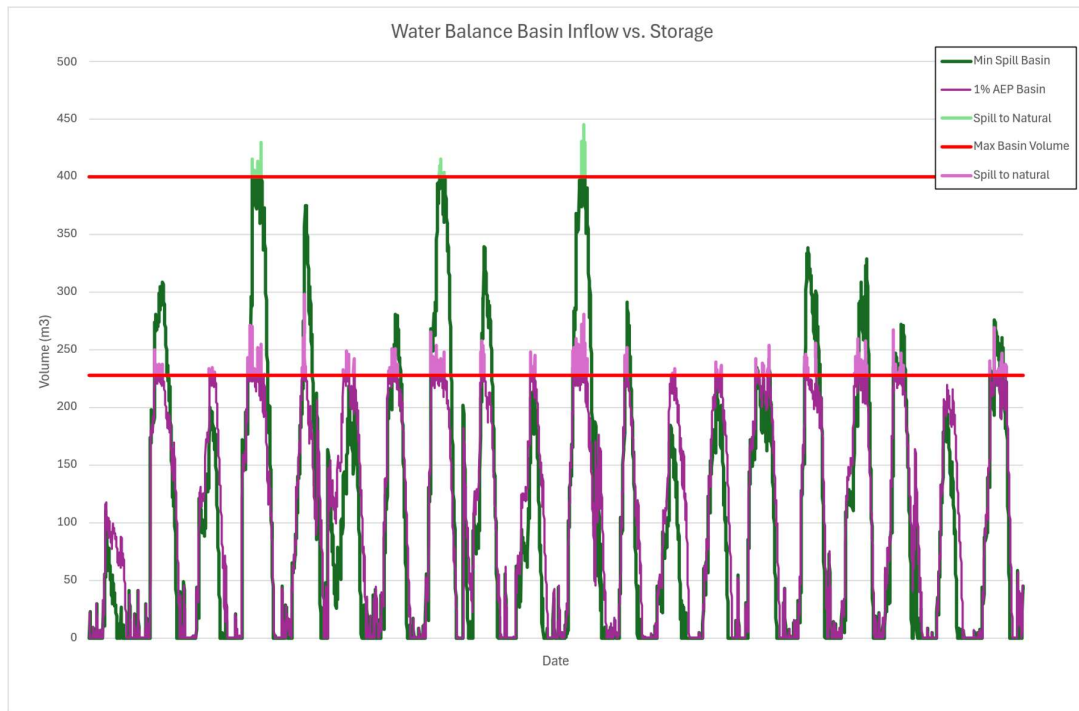


Figure 10 Catchment 1 Water Balance: Basin volume over time

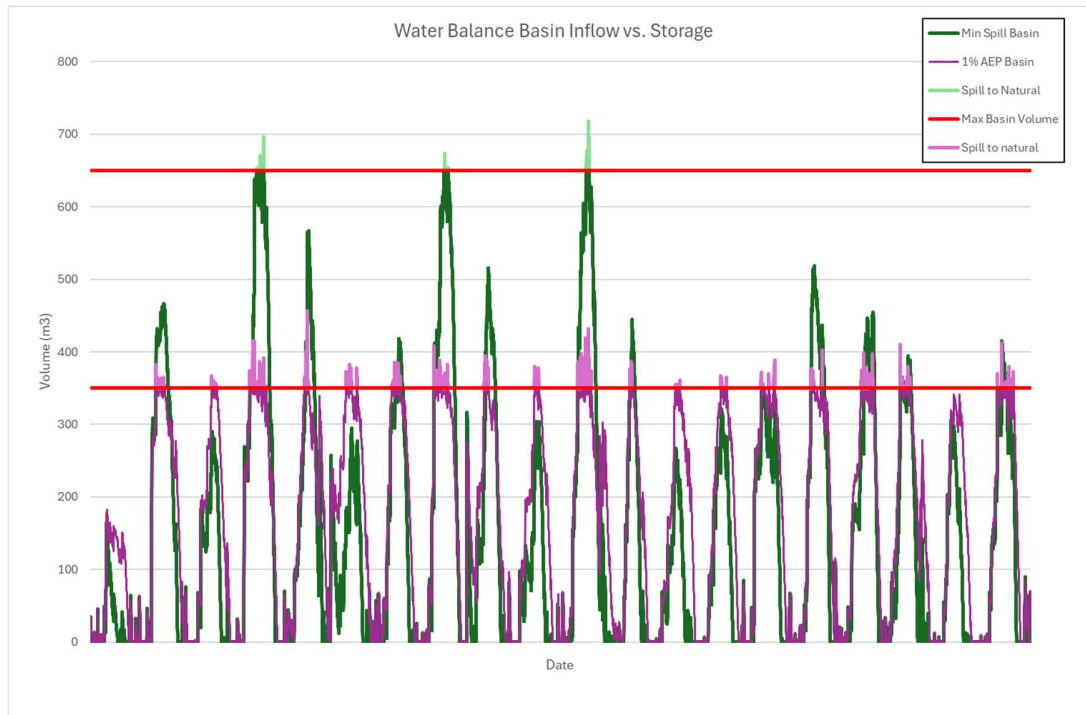


Figure 11 Catchment 2 Water Balance: Basin volume over time

The results of the modelling show that a basin with approximately 400m³ storage and 570mm depth and 650m³ and 600mm depth could minimise spills respectively. Any spills are classified as low risk and will flow into the surrounding low-lying undeveloped area. The input data, modelling results, and supporting information referenced here are included in Appendix C of this report.

5.2 Stormwater Quality Assessment

A stormwater quality model has not been undertaken as stormwater runoff will be contained within the site.

5.3 Stormwater Management Strategy

The stormwater drainage strategy for the Pelican Point Sub Station Bay 5 extension has been developed, and key infrastructure is shown in Figure 12. Key aspects of the development site drainage are proposed as follows:

- Stormwater is proposed to be managed on site.
- Runoff from Bay 5 is proposed to be directed via pipes and open drains into storage areas, with sufficient capacity for minimal spill. Discharge from the storage is proposed to be via evaporation and infiltration only.

An option for a storage area has been shown in Figure 12. However, the existing low-lying portion of the site is currently effectively acting as a storage basin. The existing low-lying area could potentially be utilised for storage of stormwater, with levels, available volume and suitability to be confirmed in the detailed design. Sufficient area exists in this location for a formalised basin if required.

- In the event of stormwater rainfall volume beyond the capacity of the proposed storage, spills from the basin are proposed to be discharged toward the adjacent low-lying undeveloped area, which presents a low risk.
- The assessment has included an allowance for climate change. The drainage system design incorporates climates projections for 2100 based on the SSP2-4.5 “Middle of the Road” scenario (Shared Socio-economic Pathway, in accordance with the Australian Rainfall and Runoff (ARR) 2019 Guidelines. The findings indicate a minimal effect.

- All overland sheet flow is proposed to be minor, depth hazard rating considered for people, vehicles and structures as per the ARR guidelines.

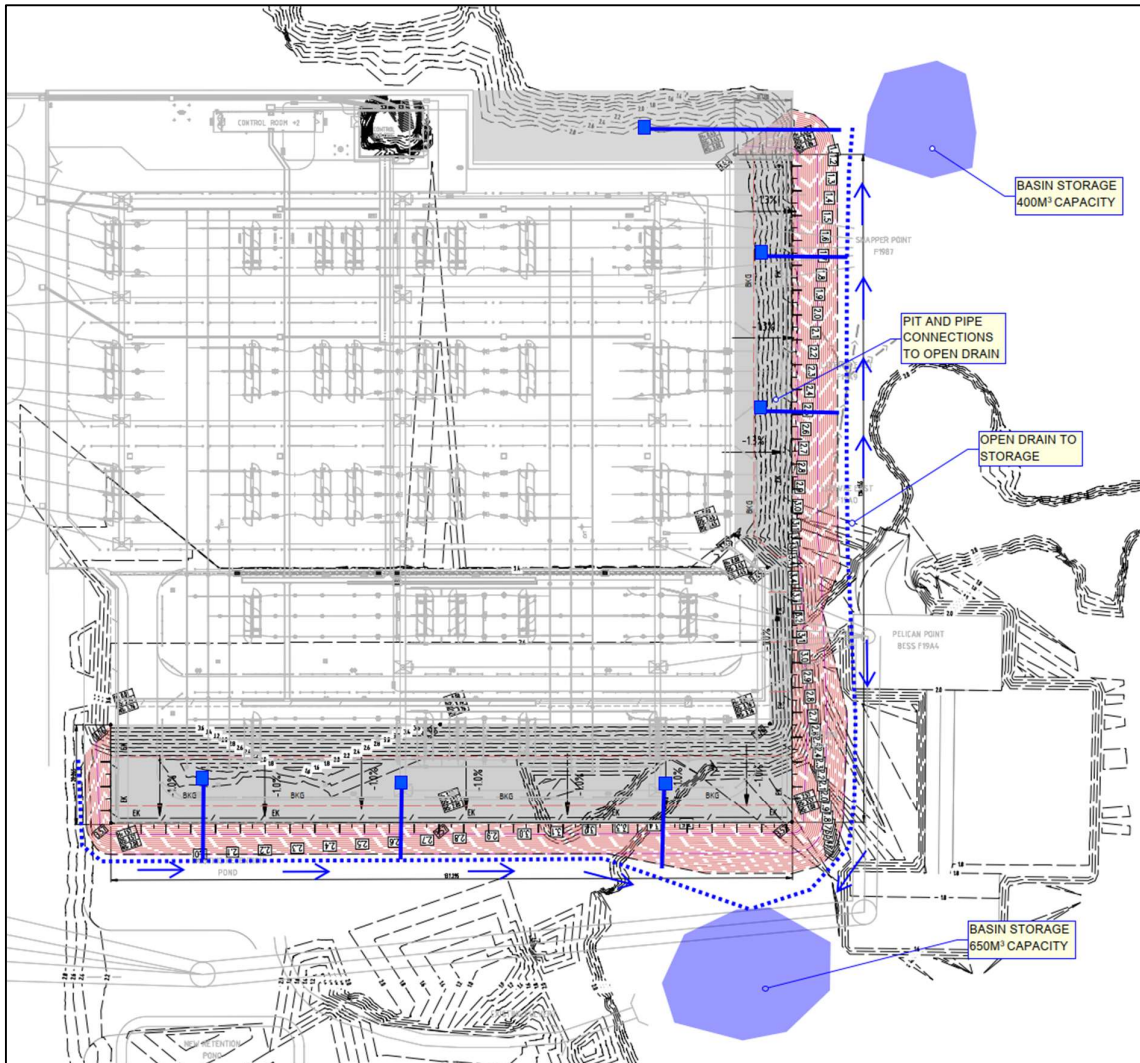


Figure 12 Proposed Site Stormwater Infrastructure

6 SEDIMENT AND EROSION MANAGEMENT PLAN (SEDMP)

The construction phase requires water management initiatives to be implemented at the site prior to construction, during construction and during the site's maintenance period. The following construction phase best practice are to be implemented in accordance the Planning Scheme, Environmental Protection Authority (EPA, and International Erosion Control Association (IECA) Australasia Guidelines:

- Prior to construction the contractor is to establish a Site-Specific Construction Erosion and Sediment Control Plan
- Construction planning is to be undertaken to ensure temporary erosion control measures are in place prior to works and ensure disturbed areas and stockpiled materials are stabilised as soon as possible.
- A stormwater pond is constructed prior to development to control sediment and erosion throughout the construction process. Following completion of construction and removal of accumulated sediment, this pond will function as the stormwater storage basin.
- Construction access is to be installed to avoid excess sediment loadings to the surrounding area.
- Construction access is to comprise of a designed gravel pad or placement of hardwood logs.
- Sediment fences are to be erected at the base of all batters and stockpiles to minimise sediment transportation off site.
- Diversion swales are to be established to divert sediment laden water, where required.
- Rock check dams are to be placed intermittently along diversion swales, where required.
- Re-vegetation or stabilisation of all disturbed areas and exposed soils is to occur as soon as possible.
- All sediment control structures are to be maintained in an effective manner and inspected after each stormwater event.
- Regular monitoring of water quality is to be undertaken to determine the effectiveness of the Sediment and Erosion Control measures.

7 CONCLUSION

The stormwater management plan for the development of the Pelican Point Substation Bay 5 site includes the following:

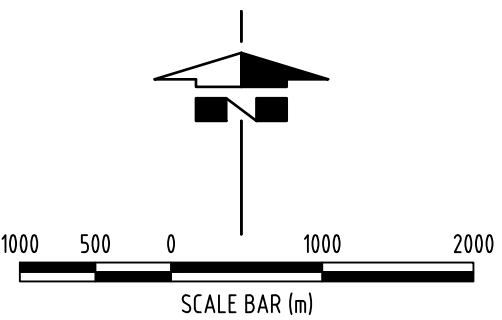
- The Bay 5 site is proposed to be modified from pervious catchment to 100% impervious post development.
- Stormwater is proposed to be managed on-site as part of the development in accordance with Council requirements for surrounding sites.
- Generally, stormwater is proposed to be collected into storage on the site via a pit, pipe and open drain system. Water stored in the basins is proposed to be dissipated by infiltration and evaporation only.
- The results of the hydraulic modelling show that storages of approximately 230m³ and 350m³ capacity are required to contain large storm events up to and including the 1% AEP event.
- The results of the continuous simulation rainfall modelling show that storages of approximately 400m³ and 650m³ capacity are required for minimal spills over the period modelled (i.e. 20 years).
- It is proposed that the existing low-lying areas on the site could be used as storage. Alternatively, formalised basins could be developed.

APPENDIX A
BAY 5 EXTENSION CONCEPT
DRAWINGS



PELICAN POINT SUBSTATION SECONDARY EXTENSION

CIVIL WORKS PACKAGE



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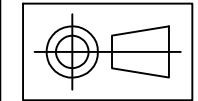
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REV	SUB TITLE				
REV	COVER SHEET - DRAWING INDEX				
ElectraNet - electricity transmission					
TITLE					
EARTHWORKS PAVING AND FENCES					
PELICAN POINT SUBSTATION					
SCALE	AS SHOWN	A1	WGA253076-SK-CV-0001	REV	DISTB
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GENERAL NOTES

GENERAL

- ALL WORKS TO COMPLETED IN ACCORDANCE WITH THE FOLLOWING PROJECT SPECIFICATIONS AND ELECTRANET STANDARDS:
 - SECTION 3 – ENGINEERING CONTRACT SPECIFICATION – EC 41069: PELICAN POINT
 - 1-11-FR-15 – SUBSTATION EARTHWORKS AND STORMWATER DRAINAGE
 - 1-11-FR-19 – SUBSTATION ACCESS ROADS
 - 1-11-ADM-15 – SUBSTATION EARTHWORKS AND STORMWATER DRAINAGE
 - 1-11-ADM-19 – SUBSTATION ACCESS ROADS
- DO NOT SCALE FROM THESE DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE. ALL LEVELS ARE EXPRESSED IN M AHD UNLESS STATED OTHERWISE. ALL CHAINAGES ARE EXPRESSED IN METRES.
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE RELEVANT AUSTRALIAN STANDARDS, ELECTRANET FR AND ADM AND OTHER RELEVANT CODES AS REFERENCED IN THE TECHNICAL SPECIFICATION, UNLESS OTHERWISE STATED.
- ALL WORKS IN PUBLIC LANDS SHALL BE TO THE APPROVAL AND SATISFACTION OF THE RELEVANT AUTHORITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND OBTAINING RELEVANT AUTHORITY WRITTEN APPROVAL OF THE WORKS.
- WHERE SPECIFIC PRODUCTS HAVE BEEN CALLED FOR, EQUIVALENT PRODUCTS, SUBJECT TO THE SUPERINTENDENT’S REPRESENTATIVE’S APPROVAL, MAY BE USED.
- THE CONTRACTOR IS RESPONSIBLE FOR SETTING OUT THE WORKS. ALL DISCREPANCIES BETWEEN THE DRAWINGS AND SITE FEATURES SHALL BE REFERRED TO THE SUPERINTENDENT’S REPRESENTATIVE FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK. (HOLD POINT)
- ALL EXISTING SERVICES ARE TO BE LOCATED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
- EXISTING SURFACE CONTOURS AND NATURAL SURVEY TIN ARE REPRODUCED FROM PUBLICLY AVAILABLE DATA.
- THE CONTRACTOR SHALL NOT UNDERTAKE ANY CLEARING WORK OR ANY TYPE OF DISTURBANCE OUTSIDE THE LIMITS OF WORK UNLESS APPROVED BY THE SUPERINTENDENT’S REPRESENTATIVE.
- ON COMPLETION OF THE WORKS THE CONTRACTOR SHALL REMOVE ALL UNWANTED MATERIALS, PLANT, EQUIPMENT AND TEMPORARY CONSTRUCTION FACILITIES FROM THE SITE, REMEDIATE AREAS USED BY THE CONTRACTOR DURING THE COURSE OF THE WORK, AND RESTORE THE SITE TO A NEAT AND TIDY CONDITION. ALL WORK AREAS SHOULD BE SMOOTHED AND GRADED IN A MANNER TO CONFORM TO THE APPEARANCE OF THE SURROUNDING LAND. (HOLD POINT)
- THE 3D DESIGN MODEL & SET-OUT CAD FILES ARE TO BE PROVIDED AT IFC FOR DRAWINGS AS REQUIRED.

SAFETY AND SERVICES

- THE CONTRACTOR SHALL UNDERTAKE THE WORKS IN ACCORDANCE WITH THE STANDARDS LAID DOWN IN APPLICABLE OCCUPATIONAL HEALTH, SAFETY AND ENVIRONMENTAL ACTS AND ALL REGULATIONS THEREUNDER.
- THE IDENTIFICATION, LOCATION AND SAFE WORKING WITH RESPECT TO ALL EXISTING SERVICES IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL LIAISE DIRECTLY WITH ALL SERVICE AUTHORITIES INVOLVED AND SHALL COMPLY WITH ALL THEIR REGULATIONS AND REQUIREMENTS AND SHALL PAY ANY FEES OR CHARGES. WHERE SERVICES THAT ARE REQUIRED TO REMAIN ARE DAMAGED DURING THE COURSE OF THE WORKS, THEIR REPAIR SHALL BE CARRIED OUT AT THE CONTRACTOR’S EXPENSE.

EROSION CONTROL

- CONTRACTOR APPROVED SOIL EROSION AND DRAINAGE MANAGEMENT PLAN SHALL BE STRICTLY ADHERED TO DURING THE LENGTH OF THE CONTRACT.
- ALL WORKS TO COMPLETED IN ACCORDANCE WITH ELECTRANET STANDARD 1-11-ADM-15 – SUBSTATION EARTHWORKS AND STORMWATER DRAINAGE

STORMWATER

- ALL WORKS TO COMPLETED IN ACCORDANCE WITH ELECTRANET STANDARD 1-11-ADM-15 – SUBSTATION EARTHWORKS AND STORMWATER DRAINAGE AND AS3500.3.
- CONTRACTOR TO CONFIRM SETTING OUT OF ALL FINISHED SURFACE LEVELS AT PITS, INVERTS OF ALL EXISTING DRAINS, PIPES AND SUMPS PRIOR TO CONNECTING AND LAYING NEW PIPEWORK. (HOLD POINT)
- SUPERINTENDENT TO CHECK ALL STORMWATER EXCAVATED SURFACES BEFORE PLACING BEDDING MATERIAL AND ALL PIPE JOINTS BEFORE CONVERGING.
- CULVERTS TO BE PRECAST CONCRETE ACCORDING TO AS 4058 – CLASS 4 U.N.O (IF REQUIRED)
- ALL CONCRETE PIPES TO BE PLACED TO THE ALIGNMENTS AND LEVELS AS SHOWN ON THE DRAWINGS AND A MIN 500mm CLEARANCE FROM STRUCTURAL FOOTINGS.
- CONSTRUCT OVERLAND FLOW DIVERSION DRAINS/BUNDS SUCH THAT THEY DIVERT WATER AWAY FROM THE PLATFORM, ROADWAY AND STRUCTURES.
- ALL PIPE AND CULVERT OUTLETS SHALL BE PROVIDED WITH AN END HEAD WALL AND WITH ROCK ARMOUR WHERE SHOWN. ROCK ARMOUR TO BE SIZED AS NOMINATED ON DRAWINGS.
- ROCK ARMOUR SHALL BE CONSTRUCTED WITH APPROPRIATE MATERIALS AS APPROVED BY THE SUPERINTENDENT.
- ALL PIPES OF DIAMETER 300mm OR GREATER SHALL HAVE A SECURITY GRILL OR SIMILAR PROVIDED AT OUTLET TO PREVENT UNWANTED ENTRY.

ACCESS ROAD

- INTERSECTION DESIGNED IN ACCORDANCE WITH AUSTRROADS PART 4 FIGURE 7.4
- ACCESS ROAD WIDTH 6M, MAX CROSS FALL 3% (TYPICAL ALIGNING WITH NATURAL TOPOGRAPHY (CROSS FALL))

EARTHWORKS

- ALL WORKS TO COMPLETED IN ACCORDANCE WITH ELECTRANET STANDARD 1-11-ADM-15 – SUBSTATION EARTHWORKS AND STORMWATER DRAINAGE

PAVEMENT

- ALL WORKS TO COMPLETED IN ACCORDANCE WITH THE FOLLOWING ELECTRANET STANDARDS:
 - 1-11-ADM-15 – SUBSTATION EARTHWORKS AND STORMWATER DRAINAGE
 - 1-11-ADM-19 – SUBSTATION ACCESS ROADS
- THE THICKNESS OF THE FINISHED SURFACING LAYER IS DESIGNED TO SUPPORT HEAVY VEHICLES UP TO W7 AND T44 STANDARD AXLE LOADS UNDER ALL WEATHER CONDITIONS.
- IMPORTED GRANULAR MATERIAL TO MEET CRITERIA DEFINED IN ELECTRANET STANDARD 1-11-ADM-19 V1.0 SECT 5.4.2
- THE FINISHED PLATFORM TO BE TREATED WITH “SIMAZINE” WEED CONTROL OR APPROVED SIMILAR HERBICIDE IN ACCORDANCE WITH MANUFACTURER’S RECOMMENDATIONS PRIOR TO RECEIVING A 100MM LAYER OF 20MM STONE AGGREGATE ONCE ALL CIVIL, EARTHING AND CONDUIT INSTALLATION WORK HAS BEEN COMPLETED.
- WHERE REQUIRED ALL ASPHALT WORKS TO BE IN ACCORDANCE WITH AS 2150 HOT MIX ASPHALT – A GUIDE TO GOOD PRACTICE.
- ENSURE FINISHED SURFACE HAS REQUIRED SLOPE SO AS TO ALLOW FOR SURFACE RUN-OFF OF WATER.
- PAVEMENT TOLERANCES:
 - EACH PAVEMENT LAYER SHALL BE CONSTRUCTED WITHIN A TOLERANCE OF 0 TO +10 mm
 - THE FINISHED SURFACE SHALL BE CONSTRUCTED WITHIN A TOLERANCE OF 0 TO +10 mm WHEN COMPARED WITH THE FSL DESIGN SURFACE PROVIDED BY THE DESIGNER.
- TESTING FOR COMPLIANCE WITH THE REQUIREMENTS SPECIFIED FOR BITUMINIOUS SURFACING SHALL BE CARRIED OUT BY THE CONTRACTOR. THE FREQUENCY OF DENSITY TESTING FOR ASPHALT SHALL BE 1 TEST PER 500M2.

CONCRETE

- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3600 CONCRETE STRUCTURES, THE SPECIFICATION AND DETAILS PROVIDED ON THE DRAWINGS, UNLESS INSTRUCTED OTHERWISE BY THE ENGINEER.
 - THE BUILDER SHALL CO-ORDINATE WITH ALL TRADES TO ENSURE THAT PROVISION IS MADE FOR ALL NECESSARY REBATES OR OPENINGS IN CONCRETE, AND CASTING IN OF CONDUITS. REFER ALL CONTRACT DRAWINGS.
 - CLEAR CONCRETE COVER TO REINFORCEMENT FOR IN-SITU CONCRETE ELEMENTS SHALL BE AS PER TABLE C1.
- | COVER (mm) – (TABLE C1) | | | |
|-------------------------|-----------|-----------|---------------|
| LOCATION | TOP | BOTTOM | SIDE EXTERNAL |
| DRAINAGE AND ROAD WORKS | 50 U.N.O. | 50 U.N.O. | 50 U.N.O. |
- REQUIRED SURFACE FINISH AND CLASS OF FORMWORK FOR IN-SITU CONCRETE SHALL CONFORM WITH THE FOLLOWING UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER. (REFER TABLE C2.)
- | SURFACE FINISH – (TABLE C2) | | | |
|-----------------------------|-------------|----------------|-------------------|
| DRAINAGE AND ROAD WORKS | SURFACE | TYPE OF FINISH | CLASS OF FORMWORK |
| DRAINAGE AND ROAD WORKS | TOP FACE | STEEL TROWEL | - |
| DRAINAGE AND ROAD WORKS | SIDE FACE | OFF-FORM | 4 |
| DRAINAGE AND ROAD WORKS | BOTTOM FACE | - | - |
- SCHEDULE OF CONCRETE PROPERTIES TO BE USED FOR THE PARTICULAR SECTION OF WORK SHALL BE AS FOLLOWS UNLESS OTHERWISE INSTRUCTED. MIX DESIGNS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW 28 DAYS PRIOR TO POUR. (REFER TABLE C3.)
- | CONCRETE PROPERTIES – (TABLE C3) | |
|----------------------------------|-------------|
| LOCATION | GRADE (MPa) |
| DRAINAGE AND ROAD WORKS | N32 |
- ALL REINFORCEMENT IN SLABS AND FOOTINGS SHALL BE SUPPORTED ON CHAIRS TO GIVE THE REQUIRED COVER. SPACING OF THE CHAIRS TO SLAB REINFORCEMENT SHALL BE SUFFICIENT TO SUPPORT LOADS WITHOUT DISTORTION. REINFORCEMENT TIES SHALL BE SUFFICIENT TO ENSURE THAT ALL BARS REMAIN IN THEIR INTENDED POSITIONS DURING ALL CONSTRUCTION ACTIVITIES AND SHALL BE AT THE STEEL FIXERS’ DISCRETION. IN ALL CASES, AS A MINIMUM TIE TOP MAT REINFORCEMENT AT EVERY FIFTH INTERSECTION. TIE BOTTOM MAT REINFORCEMENT AT EVERY SEVENTH INTERSECTION.
 - LAPS. UNLESS NOTED OTHERWISE, ALL LAPS SHALL BE AS PER TABLE C4. NOTE: ALL BAR CRANKS TO BE NO GREATER THAN 1 IN 6 U.N.O.

BAR LAPS – (TABLE C4)

BAR SIZE	LAP (BOTTOM BAR)	LAP (TOP BAR)
N12	400mm	500mm
N16	550mm	700mm
N20	800mm	1000mm
N24	1100mm	1350mm

- REINFORCEMENT GRADE AS PER TABLE C5

REINFORCEMENT – (TABLE C5)

BARS	GRADE 500N TO AS4671
FABRIC	GRADE 500L TO AS4671
LIGATURES AND TIES	HARD DRAWN WIRE GRADE 450W TO AS1303

- A WORK METHOD STATEMENT SHOULD BE PROVIDED FOR WHENEVER THE CURRENT AMBIENT TEMPERATURE OR THE TEMPERATURE FORECAST FOR THE DAY OF POUR EXCEEDS 32°C. IF NO WORK METHOD STATEMENT IS IN PLACE THE BUILDER SHALL NOTIFY WGA WITHIN 24 HOURS OF THE INTENTION TO POUR CONCRETE. THE ENGINEER AT THEIR DISCRETION MAY OR MAY NOT PERMIT CONCRETE POURING.
- CONSTRUCTION JOINTS WHERE NOT SHOWN ON THE DRAWINGS SHALL BE LOCATED TO THE APPROVAL OF THE ENGINEER.
- NO REINFORCEMENT SPLICES SHALL BE MADE IN POSITIONS OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
- TYPICAL REINFORCEMENT NOTATION: 23-N24-200 BF
 - 23 – DENOTES NUMBER OF BARS REQUIRED
 - N – DENOTES GRADE OF REINFORCEMENT
 - 24 – DENOTES BAR DIAMETER IN MILLIMETRES
 - 200 – DENOTES BAR SPACING IN MILLIMETRES
 - BF – ABBREVIATION (REFER TABLE C6. FOR TYPICAL ABBREVIATIONS).
- EARTHING OF REINFORCEMENT SHALL BE TO ELECTRANET ADVICE.

REINFORCEMENT NOTATION – (TABLE C6)

ABBREVIATIONS	DENOTES
B, BF, BB, B1	BOTTOM MOST BOTTOM BARS / BOTTOM BARS PLACED FIRST
BU, B2	BOTTOM BARS / BOTTOM BARS PLACED SECOND
EW	EACH WAY
EF	BARS IN EACH FACE
SF	BARS IN SIDE FACE
NF	BARS IN NEAR FACE
FF	BARS IN FAR FACE
NSOP	NOT SHOWN ON PLAN
T, TF, TT, T2	TOP MOST TOP BARS / TOP BARS PLACED FIRST
TU, T2	TOP BARS / TOP BARS PLACED SECOND
CENT	BARS PLACED CENTRALLY
ABR	ALTERNATE BARS REVERSED
ALT	BARS ALTERNATING
STAG	BARS STAGGERED
HORIZ	HORIZONTAL BARS
VERT	VERTICAL BARS
MAX	MAXIMUM
MIN	MINIMUM
CTS	AT CENTRES (SPACING)
TYP	TYPICAL

G **R** **B**
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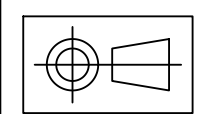
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CIVIL WORKS CODES AND PRACTICES PELICAN POINT SUBSTATION		
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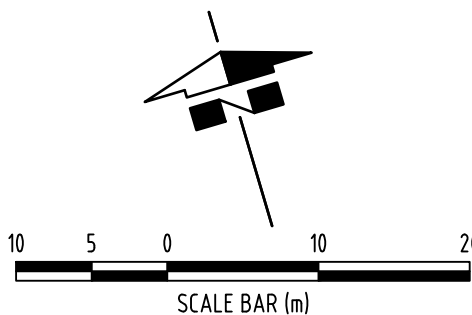
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LEGEND:

- EXISTING CONTOURS
- EXISTING CONTOURS
- FINISHED SURFACE LEVEL (F.S.L.) 100mm INTERVALS
- NEW SECURITY FENCE
- EDGE KERB
- SPOON DRAIN
- FALL DIRECTION
- STORMWATER PIPE - RCP
- VEE - GRATED INLET PIT
- SWALE DRAIN
- HEADWALL OUTLET AND ROCK SCOUR PROTECTION, REFER DETAIL
- PAVEMENT TYPE 1 - BENCH EXTENSION

PLANNING REQUIREMENTS

	MINIMUM m (AHD)	REOPTED m (AHD)
GROUND LEVEL	3.30	3.45
FFL	3.55	3.70



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SITE DRAINAGE PLAN - SHEET 1				
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TITLE SITE DRAINAGE - CLEAN AND OILY WATER DRAINAGE FLOWS PELICAN POINT SUBSTATION				
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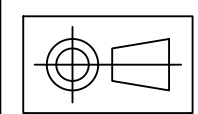
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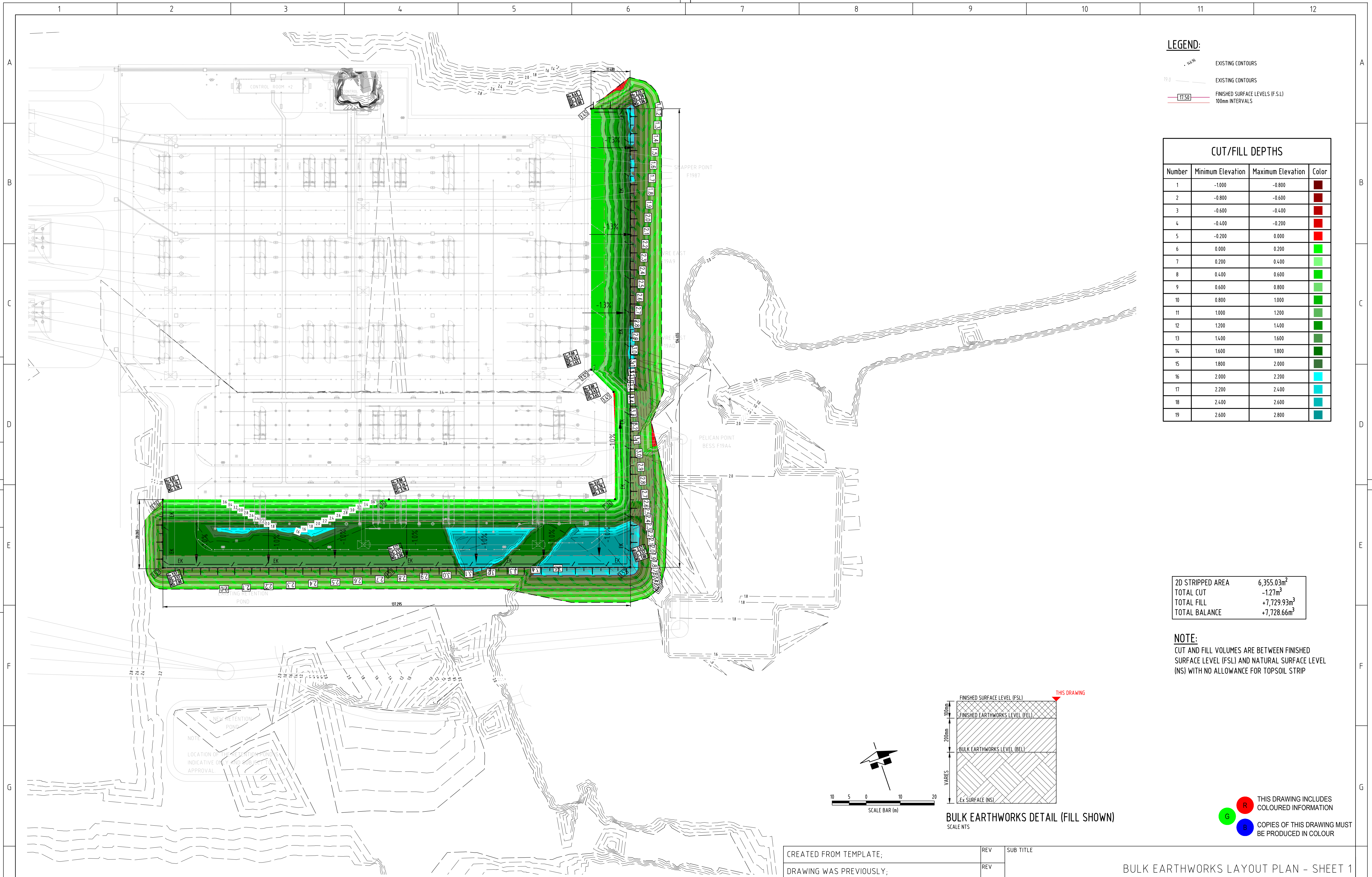
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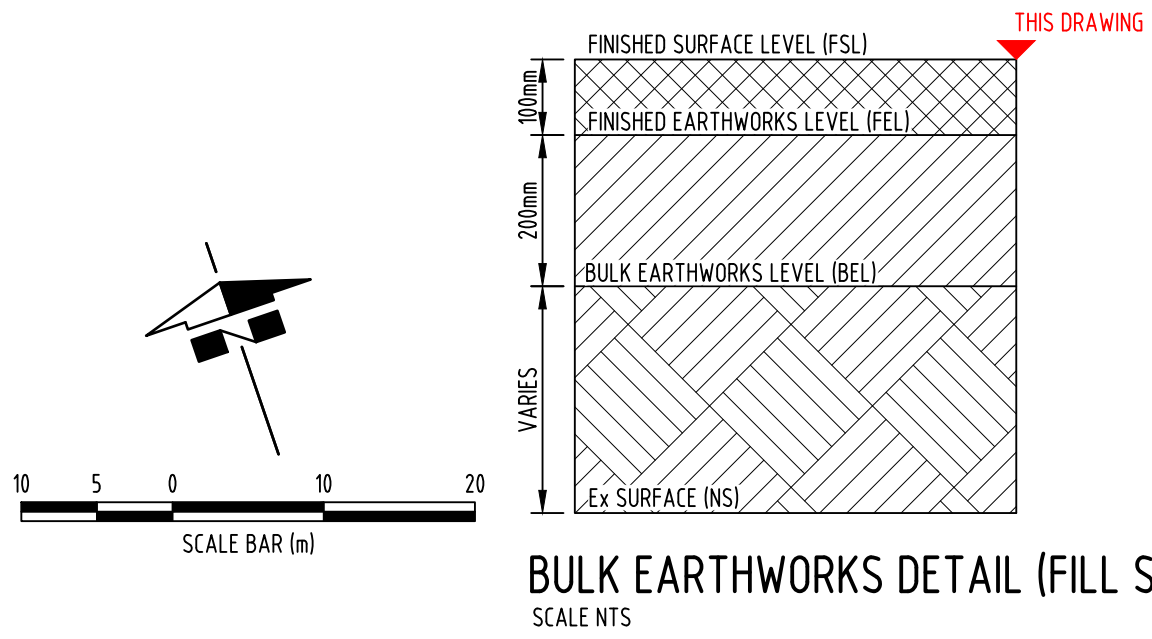
LEGEND:

- EXISTING CONTOURS
- EXISTING CONTOURS
- FINISHED SURFACE LEVELS (F.S.L.)
- 100mm INTERVALS

CUT/FILL DEPTHS			
Number	Minimum Elevation	Maximum Elevation	Color
1	-1.000	-0.800	
2	-0.800	-0.600	
3	-0.600	-0.400	
4	-0.400	-0.200	
5	-0.200	0.000	
6	0.000	0.200	
7	0.200	0.400	
8	0.400	0.600	
9	0.600	0.800	
10	0.800	1.000	
11	1.000	1.200	
12	1.200	1.400	
13	1.400	1.600	
14	1.600	1.800	
15	1.800	2.000	
16	2.000	2.200	
17	2.200	2.400	
18	2.400	2.600	
19	2.600	2.800	

2D STRIPPED AREA	6,355.03m ²
TOTAL CUT	-1.27m ³
TOTAL FILL	+7,729.93m ³
TOTAL BALANCE	+7,728.66m ³

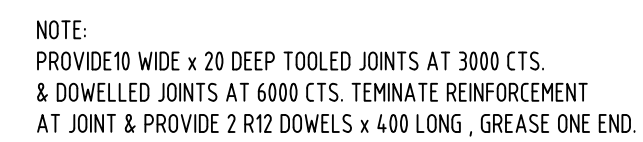
NOTE:
CUT AND FILL VOLUMES ARE BETWEEN FINISHED SURFACE LEVEL (FSL) AND NATURAL SURFACE LEVEL (NSL) WITH NO ALLOWANCE FOR TOPSOIL STRIP



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A TENDER DESIGN				EJ MF - 11/25				DRN E. JEFFS (WGA) 11/25				TITLE				ElectraNet - electricity transmission				EARTHWORKS PAVING AND FENCES PELICAN POINT SUBSTATION			
REV DETAILS OF REVISION				RVD CKD APD DATE				CKD M. FONG (WGA) 11/25				SCALE AS SHOWN				A1 WGA253076-SK-CV-0004				REV A			
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7				8				9				10				11				12			

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	CKD	M. FONG (WGA)	11/25	TITLE SITE DRAINAGE - CLEAN AND OILY WATER DRAINAGE FLOWS PELICAN POINT SUBSTATION					
	INSP		11/25						
	AUTH			SCALE	AS SHOWN	A1	WGA253076-SK-CV-0006	REV	A

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APPENDIX B

WATER BALANCE INPUTS







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