

TFA Ref: 20399

20th October 2022

Department of Planning and Environment (NSW)
320 Pitt Street
Sydney NSW 2000
Via Major Projects Portal:

Attention: Deana Burn.

Dear Deana,

RE: (SSD-33042483) Environmental Impact Statement (EIS) Response for Stormwater Quality Requirements at Foreshore Road, Port Kembla – Described as Part of Lot 6 on DP1236743 and Lot 2 on DP1182823.

Please find below the responses to address items identified in the received assessment, advice and recommended conditions of approval for the aforementioned property dated 19th August 2022.

Information Requested	Response
<p>1. Floodplain Risk Management – criteria in Attachment 2</p> <p>The flood assessment in the Site Based Stormwater Management Plan report provides insufficient information to assess the proposal against the SEARs.</p> <p>Recommended action:</p> <p>Address information on:</p> <ul style="list-style-type: none"> • Flood Planning Area • Hydraulic Categorisation • The effects of the proposed project (including fill) on the flood behaviour for the full range of design flood events specified in Section 2 of the flooding SEARs including consideration of climate change • The impact of the development on: <ul style="list-style-type: none"> ○ The existing flood behaviour for a full range of flood events including up to the probable maximum flood ○ Other developments or land including the redirection of flow, flow velocities, flood levels, hazards and hydraulic categories (no flood impact mapping has been provided) ○ The list on requirements in Section 5, including consideration of emergency management, evacuation and access etc. • How site-specific requirements are addressed including storage of hazardous materials and the integrity of the proposed structures including 	<p>With regard to this item, the majority of the responses are provided with the Flood Report, prepared by SMEC.</p> <p>Regarding the integrity of proposed structures during flood events, the following is noted in this regard:</p> <ul style="list-style-type: none"> • The proposed office building is proposed to be raised on stilts, to allow flood water to flow beneath during a 1% AEP Event; • The bund walls are of a height that would not allow flood water entering the main bulk storage compound, including all flood events up to PMF; • The bund walls will be designed as to withstand the highest expected flood velocities, as outlined within the Flood Report. <p>It is therefore not considered that the structural integrity of proposed structures would be of concern.</p>

Information Requested	Response
<p>consequences of flooding on the environment by way of a risk assessment over the full range of flood events up to and including the Probable Maximum Flood (PMF).</p>	
<p>5. Coastal Risk Management</p> <p>The Allans Creek Flood Study may include coincident modelling of coastal and catchment flooding but this has not been discussed in the EIS.</p> <p>Recommended action:</p> <ul style="list-style-type: none"> Given the potential high risk of impacts to people and the environment from the hazardous material to be stored on site, there should be consideration of the structural integrity of storage facilities to withstand extreme events, and control and remediation measures should structures fail. 	<p>Based on the Flood Report prepared by SMEC, it has been determined that the flood levels impacting the subject premises from upstream would not achieve a level that would spill into the bunds, even in extreme events. It is therefore not expected that flooding up to PMF levels would impact upon the proposed storage tanks.</p> <p>Further, the bund walls will be designed to cater for the expected flood water velocity impacting the subject premises, as to ensure that they do not fail in an extreme flood event. Given this, it is not expected that the proposed storage tanks would be at risk to failing during a flood event, which would result in the release of hazardous material to the environment.</p>
<p>6. Coastal Risk Management – Water Quality</p> <p>The area is mapped as Coastal Environment Area under the Chapter 2 of the Resilience and Hazard SEPP and should demonstrate it will not cause an adverse impact on the water quality.</p> <p>Recommended Action:</p> <ul style="list-style-type: none"> The development proposal should demonstrate it will not cause an adverse impact on the water quality. 	<p>Stormwater quality improvement devices have been proposed as outlined in the Site Based Stormwater Management Plan report (SBSMP) previously submitted. The performance of the proposed stormwater treatment train has now been modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC - Version 6.3) in order to demonstrate the concentration of nutrients, suspended solids and gross pollutants that will be released from the site will comply with the relevant NSW Department of Planning and Environment requirements.</p> <p>Details of the MUSIC model and the overall stormwater quality assessment carried out for the operational stage of the project have been included in Appendix A of this document.</p> <p>The results of the MUSIC Modelling for stormwater pollutant treatment effectiveness for Total Phosphorus (TP) and Total Nitrogen (TN) to be released into the receiving waters after treatment are 29.6 and 241 µg/L respectively. These values meet the Water Quality Levels recommended for the Illawarra region as detailed in Table 1.0 of the attached Appendix A.</p> <p>In addition to the above, Total Suspended Solids (TSS) are reduced to 8290 µg/L and Gross Pollutant load will be reduced to 0.27 kg/Day.</p> <p>This reduction in nutrients improves the turbidity of stormwater released from the site.</p> <p>In terms of the measures proposed to minimise contamination of stormwater runoff from high-risk</p>

Information Requested	Response
<p>7. Coastal Risk Management – Sea Level Rise and Flooding</p> <p>The EIS also contains a very limited discussion on sea level rise and flooding. It is unclear whether sea level rise has been taken into account when designing infrastructure, for example will stormwater management structures such as the GPTs still be effective into the future.</p> <p>Recommended Action:</p> <ul style="list-style-type: none"> Provide discussion on sea level rise and flooding (taking into account infrastructure such as stormwater management structures). 	<p>areas (tank compound), please refer to section 5.2 of the previously submitted SBSMP for further details.</p> <p>Sea level rise will result on higher water levels in the canal during frequent storm events (AEP>10%), however, given the proposed lawful points of discharge for the site are located above the top of the existing canal walls, we do not anticipate sea level rise to have any impact on the normal operation of the proposed stormwater management structures.</p> <p>In the event of a flood (rare events), it is likely that the entire stormwater network will be submerged including the stormwater management structures. Nonetheless, there is no concern in relation to the operation of the GPT’s following a flood event as they can be brought back to normal operation after undertaking routine cleaning/maintenance.</p> <p>The GPT’s maintenance only involves removal of floatable material as well as the sediment that accumulate in the sump from a vacuum truck. A maintenance manual with detail information is included in the original SBSMP report.</p>
<p>8. Coastal Risk Management – Sea Level Rise and Flooding</p> <p>The EIS should consider the background condition of the receiving waterbody for the stormwater discharge and proposed monitoring to ensure stormwater management controls are affective.</p> <p>Recommended action:</p> <ul style="list-style-type: none"> Provide details of consideration of the background condition of the receiving waterbody for the stormwater discharge and proposed monitoring to ensure stormwater management controls are affective. 	<p>We note that the undeveloped site is characterised by unsealed surfaces/gravels and stockpiles with all the stormwater runoff flowing unmitigated into the existing channel running along the western side of the site. No defined lawful points of discharge are currently present and the current site conditions are likely to discharge significant amounts of sediment and suspended solids into the receiving waterbody.</p> <p>The proposed development will delineate drainage catchments, seal the surfaces, convey stormwater runoff through a piped network and ultimately treat the water before is discharged into the receiving waterbody via defined lawful points of discharge. The implementation of these water sensitive urban design measures will ensure that there is no-worsening of the pre-development conditions.</p> <p>Furthermore, all the proposed stormwater treatment devices will be monitored and maintained strictly in accordance with the manufacturer’s recommendations to ensure their adequate operation. Section 6 of the previously submitted SBSMP provide details of the required maintenance procedures and frequency.</p> <p>If required, monitoring of the stormwater quality prior to discharge can be implemented downstream of the stormwater quality improvement devices.</p>

We trust that the attached information conforms to NSW Department of Planning and Environment requirements for their earliest approval. Please feel free to contact me on (07) 3854 2921 or Juan.Avella@tfa.com.au should you require any additional information.

Yours faithfully,



Juan Avella

Director - Civil/Structural Engineering

BEng(Civil) MBA MIEAust, CPEng, NER, RPEQ (11899)

For and on behalf of TFA Group Pty Ltd

Encl. Appendix A – Detail Water Quality Assessment – Operational Stage
Appendix B – Site Grading and Drainage Plans

**APPENDIX A - DETAIL WATER QUALITY ASSESSMENT – OPERATIONAL
STAGE**

1.0 DETAIL WATER QUALITY ASSESSMENT – OPERATIONAL STAGE

Impacts on receiving waters and surrounding areas will be minimised during the operational phase of the project with measures as outlined in the SBSMP. Music Modelling will be used to assess the effectiveness of the proposed stormwater quality control measures during the operational phase of the facility.

1.1 Pollutants

The key pollutants typically generated during this phase for the entire catchment are shown in Table 1 below.

Table A.1: Pollutant typically generated during the operational phase

Pollutant	Potential Source
Litter / Gross Pollutants	Waste materials, food, food packaging etc.
Ethanol	Ethanol spills from (tanks' bunded areas, loading/unloading areas, or/and on pump bunded areas)
Nutrients (N & P)	Nitrogen, Phosphorus
Sediments	Aggregates bins, wind deposits and truck trails
Surfactants	Detergents, cleaning agents

1.2 Proposed Stormwater Treatment

1.2.1 Catchment A & B – Gross Pollutant Trap (GPT) Humes Humegard

A Humes Humegard is proposed to treat the stormwater generated from both catchments. A GPT is a treatment device designed to separate and capture litter, vegetation matter, gross pollutants, sediments, silts, total suspended solids, some nutrients and oil & grease from stormwater runoff. GPTs are often used as the first treatment element in a treatment train.

The Humegard unit incorporates a unique floating boom and bypass chamber to enable the continued capture of floating material, even during peak flows. This unit claims to remove 49% of Total Suspended Solids (TSS), 40% of Total Phosphorus (TP), 90% of Gross Pollutants (GP), 29% of Total Nitrogen and 90% of Hydrocarbons.

Catchment A comprises the bunded area housing the 6 Ethanol tanks and the northern areas surrounding this bund. A Humegard HG15 unit is proposed to treat stormwater generated from this catchment. **Figure 5** of the SBSMP indicates Catchment A treatment philosophy.

Catchment B comprises the southern areas of the site. A Humegard HG15 unit is proposed to treat stormwater generated from this catchment. **Figure 6** SBSMP indicates Catchment B treatment philosophy.

Refer to **Appendix C** of the SBSMP for details of the Humegard HG15.

1.3 MUSIC Modelling

1.3.1 Introduction

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC - Version 6.3) was used to assess the performance of the proposed stormwater treatment measures required to achieve statutory pollutant reduction targets for the operational phase of the project.

1.3.2 Music Model Setup

The input parameters for source node, soil behaviour and pollutant generation characteristics are based on Table A1.2 and 3.9 of MUSIC Modelling Guidelines Version 3.0 - 2018, WaterByDesign (2018). The following inputs were used:

- Illawarra Water Quality Objectives (2006).

The Water Quality Objectives for the Illawarra Region are as shown in Figure A.1 below.

Figure A.1: Water Quality Objectives, Illawarra Region (Source: NSW Department of Planning and Environment)

Aquatic ecosystems	
Indicator	Numerical criteria (trigger values)
Total phosphorus	<ul style="list-style-type: none"> • Upland rivers: 20 µg/L • Lowland rivers: 25 µg/L for rivers flowing to the coast; 50 µg/L for rivers in the Murray-Darling Basin • Lakes & reservoirs: 10 µg/L • Estuaries: 30 µg/L
Total nitrogen	<ul style="list-style-type: none"> • Upland rivers: 250 µg/L • Lowland rivers: 350 µg/L for rivers flowing to the coast; 500 µg/L for rivers in the Murray-Darling Basin • Lakes & reservoirs: 350 µg/L • Estuaries: 300 µg/L
Chlorophyll-a	<ul style="list-style-type: none"> • Upland rivers: not applicable • Lowland rivers: 5 µg/L • Lakes & reservoirs: 5 µg/L • Estuaries: 4 µg/L
Turbidity	<ul style="list-style-type: none"> • Upland rivers: 2-25 NTU (see supporting information) • Lowland rivers: 6-50 NTU (see supporting information) • Lakes & reservoirs: 1-20 NTU • Estuaries: 0.5-10 NTU
Salinity (electrical conductivity)	<ul style="list-style-type: none"> • Upland rivers: 30-350 µS/cm • Lowland rivers: 125-2200 µS/cm
Dissolved oxygen	<ul style="list-style-type: none"> • Upland rivers: 90-110% • Lowland rivers: 85-110% • Freshwater lakes & reservoirs: 90-110% • Estuaries: 80-110% <p>Note: Dissolved oxygen values were derived from daytime measurements. Dissolved oxygen concentrations may vary diurnally and with depth. Monitoring programs should assess this potential variability.</p>
pH	<ul style="list-style-type: none"> • Upland rivers: 6.5-8.0 • Lowland rivers: 6.5-8.5 • Freshwater lakes & reservoirs: 6.5-8.0 • Estuaries: 7.0-8.5 <p>Changes of more than 0.5 pH units from the natural seasonal maximum or minimum should be investigated.</p> <p>See supporting information</p>
Temperature	See ANZECC 2000 Guidelines, table 3.3.1.
Chemical contaminants or toxicants	See ANZECC 2000 Guidelines, chapter 3.4 and table 3.4.1.
Biological assessment indicators	This form of assessment directly evaluates whether management goals for ecosystem protection are being achieved (e.g. maintenance of a certain level of species diversity, control of nuisance algae below a certain level, protection of key species, etc). Many potential indicators exist and these may relate to single species, multiple species or whole communities. Recognised protocols using diatoms and algae, macrophytes, macroinvertebrates, and fish populations and/or communities may be used in NSW and interstate (e.g. AusRivAS).

The details of the catchments/source nodes used in the MUSIC model and the proposed treatment train modelled are shown in Table A.2 below.

Table A.2: MUSIC catchment parameters

Catchment	Total Area (m ²)	Split Catchment Area (m ²)	Land Use	% Impervious	Proposed treatment train
A	3451.6	1,094.6	Roof areas	100	Hume Gard HG15
		1,690.0	Paved areas	100	
		667.0	Landscaped areas	0	
B	9998.0	189.0	Roof areas	100	Hume Gard HG15
		7,870.0	Paved areas	100	
		1,939.0	Landscaped areas	0	
TOTAL	13,449.6	13,449.6			

The proposed stormwater treatment train modelled in MUSIC consists of a Hume Gard HG15 for both catchments A and B. Figure A.2 below shows a schematic representation of the models analysed and Table A.3 demonstrates that the pollutant load reduction objectives for the site have been achieved, i.e. the treatment methods proposed are adequate.

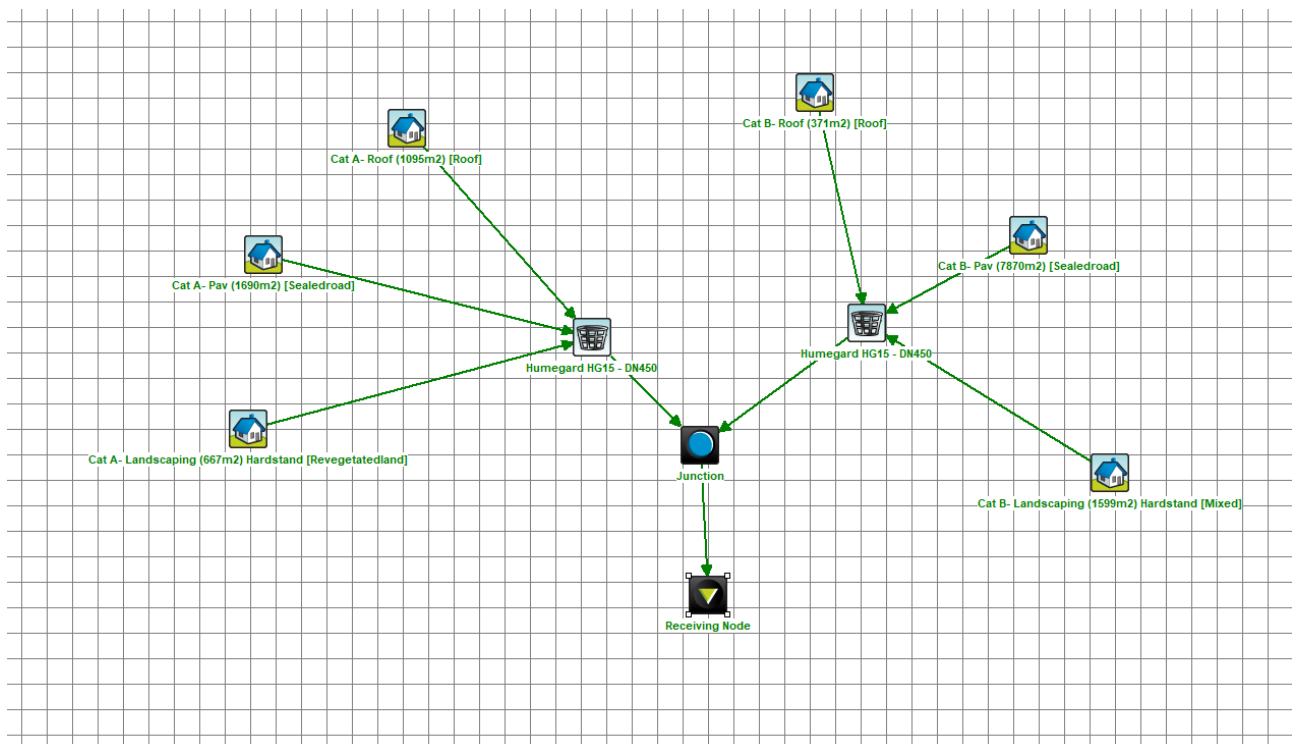


Figure A.2: MUSIC model schematic - Manildra Group – Port Facilities, Foreshore Road, Port Kembla NSW 2505

1.3.3 Music Modelling Results

The proposed stormwater treatment measures were modelled in MUSIC and the results of MUSIC modelling are as shown in Table A.3 and Table A.4 respectively.

Table A.3: Details of proprietary treatment systems as modelled in MUSIC

Catchment	System Used	Number of units
A	Hume Gard HG15	1
B	Hume Gard HG15	1

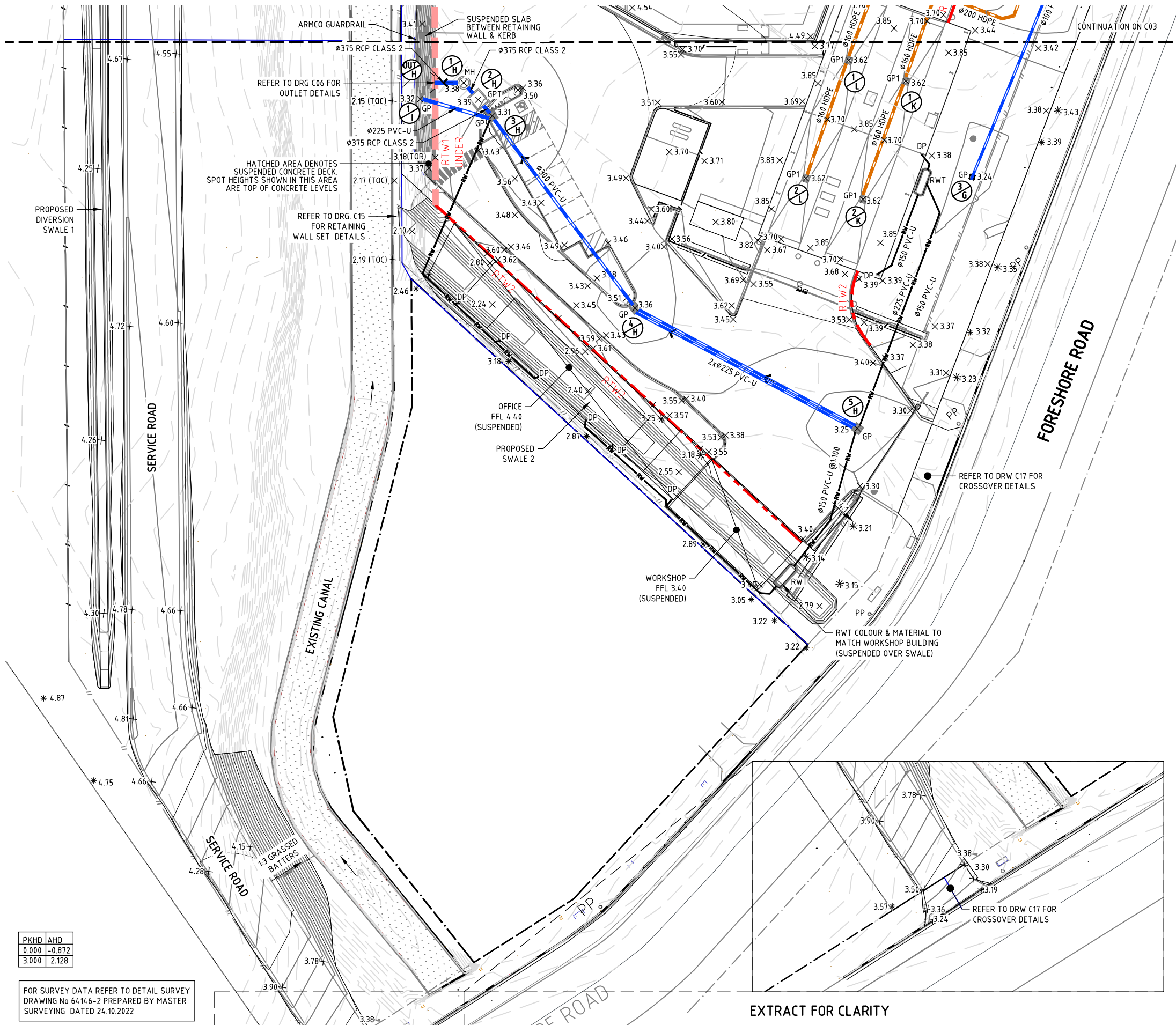
Table A.4: MUSIC model treatment effectiveness

Parameter	Trigger Values	Music Results Achieved	Objective Achieved
Total Phosphorus	30 µg/L	29.5 µg/L	Yes
Total Nitrogen	300 µg/L	241 µg/L	Yes

Table A.4 above, demonstrates that the pollutant load reduction objectives for the site have been achieved, i.e., the treatment methods proposed are adequate.

Further to the above-mentioned results, the proposed treatment device also reduces Gross Pollutants and Total Suspended Solids. The MUSIC model achieved a residual pollutant of 0.27 kg/Day and 8290 µg/L for Gross Pollutants and Total Suspended Solids respectively. Concentrations of Total Suspended Solids, Total Phosphorus and Total Nitrogen are related to Turbidity of water. It is to be noted that, a reduction in values of these contaminants will improve the turbidity of the stormwater released from the site into receiving waters.

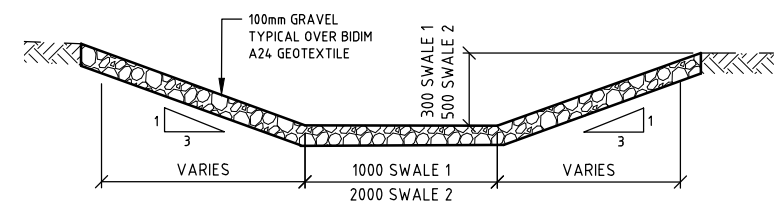
APPENDIX B – SITE GRADING AND DRAINAGE PLANS



- LEGEND:**
- PROPERTY BOUNDARY
 - PROPOSED RETAINING WALL REFER MANUFACTURER DRAWINGS FOR DETAILS
 - PROPOSED RETAINING WALL REFER STRUCTURAL ENGINEERING DRAWINGS FOR DETAILS
 - EXISTING CONTOUR LEVEL (0.25m INTERVAL)
 - PROPOSED CONTOUR LEVEL (0.10m INTERVAL)
 - PROPOSED STORMWATER
 - PROPOSED RAINWATER
 - PROPOSED DRAINAGE TO HOLDING TANK
 - DIVERSION SWALE FLOW DIRECTION
 - PROPOSED SPOT HEIGHT (mPKHD)
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 - EXISTING SPOT HEIGHT ON CANAL WALL (mPKHD)
 - PROPOSED SPOT HEIGHT ON RETAINING WALL (mPKHD)
 - FINISHED FLOOR LEVEL (mPKHD)
 - GROSS POLLUTANT TRAP HUMES HUMEGARD HG15
 - STORMWATER MANHOLE
 - STORMWATER GULLY PIT
 - TRENCH DRAIN
 - STORMWATER/ETHANOL SPILLS GULLY PIT
 - COLLECTION PIT FITTED WITH A VALVE
 - HOLDING TANK
 - 2x AIR PUMPS.REFER MECHANICAL DRAWINGS FOR DETAILS
 - POWER POLE
 - MAIN COLLECTION CHAMBER
 - PROPOSED DOWNPIPE
 - 5kL RAINWATER TANK INCLUDING IRRIGATION SYSTEM
 - INFRASTRUCTURE NUMBER TAG. REFER DRW C04 FOR PIT SCHEDULE FOR DETAILS

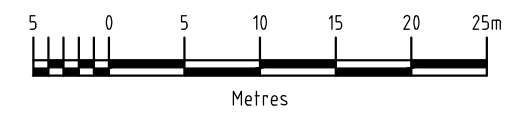


REFER DRAWINGS ESC01 TO ESC09 FOR EROSION & SEDIMENT CONTROL MEASURES DURING CONSTRUCTION



DIVERSION SWALE TYPICAL DETAIL
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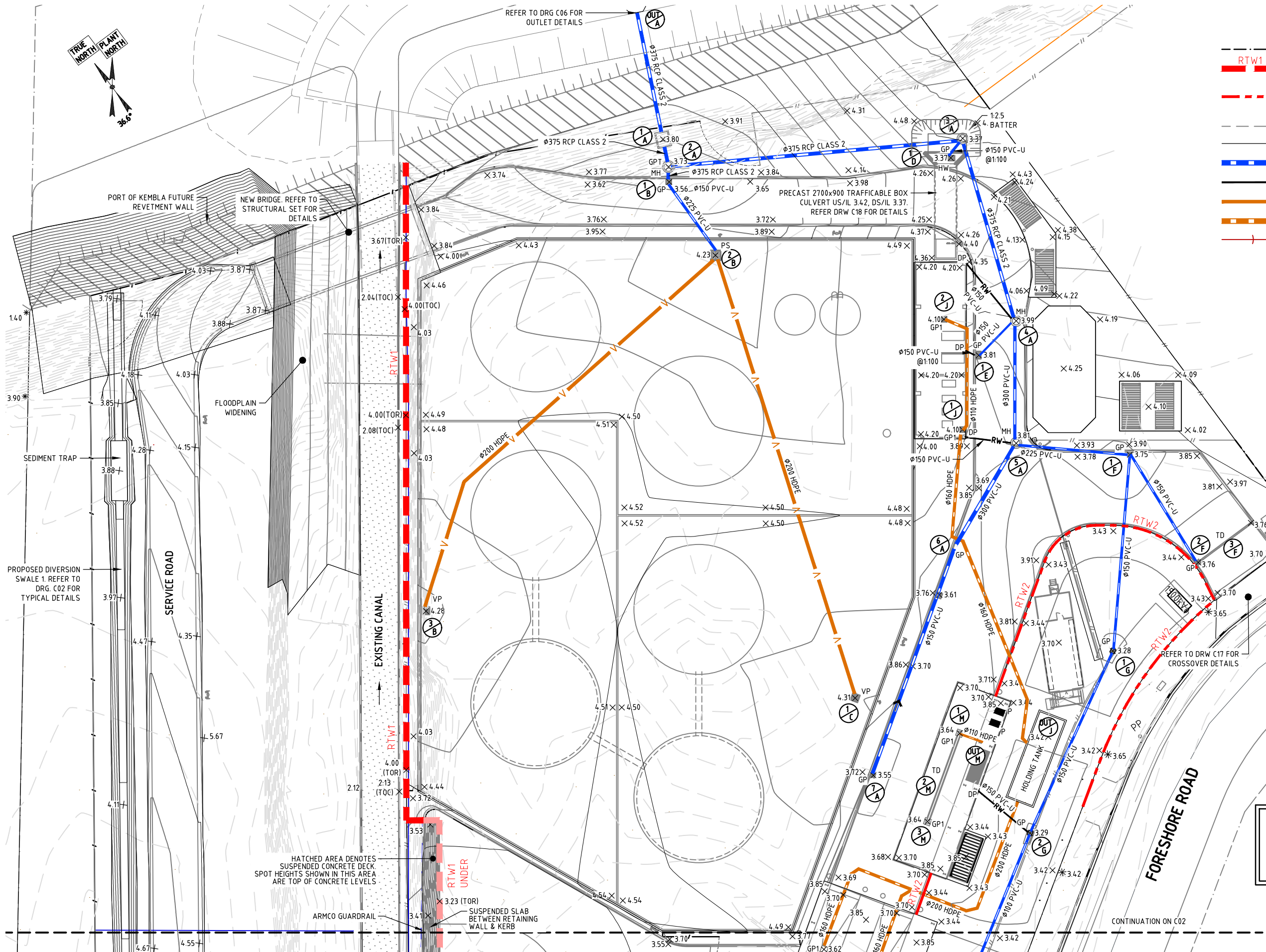
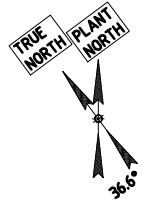
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NOT FOR CONSTRUCTION



PKHD	AHD
0.000	-0.872
3.000	2.128

FOR SURVEY DATA REFER TO DETAIL SURVEY DRAWING No 64146-2 PREPARED BY MASTER SURVEYING DATED 24.10.2022

PROJECT MANAGERS PLANNERS DESIGNERS ENGINEERS				REV			DESCRIPTION			PROJECT CLIENT			PROJECT DETAILS			DRAWING TITLE			STATUS		
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	B	21.02.2022	LS	BUILDING'S RWT RELOCATED. TABLE AMENDED	BY	BY	BY	MANILDRA GROUP	MANILDRA GROUP	PORT KEMBLA	BULK LIQUIDS FACILITY	FORESHORE ROAD	PORT KEMBLA, NSW	PLAN. SHEET 1 OF 2			DATE CREATED	ORIGINAL SCALE	SHEET		
	C	01.09.2022	CV	SITE LAYOUT UPDATED	BY	BY	BY	MANILDRA GROUP	MANILDRA GROUP	PORT KEMBLA	BULK LIQUIDS FACILITY	FORESHORE ROAD	PORT KEMBLA, NSW	DO NOT SCALE THIS DRAWING. CONFIRM ALL DIMENSIONS ON SITE.			02.09.2021	1:500	A3		
	D	10.10.2022	DS	REVISED DISPOSAL LOCATION	BY	BY	BY	MANILDRA GROUP	MANILDRA GROUP	PORT KEMBLA	BULK LIQUIDS FACILITY	FORESHORE ROAD	PORT KEMBLA, NSW	DRAWING NO			REV				
	E	01.12.2022	DS	SOUTHEAST SURFACE LOWERED	BY	BY	BY	MANILDRA GROUP	MANILDRA GROUP	PORT KEMBLA	BULK LIQUIDS FACILITY	FORESHORE ROAD	PORT KEMBLA, NSW	20399-C02			E				



LEGEND:

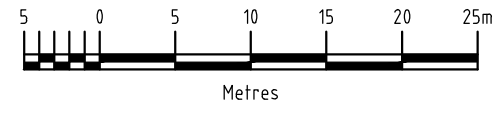
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	C	02.09.2022	CV	SITE LAYOUT UPDATED						02.09.2021	1:500	A3
	D	10.10.2022	DS	REVISED DISPOSAL LOCATION						DO NOT SCALE THIS DRAWING. CONFIRM ALL DIMENSIONS ON SITE.		
	E	01.12.2022	DS	SOUTHEAST SURFACE LOWERED						DRAWING NO	REV	
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