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McConnell Dowell Constructors
MCD Management System

EARTHWORKS EROSION AND SEDIMENT CONTROL PLAN

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Client: EASTLAND PORT LTD

Project: WHARF 7 REBUILD

Location: Gisborne Port

Project No: 6989

Revision History

Rev	Date	Details	Author	Reviewer	Approver
A	18AUG2021	Draft for review	P. Alcock	H. Robinson B. Barnett	
B	09DEC2021	Updated to include wet pile spoil handling process.	B. Barnett		
C	20DEC2021	Issued for Certification	B. Barnett		H. Robinson
D	18/01/2022	Updated to include council comments Reissued for certification	B. Barnett		H. Robinson

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TERMS AND DEFINITIONS

Please refer to MMS Definitions (HSEQ-DOC-PRO001-GEN-GRP-ATT 2) plus:

Term/ Acronym	Definition
CEMP	Contractor's Environmental Management Plan
EESCP	Earthworks Erosion and Sediment Control Plan
CEP	Construction Execution Procedure
CMO	HSEQ compliance database software
CMP	Construction Management Plan
CLMP	Contaminated Land Management Plan
MCD	McConnell Dowell Constructors Ltd
EMS	Environmental Management System
EPI	Environmental Protection Instructions
ERP	Emergency Response Plan
HSEQ	Health, Safety, Environment and Quality
JSEA	Job Safety and Environment Analyses
PMP	Project Management Plan
MMS	McConnell Dowell Management System

1 RELEVANT CONSENT CONDITIONS

The consent conditions relevant to the Earthworks Erosion and Sediment Control Plan (“EESCP”) are summarised in below. Refer to Construction Management Plan for the full suite of resource consent conditions for the Project.

Condition Number	Condition Requirement	Section Referenced In The Plan
19	<p>Not less than 30 working days prior to commencement of construction works onsite, the Consent Holder shall submit to the Council’s Consents Manager, for certification an Erosion & Sediment Control (EE&SCP). The EE&SCP shall cover the following matters:</p> <ul style="list-style-type: none"> a) The staging of the earthworks, sheet piling and reclamation works b) The location and extent of the temporary land based drying and storage areas c) The temporary silt control measures to be taken to eliminate / minimise the discharge of silt laden runoff into the coastal marine area d) The protocols surrounding the use of a geotextile curtain to confine silt laden runoff associated with the reclamation activities to the immediate works area within the coastal marine area e) Engagement with Te Tai Uru (or where Te Tai Uru has not been established in accordance with the condition 4(d), each of the hapu identified in condition 4(a)), including identification of any recommendations made and implemented, and where such recommendations have not been accepted or acted upon, the reasons why 	<p>3.3</p> <p>8.2.1</p> <p>8</p> <p>8.2.2</p> <p>6</p>
20	<p>Following its certification, the Consent Holder shall provide a copy of the EE&SCP to Te Tai Uru (or where Te Tai Uru has not been established in accordance with condition 4(d), each of the hapū identified in condition 4(a)).</p>	General
21	<p>Earthworks on the site shall be undertaken in a manner to control silt contaminated stormwater in accordance with the Auckland Council’s Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05) 2016 or any update of that guide.</p>	5.1, 8
22	<p>Temporary silt detention controls shall be installed where there is a potential discharge effect from land disturbance to the coastal marine area. Temporary silt detention controls shall also be installed directly down slope of any earthworks as an initial detention control.</p>	8

Condition Number	Condition Requirement	Section Referenced In The Plan
23	Apart from minor maintenance work, earthwork shall not be carried out during the period 1 June to 30 September inclusive, unless Council approved erosion and sediment control measures are in place	3.3
24	All cut material from the earthworks that is not re-used on site shall be removed from the site and deposited in an appropriately permitted fill disposal location or stockpiled at a suitable site with appropriate controls for future use.	8.1
25	All disturbed areas (excluding cut faces) of land resulting from the activity shall be hard surfaces or have a groundcover established to the satisfaction of the council.	8.2
26	An 'as built' earthworks plan, and an earthworks completion report with photographs recording various stages of construction, shall be submitted to the Council for approval, within sixty (60) working days of the completion of earthworks. This shall include and show (but is not limited to) areas of cut and fill; volumes of fill; and drainage installation.	3.4
27	At all times, the timing of construction shall be restricted to a period when ground conditions are such that spoil can be excavated and compacted, and that stripping, benching and filling can occur without wheeled vehicles causing rutting or puddling greater than 300mm deep.	3.3

2 INTRODUCTION

This Earthworks Erosion and Sediment Control Plan (“EESCP”) forms part of a comprehensive suite of environmental controls within the Construction Management Plan (CMP) for the Eastland Port Wharf 7 Rebuild (The Project) which is being delivered by McConnell Dowell Constructors (MCD).

This plan is limited to the construction works undertaken by McConnell Dowell for Wharf 7 and does not consider day to day Eastland Port operations or other Twin Berth redevelopment works outside of MCD scope.

This plan should be read in conjunction with the Construction Management Plan (CMP) and Contaminated Land Management Plan (CLMP).

2.1 Plan Purpose

This EESCP sets out the measures to be implemented during construction to minimise the environmental effects of earthworks. This plan outlines erosion and sediment controls and methodologies used to prevent discharge within the land and coastal marine area.

This EESCP is a live document which will be updated when necessary, throughout the life of the project to reflect changes in design, construction methodologies or to manage effects. Any changes will be captured within this plan and submitted to Gisborne District Council Consent Manager for approval prior to undertaking these changes.

3 PROJECT DESCRIPTION AND SCOPE

Due to the forecasted increase in exports, Eastland Port Limited (EPL) are undertaking the Twin Berth Redevelopment Project to meet the projected export shipping volumes.

At present, EPL and the entire New Zealand North East Coast forestry industry relies on a single log berth – Wharf 8, as the existing Wharf 7 has various operation restrictions due to the age of the structure. To meet the forecasted timber supply, EPL require additional log storage, stronger wharves to handle logs and the ability to operate one 200 m long and one 185 m ship at the same time.

The Twin Berth Redevelopment encompasses multiple projects, with the collective purpose of achieving the objectives above. The project forms one part of the overall Twin Berth Redevelopment – the Wharf 7 Rebuild (the project).

Wharf 7 is past its design life and requires significant maintenance to achieve its original capacity. Inspections were undertaken in 2017 which concluded that the wharf should be rebuilt, rather than repaired.

Further detail on the Wharf 7 Rebuild project scope and activities are outlined in Section 2 of the CMP.

3.1 Project Location

Eastland Port Ltd (EPL) is located in Gisborne on the east coast of New Zealand's North Island. The site is adjacent to Rakaiatane Rd.



Figure 1 – Eastland Port Infrastructure

3.2 Construction Activities

The construction activities relevant to this plan are listed below in Table 1. An overview of all project activities is included in Section 2 of the CMP.

Table 3-1: Construction activity timeframes

Activity	Timeframe/s
Demolition of the existing Wharf 7 structure and parts of Wharf 7 and 8	10 months
Excavation of the Site	7 Months
Piling	7 Months
Construction of a new Wharf	9 Months
New pavement construction	3 Months
Installation of new utilities services, such as stormwater and potable water pipes and ducts in trenches.	3 Months

3.3 Works staging

The works will be staged to minimise the disruption to the port operations as well as minimising the erosion and sediment generating effects of the earthworks. The full works staging is located in section 2.1 of the CMP.

Except for minor maintenance work, earthworks shall not be carried out during the period 1 June to 30 September inclusive without the controls outlined within this plan in place.

The timing of construction activities shall be restricted to a period when ground conditions are such that spoil can be excavated and compacted, and that stripping, benching and filling can occur without vehicles causing rutting or puddling greater than 300mm deep.

3.4 'As-Built' Earthworks Plan

At the completion of works, an 'as built' earthworks plan, and an earthworks completion report with photographs recording various stages of construction, shall be submitted to the Council for approval, within sixty (60) working days of the completion of earthworks.

This earthworks plan shall include all aspects of earthworks throughout the lifetime of the project works, including all areas of cut and fill; volumes of fill; and drainage installation.

Detailed records of the works, photographs and as built design records will be stored within the project SharePoint. These records will be captured during daily informal walkover and weekly formal inspections from the site / project engineer, site supervisors and HSEQ staff members.

4 RESPONSIBILITIES

Table 2: Key personnel details

Name	Position	Ph Number	Email
Mike Bonnette	Project Manager	021 814 567	Mike.Bonnette@mcdgroup.com
Hugh Robinson	Senior Project Engineer	021 713 839	hugh.robinson@mcdgroup.com
Brendon Barnett	Environmental Manager	021 527 461	Brendon.Barnett@mcdgroup.com
Gavin Mecchia	Health & Safety Manager	021 243 0408	Gavin.Mecchia@mcdgroup.com
Adrien Batterham	Superintendent	021 940 978	Adrien.Batterham@mcdgroup.com

5 RESOURCE CONSENTS

Table 3: Resource consents

Relevant Legislation, Permits and Approvals	
Relevant Environment Act(s)	Resource Management Act 1991
Consent references	LU-2017-107945-00 CD-2017-107944-00 DW-2017-107943-00 DL-2017-107942-00
Relevant Environmental Regulations	Tairāwhiti Resource Management Plan
Erosion / Sediment Guideline Document	<i>Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region. (GD05)</i>

5.1 Relevant legislation, standards and guidelines

All erosion and sediment control measures will be constructed and maintained so as to operate and perform in accordance with Auckland Council *GD2016/005: Erosion Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05)*, as stated in condition 21 of the resource consent.

It is to be noted that the landside works will be undertaken within land subject to areas of potential contamination. As such, the ability to discharge runoff generated by the works is also regulated by compliance with the Contaminated Land Management Plan (CLMP), which requires that no water which has come into contact with potentially contaminated soils/spoil etc. shall be allowed to discharge into the stormwater system or directly to the CMA or tributaries.

6 TE TAI URU ENGAGEMENT

Eastland Port and MCD will engage with mana whenua during the preparation of this EESCP.

The forum comprises of Hapu who have an interest in the area that the Project and its related activities will be carried out.

A copy of the EESCP will be provided to the Te Tai Uru forum for review and comment prior to certification by GDC.

6.1 Cultural values

The key cultural values in relation to this EESCP include:

- Provision for Hapu to effectively exercise their role of kaitiaki over the land and coastal environments
- Protection of the relationship Hapu has with Turanganui River;
- Protection of the Mauri of the coastal environment, including the wai (water) quality of the Project area, The Turanganui River and associated taonga;
- Protection of human and cultural health from discharges to air and from the disturbance of contaminated land;
- Provision for Hapu for express their tikanga over the land and water spaces;
- Recognition of the interconnectedness of the land and coastal environments and the need to balance any development activities with the need to protect cultural values and wellbeing;
- Avoidance of cultural degradation of the coastal environment both tangible and intangible;
- Avoidance of cultural impacts through appropriate management of land disturbance and runoff activities; and
- The need for a partnership approach throughout the project to deal with the adverse environmental and cultural effects of land disturbance and runoff activities to ensure that cultural wellbeing is acknowledged and provided for.

7 PRINCIPLES OF EROSION AND SEDIMENT CONTROL

The key principles to be employed for the project are to undertake land disturbing activities in a manner that reduces the potential for erosion of bare soils (erosion control) and, to control all sediment laden water prior to discharging from the site (sediment control). The basic erosion and sediment control principles applicable to this project are as follows:

1. **Minimise disturbance:** Only work those areas required for construction to take place.
2. **Stage construction:** Carefully plan works to minimise the area of disturbance at any one time.
3. **Protect steep slopes:** Steep slopes should be avoided where possible. Where disturbed, steep slopes should be rapidly stabilised and special protection may be required.
4. **Stabilise exposed areas rapidly:** Where possible a “cut & cover” approach will be employed to limit the amount of exposed ground at any one time.
5. **Install perimeter controls:** Divert clean water away from areas of disturbance and divert runoff from areas disturbed to sediment control measures.
6. **Experience and training:** Make sure an experienced and trained person is responsible for installing and maintaining erosion and sediment control practices.

7. **Make sure the ESCP evolves:** As construction progresses and the nature of land disturbing activities change, the ESCP needs to be modified to reflect the changing conditions on site.
8. **Assess and adjust:** Inspect, monitor and maintain control measures.

8 CONTROL METHODS

The proposed measures described below will be installed in accordance with the Auckland Council GD05 guidelines.

In general, the controls on site will typically be 'small site' controls given the small scale of earthworks required for the project.

The measures detailed below are the anticipated control measures based on the construction methodology and programme.

As part of planning, Site Specific Erosion and Sediment Control Plans (SSESCPs) have been developed for each area of work (including construction yards) and are included as appendices to this EESCP in Appendix A. This EESCP along with its appendices will be updated as required and will be submitted to Gisborne District Council for approval if material changes are made.

The scope of these SSESCPs will vary with the specific activities that they address.

Table 8-1: Erosion and Sediment Controls

Control	Application
Stabilised Construction Access and pathways	Stabilised entrance and exits to the Project construction support areas to prevent sediment tracking out of the site and sediment uplift from vehicle movement. Typically, consist of 150mm GAP 65 aggregate formed paths. This will occur if the existing impervious surface is removed for construction purposes.
Street sweeper	Due to the elongated construction site and the constricted port surrounds, the operation of a street sweeper to contain and maintain clean roads around the site is a feasible option
Hot mix diversion bunds	To prevent clean upstream surface flows entering excavations. Diverted to catchpits for discharge to stormwater network but assist to minimise the flows entering into the construction area and transporting sediment. Also used for containing dirty water flows within the construction site. Generally used when ground material is already paved.
Silt Fence	Acts as a perimeter boundary to prevent silt/sediment escaping the site area downstream where permeable (green space) areas are located, used to protect sensitive areas. Silt fences are buried into the ground 200mm. To be applied in accordance with AC GD05 section F1.3.
Filtering	Used to filter sediment from ponded sediment laden water to a discharged point – usually a protected catchpit or inlet.

Silt sock	Can be used for two purposes, to treat sediment-laden water prior to discharge or as a perimeter control to prevent sediment escaping the site area and as additional sediment protection around catchpits
Geotextiles and/or filter fabric	Can be applied to cover exposed slopes preventing erosion or to cover stockpiles to prevent sediment mobilisation. Filter fabric is used to cover catchpits to collect and prevent sediment entering the existing SW network.
Silt Curtain	Either a permeable or impervious structure that sits suspended in the water column to control migrating water borne sediment.
Portable lamella plate clarifier	Compact piece of equipment that allows sediment to be removed “quickly” from the water column and can be moved around the site a construction area also move. Can be used for dewatering from excavations as required.

8.1 Earthworks

8.1.1 SPOIL MANAGEMENT

All cut material from the earthworks that is not re-used on site shall be removed from the site and deposited at the Dunstan Rd yard as per the Contaminated Site Management Plan (CSMP).

The material being disposed of will be sampled and tested in line with the CSMP prior to transportation to the Dunstan Rd yard.

The controls implemented will be the use of bunds, covering stockpiles with geotextile fabric and silt socks to prevent erosion occurring and sediment discharging into the wider environment. Stockpiles will be routinely inspected to ensure that all controls are working effectively. Exposed soil will be stabilised in line with the controls outlined in GD05.

All disturbed areas (excluding cut faces) of land resulting from the activity shall be hard surfaces or have a groundcover established to the satisfaction of the council. This groundcover will be through the use of geotextile fabric.

8.1.2 PILE SPOIL

Spoil generated from pile drilling will be loaded directly into trucks if it is dry enough for transport or into skip bins where it is wetter. The skip bins will allow for initial drainage of water from the spoil before being transferred to a bunded area off the wharf where the remaining water can be drained to a soak away pit. If the water does not effectively soak away it will be pumped back to the piling area where it will be contained by the silt curtain and allow any suspended sediments to resettle.

Once bulk of the water has drained from the spoils it will be mixed with hydrated lime or cement using an excavator to achieve a firmer consistency for transport or land-based reuse.

Best practice dust control measures will be implemented to prevent dust being discharged into the surrounding environment during the spoil mixing process.

8.2 Erosion and Sediment Controls Measures – Demolition of Wharf 7 / Partial Demolition of Wharf 6 & 8

8.2.1 CONSTRUCTION ACTIVITIES

1. Demolition of Wharf 7 and adjoining sections of Wharf 6 & 8
2. Extraction of old timber piles
3. Disconnection and removal of external components (ladders, stairwells, fenders etc)
4. Saw cutting and concrete breaking smaller wharf elements
5. Cutting existing piles
6. Full extraction of existing piles and backfill voids with concrete
7. Excavation of marine sediment

8.2.2 EROSION AND SEDIMENT CONTROL MEASURES

- Clean water diversion bunds and silt socks will be installed on the site perimeter to divert inbound clean water from the site
- The existing stormwater flow paths and drainage infrastructure will be utilised where possible to divert clean water flows away from the works area.
- Existing nearby cesspits will be retained and will be protected (where they are within the active construction area) by filter material and silt socks noting that the primary measure will be to keep flow paths clean.
- A Silt Curtain will be installed within the Coastal Marine area around any work that could disturb the seabed or create sediment that enters the marine environment. These will be installed using a small workboat, before any construction works take place. This will be installed as per manufacturer recommendations
- The silt curtain will prevent suspended sediment from the pile extraction works from being deposited throughout the wider harbour
- During saw cutting and concrete breaking, a floating pontoon lined with plastic liner will be installed beneath the wharf. This will capture concrete slurry and loose debris during the demolition process
- A wet vacuum will be used on the surface of the wharf to remove concrete slurry from the deck
- Concrete will be pumped into open voids post pile extraction. This will be done using a cement mixer and extended concrete pump. The worksite will be managed to avoid concrete runoff entering the CMA.
- Dewatering treatment requirements will be assessed based on site needs and will be consistent with the methods described in Section 9.

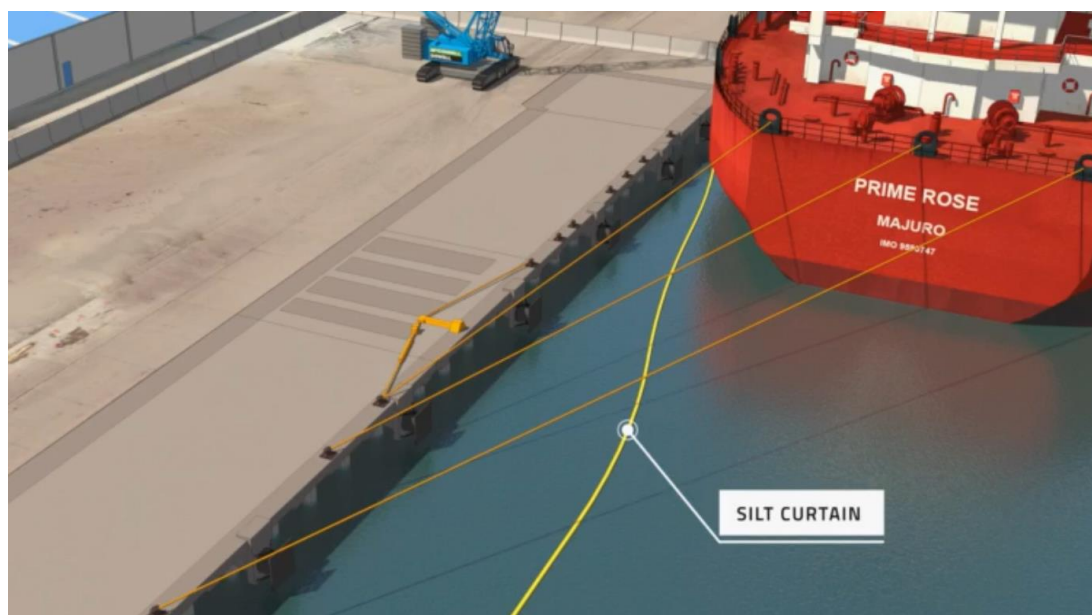


Figure 2 - Silt curtain installed within the CMA

8.3 Erosion and Sediment Controls Measures – Piling for new Wharf

8.3.1 CONSTRUCTION ACTIVITIES

1. Pre-drilling holes into the seabed
2. Driving steel tubes piles into seabed using vibro and impact hammers
3. Removing material from driven pile and disposal

8.3.2 EROSION AND SEDIMENT CONTROL MEASURES

Regarding erosion and sediment control the piling works have the potential to generate sediment. While these work areas are semi static, the movement of the piling rig and trucks disposing of spoil will be controlled to avoid unwanted sediment deposition. There is the possibility for marine sediment to be disturbed and migrating throughout the harbour during these works.

- Lengths of silt curtain will be used to encapsulate the areas where the piling is being performed to prevent the spread of sediment generated from the piling activities.
- Marine sediments flocculate rapidly, and the minor disturbance generating by the piling activities will not result in extended suspension.
- Piles may be dewatered prior to drilling, with the clean water returned to the CMA. Where this is done, the spoil drilled out will be relatively dry. If a pile cannot be dewatered prior to drilling, the spoil removed will be wet.
- Sediment / spoil removed from the bored sections will first be placed into a skip bin or other watertight container next to the drill rig. An excavator will then load the spoil into a truck. If the spoil is too wet to be taken off site it will be stored in skips and mixed with drier spoils for transport.

- Any deposition of sediment onto the wharf deck, roads or carriageways will be swept and disposed of to prevent spread and run off potential.
- If temporary spoil laydown is required, it will be on a non-permeable surface and covered / bunded to prevent runoff.



Figure 3 – Examples of silt curtain & silt socks used on a marine piling project

8.4 Erosion and Sediment Controls Measures – Construction Yard and Laydown area

8.4.1 CONSTRUCTION ACTIVITIES

- Main project office and smoko facilities
- Project store
- Car parking
- Workshop
- Material storage

8.4.2 YARD CONTROL MEASURES

A key sediment measure for the yards and laydown area will be to limit the exposed areas, due to the construction activities in these yards. A construction access will be created and the full construction area at each park site will be stabilised with aggregate

To prevent sediment being tracked onto public roads on to the public roads, as an initial measure the layout of the yard area will be designed to minimise the potential for vehicles to traverse sediment laden areas. As a contingency at the exit from the site a water blaster will be available to facilitate the washing of the wheels and tailgates if required.

Washing of wheels will be a contingency measure, with planning and monitoring to ensure that trucks always remain on sealed surfaces which minimises the potential for the wheels to become dirty. This will include removal of any dropped spoil at the load out points before it is trafficked from site, regular sweeping will be also undertaken to keep these surfaces clean. If wheel washing is required, the runoff from this will be collected or directed using water diversions to the water treatment device.

All nearby stormwater cesspits will be protected using geo fabric and silt socks.

9 DEWATERING

It is not anticipated that any significant dewatering will be required given the minor nature of the earthworks in the project scope.

Where water being pumped has been maintained as clean, and has not become sediment laden, it will be pumped into the CMA. Examples of this include.

- When a steel tube pile is first inserted into the ground, but before any drilling, there will be a quantity of clean seawater trapped inside the pile. This water is pumped out so that the spoil contains less moisture when it is drilled out of the pile.
- Rainwater that accumulates inside sealed containers, manholes and the like and is not exposed to disturbed soil or contaminants will be pumped out without being treated.

Wherever water has been exposed to increased sediment such as within a trench on the landside works or there are potential for changes in pH the following testing will be performed to ensure it meets the acceptance criteria below.

This will be recorded in the Routine Water monitoring Checklist prior to any discharge and daily while discharging to stormwater. Disposal classification is as follows:

Table 9-1: Dewatering parameters

Acceptable conditions for discharge to stormwater	Clarity \geq 100mm and pH within range 5.5 to 8.5
If clarity \leq100mm measured with a secchi disk	Follow steps as per section 9.1
If pH is outside acceptable range measured using a pH meter or pH strips	Follow steps as per Section 9.1

9.1 Dewatering Treatment

If the dewatering parameters for clarity cannot be met the following measures will be implemented.

- A “turkeys nest” filtration device or silt sock will be used to pump sediment laden water through prior to discharge to remove sediments.
- A skip bin or settling tank may be used to store the water until the sediments have settled and then the clean water can be pumped off and discharged.

If the dewatering parameters for pH cannot be met the following measures will be implemented.

- The water will be pumped to a skip bin or settling tank where it can be dosed with citric acid or sodium bisulphate to reduce the pH.
- Once the required pH parameters have been met and sediments have settled the water can then be discharged.

10 MONITORING

The monitoring and inspection of the site and in particular, erosion and sediment controls will be undertaken in five main stages.

- Pre-Construction inspection
- Informal Random Inspections
- Post-weather Event Inspection
- Regular Recorded Inspection
- Final Inspection

10.1 Inspections

Pre-Construction

The Pre-Construction Inspection will be used to ensure that the controls detailed on the specific Erosion and Sediment control Plan are appropriately installed and will be effective. This inspection will also be used to show and confirm that the site foremen for the areas are fully aware of the requirements in these specific areas.

The Pre-Construction Inspection will be undertaken by the Environmental Manager, the Project Engineer, and the Superintendent

Informal Random Inspection

Informal random inspections will verify that the approved controls are installed correctly and that they are operating efficiently. Any maintenance issues will be immediately rectified. Any minor adjustments to the erosion and sediment control measures will be determined during this time.

The random inspections will be undertaken by the HSE representative, Site Engineer or Project Engineer as agreed onsite.

Post-weather Event Inspection

Inspection specifically carried out within 24 hours following a weather event or storm surge to identify any impacts or potential risks created due to damage to site controls.

Regular Recorded Inspections

The Regular Recorded inspections will be undertaken weekly to verify that any maintenance requirements are being carried out and that these requirements are being completed in an appropriate time frame. These inspections will also provide an opportunity to fine tune any existing controls to improve the efficiencies of these controls.

The weekly inspections will be undertaken by the HSE representative, site engineer or Project Engineer as agreed onsite.

Final Inspection

The final inspection will be undertaken on areas that have been stabilised in order to verify that the Erosion and Sediment controls can be removed.

The final inspection will be undertaken by the Environmental Manager, the Project Engineer and the Superintendent.

10.2 Maintenance

Maintenance of the erosion and sediment controls will be undertaken as required to ensure they remain effective in the prevention of adverse environmental effects.

Typically, the following timeframes will be followed

The removal of accumulated sediment within sediment retention devices will occur before the total storage volume of the device has been reduced by 50%

Any perimeter controls requiring maintenance will be repaired immediately after the maintenance issue is found

Internal controls such as contour drains etc will be repaired prior to forecast rain

Any failure of controls as a result of, or during rain events will be repaired as soon as is practicable taking into account location, nature of failure, ground conditions and weather conditions.

11 PROBLEM SOLVING

In the event that the installed erosion and sediment controls are considered to be performing at a standard less than anticipated by GD05, the following options for improvement will be considered

1. Is the lack of performance due to significant rainfall event?
 - Confirm that any reduction in performance is not due to significant rainfall event in excess of the devices design criteria
2. Is the lack of performance due to a structural failure?

- Confirm that any reduction in performance is not due to a structural failure such as a rip or tear in a silt fence for instance
3. Is the lack of performance due to inappropriate use?
 - Confirm that any reduction in performance is not due to 'human error', direct pumping to the outlet of a sediment control tank for instance
 4. Are the design assumptions correct?
 - Is the dewatering device suitable for the flow rate or has it changed?
 - Have the slopes of the contributing catchment changed due to site activities?
 - Have the overland flow paths changed due to site activities?

Assuming that the above issues do not highlight any specific non-compliance with the design principles of GD05, the options for improving the efficiency of the controls will include:

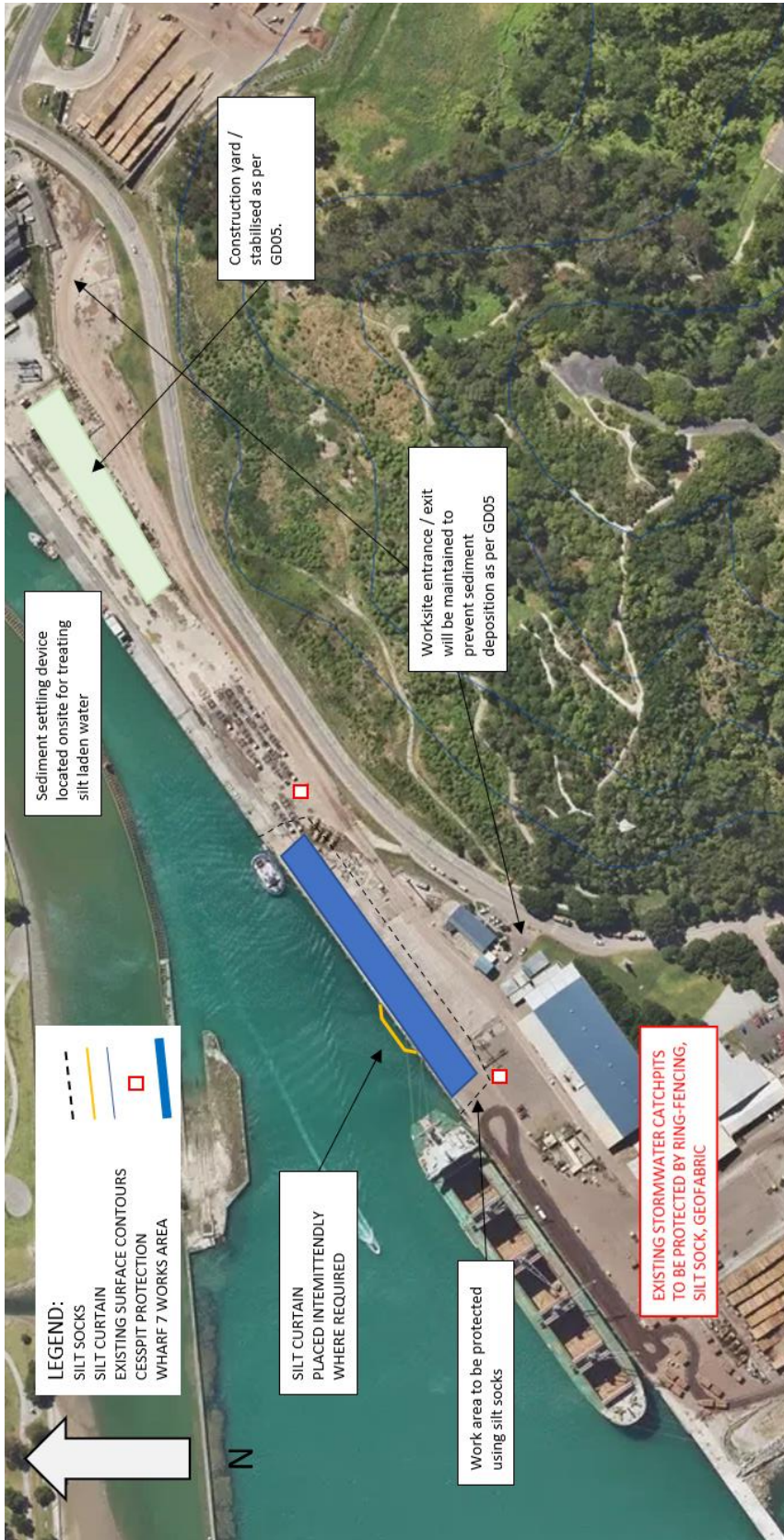
1. Can the exposed areas be reduced?
 - Can the exposed areas be reduced by staging?
 - Can the exposed areas be reduced by temporary stabilisation?
2. Can a higher level of control be installed?
 - Where the compliant control is for instance a silt fence, with a typical control efficiency of 50% sediment retention, can a higher efficiency control such as a DEB (75%) be installed
3. Can the works be accelerated to reduce the duration of discharge?
 - Can alternative construction methods, additional plant or materials be used to accelerate the works to reduce duration of any actual or potential discharge?

12 RECORDS

The following records will be maintained for recording erosion and sediment control inspection:

- Weekly inspection check sheets (recorded on CMO and uploaded to project SharePoint)
- Council Erosion and Sediment Control Inspection reports (Uploaded to project SharePoint)

Appendix A – Site Specific Erosion and Sediment Control Plans



Appendix B – Te Tai Uru Feedback

Copies of the draft management plans were provided to Te Tai Uru on 30 September 2021 and members were invited to provide any written comments and recommendations within 20 working days. After the required time there were no requests or recommendations for any changes.

Appendix C – Water Monitoring Checklist

REF-HSEQ-ENV-FRM010-GEN-ALL

ROUTINE WATER MONITORING CHECKLIST

Project Name: St Mary's Bay Outfall **Project Number:** 7875

PARAMETER	CRITERIA	PROCEDURE
pH Stormwater (SW)	5.0 - 9.0	1. Record visual observations, pH and turbidity readings. Important to indicate whether oil or grease are visible in the sample water. 2. If measurements exceed criteria, alert supervisor and Environmental Advisor (EA), if EA is not present alert site HSE advisor
pH Wastewater (WW)	6.0 - 10.5	
Clarity	SW =>100mm WW=>10mm	

Test	Date	Time	Weather	Test Reason / Construction Activity <i>(e.g. pile concrete pouring, excavation in river etc.)</i>	Monitoring Location	Test Results			Meets Criteria (Y/N)
						Visible plume, Oil, Grease (Y/N)	Clarity (mm)	pH	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
						Name	Signature	Date	
Testing	Testing undertaken by								
Reviewed	Supervisor; or								
	Project Environment Management Representative								

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