Project Number: W-SL007.01

Herne Bay Wastewater Trunk Sewer Upgrade

22 September 2023

Draft Erosion and Sediment Control Plan

wsp

150 YEARS IN AOTEAROA

Contact Details

Mahin Sheikh

WSP
Level 3 The Westhaven
100 Beaumont St
Auckland 1010
+64 9 355 9500
0272022594
mahin.sheikh@wsp.com

Document Details:

Date: 22/09/2023
Reference: W-SL007.01
Status: Draft

Prepared by
Mahin Sheikh

Reviewed by
Warren Bird

Approved for release by
Marina Kudoic

Document History and Status

Revision	Date	Author	Reviewed by	Approved by	Status
1	11/05/23	M Sheikh	W Bird	M Kudoic	Draft
2	22/09/23	M Sheikh	W Bird	M Kudoic	Draft

Revision Details

Revision	Details
1	Draft Erosion Sediment Control Plan
2	S92 Responses

Contents

1 Introduction

The Herne Bay Wastewater Sewer Upgrade aims to improve water quality in the Herne Bay area, by reducing sewer overflows in the reticulated networks. A new large diameter sewer is being proposed to capture Engineering Overflow Points (EOPs) within the Herne Bay area.

2 Purpose

This report provides details for the provisional erosion and sediment control plan for the construction of the Herne Bay Wastewater Sewer Upgrade. The information outlined in this Erosion and Sediment Control Plan is indicative only and will be adapted and developed by the appointed contractor to reflect their specific construction methodology.

3 Site

The site for the project works falls within the northern boundary of the Grey Lynn stormwater catchment. The receiving environment for this catchment is the Waitemata harbour. A total of 10 sites are present within the project area, where shafts will be constructed. Erosion sediment control has been designed for each of these sites, along with any smaller connections from existing wastewater sewers to the main trunk sewer.

4 Erosion and Sediment Control Principles

In the absence of controls, stormwater runoff flowing over the site has the potential to cause short term flooding, mobilise and transport sediment into downstream watercourses. Suspended sediments in the watercourses could clog fish gills and limit light penetration essential for aquatic life processes. Sediment laden water could also end up in public utilities surrounding the site and jeopardise their operation. Hence, it is vital to implement appropriate erosion and sediment controls to avoid the potential adverse impacts on the receiving environment when undertaking land disturbing activities.

The erosion and sediment controls outlined in the following section align with best practice and Auckland Council Guideline Document GD05 – Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region. The ten fundamental principles of erosion and sediment control listed under the Auckland Council guideline GD05 are as follows:

- Minimise disturbance by retaining existing environment values and minimising earthworks.
- Stage construction to minimise the extent of land disturbance at a given time.
- Protect steep slopes.
- Protect receiving environments locate and map out and all existing watercourses on the plan.
- Fully stabilise disturbed soils and exposed earthworks areas with vegetation rapidly after each stage and at specific milestones within stages.
- Install perimeter controls to retain dirty water within the site and clean water out of the working site.
- Employ sediment retention devices to collect and treat sediment-laden water to protect surrounding watercourses.

- Engage trained and experienced staff when implementing erosion and sediment controls.
- The erosion sediment control must adapt to the site's changing needs as the project progresses.
- Inspect, monitor, and maintain the operation of erosion and sediment control measures.

4.1 Erosion and Sediment Controls

The following erosion sediment controls are aimed at providing treatment of sediment-laden runoff from the site. The measures proposed should be monitored weekly during the construction and adapted as required to suit the specific conditions.

The indicative locations are shown in Appendix A. It is expected the appointed contractor will develop a detailed erosion and sediment control to align with the final construction staging and methodology.

4.1.1 Hot Mix Bunds and Silt Socks

For clean and dirty water diversion around the shaft sites, hot mix bunds have been designed around the perimeter of the working boundaries on road surfaces. Where sites are completely on the road, the perimeter of the sites marked out by the hot mix bunds do not include the kerb and channel. This allows for clean water diversion around the shaft site and into the existing stormwater network.

The hot mix bunds also trap dirty water within the site areas for appropriate disposal. Dirty water is to be disposed of through the contractors designated waste disposal method onsite. In sites which are on a steeper gradient, dirty water will pond at the most downstream bunds of the shaft sites, so dirty water should be removed frequently to prevent overflow.

Where the site includes part of the berms and surrounding footpaths, silt socks have been places around the boundary of the site in these areas. The silt socks will filter dirty water exiting the site from these areas, providing a form of treatment.

4.1.2 Stabilisation – Entrances and Support Areas

Two construction support areas (CSAs) are proposed for the site, one at Salisbury Reserve in Herne Bay and the other at the 94A Shelly Beach Rd Reserve, near Pt Erin. Temporary access paths have been proposed (where needed) as entry and exit points for these support areas, with the sites intended to transport plant, labour, and materials to the multiple shaft sites throughout the project area. The access points and entrances to all these support areas must be adequately stabilised in accordance with GD05.

Appropriate stabilisation of entrances and access paths will prevent these locations from becoming sources of sediment, minimise dust generation, and minimise disturbance to surrounding areas. Wheel wash-downs can be placed along the access paths or at entrances to prevent unintended tracking of sediments from the site onto public roads.

The CSAs will be completely stabilised with geotextile fabric and gravel. This will require a top-soil scrape, done by excavators, of at most 400 mm from the surface of the area, dependent on the type of surface available. In order to maintain the clean and dirty zones of the areas post set up, the top-soil scrape process will be followed with rapid stabilisation.

Rapid stabilisation consists of ensuring that the disturbed areas of soil from the scrape are stabilised rapidly with compaction, laying of the geotextile fabric, and gravel laid on the surface within the same day. To meet this requirement, no more than 1500 m^2 will undergo soil scraping at once at a CSA.

4.1.3 Silt Fences / Super Silt Fences

Silt fences will be installed around the perimeter of the site to treat sediment-laden sheet flow where dirty water cannot practically be removed by other devices.

Silt fences must be installed along the contour. Where this is not possible, short silt fence returns that project upslope must be installed to minimise the concentration of flows. Silt fences and super silt fences must be installed according to GD05 and must be maintained operational until contributing catchment area is appropriately stabilised.

4.1.4 Construction Discharge Locations

All runoff generated from the site will be discharged into the receiving environment for the Grey Lynn stormwater catchment (Waitemata Harbour) or be directed into the shafts for stormwater disposal. Appropriate energy dissipation will be in place to minimise the risk of erosion adjacent to the outlet.

Stormwater inlets receiving dirty water within the construction zones for the tunnel shafts will be protected with sediment filters, to ensure treatment of dirty water before entering the existing stormwater network. Inlets downstream of the construction zones will also receive sediment filter protection as a precautionary measure to account for any dirty water that may escape from the site.

4.2 Earthworks

Estimated volumes and areas of earthworks related to each site location with the project area can be found within Table 1. The sedimentation control in place for each site has been designed to withstand and effectively control these volumes and areas of earthworks. Definitions of the areas and volumes by locations are provided below.

4.2.1 Areas and Volumes Definitions

4.2.1.1 Main Tunnel and Interception Shafts

The area values consist of the circular area of the tunnel shafts. This will be the only disturbed area within the road reserve for the sites specified on the plans. The volumes include the depth of the shafts, which indicates the total estimated earthworks for the site.

4.2.1.2 EOP Connections

Areas for the EOP connections depend on the construction method being used for these connections. For open trenched connections, the area is the footprint of the trench, with the volume of the trench including the depth. A conservative trench width has been used for these values.

The trenchless areas include the footprint of the pit to contain the equipment and the run of the pipe. The volume for these values consists of the pit volume along with the pipe volume, combined.

4.2.1.3 CSA Sites

The areas for the CSA sites are the total areas of the CSAs, based off GIS measurements. The volume of earthworks is determined by a 400 mm maximum topsoil scrape of the total area. This is a conservative estimate, as the scrape and stabilisation will be based on the type of surface available in those areas.

Table 1 - Earthworks Areas and Volumes

Location	Area (m^2)	Volume (m^3)
Main Tunnel Shafts		
Shaft One	133	2,242
Shaft Two	95	1,844
Shaft Three	133	3,010
Shaft Four	95	2,153
Shaft Five	133	3,349
Shaft Six	95	1,292
Shaft Seven	133	1,533
Shaft Eight	7	17
Interception Shafts		
SE01	10	225
SE02	10	187
SE03	10	139
SE04	10	119
EOP Connections		
EOP195	13	20
EOP202	0.2	114
EOP201	9	23
EOP1019	0.2	291
EOP740	11	30
EOP197	0.1	67
EOP198	7	16
EOP199A	53	107
CSA Sites		
CSA-1 – Salisbury Reserve	2,400	960
CSA-2 – Shelly Beach Road	3,100	1,240

4.3 Dewatering

Low-lying areas at the site are likely to be inundated with stormwater after a rainfall event. As a result, intermittent dewatering of the site must be undertaken. Dewatering bags or pipe socks could be used for small volumes of water and larger volumes of water will be pumped out into the contractor's disposal unit. If a water clarity requirement of 100 mm can be achieved, the water may be discharged directly offsite. Where this is not possible, the dirty water will be treated within the site before being discharged offsite.

4.4 Heavy Rainfall Response and Contingency Measures

Erosion and sediment controls are prone to damage under heavy rainfall events which could lead to uncontrolled sediment discharge. As a minimum, the appointed contractor must monitor weather patterns on the site daily, maintain erosion and sediment controls, and ensure that devices are fit for use before any forecasted rainfall event.

In general, the appointed contractor must:

- Monitor weather forecasts regularly to assess the risks and amend erosion and sediment controls to suit weather conditions.
- Inspect controls after heavy rainfall and repair any damage immediately.
- Report heavy rainfall incidents and liaise with Auckland Council as part of the routine reporting.
- Report any serious incidents within 24 hours.

4.5 Monitoring and Maintenance

GD05 provides indicative regimes for the maintenance of each proposed control. As a minimum, it is recommended that each device is inspected once a week, and after every rainfall event for correct operation. It is also recommended that accumulated sediment in the device is removed regularly and that sediment disposal locations are clearly identified. Any damage on any device must be immediately remediated. The contractor is expected to have a trained environmental manager to supervise the sediment controls. The contractor must also keep all records of inspection and provide related reports at the request of the engineer. Other device-specific maintenance procedures are listed in the table below.

Erosion and Sediment Control Measure	Indicative Maintenance Procedure	Frequency
Hot-mix Bunds	• Inspect for tunnel gullies, water ponding, and blockages and reinstate if damaged. • Inspect inverts and outlets for any signs of scour and erosion. • Maintain full stabilisation cover and reinstate as necessary. • Remove sediment deposited around the bunds to avoid overtopping due to lack of freeboard.	Weekly and after every rainfall event.
Silt Socks	• Check for leaks and blockage. Repair or replace immediately.	Daily.
Silt and Super Silt Fences	• Check that silt fences are fixed onto the ground correctly. • Inspect any rips, tears, and leaking joins in fabric and irregularities in fence posts. • Repair when a bulge occurs or when sediment accumulates to 50% of the fabric height.	Weekly.

Stabilised Construction Entrances	• Inspect daily and after each rainfall maintain as per required to preserve function. • De-sludge before sump is 20% full. • Re-construct or re-surface construction entrance if it becomes ineffective through surface contamination.	Daily and after every rainfall event.

5 Conclusion

The upgrade of the Herne Bay wastewater trunk sewer has the potential to create sedimentation and erosion effects on the receiving environment. Provided control measures are implemented as per this report, the project will have less than minor effects on the environment.

This provisional Erosion and Sediment Control Plan is expected to be adopted and developed further by the appointed contractor. Any developments on the controls listed on this plan must align with principles and guidelines listed provided in Auckland Council's GD05.

Appendix A
Drawings

Note: *The location of the erosion and sediment control measures are indicative only.*

wsp.com/nz