

MANILDRA GROUP

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EROSION SEDIMENT CONTROL PLAN (ESCP)

Project Name:	Port Kembla Bulk Liquids Facility
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Documents to be read in conjunction with this Plan:

This management plan is to be read in conjunction with the following project documents:

- Manildra Group (2023). Port Kembla Bulk Liquids Facility - Construction Health, Safety Management Plan (HSMP).
- Manildra Group (2023). Port Kembla Bulk Liquids Facility - Construction Environmental Management Plan (HSMP).

Glossary and Abbreviations

Abbreviation	Meaning
CEMP	Construction Environmental Management Plan
CPESC	Certified Professional in Erosion and Sediment Control
EC	Electrical Conductivity measurement of salinity
ESCP	Erosion and Sediment Control Plan
EM	Environmental Manager
EPL	Environmental Protection Licence
EWMS	Environmental Work Method Statements
PESCP	Progressive erosion and sediment control plans
PM	Project Manager
PSS	Project Soil Specialist
TPZ	Tree Protection Zone

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1 Introduction

1.1 Context and Purpose

This Erosion and Sediment Control Plan (ESCP) forms part of the Construction Environmental Management Plan (CEMP) for the Manildra Group – Port Kembla Bulk Liquids Facility (the Project).

The purpose of this Plan is to outline the fundamental principles of erosion and sediment control to support the development of more detailed (Site specific) and progressive erosion and sediment control plans (PESCP) to be prepared for: the stages of construction (eg clearing and grubbing, stripping and stockpiling, bulk earthworks); and various work areas.

This plan has been prepared to address the applicable statutory requirements and aims to ensure that project commitments are met.

1.2 Process

The PESCPs will identify risk and be prepared just prior to each construction activity and indicate (where relevant):

- Catchment areas (ie within and outside the road reserve).
- Construction boundaries.
- Exclusion zones and sensitive areas.
- Contours and drainage paths.
- Access points and tracks (eg haulage).
- Compounds and storage areas.
- Stockpile sites.
- Temporary work areas.
- Material processing areas.
- Concrete washout pit sites.
- Permanent and temporary controls (including order of implementation).

Progressive ESCPs will be prepared jointly by both the Project Soil Specialist (PSS) and the Contractor's environmental and field personnel to formulate practical documents for field reference. Additionally, PESCPs will be developed with consideration of other environmental aspects (eg sensitive vegetation, waterways etc). Where required PESCPs will be developed jointly with Environmental Work Method Statements (eg major drainage structures, bridges etc).

The PESCPs will be entered onto a register (refer to Attachment D) and placed behind this Plan to create a 'living' record of erosion and sediment control. The PESCPs will be prepared in accordance with the project Specification and requirements of the Blue Book and are to be read in conjunction with this Plan.

2 Environmental Requirements

2.1 Legislation, Standards and Guidelines

Legislation and guidelines relevant to this plan include:

- Protection of the Environment Operations Act 1997 (POEO Act).
- Protection of the Environment Operations (Waste) Regulation 2014.
- Department of Housing (1998), Managing Urban Stormwater: Soils and Construction, Vol 1, 4th Edition (ie Blue Book).
- Department of Environment and Climate Change (2008), Managing Urban Stormwater: Soils and Construction, Vol 2A, Installation of Services (ie Blue Book).
- Department of Environment and Climate Change (2008), Managing Urban Stormwater: Soils and Construction, Vol 2D, Main Road Construction (ie Blue Book).

3 Site Water Balance

A water balance was prepared for the construction stage with reference to Section 6.3.3 of the “Blue Book” and NSW EPA (2022) industry guidance for water pollution discharge assessments. Results are provided in **Attachment A** and were applied to support rainfall sump and basin sizing.

- design rainfall depth: 43.5 mm (5-day, 80th percentile for Wollongong);
- site comprises a catchment area of 14,070m² with three (3) sub-catchments A, B, and C;
- sump and basin sizing requires three basins with total capacity of 228.9m³;
- pumping rates – no regular pumping or dewatering is proposed where the project works are above the groundwater table;
- onsite storage volumes comprise ~228.9m³ (0.2289ML) basins and minor rainwater tanks with no additional storage required;

Water demand during construction is projected in Table 3-1 with a weekly requirement of approximately 0.27ML. The water balance assessment indicates the project water use during construction will be greater than the stormwater runoff and hence discharge is highly unlikely. The assessment does not trigger further progression to a detailed water pollution discharge study and the environmental values of the waterway won't be impacted during construction of the project.

Table 3-1 Summary of water use during construction

Water Use	Demand	Unit/Interval	ML/Week	ML/month	ML/yr
i. Dust suppression	0.03	ML/day	0.18	0.72	8.64
ii. site facilities (toilets, basins)	0.005	ML/day	0.03	0.12	1.44
iii. washdown bays and equipment	0.01	ML/day	0.06	0.24	2.88
iv. washdown construction surfaces	0.000001	ML/m ²	0.000006	0.000904	0.011
Total			0.27	1.08	12.97

- i. Assume 2*15 KL water truck loads per day for high porosity soils.
- ii. Assume 100 workers *50L pp/day. Working 6 days per week and 4 weeks per month.
- iii. Assumed 10 KL per day to wash down (equipment, plant).
- iv. Assume 5L per m² for preparation of paved and built areas. TFA Music model reports 10,843.6m².

4 Key Management Strategies

The following list outlines principles and control measures that will be implemented on this project for minimising erosion and sedimentation.

4.1 Consultation and Professional Expertise

The project shall engage with a soil specialist to oversee all construction and sediment controls required for the project.

4.2 Training

The following points summarise the key training requirements for this Plan:

- Highlighting the importance of soil conservation issues during site inductions.
- Scheduling awareness seminars early in the project for all personnel involved in construction. The program will cover:
 - Environmental impacts;
 - Relevant legislation;
 - Principles of erosion and sediment control;
 - Techniques of erosion and sediment control.
- Conducting advanced soil conservation seminars for personnel with special responsibilities. This may include training in flocculation and water-quality management of sediment basins or preparation of Detailed / PESCPs.
- Continually addressing relevant matters to erosion and sedimentation management at regular 'toolbox' meetings during the course of the project (eg maintenance of temporary controls).

4.3 Minimising Extent and Duration of Disturbance

- Marking clearing limits.
- Staging of clearing operations.
- Initially clearing and grubbing to leave the soil surface in a reasonably rough condition with some surface vegetative cover.
- Minimising disturbance of vegetation outside the limits of clearing with special emphasis on management of construction activities adjacent to watercourses / areas of concentrated flow.

4.4 Discharge Pollution Control Measures

The updated project design, along with improved management measures during construction, incorporates water pollution control measures for discharges. These measures are designed to meet the assessment criteria outlined in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018). The attached document (Attachment A) illustrates the site water balance, indicating that the construction water demand surpasses the site's catchment and storage capacity. As a result, no planned discharges are anticipated. Details regarding water pollution control measures and criteria for potential discharges can be found in the TARP Section 4.5, while controls for stormwater flows are outlined in Section 4.6.

4.5 Trigger Action Response Plan (TARP)

The TARP (Trigger Action Response Plan) provides a tool for the monitoring and tracking of any trends associated with water quality and enables reactive management to be implemented in the event of an observed deterioration in the water quality. The TARP documents the strategy, procedures and actions to be taken in response to specific triggers or events affecting water quality. The TARP focuses on immediate responses based on monitoring results particularly for parameters with real-time data, such as pH, EC (electrical conductivity), turbidity, and visual oil and grease. The goal of the TARP is to investigate and identify the source of any exceedance in water quality, determine responsible parties, and report on corrective measures to address and mitigate the identified issues.

A Trigger Action Response Plan (TARP) for potential discharges to waters including alternative disposal options for water with contaminant concentrations exceeding relevant criteria is provided in Attachment B.

In the event where water quality monitoring results exceed the project criteria and recommended trigger values, the Environment Manager (EM or their delegate) will assess the situation with the Project Manager (or delegate) and the relevant project environmental specialist with the primary aim to identify the likely cause of any trigger event.

If the elevated results are determined to be a direct result of the project works, the EM (or delegate) will determine the appropriate mitigation measures to be implemented in consultation with the environmental specialist. Where relevant, the assessment will be supported by additional sampling and/or installation of additional controls such to contain the waters. The proposed measures will consider the significance of the exceedance and the impacts that the increased turbidity/pollutants may be having on the physical and ecological parameters of receiving waters (Port Kembla Harbour).

Any exceedance that is found to be caused solely by contractor activities will be recorded by the Principal Contractor (or delegate) and lodged as an official Environmental Incident Report to the EM and PM. These details will include, but not be limited to:

- Location, time, and date.
- Weather (rainfall records).
- Tidal movements.
- Details of construction processes.
- Water quality monitoring results.

In addition to the actions provided in Attachment B where there has been an exceedance of monitoring trigger levels, the EM in consultation with the PM will:

- Establish that all plant, equipment, and environmental controls are operating in a proper and efficient manner.
- Identify the likely source of contamination.
- Implement any required corrective measures.
- Stop work activities if required when an exceedance is demonstrated to be caused by the project works and is above the project criteria and background levels (Trigger Level 3).

A case-by-case investigation process will be implemented for exceedances of the trigger levels throughout the project works. Further to this, an Environmental Incident Report will be overseen by the EM if the monitoring values exceed Trigger Level 3 provided in Attachment B.

Information recorded in the investigation will include, but is not limited to:

- Weather (tides, rainfall, winds etc.).
- Port activities on the day.
- Excavation or disposal being undertaken works on the day.
- Shipping movements in and out of the port not related to the Stage 2A works.

The initial goal of the investigation will be to:

1. identify the source of the exceedance; then
2. determine the responsible party(s) for the exceedance and
3. report on how the problem can be solved.

4.6 Control of Stormwater Flows onto, through and from the Site

The project construction design has been refined to address contamination risks identified during site investigations, including relocation of proposed on-site containment cell, retaining wall redesign, construction staging and additional investigations:

- Excavation depths have been reduced in some areas to limit potential interaction with groundwater. This includes: – Use of screw piles for the gravity retaining wall instead of a deeper trench;
- Reduced excavation depths at stormwater treatment units and underground storage tank;
- Changes to design levels and consolidation of proposed on site containment areas to just one new area;

key strategies and controls for managing stormwater flows onto, through and from the site include:

- Separating 'clean' run-on water from 'dirty' (eg turbid) construction area run-off.
- Constructing permanent drainage structures early in the project including:
 - Sediment basins and traps;
 - Catch drains with linings;
 - Culverts and associated inlet and outlet protection (eg dissipators).
- Maximising the diversion of turbid construction runoff into sediment basins or traps.
- Controlling run-off during the construction of embankments (eg fill shaping and the construction of temporary dykes and batter drains).
- Diverting formation run-off through sediment traps and into pits and the stormwater drainage system as soon as practical to reduce surface flow lengths and velocities.

In addition to the above key strategies and controls, the construction stages must apply the enhanced measures included in the RTS and set out in the Construction Stormwater Management Plan (SMEC, 2022) and the Technical Memorandum Addendum to RAP (SMEC, 2022) provided as Appendix E of this CEMP.

4.6.1 Contingency measures for managing contaminated runoff

The following additional contingency measures would be applied to manage potential contaminated runoff:

- Reduce potential exposure of contaminated soils to stormwater runoff through works scheduling within a suitable forecast 'weather window' (i.e. reduced rainfall risk) based on expected construction stage duration and by adopting efficient construction methodologies (i.e. prefabricated installations etc).
- Avoid/minimise uncontrolled stormwater discharges from Site to receiving environment by capturing and retaining for offsite disposal (i.e. via proposed stormwater runoff retention basin and/or via 'sump and pump' into suitable holding tanks) and employing effective contingency mitigation measures prior to predicted heavy rainfall where reasonable and feasible.
- All liquid chemical handling/storage, refuelling and vehicle washdown activities will be located at a designated bunded area near the driveway entrance, away from stormwater drains and at least 50m away from the stormwater channel and harbour foreshore
- An environmental spill kit will be readily available suited to the chemical type and application (i.e. hydrocarbon / oil type for plant machinery)
- All powered mobile plant will be inspected daily and checked for evidence of leaks prior to use
- Any environmental incidents (i.e. spills) would be documented and recorded in accordance with incident reporting protocols outlined within the CEMP.

4.7 Erosion Control Measures to Prevent On-Site Damage

- Constructing a range of erosion controls within the various site sub-catchments to reduce flow velocities and to compliment and increase the effectiveness and efficiency of sediment controls in the lower areas (eg weir type structures, diversion banks, progressive revegetation).
- Using geotextile or similar linings to provide temporary surface protection in areas of concentrated flows (eg batter drains, culvert construction, temporary drains etc). Rock armouring of construction sediment basin outlets.
- Siting stockpiles of soil material in low-hazard areas clear of watercourses (ie at least 50 metres). Additional protection to be afforded with temporary vegetation, upslope diversion banks and downslope sediment control measures, if required. Toe of stockpiled material to be at least 5 metres from a fence, drain or trees to be retained.
- Stockpiles no greater than 2 metres in height with batters no steeper than 2:1.

4.8 Sediment Control Measures to Prevent Off-Site Damage

- Construct control measures as close to potential sources of sediment as possible and use of alternative controls (ie. cover) where end of line basins are not possible.
- Ensuring sediment basin management of turbid water within 24 hours after rain with one or a combination of:
 - Flocculation with gypsum (or approved alternative flocculant);
 - Pump-out for construction purposes (ie. compaction) or dust control.
- Water not to be released from sediment basins prior to achieving acceptable water quality standards, as outlined in the Dewatering Procedure, Appendix C of the Project CEMP.

- Preferential re-use of water onsite from construction sediment basins.
- Managing water quality during de-watering activities (eg dust suppression, filtering techniques, flocculation with gypsum, pumping for treatment into a sediment basin).
- Controlling the deposition of mud and soil material onto local roads.
- Dust suppression via water carts, restricting plant and vehicle movements to designated routes and limiting vehicle speeds etc.

4.9 Stabilisation and Revegetation

- Ensuring the success of the later revegetation program by utilising a good topsoil management program.
- Keying in of topsoil to batters. Topsoil depth to be 5 cm to 10 cm.
- Progressively revegetating disturbed areas utilising appropriate species.
- Controlling dust through progressive revegetation techniques.

4.10 Inspection and Maintenance

- Ensuring the progressive and continual implementation of temporary erosion and sediment controls (eg sediment fences, diversion banks, diversion drains, sediment traps).
- Initiating an inspection program to ensure regular maintenance of all erosion and sediment control measures. Sediment cleaned from structures, including sediment basins, to be deposited in a secure location where further pollution will not occur.
- The project soil specialist must inspect and review all erosion and sediment controls on a monthly basis, or as otherwise agreed by the Principal Representative, until the Date of Construction Completion and prepare reports on these inspections. Issues identified in these inspection reports must be acted on and reported to the Project Soil Specialist and Principal project representative within five (5) working days. The project soil specialist must assist in project training in regards to project erosion and sediment control issues.
- Additional inspections will be conducted by Project personnel:
 - During significant rainfall events exceeding 10 mm and during prolonged rainfall to monitor the functioning of controls (i.e. within 3 hours during normal work hours and days, or within 24 hours outside normal work hours and days).
 - Within 24 hours of the cessation of a rainfall event causing runoff to occur on or from the project.

4.11 Water Monitoring Program

The following surface water monitoring would be carried out to monitor for potential impacts to surface water/stormwater runoff during construction stage:

Monitoring objectives: Surface water monitoring events would be carried out during and post-construction with the monitoring objectives to:

- Monitor for potential changes in surface water quality down-stream of Site by comparison to up-stream locations (i.e. control-impact study design).
- Monitor the Site water quality during 'wet weather' events.
- Assess potential impacts associated with construction activities

Sampling and analysis plan: Table 4-1 outlines the proposed analytes, monitoring points, and minimum frequency for surface water monitoring events during construction stages.

Table 4-1 Construction water monitoring plan

ID	Location	Frequency	Analytes
SW1	Canal upgradient adjacent western boundary. E307702 / N6182976	Monthly for 3 months, then quarterly. Sample on outgoing tide.	pH, EC, Turbidity, Oil & grease.
SW2	Canal adjacent mid point of boundary site boundary. E 307766 / N6183074	Monthly for 3 months, then quarterly. Sample on outgoing tide.	pH, EC, Turbidity, Oil & grease.
SW3	Canal downstream of site. E307825 / N6183152	Monthly for 3 months, then quarterly. Sample on outgoing tide.	pH, EC, Turbidity, Oil & grease.
SB1	Sediment Basin 1 (north)	Prior to application or discharge	pH, EC, Turbidity, Oil & grease.
SB2	Sediment Basin 2 (east)	Prior to application or discharge	pH, EC, Turbidity, Oil & grease.
SB3	Sediment Basin 3 (west)	Prior to application or discharge	pH, EC, Turbidity, Oil & grease.
The monitoring plan should continue to be reviewed and updated based on site conditions.			

Sample methodology:

Sampling would be carried out with reference to;

- Australian/New Zealand Standard (AS/NZS) 5667.1:1998 Water quality - Sampling Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples; and
- NSW EPA (2022). Approved methods for the sampling and analysis of water pollutants in NSW

Field parameters would be measured using a calibrated water quality meter which included dissolved oxygen (DO), electrical conductivity (EC), pH, redox potential, and temperature. Observations would be made including water clarity, colour, odours, presence of staining.

Surface water samples would be collected on low or outgoing tides to assess potential Site impacts on receiving environment. Surface water samples would be collected at location to represent the 'worst case' at observable points of stormwater discharges (if present) or immediately beneath these location.

Surface water samples would be collected wearing a new clean pair of nitrile gloves and transferred directly into sampling containers supplied by contract laboratories which contained appropriate preservatives for the analysis undertaken. Sample containers would be filled to the brim and sample lids sealed to prevent exposure to atmosphere. Samples requiring analysis of heavy metals would be collected twice (unfiltered and field filtered to 45µm prior to filling sample containers) to assess both total and dissolved concentrations.

- Samples would be immediately placed in an ice-filled chest to keep the samples chilled until transport to the laboratory for analysis.

Monitoring criteria:

Table 4-2 Water quality monitoring criteria

Analyte	Criteria
pH	7.0-8.5 (Estuaries) <i>ANZECC & ARMCANZ (2000) Table 3.3.2. Default trigger values for physical and chemical stressors for South-east Australia for slightly disturbed marine ecosystems, applying to estuaries</i> Or within the range of Background Values ($\leq$ BV).
EC	Within the range of Background Values ($\leq$ BV). <i>ANZECC & ARMCANZ (2000) Table 3.3.3 Ranges of default trigger values for conductivity (EC, salinity) indicative of slightly disturbed ecosystems in south-east Australia.</i>
Turbidity	0.5-10 NTU (Estuarine & marine) <i>ANZECC & ARMCANZ (2000) Table 3.3.3 Ranges of default trigger values for, turbidity and suspended particulate matter (SPM) indicative of slightly disturbed ecosystems in south-east Australia.</i> Or within the range of Background Values ($\leq$ BV).
Oil & Grease	No visible film on the water nor should they be detectable by odour. <i>ANZECC & ARMCANZ (2000) Section 5.2.3.3</i>
Notes: Background Values (BV) calculated based on average readings at SW1 and SW2 recorded within ~30 minutes of the exceedance.	

Reporting: Following each surface water monitoring event, monitoring results should be presented within a brief factual monitoring report which includes a comparison to relevant adopted assessment criteria.

4.12 Documentation and Recording

- Rainfall / climatic records.
- Developing documentation and systems for recording erosion and sediment control activities via:
 - Detailed and Progressive ESCPs (PESCPs);
 - Inspection reports completed by the Project Soil Specialist including details of Site location, control, recommendations/comment, action and 'close-out';
 - Register for Inspections and Maintenance to include volumes of sediment removed and method of disposal etc.
- Site notes distributed internally between environmental and construction personnel.
- Dewatering procedure and records.
- Air quality / Dust Management Plan.
- Meeting minutes.
- Formal correspondence (eg Client, Environment Protection Authority).
- Water quality monitoring results (eg sediment basins, upstream and downstream).

4.13 General

- Monitoring weather forecasts for planning and site 'securing' purposes.
- Ensuring erosion and sediment controls are installed at all sites associated with construction activities including:
 - Access and haulage roads and tracks;
 - Stockpile areas;

- Office and compound sites;
 - Workshop areas;
 - Temporary work areas.
- Liaising with the relevant government authorities in relation to construction and control measures in watercourses.
- Leaving temporary erosion and sediment controls in place until the disturbed catchments have over 70% vegetation cover (ie beyond pavements).

5 Sediment Basins

5.1 Construction Basins

Basins design, locations and construction, including geotechnical stability, prevention of seepage out of basins, scour protection, inlet and outlet structures plus emergency spillways in accordance with the BLUE BOOK guidelines. The design and construction must include for appropriate fencing to prevent unauthorised people from entering the basins. Low flow pipe outlets will not be accepted in sediment basin designs.

At least 14 days before commencing construction of each construction sediment basin and connecting drainage, the construction sediment basin design drawings will be submitted for approval by the Project Soil Specialist.

Where sediment basins are required for water treatment, install the construction sediment basins including connecting drainage and other water quality structures in each catchment together with associated connecting stormwater drainage (temporary/permanent pipes and/or catch drains) and fencing prior to commencement of any construction activities within the identified catchment for the basin. Direct water from each catchment to the sediment basins via stabilised controls such as diversion drains.

Locate all basins within the Project construction footprint. The design should minimise any clearing in threatened or endangered ecological communities. The project soil specialist must undertake site inspections as required, but at least monthly and prepare a report detailing findings from these inspections. Issues identified in these inspection reports must be acted on and reported to the Principal within 5 working days.

Installation of construction sediment basins will be in accordance with the requirements for any operational basins, unless alternative designs using equivalent materials and construction methods are proposed and approved by the Principal. If such alternative designs are used, the details of the alternative design must be provided in the PESCP. The alternative design must be prepared by a suitably qualified engineer experienced in the type of work, and its use is subject to the agreement of the Principal.

Sediment basins inlets, outlets and spillways will be constructed as soon as possible using rock filled woven galvanised steel mattresses laid on a needle punched, mechanically bonded, non woven geotextile filter fabric.

Design construction sediment basins and other water quality control structures so they are easily maintainable. During the construction of each basin, a depth meter must be installed, as well as basin identification signage which clearly identifies the basin number and whether it has an EPL licenced discharge point. In addition, the basin depth meter must also clearly show the 60 percent sediment storage zone height from design floor, so that the maintenance trigger is easily identifiable.

If operational basins are proposed for sedimentation control during the duration of the Contract, the environmental requirements specified for any discharge must be complied with. Remove or convert to operational water quality basins as required by stormwater management design, all construction sediment retention basins and sediment traps before Completion, but not before all upstream areas have been vegetated or otherwise stabilised in accordance with BLUE BOOK.

5.2 Inlets, Outlets and Spillways

Inlets, outlets and spillways will be constructed soon as possible using rock filled woven galvanised steel mattresses laid on a needle punched, mechanically bonded, non-woven geotextile filter fabric. Alternative methods for constructing the inlets, outlets and spillways, must be approved by the project soil specialist.

5.3 Maintenance of Sediment Basins

Suitable access to sediment basins and sediment traps to allow cleaning out in all weather conditions will be provided and maintained. Sediment basins will be cleaned out, at a minimum, whenever the accumulated sediment exceeds 60% of the sediment storage zone, as shown by the basin depth meter.

This will involve removal of accumulated sediment from sediment basins, water diversions, associated facilities and traps. The sediment removed from sediment basins will be appropriately managed and disposed of (including potentially contaminated sediment) both during and immediately prior to Completion of the project.

On-site disposal locations must ensure that sediment will not be conveyed back into the construction areas, into watercourses or off site.

5.4 Removal of Sediment Basins

All construction sediment retention basins and sediment traps will be removed or converted to operational water quality basins as required by the project stormwater management design, before completion, but not before all upstream areas have been vegetated or otherwise stabilised in accordance with BLUE BOOK (i.e. 70 % of the disturbed area beyond the footprint is stabilised or as otherwise agreed with the Principal).

Restore the ground disturbed by the construction of the sediment basins/traps to a similar condition to that previously existing. Include the following in the restoration work:

- removal of all redundant mattresses from the inlets and spillway(s) and their subsequent burial into the basin area or their use as scour protection or their removal from Site
- spreading and compaction of the embankment material into the basin area
- removal of access roads

- removal and appropriate disposal/reuse of sediment (including potentially contaminated sediment).

Compact the disturbed ground to at least the relative density of the material in the ground adjacent to it.

6 Stockpile Management

6.1 Pre-Approval of Proposed Locations

Prior to requesting the assessment of a stockpile location from the Environment Manager, the engineer or supervisor requesting the new location is to check approved locations to ensure current approved sites cannot be better utilised. Minimise the number of stockpiles sites wherever practicable. If existing sites cannot be used, the expected quantity of material, expected dimensions required, expected stockpiling timeframes, whose land the stockpile will be located on and the type of material to be stockpiled must be detailed. Once this information is known, the Environment Manager shall be contacted for an assessment of the proposed stockpile location.

The engineer or supervisor shall utilise the Stockpile Location Checklist (Attachment C) to assess the stockpile location. The new stockpile location is also to be assessed against Sensitive Area Plans. The engineer or supervisor shall give the completed Stockpile Location Checklist (Attachment C) to the Environment Manager for review and assessment. Stockpile location to be approved/rejected by the Environment Manager based on the information provided as detailed above. Following this approval, the Environment Manager shall note the new stockpile within the project stockpile register.

6.2 Stockpile Tracking

If the proposed stockpile site is approved, the boundaries will be agreed between the person proposing the stockpile and the Environment Manager. The proposed stockpile site boundary will be marked out and appropriate erosion and sediment controls installed. Stockpile sites will also be signposted to clearly identify and delineate between other stockpiles. The erection of signs will be agreed with the Site Foreman. Details of stockpile management in regard to erosion and sediment control will be included in the relevant ESCP/ PESCP which contains the stockpile. Details of materials entering, leaving and maintenance must be appended to the stockpile register and kept on file by the Environment Manager. This register will be kept on file by the Environment Manager who will ensure that any additional erosion and sediment control measures are included in the relevant PESCP.

6.3 Stockpile Locations

Stockpiles will be established in a manner that minimises any damage to natural vegetation and trees, maintaining the existing surface drainage and such that the stockpiled material is accessible for carting away at any time. Stockpiles will also be located:



- outside of the tree protection zone (TPZ) of trees or native vegetation identified for retention. Delineate the TPZ in accordance with AS 4970 and to ensure a zone of at least 5 metres from retained trees and outside the drip line.
- above 1% AEP Flood Level
- away from key views and visual receptors where possible (unless being revegetated and used as part of boundary screening). Use appropriate screening measures and practices where this is not possible outside of utility easement corridors.

6.4 Stockpile Segregation

Each stockpiled material must be clearly delineated to prevent mixing and cross contamination. All stockpiles of contaminated material, topsoil or any other long terms stockpiles (stockpiles left for more than 20 days) must be clearly signposted with a stockpile number, date established, material classification, origin and quantity.

6.5 Erosion and Sediment Controls

Erosion and sediment controls will be established and maintained to divert offsite stormwater, manage onsite stormwater runoff and stabilise stockpiles as required. Sediment and erosion control should be undertaken in accordance with the 4th edition of "Managing Urban Stormwater – Soils and Construction" Volume 1 (the Blue Book). Erosion and sediment controls will include, but not be limited to:

- Diversion bunds or catch drains upslope of the stockpiles to divert water around the stockpile
- sediment fences or mulch bunds downslope of stockpiles to catch sediment runoff
- stabilisation of stockpile that will be left for more than 20 days.

Stockpile locations and the erosion and sediment controls around them will be included on the PESCPs. Erosion control and sediment capture measures must be installed prior to stockpiling material.

Stockpile heights will not exceed 2 m, unless otherwise approved by the Principal, and slopes to no steeper than 2:1. Locate stockpiles so that any slump of the stockpile will not affect erosion and sediment control measures or infringe specified minimum clearance requirements.

6.6 Dust Controls

During stockpiling activities, watercarts will be used to suppress dust. Stockpiles that will be left for more than 20 days will be stabilised where feasible by seeding with a cover crop, bonding/tackifier agent or fully covered to suppress dust and erosion. Any stockpiles that are susceptible to wind or water erosion which cannot be stabilised, must be covered within 5 days of forming each stockpile.



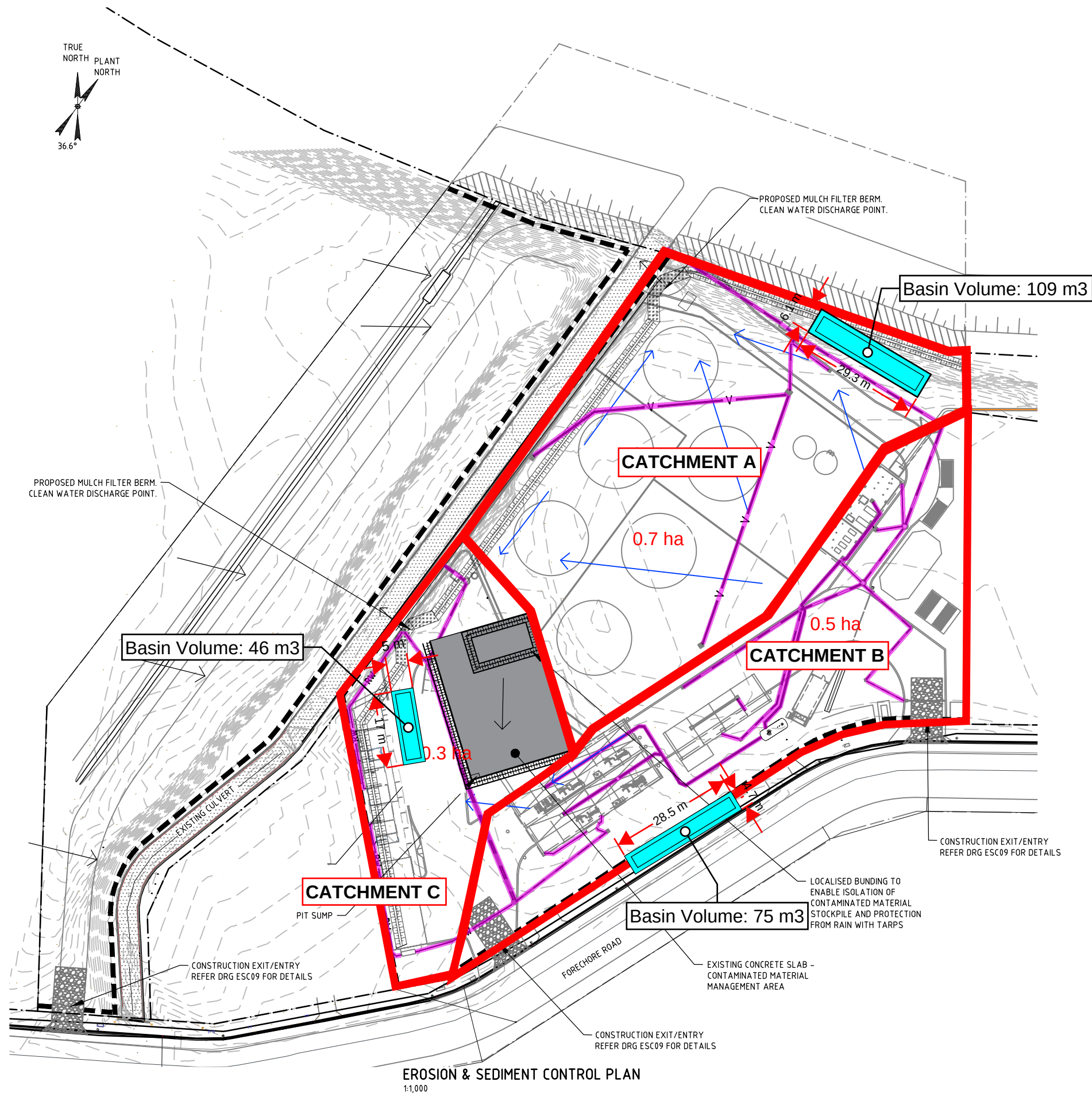
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Erosion Sediment Control Plan
Manildra Group – Port Kembla Bulk Liquids Facility

Attachment A

Water Balance & Basin Sizing



LEGEND:

	PROPERTY BOUNDARY.
	EXTENT OF SEDIMENT FENCE OR STRAW BALE FILTER. REFER TO BLUE BOOK STD DRAWINGS SD6-7 AND SD6-8 FOR DETAILS OR APPROVED EQUIVALENT.
	FLOW DIVERSION BANK (300mm HIGH, TYP.) REFER BLUE BOOK STD DRAWING SD5-5 FOR DETAILS OR APPROVED EQUIVALENT.
	EXISTING CONTOUR LEVELS (0.25m INTERVALS).
	DIRECTION OF SURFACE FALL.
	CLEAN WATER DIRECTION.
	MULCH FILTER BANK OR ROCK FILTER DAM. REFER IECA STD DRAWING MB-01 OR BLUE BOOK STD DRAWING RFD-01 FOR DETAILS OR APPROVED EQUIVALENT.
	STAGE 3A EXTENT OF WORKS (APPROXIMATE).
	PROPOSED STORMWATER RUNOFF RETENTION BASIN.

NOTES:

- STAGE 3A WORKS CONSISTS OF:
 - TRENCHING OF UNDERGROUND SERVICES AND BACKFILLING WITH CLEAN MATERIAL.
 - CONTAMINATED MATERIAL TO BE STORED AND STOCKPILED.
 - DRIVING OF PILES.
 - CONSTRUCTION OF TANKS FOOTINGS AND ERECTION OF TANKS.
 - SHALLOW EXCAVATIONS AND FILLING TO ENABLE RECOUNTING OF THE SITE.
- THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES ARE PROPOSED:
 - THE INSTALLATION OF DIVERSION BUNDS AT THE TRENCH EXTENTS TO MINIMIZE CATCHMENT AREA OF DIRTY WATER
 - THE CONTRACTOR IS TO ENSURE THAT MOBILE TEMPORARY PUMPS ARE AVAILABLE IN THE EVENT INCLEMENT WEATHER IS FORECASTED TO EXTRACT WATER OUT OF THE EXTENT OF WORKS AND DISPOSED ACCORDINGLY.
 - THE CONTRACTOR SHALL PLACE A TEMPORARY COVER SYSTEM AS FILLING WORKS OF THE CONTAMINATED AREA OCCUR, TO LIMIT THE CONTAMINATED FILL SATURATING. IF HEAVY RAINFALL EVENTS ARE FORECASTED, A MITIGATION MEASURE (i.e. COVER THE TOP OF ENTIRE AREA) WILL BE IN PLACE TO LIMIT THE CONTAMINATED AREA FILLING WITH WATER.
 - PROGRESSIVE TRENCHING AND BACKFILLING WORKS WHERE PRACTICAL.

PROJECT MANAGERS PLANNERS DESIGNERS ENGINEERS				REV	DATE	BY	DESCRIPTION	CHK	APP	PROJECT CLIENT	PROJECT DETAILS	DRAWING TITLE	STATUS		
 Copyright TFA Group Pty Ltd This drawing including design & information is covered by Copyright and all rights are reserved. This document may not be copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part, without prior consent in writing from TFA Group Pty Ltd. ACN 612 132 233 Ph: 61 7 3854 2900 Aust Wide: 1300 794 300 Email: enquiry@tfa.com.au Web: www.TFA.com.au				A	26.08.22	DS	ISSUED FOR REVIEW	JA		 MANILDRA GROUP 100% AUSTRALIAN OWNED	MANILDRA GROUP PORT KEMBLA BULK LIQUIDS FACILITY FORESHORE ROAD PORT KEMBLA, NSW	CONCEPTUAL EROSION & SEDIMENT CONTROL PLAN STAGE 3A WORKS	TENDER		
				B	06.10.22	DS	REVISED DISPOSAL LOCATION	JA					DATE CREATED 25.08.22	ORIGINAL SCALE AS SHOWN	SHEET A3
				C	12.10.22	DA	STAGING OF WORK CLARIFIED	JA					DO NOT SCALE THIS DRAWING. CONFIRM ALL DIMENSIONS ON SITE.		
												DRAWING NO		REV	
												20399-ESC04		C	

1. Erosion Hazard and Sediment Basins

Site Name: Manildra Group Bulk Liquids Facility

Site Location: Port Kembla

Precinct/Stage: Construction

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
	A	B	C				
Total catchment area (ha)	0.66	0.49	0.3				Sub-catchment 2000 to 5000 sq. m range options
Disturbed catchment area (ha)	0.601	0.446	0.273				

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	C	C	C				From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	40	40	40				Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage	4.0	4.0	4.0				E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	C	C	C				Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5	5	5				See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	85	85	85				
x-day, y-percentile rainfall event (mm)	43.5	43.5	43.5				
Rainfall R-factor (if known)							Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	11	11	11				

RUSLE Factors

Rainfall erosivity (R-factor)	2630	2630	2630				Auto-filled from above
Soil erodibility (K-factor)	0.25	0.25	0.25				RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)	65	120	45				
Slope gradient (%)	1.38	0.75	0.66				
Length/gradient (LS-factor)	0.25	0.16	0.12				
Erosion control practice (P-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (C-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)							Minimum is generally 2 months
Cv (Volumetric runoff coefficient)							See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	216	136	99				
Soil Loss Class	2	1	1				See Table 4.2, page 4-13
Soil loss (m ³ /ha/yr)	166	105	76				Conversion to cubic metres
Sediment basin storage (soil) volume (m ³)							See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m ³)							See Sections 6.3.4(i) for calculations
Sediment basin total volume (m ³)							

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

2. Flow Calculations

Peak flow is given by the Rational Formula: $Q_y = 0.00278 \times C_{10} \times F_Y \times I_{y,tc} \times A$

where: Q_y is peak flow rate (m³/sec) of average recurrence interval (ARI) of "Y" years
 C_{10} is the runoff coefficient (dimensionless) for ARI of 10 years.
 F_y is a frequency factor for "Y" years.
 A is the catchment area in hectares (ha)
 $I_{y,tc}$ is the average rainfall intensity (mm/hr) for an ARI of "Y" years and a design duration of "tc" (minutes or hours)

Time of concentration (t_c) = $0.76 \times (A/100)^{0.38}$ hrs

Note: For urban catchments the time of concentration should be determined by more precise calculations or reduced by a factor of 50 per cent. Place an x in the appropriate row below to automatically halve the time of concentration for that sub-catchment.

Structure Details								Notes
Name	A	B	C					
Catchment Area (ha)	0.66	0.49	0.3					
Place an x here to halve t_c	x	x	x					Place an x if disturbed catchment
Time of concentration (t_c)	3	3	3					minutes

Rainfall Intensities

1-year, t_c	106	106	106						Enter the relevant rainfall intensities (in mm/hr) for each of the nominated rainfall events. The time of concentration (t_c) determines the duration of the event to be used
2-year, t_c	120	120	120						
5-year, t_c	169	169	169						
10-year, t_c	206	206	206						
20-year, t_c	244	244	244						
50-year, t_c	299	299	299						
100-year, t_c	343	343	343						

C10 runoff coefficient	0.47	0.47	0.47						Use AR&R or Table F3, pg F-6
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Frequency Factors

FF, 1-year	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	Can use 0.8 for a construction site
FF, 2-year	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	Can use 0.85 for a construction site
FF, 5-year	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Can use 0.95 for a construction site
FF, 10-year	1	1	1	1	1	1	1	1	Generally always 1
FF, 20-year	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	Can use 1.05 for a construction site
FF, 50-year	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	Can use 1.15 for a construction site
FF, 100-year	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	Can use 1.2 for a construction site

Flow Calculations

								Notes
1-year, t_c (m ³ /s)	0.073	0.054	0.033					Standard Design, Type C Soil
2-year, t_c (m ³ /s)	0.088	0.065	0.04					
5-year, t_c (m ³ /s)	0.138	0.103	0.063					
10-year, t_c (m ³ /s)	0.178	0.132	0.081					
20-year, t_c (m ³ /s)	0.221	0.164	0.1					
50-year, t_c (m ³ /s)	0.297	0.22	0.135					
100-year, t_c (m ³ /s)	0.355	0.264	0.161					

NB for flow calculations on sediment basin spillways, see Worksheet 3 (if required).

3. Sediment Basin Spillway Design

Structure Details

Structure Name	A	B	C				Auto-filled from Worksheet 1
Catchment Area (ha)	0.66	0.49	0.3				Auto-filled from Worksheet 1
Time of concentration (tc)	3	3	3				Auto-calculated assuming tc is halved

Rainfall Intensities (IFD Values)

1 year, tc	106	106	106				Enter the relevant rainfall intensities (in mm/hr) for each of the nominated rainfall events. The time of concentration (tc) determines the duration of the event to be used
2 year, tc	120	120	120				
5 year, tc	169	169	169				
10 year, tc	206	206	206				
20 year, tc	244	244	244				
50 year, tc	299	299	299				
100 year, tc	343	343	343				

C ₁₀ runoff coefficient	0.47	0.47	0.47				Use AR&R or Table F3, pg F-6
------------------------------------	------	------	------	--	--	--	------------------------------

Design ARI event (select):	1	1	1	1	1	1	Select design ARI (years) from dropdown
----------------------------	---	---	---	---	---	---	---

Frequency Factor	0.8	0.8	0.8	0.8	0.8	0.8	Auto-filled based on selected ARI
------------------	-----	-----	-----	-----	-----	-----	-----------------------------------

Flow Calculation	0.073	0.054	0.033				Auto-calculated based on selected ARI
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4. Volume of Type C (Coarse) Sediment Basins

Type C Basin Design Criteria

Structure Name	A	B	C				Auto-filled from Worksheet 1
Catchment Area (ha)	0.66	0.49	0.3				Auto-filled from Worksheet 1
Sediment type (C, F or D)	C	C	C				Auto-filled from Worksheet 1
Design rainfall event	0.5	0.5	0.5	0.5	0.5	0.5	Choose design event from dropdown
Flow volume (m ³ /s)	0.037	0.027	0.017				Calculated from IFD values above
Area Factor	4100	4100	4100	4100	4100	4100	Default is 4,100. See pg 6-12
Depth of settling (water zone) (m)	0.6	0.6	0.6	0.6	0.6	0.6	Minimum is 0.6m (pg 6-12)

Type C Basin Volume Calculations

Basin Surface Area (m ²)	151.7	110.7	69.7	Not Type C	Not Type C	Not Type C	Auto-calculated
Settling (water) zone volume (m ³)	91	66.4	41.8	Not Type C	Not Type C	Not Type C	Auto-calculated
Storage (soil) zone volume (m ³)	16.9	7.9	3.5	Not Type C	Not Type C	Not Type C	Auto-calculated
Total basin volume (m ³)	107.9	74.3	45.3	Not Type C	Not Type C	Not Type C	Auto-calculated

Basin Shape

Enter length:width ratio	4.9	4.8	3.65	5	3	3	E.g. for 3:1 (L:W) enter 3.
Length (m)	27.3	23.1	16	N/A	N/A	N/A	These figures should be taken as a guide only. Detailed calcs might be required.
Width (m)	5.6	4.8	4.4	N/A	N/A	N/A	

Site area	Sub-catchment or Name of Structure			Notes
	A	B	C	
Total catchment area (ha)	0.66	0.49	0.3	Sub-catchment 2000 to 5000 sq. m range options
Disturbed catchment area (ha)	0.60	0.45	0.27	

Basin Shape

Enter length:width ratio	4.9	4.8	3.65	E.g. for 3:1 (L:W) enter 3.
Length (m)	27.3	23.1	16	These figures should be taken as a guide only. Detailed calcs might be required.
Width (m)	5.6	4.8	4.4	

Basin Surface Area (m ²)	151.7	110.7	69.7	Auto-calculated
Settling (water) zone volume (m ³)	91	66.4	41.8	Auto-calculated
Storage (soil) zone volume (m ³)	16.9	7.9	3.5	Auto-calculated
Total basin volume (m ³)	107.9	74.3	45.3	Auto-calculated

Final Dimensions

Catchment:	A	B	C	
Length (m)	29.3	28.5	17	1:1 batters
Width (m)	6.1	4.7	5	1:1 batters
Depth (m)	0.706	0.670	0.643	
V	92.3	61.1	37.5	
P	65.2	61.0	38.9	
Total basin volume (m3)	108.5	74.8	45.6	

Constraint/Opportunity	Value	Source
Rainfall Erosivity	Moderate (R-Factor = 4000)	APP B - Map 11: Rainfall Erosivity of the Wollongong topographic Sheet
Slope Gradients	Moderate (up to 1%)	Site Survey Plan
Soil Erodibility	Low to moderate (K-factor = 0.25)	Geotechnical Report SMEC (fine to medium grained sand and clay)
Soil Texture Group	Type C	Table C21. Wollongong-Port Hacking Soil Landscapes
Dispersible subsoil (%)	2-4%	Not significant, Class C Soil (less than 10%)
IFD 2-year, 6 hours storm	11.0 mm/hr	BOM Rainfall IFD data
Rainfall Depth	43.5 mm	Table 6.2a Wollongong: 5-day rainfall, 85th percentile
Cv (Volumetric runoff coefficient)	0.58	Appendix F, Table F2 (Rainfall Depth: 43.5 mm, Group C)
Total Catchment Area	14070 sq. m	Site Survey Plan
Basin Design ARI	1-year / 0.5 x 1-year ARI event	Type C Sediment retention basin, standard design
C10 (run-off coefficient)	0.47	AS 3500 Plumbing and Drainage, Cl 5.4.6



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Erosion Sediment Control Plan
Manildra Group – Port Kembla Bulk Liquids Facility

Attachment B

Trigger Action Response Plan (TARP) - Water discharge

Table 6-1 Trigger Action Response Plan (TARP)

Monitoring Type	Monitoring Site	Location	Parameter	Frequency	Criteria
Surface water – up gradient control	SW1	Canal upgradient adjacent western boundary. E 307702 / N 6182976	pH, EC, Turbidity, Oil & grease.	Monthly for 3 months, then quarterly. Sample on outgoing tide.	pH 7.0-8.5 EC ≤ BV Turbidity 10NTU Oil/Grease: Nil
Surface water – adjacent site	SW2	Canal adjacent mid point of boundary site boundary. E 307766 / N 6183074			
Surface water – down gradient control	SW3	Canal downstream of site. E 307825 / N 6183152			
Construction water	SB1	Sediment Basin 1 (north)	pH, EC, Turbidity, Oil & grease.	Prior to application or discharge	pH 7.0-8.5 EC ≤ BV Turbidity 10NTU Oil/Grease – Nil
Construction water	SB2	Sediment Basin 2 (east)			
Construction water	SB3	Sediment Basin 3 (west)			

Notes: Background Values (BV) calculated based on average readings at SW1 (upgradient) and SW2 (downgradient) recorded within~30 minutes of the exceedance.

Trigger	Trigger Level 1 Results ≤ Criteria	Trigger Level 2 Results ≥ criteria and ≤ BV	Trigger Level 3 Results ≥ criteria and ≥ BV
Action	Controls effective. Continue to utilise construction water.	Results within range of background values may be considered satisfactory supported by actions: - Confirm measurement at least three times over next 3 hours. - Alert Environment Manager (EM). - Check water quality and erosion sediment controls to ensure they are functional. - Review works being done and note any deviation from standard process. - Reduce suspended sediment attributable to works by implementing one or more adaptive management practices. - Return to normal operations can only take place if sediment generating activities are reduced by employing adaptive work management practices to minimise suspended sediment, examples include: - brief suspension of operations depending on weather and tide - optimise work methods to reduce disturbance and intensity of works. - change work location until area is stabilised.	Results above criteria and background values not suitable for re-use on site. - Confirm measurement at least three times over next 3 hours. - Alert Project Manager (PM). - Undertake additional sampling and testing to inform management options including waste classification or treatment requirements. Environmental specialist to advise on suitable waste disposal and/or treatment options, such as pH dosing, flocculation, aeration, based on monitoring results. - Project Manager to immediately instruct all plant to: - suspend operations associated with the exceedance, and works highly likely causing the exceedance, until such time contractor can demonstrate that the operation is “environmentally secure”, and all controls are functioning and in place; OR - go to established operational modes known to reduce sediment generating activities. - Contractor to investigate and identify the source of the exceedance (this can be in conjunction with the EM and PM). - Return to normal operations can only take place if sediment generating activities are reduced by employing adaptive work management practices to minimise suspended sediment, examples include: - brief suspension of operations depending on weather and tide. - optimise work methods to reduce disturbance and intensity of works. - change work location until area is stabilised.
Response	Continue to monitor, check controls, works processes and document results in project reports.	- Check controls, works processes and document results in project reports. - Continue to monitor, upstream and downstream of the point of exceedance for the above criteria; photograph monitoring of the sample point and upstream and downstream. - EM to review criteria against background values and project dataset.	- Incident investigated and reported internally; corrective actions are applied where appropriate; - The EM conducts incident investigation and mitigation processes; - The EM and PM will trigger the Incident Management process until the incident is closed; - The EM may initiate an enhanced monitoring program, with daily sampling for up to five days following the event. Additional laboratory testing may be required in accordance with the RAP; - Monitoring upstream and downstream of the point of exceedance for the above criteria; - photograph monitoring of the sample point and upstream and downstream; - The EM will develop and implement a remedial action plan (short-term focus) for immediate response; - The EM will commission an independent incident investigation; - The EM will develop and implement a remedial action plan in consultation with agencies.
Plan	A summary of results is provided within the monthly project report.	A summary of environmental incidents is provided within the monthly project report. Internal and external reporting requirements are completed in accordance with the project CEMP (Section 11) Update the ESCP and CEMP (as required) Follow up information is provided to the EPA, and NSWPorts where requested.	A summary of environmental incidents is provided within the monthly project report. Internal and external reporting requirements are completed in accordance with the project CEMP (Section 11) Update the ESCP and CEMP (as required) Follow up information is provided to the EPA, and NSWPorts where requested.



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Erosion Sediment Control Plan
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Attachment C

Stockpile Location Selection Criteria

Stockpile Location Selection Criteria

Criteria		Does the proposed site meet the criteria?	If NO, provide justification/ additional mitigation measures to demonstrate how potential impacts will be managed:
Vegetation	Site should not require removal of areas of native vegetation (where feasible and reasonable)		
	Site should be located outside of the 'dripline' of trees		
	Site should be located outside of the protection zone of trees or native vegetation identified for retention. Refer to AS 4970.		
	Site should be located outside known areas of weed infestation		
	Site should be located on land that does not require the removal of threatened species, EECs or roosting habitat for listed fauna species		
Drainage	Site should be located away from areas subject to concentrated overland flow.		
	Site should be located away from drainage lines and watercourses		
	Site should be located such that waterways and drainage lines are not directly impacted		
	Site should be located at least 5 m from likely areas of concentrated water flows and at least 10 m from waterways that are classified as Class 1 and Class 2 from the DPI Fisheries guideline "Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings"		
	Site located on a floodplain should be managed so as to minimise loss of material in flood or rainfall events.		
Dust & noise	Site should be located away from dust sensitive locations and high wind areas		
	Site should be located away from noise sensitive locations		
Access	Site must be positioned so that the stockpiled material is accessible at any time		



Criteria		Does the proposed site meet the criteria?	If NO, provide justification/ additional mitigation measures to demonstrate how potential impacts will be managed:
	Site should have ready access to the road network or direct access to the construction corridor		
Heritage	Site should be located in areas of low heritage conservation significance (including identified Aboriginal Cultural value) and not impact on heritage sites beyond those already impacted by the Project.		



Attachment D
Register of Progressive Erosion Sediment Control Plans
(PESCP)

(Append Copies of PESCPs)

Register of Progressive Erosion Sediment Control Plans (PESCP)

Plan No.	Revision	Change / Description	Prepared by	Date	Soil specialist Initials & Date	Env. Manager Initials & Date	Superseded By Plan No. / Comment
20399-ESC10	Rev.A	ESC procedures	TFA	9.03.2023			
20399-ESC11	Rev.B	Stage 1. Existing concrete wall added.	TFA	10/03/2023			
20399-ESC12	Rev.B	Stage 2A. Sediment basins designs updated	TFA	10/03/2023			
20399-ESC13	Rev.B	Stage 2A. Pipeline outline updated.	TFA	13/03/2023			
20399-ESC14	Rev.A	Stage 3.	TFA	09/03/2023			
20399-ESC15	Rev.A	Stage 4.	TFA	09/03/2023			
20399-ESC16	Rev.A	Onsite containment area	TFA	09/03/2023			
20399-ESC17	Rev.A	Construction details	TFA	09/03/2023			

Append copies of PESCPs

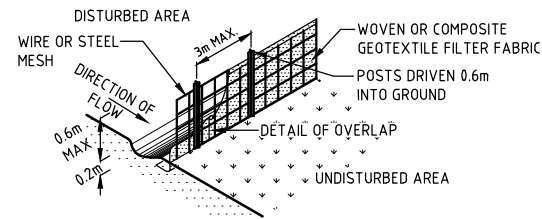


FIG. 1 - SEDIMENT FENCE

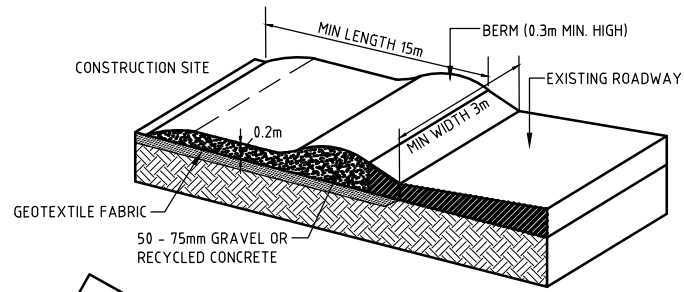
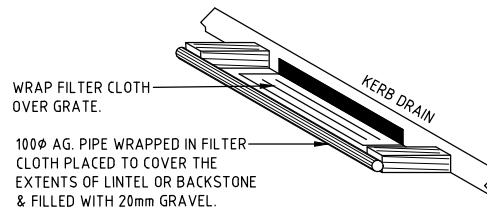


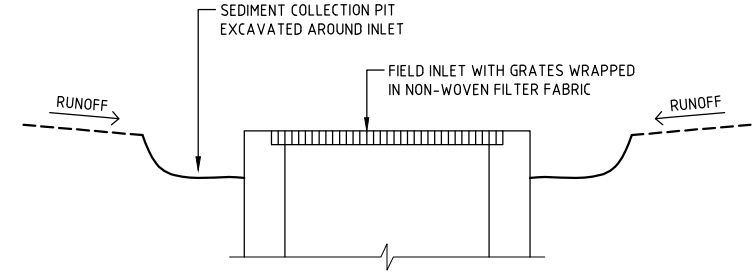
FIG. 2 - CONSTRUCTION EXIT/ENTRY

MAINTENANCE:

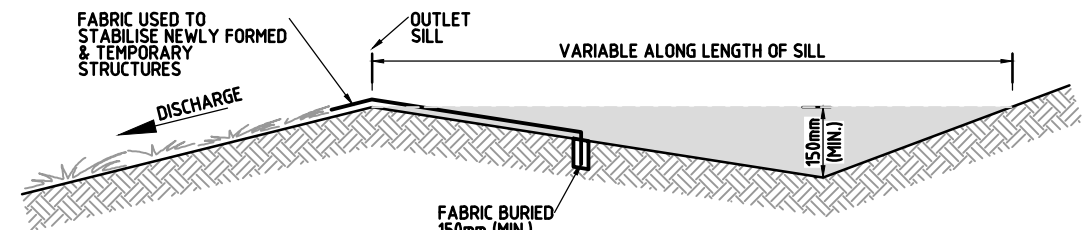
1. THE ENTRANCE SHOULD BE MAINTAINED SO THAT IT PREVENTS TYRES FROM TRACKING.
2. DRESSING WITH ADDITIONAL AGGREGATE IF REQUIRED.
3. REGULARLY REMOVE SEDIMENT FROM ROADWAY.



KERB INLET PROTECTION DETAIL



GRATED INLET SEDIMENT TRAP DETAIL

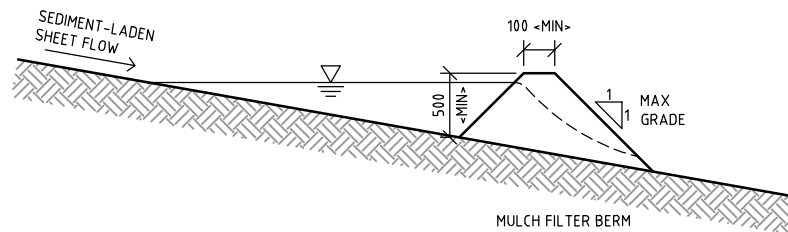


TYPICAL PROFILE OF THE OUTLET WEIR

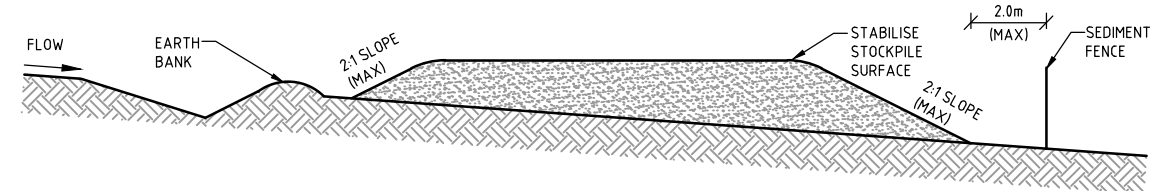
LEVEL SPREADER

LEVEL SPREADER INSTALLATION:

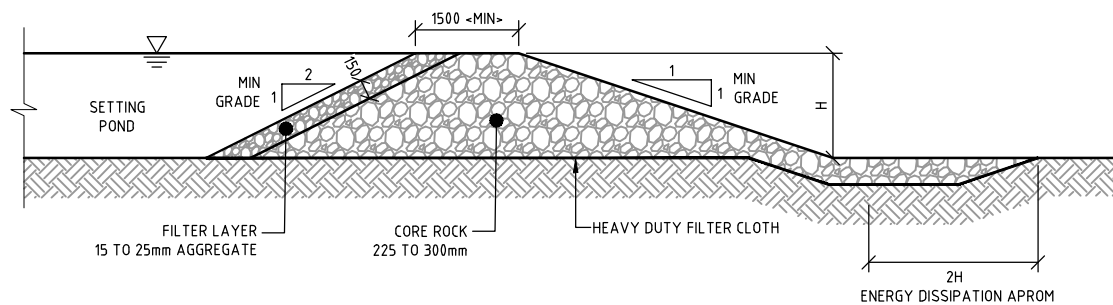
1. THE OUTLET SILL OF THE SPREADER SHOULD BE PROTECTED WITH EROSION CONTROL MATTING TO PREVENT EROSION DURING THE ESTABLISHMENT OF VEGETATION. THE MATTING SHOULD BE A MINIMUM OF 1200mm WIDE EXTENDING AT LEAST 300mm UPSTREAM OF THE EDGE OF THE OUTLET CREST & BURIED AT LEAST 150mm IN A VERTICAL TRENCH. THE DOWNSTREAM EDGE SHOULD BE SECURELY HELD IN PLACE WITH CLOSELY SPACED HEAVY-DUTY WIRE STAPLES AT LEAST 150mm LONG.
2. ENSURE THAT THE OUTLET SILL (CREST) IS LEVEL FOR THE SPECIFIED LENGTH.
3. IMMEDIATELY AFTER CONSTRUCTION, TURF, OR SEED & MULCH WHERE APPROPRIATE, THE LEVEL SPREADER.



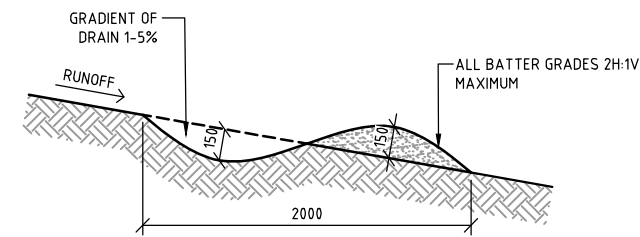
MULCH FILTER BERM



TYPICAL STOCKPILE CONFIGURATION



ROCK FILTER DAM



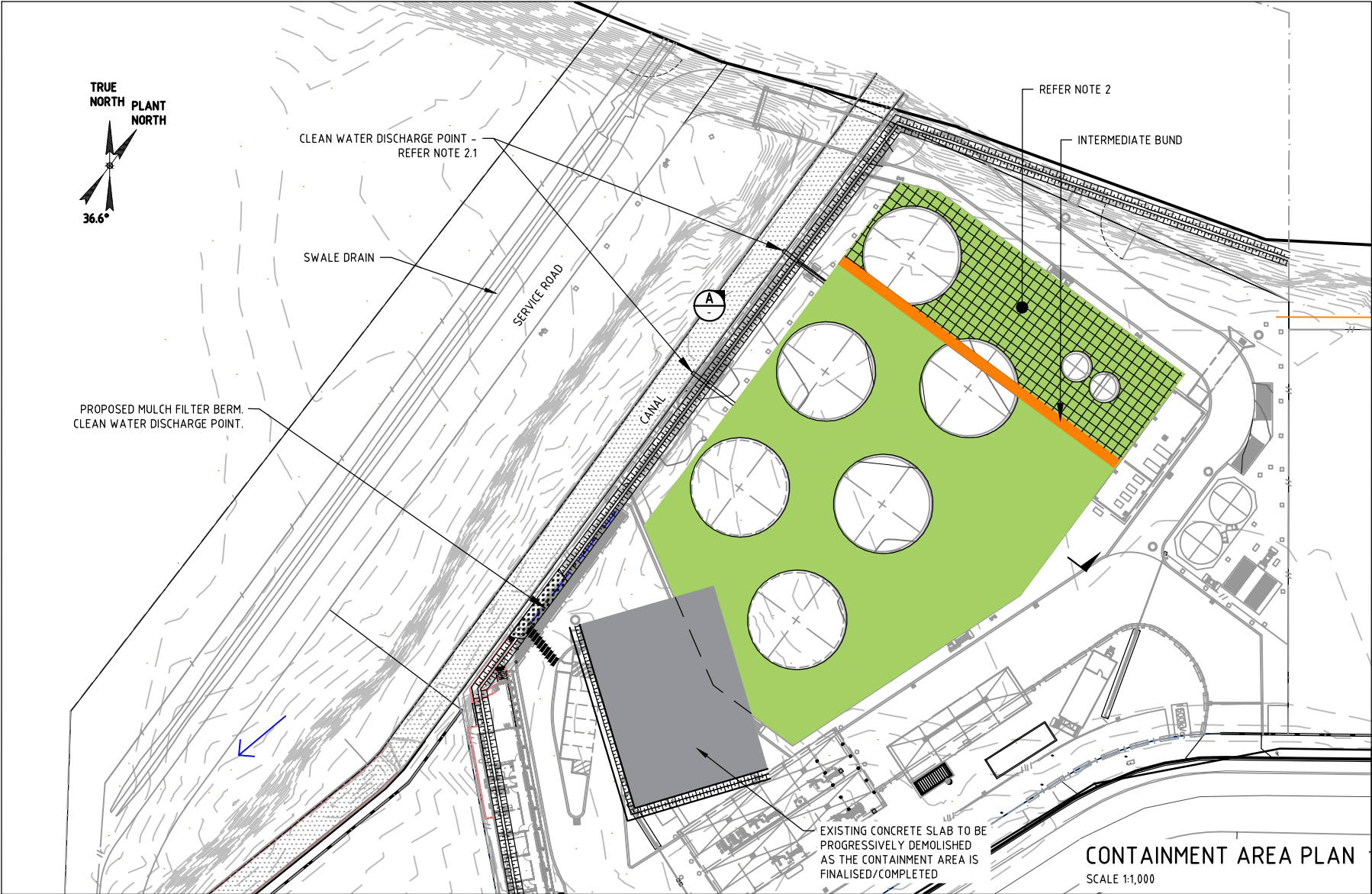
FLOW DIVERSION BANKS

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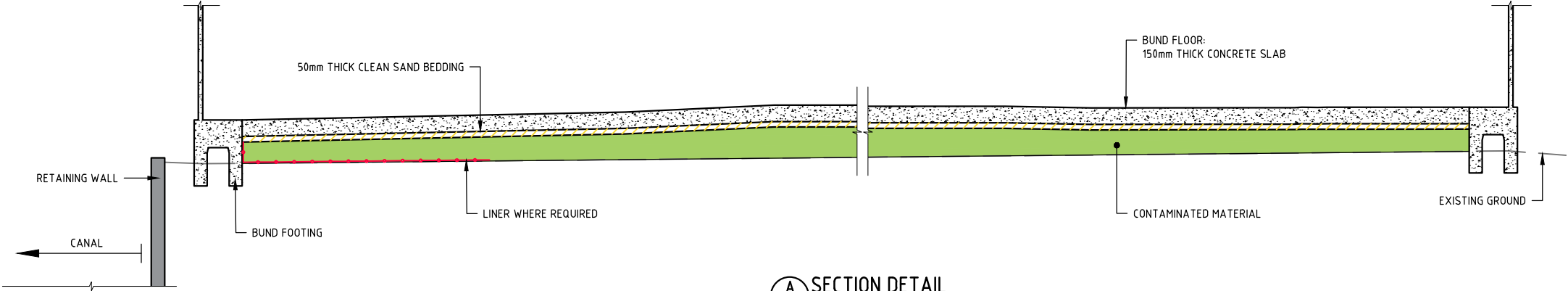
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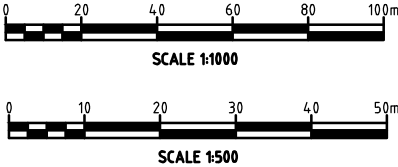


- LEGEND**
- DENOTES CONTAMINATED MATERIAL
 - CONCRETE SLAB
 - SAND BEDDING
 - PROPOSED STORMWATER RUNOFF RETENTION BASIN

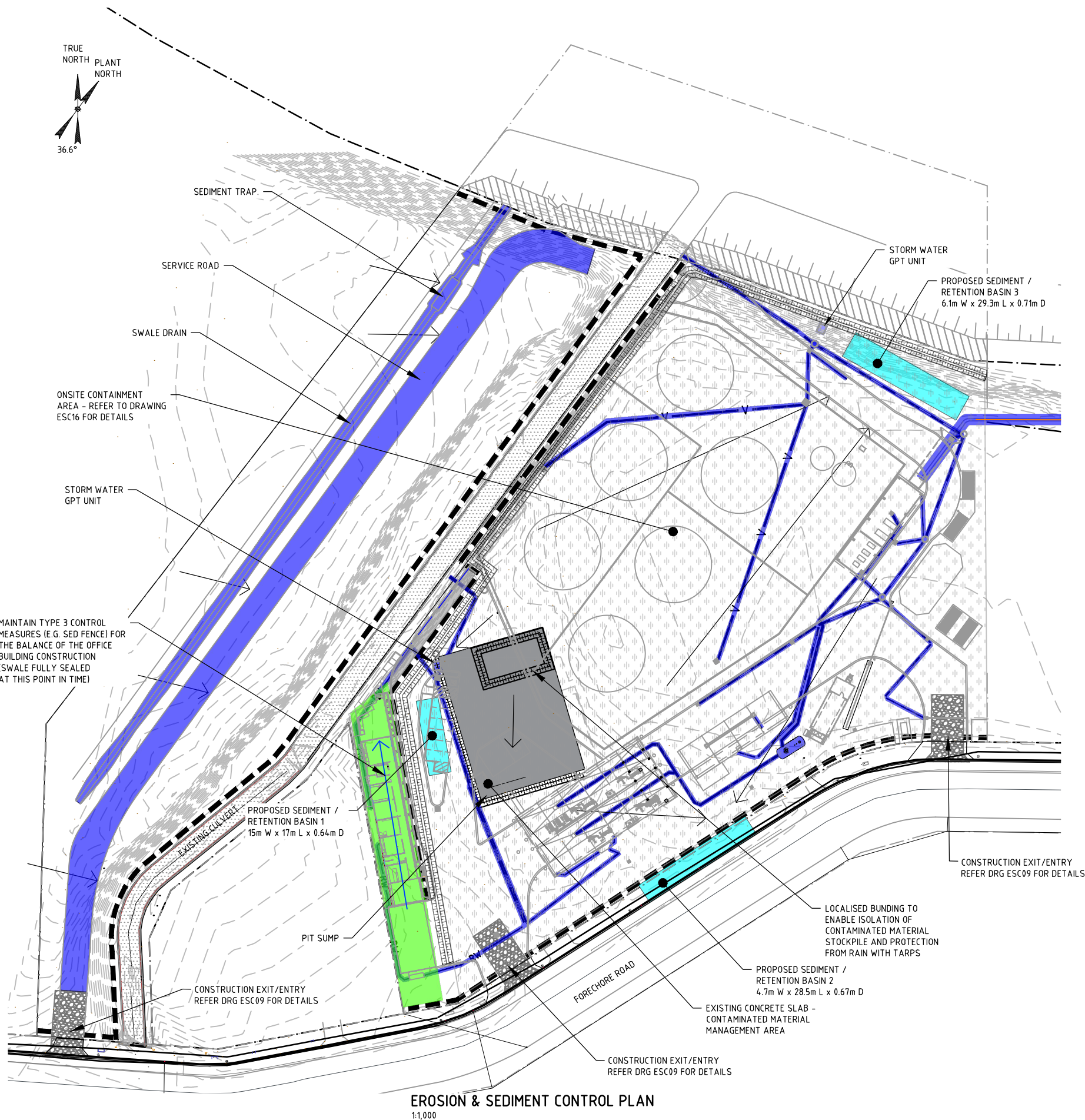
- NOTES:**
- THE CONTAINMENT FILL AREA WILL HAVE CONTROLS TO MINIMIZE ANY POTENTIAL CONTAMINATED RUNOFF BY ISOLATING THE CONTAMINATED FILL WITH INTERMEDIATE BUNDS AND CONTINUOUS AND/OR PROGRESSIVE COVERING OF THE FILLED AREA WITH IMPERMEABLE MATERIAL (I.E. BUILDERS PLASTIC) UNTIL FINAL SEALING WITH CONCRETE PAVEMENT. THE DISCHARGE POINTS PROVIDED WITHIN THE CELL ARE ESTIMATED TO BE CLEAN WATER AND AS FILL PLACEMENT OCCURS, THE DISCHARGE POINTS ARE TO BE DECOMMISSIONED TO AVOID ANY CONTAMINATED SEEPAGE. MORE DETAILED MEASURES WILL BE PROVIDED AT CONSTRUCTION PHASE.
 - DETAILS OF PROPOSED ONSITE CONTAINMENT AREA (E.I. CAPACITY, STAGING, PLACEMENT AROUND PILES, ETC) TO BE PROVIDED AT DETAIL, DESIGN/CONSTRUCTION PHASE AND REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THE REMEDIAL ACTION PLAN.



A SECTION DETAIL
HORIZONTAL 1:500
VERTICAL 1:100



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LEGEND:

- PROPERTY BOUNDARY.
- EXTENT OF SEDIMENT FENCE OR STRAW BALE FILTER. REFER TO BLUE BOOK STD DRAWINGS SD6-7 AND SD6-8 FOR DETAILS OR APPROVED EQUIVALENT.
- FLOW DIVERSION BANK (300mm HIGH, TYP.) REFER BLUE BOOK STD DRAWING SD5-5 FOR DETAILS OR APPROVED EQUIVALENT.
- EXISTING CONTOUR LEVELS (0.25m INTERVALS).
- DIRECTION OF SURFACE FALL.
- CLEAN WATER DIRECTION.
- PROPOSED FLOOD WATERS SWALE
- STAGE 3 EXTENT OF WORKS (APPROXIMATE).
- PROPOSED STORMWATER RUNOFF RETENTION BASIN.
- STAGE 3 EXTENT OF PAVEMENT GRAVELS

NOTES:

- STAGE 3 WORKS CONSISTS OF:
 - INSTALLATION OF THE UNDERGROUND SERVICES AND PROGRESSIVE PLACEMENT OF ROADBASE GRAVELS ACROSS THE SITE.
 - PLACE CONTAMINATED MATERIALS INSIDE BUND AREA AND COMPACT AND ADD FILL OF REQUIRED (PROGRESSIVELY DEMOLISH CONTAMINATED MATERIAL BUND).
 - PROGRESSIVE CONSTRUCTION OF CONCRETE BUND WALLS AND FLOORS
 - CONSTRUCTION OF BUILDING CONCRETE SLABS AND SITE DRIVEWAYS.
 - COMMISSIONING OF STORMWATER GPT'S
 - BITUMEN SPRAY SEAL OF FLOOD WATER SWALE AND INSTALLATION OF SEDIMENT FENCING.
 - CONDUCT A REVIEW AND DETERMINE THE SEQUENCE TO PROGRESSIVELY DEMOLISH THE SEDIMENT/RETENTION BASINS.
- THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES ARE PROPOSED:
 - POTENTIAL STORMWATER WITHIN EXCAVATION ZONES SHALL BE MANAGED WITHIN THE EXTENT OF WORKS.
 - THE CONTRACTOR SHALL PLACE A TEMPORARY COVER SYSTEM AS FILLING WORKS OCCUR IN THE ONSITE CONTAINMENT AREA, TO LIMIT THE CONTAMINATED FILL SATURATING. IF HEAVY RAINFALL EVENTS ARE FORECASTED, A MITIGATION MEASURE (i.e. COVER THE TOP OF ENTIRE STOCKPILE) WILL BE IN PLACE TO LIMIT THE CELL FILLING WITH WATER.
 - STORMWATER RUNOFF WILL BE DIRECTED TOWARDS THE PROPOSED SEDIMENT/RETENTION BASINS.
 - CONTRACTOR SHALL PLACE CLEAN ROADBASE FILL AS PRACTICALLY POSSIBLE TO LIMIT EXPOSURE OF DISTURBED SURFACES.

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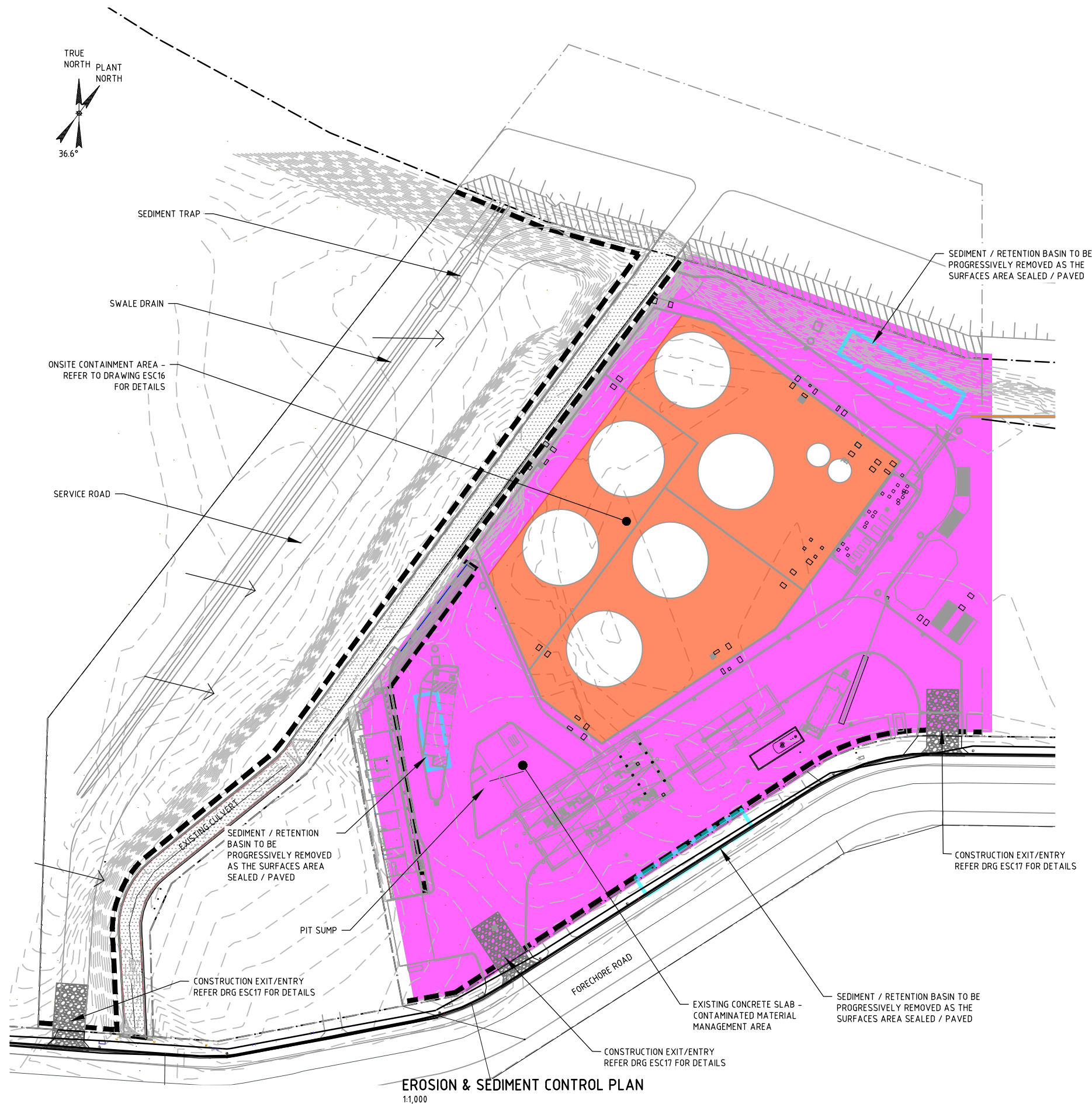
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EROSION & SEDIMENT CONTROL PLAN

1:1,000

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CONSTRUCTION EXIT – ROCK PAD MATERIALS:

- ROCK : WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTURBANCES) OR 100 TO 150mm (LARGE DISTURBANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.
- FOOTPATH STABILISING AGGREGATE : 25 TO 50mm GRAVEL OR AGGREGATE.
- GEOTEXTILE FABRIC : HEAVY-DUTY, NEEDLE -PUNCHED, NON- WOVEN FILTER CLOTH (‘BIDIM’ A24 OR EQUIVALENT).

INSTALLATION:

- CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS & OTHER VEGETATION TO PROVIDE A FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSED INTO SOFT GROUND. CLEAR SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR THE EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION & SEDIMENT CONTROL DEVICES ARE IN PLACE.
- IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF CRUSHED ROCK OR A LAYER OF HEAVY-DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.
- PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAN, OPEN-VOID ROCK.
- IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCKPAD, THUS CAUSING STORMWATER RUNOFF TO FLOW TOWARD THE ROCK PAD, THEN FORM A MINIMUM 300mm HIGH FLOW CONTROL BERM ACROSS THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUITABLE SEDIMENT TRAP.
- THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 15m WHERE PRACTICABLE, & AS WIDE AS THE FULL WIDTH OF THE ENTRY OR EXIT & AT LEAST 3m. THE ROCK PAD SHOULD COMMENCE AT THE EDGE OF THE OFF-SITE SEALED ROAD OR PAVEMENT.
- FLARE THE END THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.
- IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THEN COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

SEDIMENT AND EROSION CONTROL NOTES:

- ALL THE SEDIMENT & EROSION CONTROL MEASURES TO BE IN ACCORDANCE WITH LOCAL COUNCIL’S GUIDE LINES.

PRIOR TO THE COMMENCEMENT OF CONSTRUCTION:

- AVOID STRIPPING & EXCAVATING UNTIL READY TO BUILD .
- INSTALL SEDIMENT FENCES .

SPECIFICATION:

- SILT FENCE SHALL NOT BE REMOVED UNTIL SITE HAS BEEN PAVED & SURFACED.
- BUND WALLS SHALL BE LOCATED AROUND ALL PITS & MAINTAINED UNTIL THE CATCHMENT AREA HAS BEEN PAVED.
- KERB DRAIN EXCLUDER SHALL INCORPORATE TRAFFIC CONTROL BARRICADES IN ACCORDANCE WITH AS1742.3 – 1985, & SHALL NOT BE PLACED UNTIL WORKS ARE BEING CARRIED OUT ON THE FOOTPATH AREA, OR AS OTHERWISE DIRECTED BY COUNCIL.
- ALL SEDIMENT TRAPS, EXCLUDERS, BUND WALLS SHALL BE INSPECTED & CLEANED AFTER EACH STORM EVENT. DAMAGED OR CLOGGED BUNDING ARE TO BE REMOVED AND REPLACED.
- THE BUILDER SHALL CARRY OUT ANY ADDITIONAL WORKS DEEMED NECESSARY AND DIRECTED BY COUNCIL TO BE CARRIED OUT.
- THE SEDIMENT CONTROL PLAN SHALL BE IMPLEMENTED PRIOR TO ANY WORKS BEING CARRIED OUT ON SITE.

HOLD POINTS:

INSPECTION OF EROSION AND SEDIMENT CONTROL DEVICES MUST BE UNDERTAKEN BY THE SUPERVISING OR SUPERINTENDENT ENGINEER AT A MINIMUM AT THE FOLLOWING HOLD POINTS:

- PRIOR TO COMMENCEMENT OF BULK EARTHWORKS.
- PRIOR TO LIVE CONNECTION OF NEW STORMWATER DRAINAGE TO THE EXISTING SYSTEM.
- PRIOR TO ANY IN STREAM WORKS.
- PRIOR TO ON MAINTENANCE OR OFF MAINTENANCE INSPECTION.
- AT INTERVALS NOT EXCEEDING ONE MONTH.

COPIES OF INSPECTION REPORTS SHALL BE KEPT ON SITE.

SEDIMENT BARRIERS:

SEDIMENT FENCE

- INSTALL SEDIMENT FENCE(S) ALONG THE LOW SIDE OF THE SITE, AND IDEALLY ALONG A LINE OF CONSTANT LAND LEVEL TO PREVENT THE CONCENTRATION OF STORMWATER RUNOFF. IN AREAS WHERE IT IS EITHER UNDESIRABLE OR IMPRACTICAL TO BURY THE LOWER EDGE OF THE SEDIMENT FENCE, THE LOWER 200mm (MIN) PORTION OF THE FABRIC SHOULD BE PLACED O THE GROUND UP-SLOPE OF THE FENCE AND BURIED UNDER A 100mm (MIN)LAYER OF AGGREGATE. SEDIMENT FENCES ON BUILDING SITES CAN BE STAPLED TO APPROXIMATELY 40mm SQUARE HARDWOOD POSTS OR WIRE TIED TO STEEL POSTS.

FIELD INLET GULLIES

- SEDIMENT CONTROLS FOR STORMWATER INLETS LOCATED WITHIN THE PROPERTY BOUNDARIES MAY CONSIST OF GEOTEXTILE FABRIC PLACED EITHER DIRECTLY OVER THE GRATED INLET OR AROUND THE INLET SUPPORT BY A TIMBER FRAME. FIELD INLET PROTECTION IS NECESSARY WHERE INLETS DRAIN AREAS OF BARE AND UNPROTECTED SOIL. DURING STORMS, PONDING SHOULD BE ALLOWED TO OCCUR AROUND THE STORMWATER INLET TO ASSIST IN THE SETTING OUT OF SEDIMENTS.

PAVEMENT INLET GULLY

- A ROADSIDE INLET BARRIER IS TO BE INSTALLED, SO THAT IT SHOULD NOT BE ALLOWED TO FULLY BLOCK THE INLET STRUCTURE. ON A HILLSIDE, SEDIMENT BARRIERS MAY CONSIST OF A TEMPORARY DAM CONSTRUCTED FROM SAND AND GRAVEL BAGS AT LEAST 4 METRES UP SLOPE FROM THE GULLY INLET.

BUILDING OPERATIONS:

- ERODABLE MATERIAL MISTAKENLY PLACED WITHIN THE ROAD RESERVE (INCLUDING ACCIDENTAL SPILLAGE AND TRACKING OF SUCH MATERIALS ONTO THE ROAD) THAT CAN NOT BE PREVENTED THROUGH REASONABLE MEANS, MUST BE:
 - (a) REMOVED IMMEDIATELY IF RAINFALL IS IMMINENT OR OCCURRING.
 - (b) REMOVED PRIOR TO THE END OF THE DAY’S WORK IF RAINFALL NOT EXPECTED. MATERIALS SHOULD BE SWEEPED FROM THE ROAD, NOT WASHED DOWN THE GUTTER.
- ALL SOLID WASTE SHOULD BE STORED ON SITE IN SUCH A MANNER THAT IT IS PREVENTED FROM LEAVING THE SITE EITHER BY THE ACTION OF WIND OR WATER.
- SMALLER MATERIALS, SUCH AS LITTER, SHOULD BE CONTAINED IN COVERED BINS OR LITTER TRAPS FORMED ON THREE SIDES BY A GEOTEXTILE WIND BREAK.
- CONCRETE WASTE WASTED FROM TRUCKS AND MIXERS UNITS SHALL BE CONTAINED ON SITE AND SHALL NOT BE PLACED IN A POSITION WHERE IT COULD REASONABLY BE EXPECTED TO WASH FROM THE SITE AND HARM THE ENVIRONMENT.
- DUST SUPPRESSION OPERATIONS SHALL BE UNDERTAKEN TO MINIMISE THE RISK OF DUST RISE, INCLUDING WATER TRUCKS, MULCHING, EROSION CONTROL BLANKETS, SOIL BINDERS, VEHICLE SPEED LIMITS & STOCKPILE STABILISATION.

BULK EARTHWORKS:

- AVOID STRIPPING & EXCAVATING UNTIL READY TO BUILD.
- CONSTRUCTION OF AN ENTRY/EXIT POINT TO THE SITE SHOULD BE MANAGED SO THAT SEDIMENT IS NOT TRACKED OFF THE SITE.
- TOP SOIL SHOULD BE STOCKPILED ON SITE FOR LATER USE.
- WHERE PRACTICABLE MAINTAIN KERB VEGETATION IN A HEALTHY STATE DURING THE CONSTRUCTION PROGRESS.
- WHEN UP SLOPE WATER IS DIVERTED AROUND A WORK SITE IT IDEALLY SHOULD BE DISCHARGED AS SHEET FLOW THROUGH AN UNDISTURBED AREA BESIDE THE WORKS.

STOCKPILES:

- STOCKPILES ARE NOT TO BE STORED ON THE FOOTPATH OR THE ROAD RESERVE.
- WHERE NECESSARY STOCKPILE LOSSES CAN BE MINIMISED WITH THE USE OF COVERS.
- ALL STOCKPILES AND BUILDING MATERIAL SHOULD BE LOCATED WITHIN SEDIMENT CONTROL ZONE.
- TO MINIMISE EROSION AND THE LOSS OF SAND AND SOIL, STOCKPILES SHOULD BE NOT LOCATED WITHIN AN OVERLAND FLOW PATH. IF IT IS IMPRACTICAL TO AVOID STORMWATER RUNOFF BEING DIRECTED TO A STOCKPILE, THEN A PERIMETER BANK SHALL BE CONSTRUCTED UP SLOPE OF THE STOCKPILE TO DIRECT RUNOFF IN A CONTROLLED MANNER AROUND THE STOCKPILE.

GENERAL MAINTENANCE:

- SEDIMENT FENCES SHOULD BE REPLACED IF THE FABRIC IS RIPPED OR OTHERWISE DAMAGED. THE MAINTENANCE OF THE SEDIMENT FENCES INCLUDES THE REMOVAL OF SEDIMENT DEPOSITED UP SLOPE OF THE FENCE AND RETRENCHING THE FABRIC WHEN THE FENCE IS 25% FULL.
- FOLLOWING STORM EVENTS, THE ROAD RESERVE AND ALL SEDIMENT BARRIERS SHOULD BE INSPECTED AND ANY EXCESSIVE RESIDUE SHOULD BE APPROPRIATELY REMOVED.

SITE REHABILITATION:

- ALL GROUND DISTURBED BY THE CONSTRUCTION ACTIVITY SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED SO IT CAN NO LONGER ACT AS A SOURCE OF SEDIMENT.

SERVICES TRENCHES:

- TO AVOID UNNECESSARY SOIL EROSION, SERVICE TRENCHES SHOULD BE BACK FILLED, CAPPED AND COMPACTED TO A LEVEL AT LEAST 75-100mm ABOVE THE ADJOINING GROUND LEVEL.

OPERATION & MAINTENANCE

- EROSION & SEDIMENT CONTROL MEASURES SHALL BE INSPECTED:
 - A. DAILY (WHEN WORK IS OCCURRING ON SITE) OR WEEKLY (WHEN WORK IS NOT OCCURRING ON SITE)
 - B. WITHIN 24 HOURS OF EXPECTED RAIN
 - C. WITHIN 18 HOURS OF A RAINFALL EVENT (ie AN EVENT OF SUFFICIENT INTENSITY AND DURATION TO CAUSE RUNOFF).
- EROSION & SEDIMENT CONTROL MAINTENANCE MEASURES SHALL BE TRIGGERED WHEN THE CAPACITY OF THE MEASURE FALLS BELOW 75%. THE MAINTENANCE SHALL BE PERFORMED BY THE END OF THE DAY.
- PRIOR TO LONG PERIODS OF SHUT DOWN (GREATER THAN 5 DAYS) THE SITE SHALL EITHER TO BE PROVIDED WITH TEMPORARY GROUND COVER (AT LEAST 70% EFFECTIVE COVER) OR HAVE ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE CONTINUALLY OPERATED DURING THE SHUTDOWN, INCLUDING ONGOING MONITORING AND SEDIMENT BASIN CLEANOUTS.
- SHUTDOWN PERIODS IN EXCESS OF 3 MONTHS ARE TO HAVE 100% LONG TERM SITE COVERAGE SUCH AS HYDROMULCH OR GEOFABRIC.
- STORMWATER RELEASE LIMITS:
 - ALL RELEASES OF STORMWATER CAPTURED ON-SITE, UNLESS OTHERWISE NOTED MUST NOT EXCEED THE FOLLOWING LIMITS:
 - A. 50mg/L OF TOTAL SUSPENDED SOLIDS (TSS) AS A MAXIMUM CONCENTRATION.
 - B. TURBIDITY (NTU) VALUE LESS THAN 10% ABOVE BACKGROUND
 - C. pH VALUE MUST BE IN THE RANGE 6.5 TO 8.5 EXCEPT WHERE, AND TO THE EXTENT THAT, THE NATURAL RECEIVING WATERS LIE OUTSIDE THIS RANGE.
 - D. ANY OTHER ADOPTED CRITERIA FOR CONTAMINANTS AS DEFINED WITHIN THE CONSTRUCTION STORMWATER MANAGEMENT PLAN.
 - WEATHER FORECASTS SHALL BE MONITORED AND IN THE EVENT OF HEAVY RAIN FORECAST ALL MAINTENANCE AND PREVENTION METHODS SHALL BE IMPLEMENTED

STOCKPILE MANAGEMENT

SAND MATERIAL OR IMPORTED ROADBASE GRAVEL:

- NO COVER REQUIRED WHEN WIND EROSION AND DUST CONTROL IS NOT AN ISSUE
- SYNTHETIC COVER IS REQUIRED WHEN THE CONTROL OF WIND EROSION IS REQUIRED FOR SAFETY, TO BE INSTALLED BY THE END OF THE DAY.

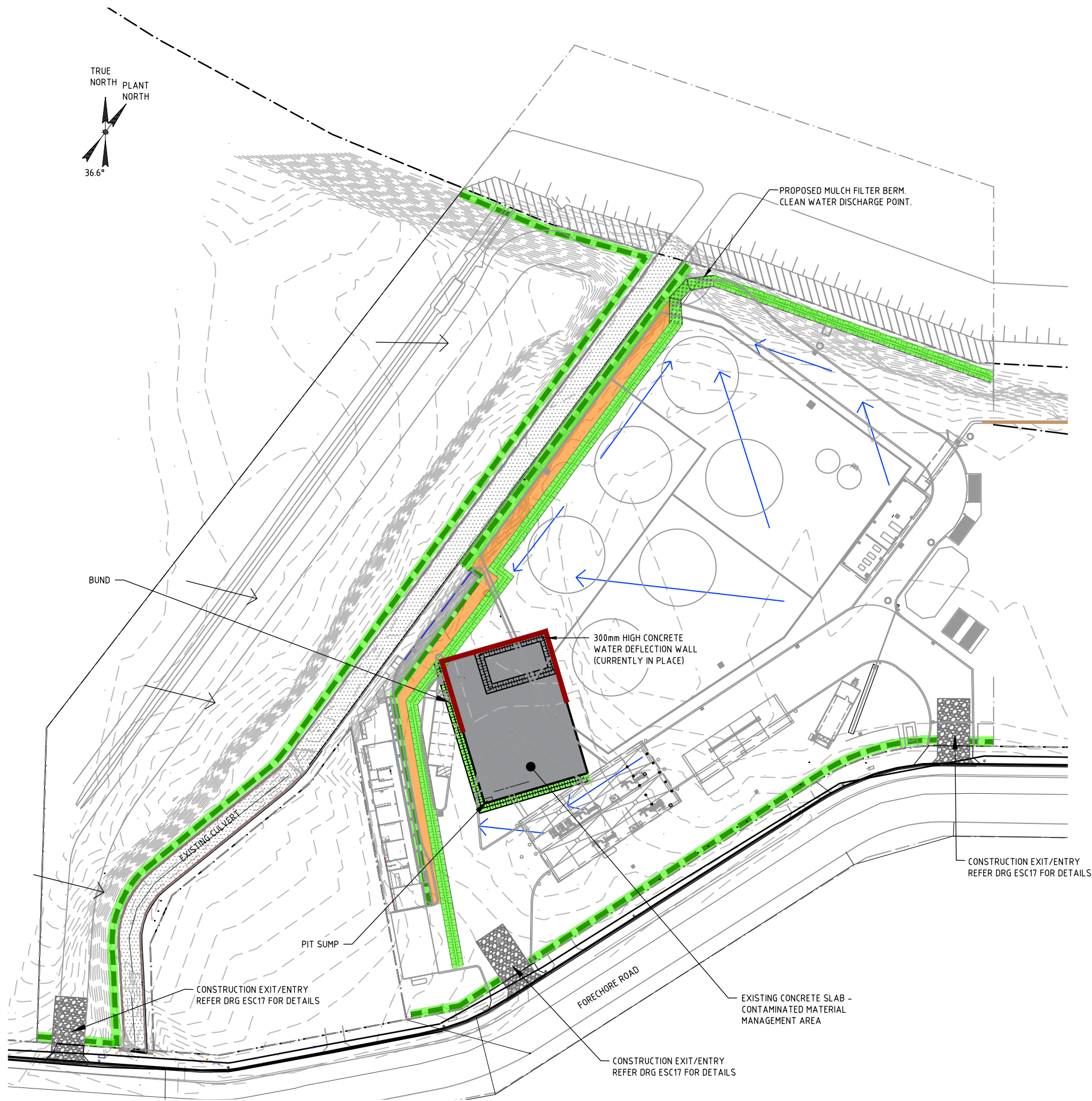
SOIL EXCAVATED MATERIAL (EXCLUDING CONTAMINATED OR ASS SOILS):

- NO COVER REQUIRED WHEN WIND EROSION AND DUST CONTROL IS NOT AN ISSUE.
- MULCHING, CHEMICAL STABILIZERS, SOIL BINDERS, IMPERVIOUS BLANKETS OR VEGETATIVE COVER IS REQUIRED WHEN:
 - >28 DAY STOCKPILING OF DISPERSIVE SOILS
 - >28 DAY STOCKPILING OF CLAYEY SOILS WHERE TURBIDITY CONTROL IS DESIRABLE
 - >5/10 DAY STOCKPILING OF SOILS DURING MONTHS OF EXTREME/HIGH EROSION RISK (JAN, FEB, MAR, APR, NOV, DEC)
 - ALL STOCKPILES OF CLAYEY SOILS WHEN TURBIDITY CONTROL IS ESSENTIAL.

SOIL EXCAVATED MATERIAL (CONTAMINATED AND/OR ACID SULFATE SOILS):

- CONTAMINATED AND/OR ACID SULFATE SOILS TO BE MANAGED AS PER REQUIREMENTS OF THE SPECIFIC MANAGEMENT PLANS WITHIN DESIGNATED STOCKPILING AREAS LOCATED AWAY FROM STORMWATER DRAINAGE PATHWAYS AND FEATURES. INCLUDING BUT NOT LIMITED TO:
 - A. SOIL MATERIALS STOCKPILED ON SUITABLE HARDSTAND OR COMPACTED IMPERVIOUS SURFACES WITHIN A BUNDED CONTAINED AREA TO DIVERT STORMWATER RUNON.
 - B. COVER REQUIRED ON ALL CONTAMINATED AND/OR UNTREATED ACID SULFATE SOILS STOCKPILED TO PREVENT LEACHING INTO STORMWATER. UNCOVERED AREAS REQUIRED TO HAVE CONTINGENCY ‘SUMP/LOW POINT’ FOR COLLECTION AND TREATMENT OF ANY RUNOFF/LEACHATE GENERATED FROM STOCKPILE.
 - C. MINIMISE DURATION OF TEMPORARY STOCKPILING WHERE POSSIBLE BY RELOCATING TO ONSITE CONTAINMENT AREA OR BACKFILLED WITHIN EXCAVATIONS.

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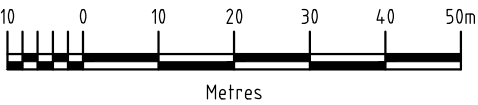


LEGEND:

- PROPERTY BOUNDARY
- EXTENT OF SEDIMENT FENCE OR STRAW BALE FILTER. REFER TO BLUE BOOK STD DRAWINGS SD6-7 AND SD6-8 FOR DETAILS OR APPROVED EQUIVALENT
- FLOW DIVERSION BANK (300mm HIGH, TYP.) REFER BLUE BOOK STD DRAWING SD5-5 FOR DETAILS OR APPROVED EQUIVALENT
- EXISTING CONTOUR LEVELS (0.25m INTERVALS)
- DIRECTION OF SURFACE FALL
- CLEAN WATER DIRECTION
- MULCH FILTER BANK OR ROCK FILTER DAM. REFER IECA STD DRAWING MB-01 OR BLUE BOOK STD DRAWING RFD-01 FOR DETAILS OR APPROVED EQUIVALENT.
- STAGE 1 EXTENT OF WORKS (APPROXIMATE)
- STAGE 1 UPSTREAM CATCHMENT

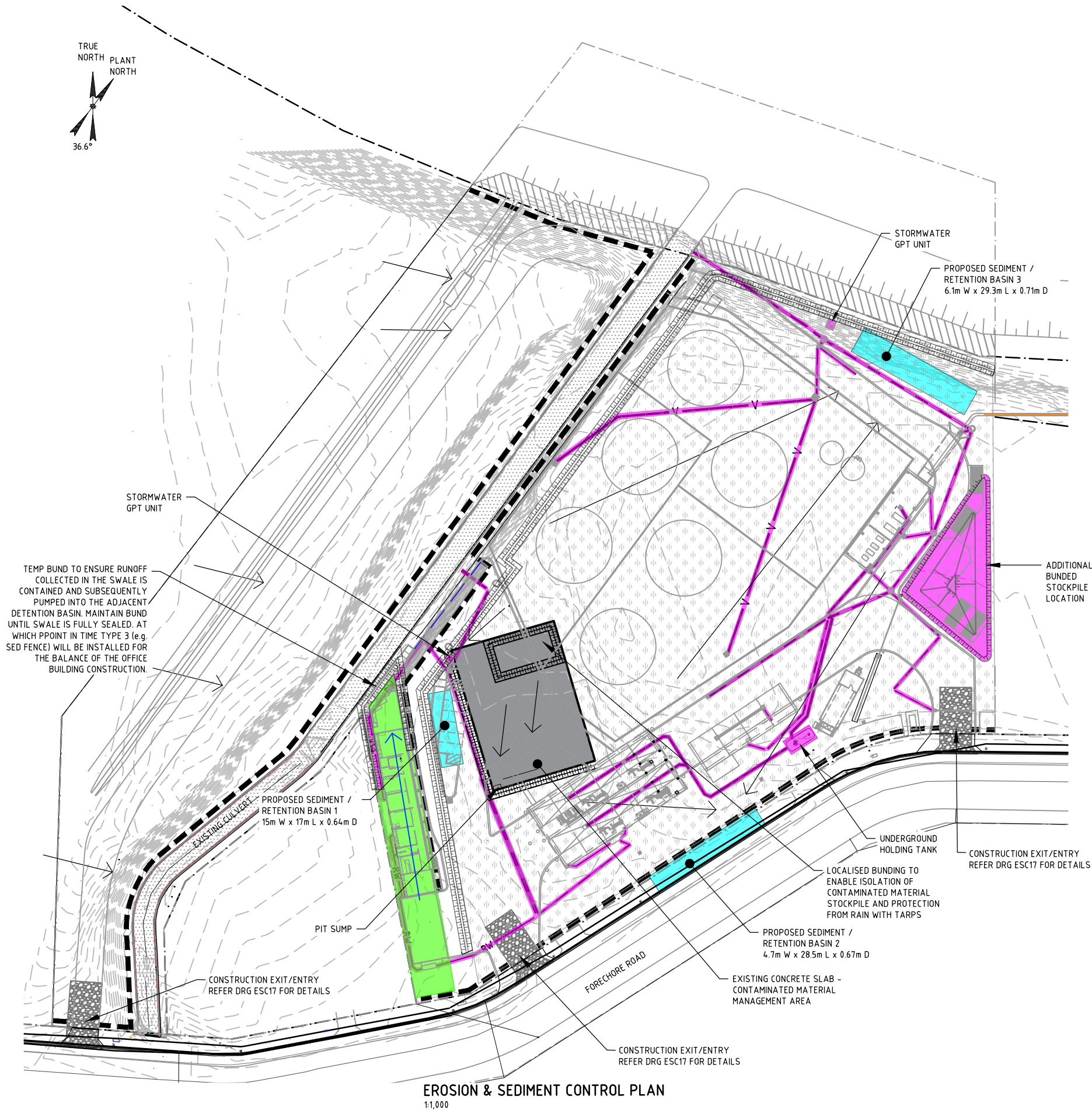
NOTES:

- STAGE 1 WORKS CONSISTS OF:
 - THE INSTALLATION OF FLOW DIVERSION BANKS ON THE UPSTREAM SIDE OF THE AREA OF WORKS, TO MINIMIZE THE AMOUNT OF SURFACE RUN OFF.
 - THE INSTALLATION OF SEDIMENT FENCE OR STRAW BALE FILTER, DOWNSTREAM OF THE AREA OF THE WORKS (I.E. BETWEEN THE RETAINING WALL AND EXISTING CANAL).
 - CONSTRUCTION OF THE GRAVITY RETAINING WALL.
 - THE FOOTING EXCAVATION WILL BE USED AS A TEMPORARY BASIN AND/OR SUMP, TO ALLOW ANY COARSE SEDIMENT TO SETTLE. THE CONTRACTOR IS TO ENSURE THAT MOBILE TEMPORARY PUMPS ARE AVAILABLE IN THE EVENT INCLEMENT WEATHER IS FORECASTED TO EXTRACT THE WATER OUT OF THE TEMPORARY BASIN AND/OR SUMP AND INTO A TEMPORARY HOLDING TANK OF SUITABLE CAPACITY PRIOR TO OFFSITE DISPOSAL.
 - INSTALLATION OF MAIN EROSION AND SEDIMENT CONTROL MEASURES.
- THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES ARE PROPOSED:
 - THE INSTALLATION OF FLOW DIVERSION BANKS ON THE UPSTREAM SIDE OF THE AREA OF WORKS, TO MINIMIZE THE AMOUNT OF SURFACE RUN OFF.
 - THE INSTALLATION OF A SEDIMENT FENCE OR STRAW BALE FILTER, DOWNSTREAM OF THE AREA OF WORKS (I.E. BETWEEN THE RETAINING WALL AND EXISTING CANAL).
 - PREPARATION OF THE EXISTING CONCRETE SLAB TO BECOME CONTAMINATED MATERIAL STOCKPILE/MANAGEMENT AREA.



EROSION & SEDIMENT CONTROL PLAN
1:1,000

PROJECT MANAGERS PLANNERS DESIGNERS ENGINEERS				REV	DATE	BY	DESCRIPTION	CHK	APP	PROJECT CLIENT	PROJECT DETAILS	DRAWING TITLE	STATUS					
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	B	10.03.23	CV	EXISTING CONCRETE WALL ADDED	JA							DATE CREATED 09.03.23	ORIGINAL SCALE 1:1,000	SHEET A3				
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	DRAWING NO												REV					
	20399-ESC11												B					



EROSION & SEDIMENT CONTROL PLAN
1:1,000

LEGEND:

	PROPERTY BOUNDARY.
	EXTENT OF SEDIMENT FENCE OR STRAW BALE FILTER. REFER TO BLUE BOOK STD DRAWINGS SD6-7 AND SD6-8 FOR DETAILS OR APPROVED EQUIVALENT.
	FLOW DIVERSION BANK (300mm HIGH, TYP.) REFER BLUE BOOK STD DRAWING SD5-5 FOR DETAILS OR APPROVED EQUIVALENT.
	EXISTING CONTOUR LEVELS (0.25m INTERVALS).
	DIRECTION OF SURFACE FALL.
	CLEAN WATER DIRECTION.
	PROPOSED FLOOD WATERS SWALE
	STAGE 2A EXTENT OF WORKS (APPROXIMATE).
	STAGE 2A EXTENT OF RECONTOURING/NULK EARTHWORKS
	RETENTION BASIN.

NOTES:

- STAGE 2A WORKS CONSISTS OF:
 - ESTABLISH BUND/S AROUND EXTERIOR OF THE SITE AND INTERNAL
 - RECONTOURING OF THE SITE (BULK EARTHWORKS)
 - CONSTRUCTION OF THE SEDIMENT AND STORMWATER RETENTION BASINS
 - TRENCHING OF UNDERGROUND SERVICES AND BACKFILLING WITH CLEAN MATERIAL.
 - CONTAMINATED MATERIAL TO BE STORED AND STOCKPILED IN THE DEDICATED BUNDED AREA
 - EXCAVATION OF FLOOD WATER SWALE
 - EXCAVATION AND INSTALLATION OF GPT'S AND INGROUND TANK
 - INSTALLATION/DRIVING OF PILES
 - CONSTRUCTION OF TANKS FOOTINGS AND WESTERN BUND WALL
 - ERECTION OF TANKS
- THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES ARE PROPOSED:
 - THE INSTALLATION OF DIVERSION BUNDS AT THE TRENCH EXTENTS TO CONTAIN ALL STORMWATER RUNOFF WITHIN THE SITE
 - THE CONTRACTOR SHALL PLACE A TEMPORARY COVER SYSTEM AS FILLING WORKS OF THE CONTAMINATED AREA OCCUR, TO LIMIT THE CONTAMINATED FILL SATURATING. IF HEAVY RAINFALL EVENTS ARE FORECASTED, A MITIGATION MEASURE (i.e. COVER THE TOP OF ENTIRE AREA) WILL BE IN PLACE TO LIMIT THE CONTAMINATED AREA FILLING WITH WATER.
 - STORMWATER RUNOFF WILL BE DIRECTED TOWARDS THE PROPOSED SEDIMENT/RETENTION BASINS
 - PROGRESSIVE TRENCHING AND BACKFILLING WORKS WHERE PRACTICAL.

PROJECT MANAGERS | PLANNERS | DESIGNERS | ENGINEERS



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REV	DATE	BY	DESCRIPTION	CHK	APP	PROJECT CLIENT
A	09.03.23	PM	ISSUED FOR REVIEW	JA		
B	10.03.23	CV	NOTE 1.5 UPDATED	JA		



MANILDRA GROUP
100% AUSTRALIAN OWNED

PROJECT DETAILS

MANILDRA GROUP
PORT KEMBLA
BULK LIQUIDS FACILITY
FORESHORE ROAD
PORT KEMBLA, NSW

DRAWING TITLE

CONCEPTUAL EROSION &
SEDIMENT CONTROL PLAN
STAGE 2A WORKS

STATUS

TENDER

DATE CREATED 09.03.23	ORIGINAL SCALE AS SHOWN	SHEET A3
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LEGEND:

STAGE 2B EXTENT OF WORKS (APPROXIMATE)

NOTES:

- 1. STAGE 2B WORKS CONSISTS OF THE PIPELINE ROUTE, INCLUDING BUT NOT LIMITED TO TRENCHING, PIPEWORK INSTALLATION AND BACKFILL.
- 2. THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES ARE PROPOSED:
 - 2.1. THE INSTALLATION OF UP GRADIENT DIVERSION BARRIERS TO MITIGATE FLOWS FROM THE UPSTREAM CATCHMENT.
 - 2.2. THE INSTALLATION OF SEDIMENT FACES ON THE DOWNSTREAM GRADIENT OF THE WORKS.
 - 2.3. ANY ADDITIONAL CONTROLS DEEMED NECESSARY AT ACCESS TRACK (PREVIOUSLY USED FOR JETTY ACCESS) FOR PIPELINE CROSSING (I.E. PROTECTION OF ANY KERB AND GUTTERS AND/OR DRAINAGE PIT INLETS).
 - 2.4. PROGRESSIVE TRENCHING AND BACKFILLING WORKS WHERE PRACTICAL.

WHARF PIPELINE PLAN
1:2,500

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	B	13.03.23	PM	PIPELINE OUTLINE UPDATED	JA					DATE CREATED 09.03.23	ORIGINAL SCALE 1:1,000	SHEET A3					
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	20399-ESC13												B				