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WEIGHT RIGHT PROGRAMME

BOMBAY COMMERCIAL VEHICLE SAFETY CENTRE

EROSION AND SEDIMENT CONTROL PLAN (INDICATIVE)

11 March 2024

Internal Review





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Disclaimers and Limitations

This report ('Report') has been prepared by WSP exclusively for Waka Kotahi NZ Transport Agency ('Client') in relation to the proposed Weight Right site in Bombay, Auckland as part of the Weight Right Programme ('Purpose') and in accordance with the NZ Transport Agency Professional Services Contract No: 5302 Weight Right Programme Pre-implementation and implementation dated 9 September 2021. The findings in this Report are based on and are subject to the assumptions specified in the Report and WSP's revised Offer of Service dated 10 August 2021. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

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1 Introduction

The proposed Bombay Commercial Vehicle Safety Centre (CVSC) will be located at 253 Mill Road, with access to the site from Great South Road. Upon commencement of operations, Heavy Commercial Vehicles will access the facility via Mill Road from the Bombay Interchange off-ramps, as illustrated in Figure 1. The CVSC will include a Tier 1 control building, inspection shed, weighbridge, six inspection bays, staff and visitor parking facilities, as well as an off-loading area. During the construction and site preparation phase, the following activities will be undertaken:

- Earthworks for the establishment of foundations, retaining walls, and embankments.
- Earthworks within and in proximity to a modified intermittent stream (classified induced wetland, sometimes referred to simply as “the wetland” elsewhere in this document) and permanent stream.

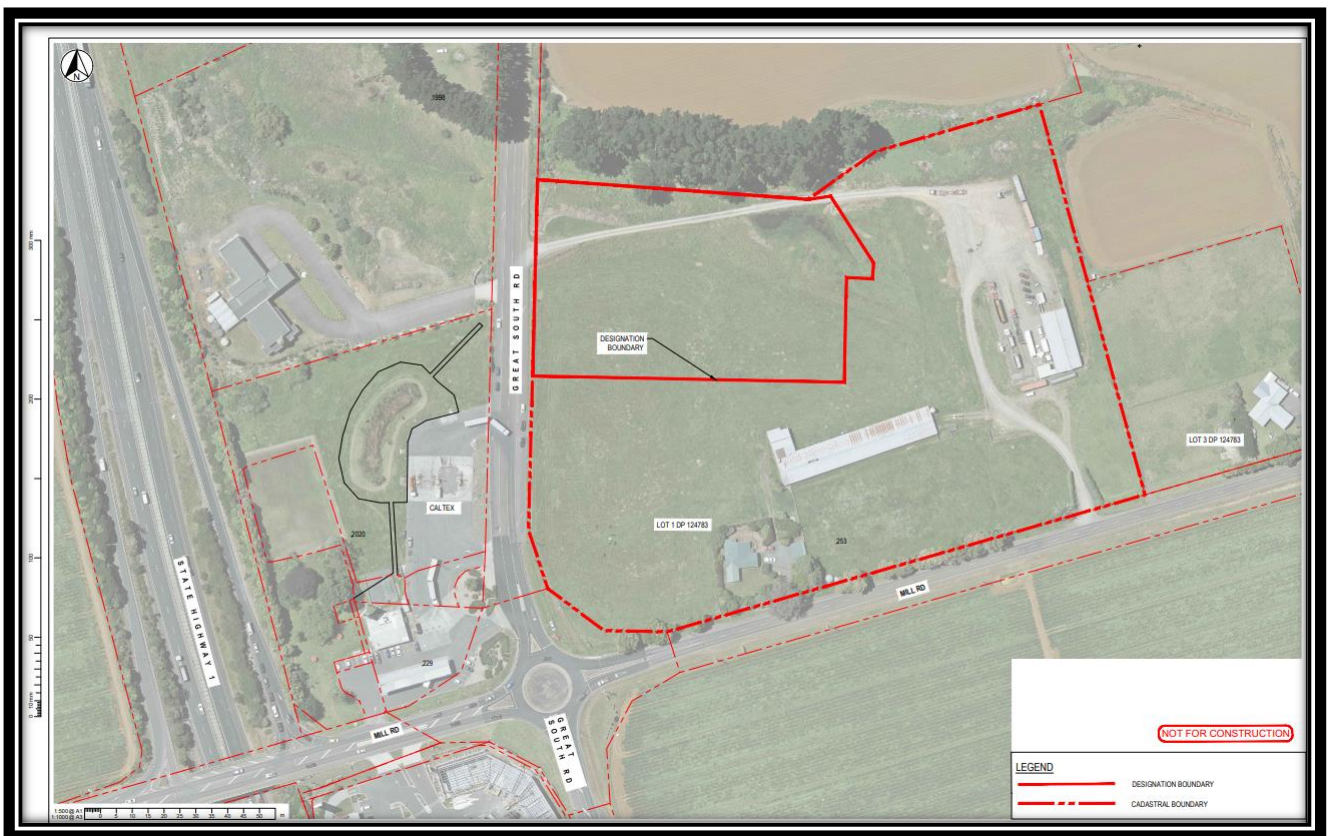


Figure 1: Approximate Project Designation Boundary and Surrounding Road Network

Stormwater flowing over the work site poses multiple threats, including short-term flooding, sediment mobilisation, and off-site transport into the adjacent stream, ultimately leading to contamination of the Manukau Harbour. The sediment-laden runoff not only diminishes water quality but also poses a direct threat to aquatic life by smothering the water body's base.

To address these concerns, it is imperative to implement effective erosion and sediment control (ESC) practices throughout the construction process. These practices are vital for mitigating erosion and sediment generation, safeguarding both the construction site and surrounding areas. The project will adhere to erosion and sediment control (ESC) practices outlined in the Auckland Council's Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05). Of particular importance is the management of construction activities around watercourses, which will be a primary focus for the contractors at this site. By prioritising ESC



measures, the project aims to minimise environmental harm and ensure compliance with regulatory standards, promoting sustainable construction practices and protecting local waterways.

2 Purpose

This Indicative Erosion and Sediment Control Plan (ESCP) serves as a comprehensive framework for managing sediment generation and its impact on receiving environments throughout the construction phase of the project. Aligned with best practice methods, the ESCP outlines key principles to be adhered to and provides strategies for addressing soil erosion, sediment runoff, and sediment deposition in watercourses.

Central to the ESCP are procedures aimed at avoiding, remedying, and mitigating the effects of these processes, ensuring the preservation of water quality and ecological integrity. Additionally, provisions for contaminated ground management are recognised, reflecting a proactive approach to environmental stewardship.

Integral to the effectiveness of the ESCP is ongoing monitoring and maintenance, which serve to identify and address potential issues promptly, safeguarding against adverse environmental impacts.

As the final construction methodology will influence the specifics of the ESCP, the Contractor's site-specific plan will be informed by their adopted approach. This draft ESCP has been developed to incorporate relevant technical assessments provided with the Resource Consent Application. Through this cohesive framework, the ESCP aims to promote responsible construction practices and uphold environmental standards throughout the duration of the Project.

2.1 Land Disturbance Activities

In assessing the magnitude of earthworks and selecting the appropriate erosion and sediment control measures, the project aims to effectively manage potential environmental impacts associated with soil disturbance. This evaluation considers the area and volume of earthworks, as outlined in Table 1. By aligning the extent of earthworks with the necessary erosion and sediment control measures, the project ensures that the chosen controls are customised to the specific requirements of the site, promoting efficient and sustainable construction practices.

Table 1: Earthwork Area and Volumes

Location	Type (cut/fill)	Area (m ²)	Volume (m ³)
Project Site	Cut	8,679	15,747
	Fill	1,552	1,260
	TOTAL:	10,231 m²	17,007 m³

3 Site

The natural topography of the designation site slopes gently towards the north, with elevations ranging from 171 meters RL (AVD-1946) at the highest point to 160 meters RL at the permanent stream. This gradient of approximately 10% dictates the flow of water across the site.

According to Landcare Research S-Map, the predominant soil type within the area is Orthic Granular (NO), which influences water infiltration and drainage characteristics.

The project site falls within the Ngakoroa Stream stormwater catchment, which covers an area of 4,106 hectares, primarily comprised of agricultural land. This catchment ultimately drains into the Manukau Harbour, making it crucial to manage any potential runoff or sedimentation.

Watercourses are integral features within and surrounding the site, serving as conduits for runoff and drainage. These watercourses include overland flow paths, a channelised overland flow path, a modified intermittent stream (classified induced wetland) with a raised culvert, and a permanent stream.

The permanent stream, a tributary of the Ngakoroa Stream, runs through the site from east to west, while a modified intermittent stream (classified induced wetland), drained to the permanent stream by a raised level culvert, pools behind the inlet to the northwest of the project site. Overland flow from the eastern portion of the site converges with this modified stream before flowing into the permanent stream. Conversely, runoff from the west drains into a channelised overland flow path along the edge of Great South Road at the site's frontage.

GeoMaps land cover data depicts the predominant land cover as grassland, interspersed with gravel accessways and scrub/shrub vegetation. These land cover types influence runoff patterns and sediment transport within the site.

Ultimately, the watercourses on the site contribute to the tributary system, which ultimately discharges into the Manukau Harbour at the Category 1 Marine SEA (SEA-M1-29b), highlighting the interconnectedness of the site's hydrological features with the wider coastal environment.

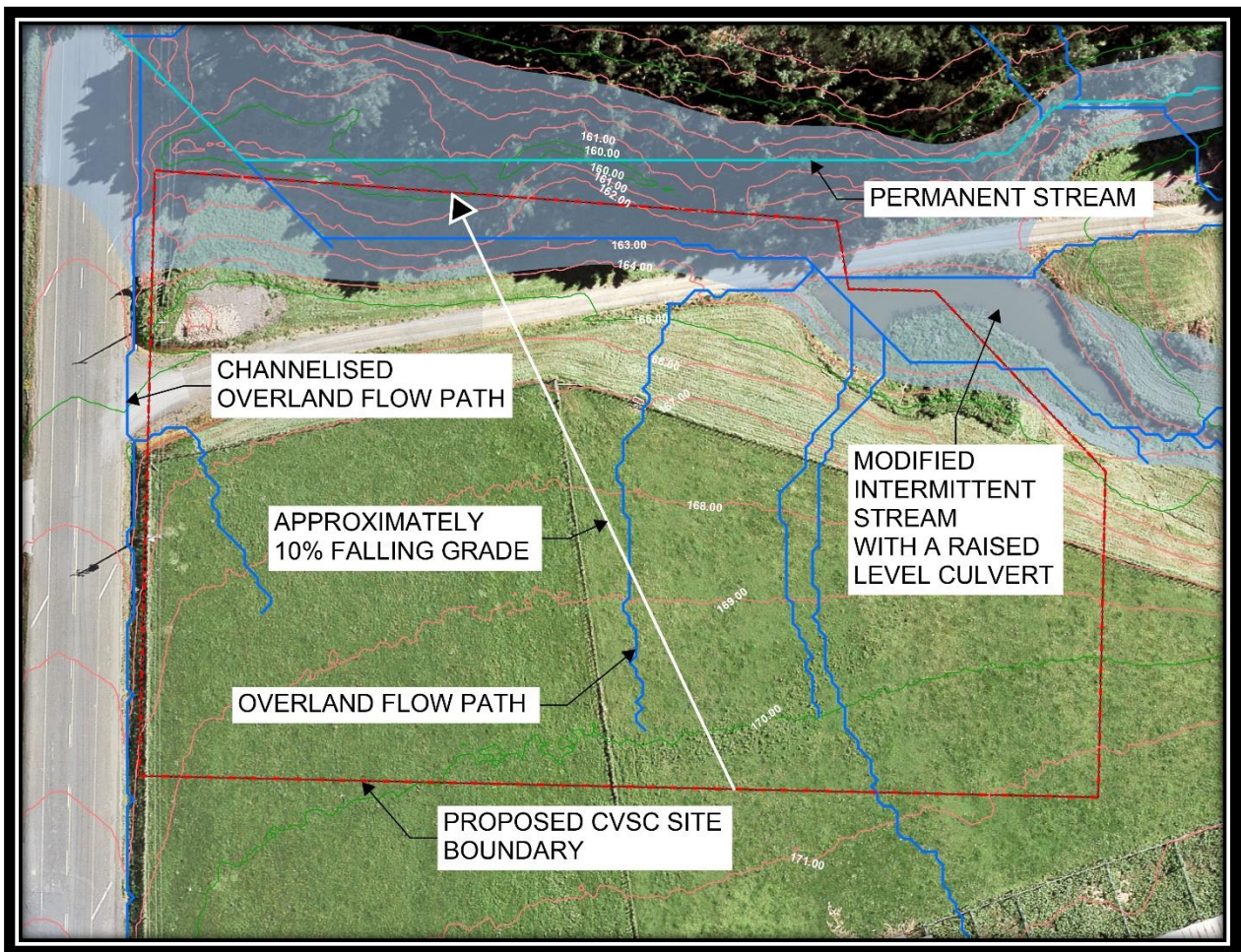


Figure 2: Site Map with Contours and Hydrological Features



4 Erosion and Sediment Control Principles

In the absence of proper controls, stormwater runoff poses significant risks to the site, including short-term flooding, sediment mobilisation, and downstream sediment transport. This runoff carries suspended sediments that can obstruct fish gills and hinder essential light penetration crucial for aquatic life processes. Additionally, sediment-laden water may infiltrate public utilities surrounding the site, posing operational threats. To address these potential issues, it is imperative to implement effective erosion and sediment controls during land-disturbing activities.

The erosion and sediment controls outlined in the subsequent section adhere to best practices outlined in GD05. These controls are designed to mitigate the adverse impacts of sediment runoff and ensure compliance with regulatory standards. The ten core principles of erosion and sediment control provided in GD05 serve as a comprehensive framework for implementing effective control measures. By aligning with these principles, the project aims to minimise environmental impacts and protect the receiving environment from the adverse effects of sedimentation.

These principles are as follows:

- Preserve existing environmental values and minimise earthworks to reduce disturbance.
- Stage construction activities to limit land disturbance at any given time.
- Protect steep slopes.
- Identify and map all existing watercourses on the plan to protect receiving environments.
- Promptly stabilise disturbed soils and exposed earthworks areas with vegetation or mulch after each stage and at specific milestones within stages.
- Implement perimeter controls to confine dirty water within the site and channel clean water away from the working area.
- Utilise sediment retention devices to capture and treat sediment-laden water from within the site, safeguarding surrounding watercourses.
- Employ trained and experienced personnel to execute erosion and sediment controls effectively.
- Adapt erosion and sediment control measures to the evolving needs of the site as the project progresses.
- Regularly inspect, monitor, and maintain erosion and sediment control measures to ensure operational effectiveness.

4.1 Erosion and Sediment Control Methods

The ESCP Drawing with indicative locations of controls is attached as Appendix A, providing a visual representation of the proposed erosion and sediment control measures. To ensure effective implementation, it is recommended that the appointed contractor reviews and builds upon this ESCP. The Contractor's ESCP should encompass various components:

- Details of all principles, procedures, and practices to undertake erosion and sediment control, minimising the potential for sediment discharge from the site.
- Design criteria, calculations, and dimensions for key erosion and sediment control structures.
- A site plan identifying waterway, soil disturbance areas, buffer zones adjacent to watercourses, cut and fill areas, stockpile locations, and other relevant site information.
- Construction timetable for erosion and sediment control works and bulk earthworks.
- Timetable and nature of progressive site rehabilitation and re-vegetation.
- Maintenance, monitoring, and reporting procedures.



- Rainfall response and contingency measures.
- Procedures for ESCP review and amendment.
- Identification and contact details of personnel responsible for operation and maintenance.

Based on the ESCP, the construction site will be demarcated by a network of clean water bunds and dirty water channels, effectively containing dirty water within the site boundaries.

Additional control measures recommended for implementation during the construction include:

- Stabilised construction entrance and exit for plant access.
- Wheel wash facilities to prevent sediment tracking.
- Perimeter security fencing.
- Cut and cover methodology to limit exposed areas.
- Protection of inlets to prevent contamination.
- Containment of stockpiles.
- Controlled dewatering, if required.
- Sediment retention pond(s) with clean water discharge(s)

The ESCP offers a range of options tailored to specific site requirements, including stormwater inlet protection, diversion channels and a sediment retention pond (SRP).

All erosion and sediment control measures and devices are to be removed upon completion of works, as decided by the Engineer and Auckland Council's representative, ensuring the site is restored to its original condition.

4.2 Dust Control Procedures

To mitigate dust generation, the Contractor will implement comprehensive dust control procedures, ensuring a proactive approach to environmental stewardship. These procedures encompass various measures:

- Timing of works will be coordinated with careful consideration of prevalent wind direction, minimising the potential for dust dispersion.
- During dry or windy conditions, exposed soils will be dampened with water to suppress dust effectively.
- Wheel wash facilities will be strategically positioned at the site exit, facilitating the thorough cleaning of vehicles before leaving the site, thus preventing dust accumulation on roadways and nearby areas.
- To further reduce dust levels, stockpiles will be stabilised and covered, minimising the potential for airborne particulate matter.

Through the implementation of these dust control measures, the Contractor is to uphold environmental standards and ensure compliance with regulatory requirements, promoting a safe and sustainable construction environment.



4.3 Water Management During Construction

4.3.1 *Overland Flow Paths and Flood Plains*

Stormwater management during construction is an integral component of the ESCP, ensuring comprehensive environmental protection throughout the project. To effectively manage stormwater runoff, diversion bunds or structures will be constructed to redirect clean water flows arriving at the site around construction activities and areas. By incorporating these measures into the ESCP, the project aims to mitigate the risk of environmental degradation and ensure the preservation of natural hydrological processes. Proposed diversion of overland flow paths will be conducted in strict accordance with the Contractor's ESCP and GD05 (incorporating Amendments 1 to 3).

Temporary diversion drains capable of conveying the 1 in 20-year Average Recurrence Interval flows will be required. In implementing these measures, priority will be given to maintaining, as far as possible, the natural drainage paths.

Given the nature of the proposed earthworks, which include both cut and fill operations, careful management and control of ponding in excavations are essential. The Contractor is to implement appropriate measures, such as proper drainage and sediment control practices, to ensure containment of dirty water within the site until it has received sufficient treatment to be discharged.

All works associated with the Project, both permanent and temporary, are to take account of the nature and extent of existing floodplain areas throughout the construction process.

4.3.2 *Fuel or Chemical Spill Management*

On-site refuelling of plant and equipment near waterways is strictly prohibited. Instead, refuelling should only occur at a specially prepared area of hard stand, ensuring containment and preventing accidental spills or leaks from reaching watercourses.

Furthermore, the final ESCP will encompass comprehensive measures to address the storage of fuels, lubricants, hazardous, and/or dangerous materials on site. These measures will include stringent storage protocols and contingency procedures to manage emergency spill responses and clean-up efforts effectively.

4.4 Contaminated Land Management

The Bombay Site Investigation Report, appended to the Application, serves as a crucial document providing an assessment of land contamination effects. This report identifies areas of potential contamination that may pose risks to both the environment and public health during construction. It should inform the Contractor's E&SCP so as to mitigate risks associated with the release of contaminants.

4.5 Erosion and Sediment Controls

The erosion sediment controls outlined below are designed to effectively treat sediment-laden runoff from the site, addressing potential environmental impacts associated with construction activities. To ensure their effectiveness, the proposed controls should be monitored at least weekly during construction and adjusted as necessary to accommodate changing site conditions.

Indicative locations of the controls are provided in Appendix A, offering a visual reference for their placement and implementation. The appointed contractor will develop a comprehensive erosion and sediment control plan tailored to the final construction staging and methodology and incorporating monitoring and adaptive management.

4.5.1 Clean Water Diversion

To manage clean water runoff diversion bunds are to be constructed upslope of the site to intercept and divert clean water around the works area, reducing the volume of runoff to be treated and preventing contamination and sedimentation. Clean water diversion bunds must be engineered to safely accommodate flow from the 5% annual exceedance probability (AEP) storm, with a minimum freeboard of 300 mm. The bunds are to be lined with needle-punched geotextile to prevent them from becoming a source of sediment during operation. Clean water bunds must remain operational until disturbed areas are permanently stabilised.

Clean runoff from the south of Great South Road carriageway is assumed to be contained within the current table drain that flows past the site. A conduit for these flows must be maintained at all times.

4.5.2 Dirty Water Diversion

A dirty water diversion channel will be constructed to divert dirty water towards an SRP for containment and treatment. It must be engineered to accommodate flow from the 5% annual exceedance probability (AEP) storm, with a minimum freeboard of 300 mm. The channel must remain operational until land disturbed areas are permanently stabilised. Continuous maintenance and monitoring of the channel are essential.

4.5.3 Sheet Piles

In the northwest section of the site, where the intermittent stream (classified induced wetland) is located, a sheet piling barrier will be installed along with a temporary earth bund to divert dirty runoff:

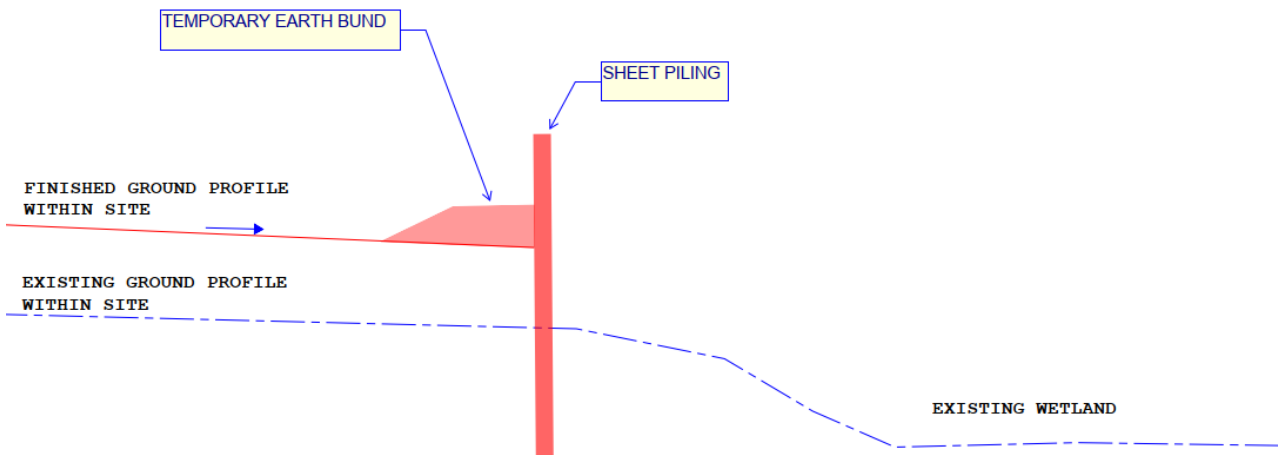


Figure 3: Sheet Piling at North-Eastern Corner, with Earth Bund

This barrier will effectively divert sediment-laden runoff from the construction site towards the dirty water diversion channel, ultimately directing it to be discharged into the SRP. The combination of the temporary earth bund and sheet piling barrier reinforces the protection of the wetland. The excavator driving the sheet piles into the ground must be positioned within the construction laydown area during installation, as far as practicable from the wetland. The Contractor is also to ensure that during the sheet piling operation a barrier is in place to prevent sediments from reaching the wetland. It is likely that dirty water from this operation will need to be pumped to the SRP.



4.5.4 Sediment Retention Pond

To treat sediment-laden water generated within the site, an SRP will be constructed as the primary retention and treatment device. Discharge will be to the northwest of the site via a stabilised outlet structure.

The design and capacity of the SRP is to be consistent with the requirements of Auckland Council's GD05 guidelines. The SRP must have a minimum volume numerically equivalent to 2% of the total contributing catchment area for the earthworks site, and with a capacity of not less than 200 m³. This capacity is aimed at treating approximately 1 Ha catchment encompassing the site, ensuring adequate treatment for sediment-laden water.

The SRP must feature a stabilised emergency spillway designed to convey runoff from a 1% AEP event.

If appropriate, chemical flocculation may be employed within the SRP. In this instance a flocculation management plan will be developed by the Contractor's engineer to guide the Contractors regarding the size and implementation of the flocculation device.

The SRP should remain in place until the disturbed area is permanently stabilised against erosion. It is expected that the appointed contractors will provide site-specific design details for the proposed SRP in accordance with the requirements outlined in GD05.

4.5.5 Stabilised Vehicle Entry with Wheel Wash Station

A temporary access path on the western boundary of the site has been proposed to facilitate the transportation of plant, labour, and materials. This path, along with all access points or entrances along Great South Road, must undergo adequate stabilisation in accordance with GD05 guidelines.

To further enhance sediment control measures, wheel wash-downs are to be installed to prevent unintended tracking of sediments from the site onto public roads.

4.6 Earthworks Staging

To ensure effective management of earthworks, a staging strategy should be employed by the appointed contractor to minimise the area of exposed soils at any given time. The staging of earthworks must adhere to guidelines outlined in GD05, emphasising the importance of rapid stabilisation measures to mitigate environmental impacts.

Further details regarding the staging plan, including the delineation of staged earthworks areas and proposed timeframes, are to be provided by the Contractor. Unless Council consent to work outside the earthworks season is obtained, all earthworks' activities are completed within the Auckland Council's designated earthwork season, spanning from October 1st to April 30th. Any extensions beyond this period would necessitate additional permits to ensure compliance with regulatory requirements.

The specifics of the staging plan should be updated by the Contractor as necessary to ensure that environmental safeguards remain consistent throughout the project lifecycle.

4.7 Dewatering

Given the propensity for low-lying areas at the site to become inundated with stormwater following rainfall, intermittent dewatering measures will be required. For smaller volumes of water, dewatering bags or pipe socks present viable solutions, effectively managing localised water accumulation. Conversely, larger volumes of water necessitate a more robust approach, with water being pumped into the SRP for containment and treatment.



In instances where direct offsite discharge is feasible, stringent clarity requirements of a minimum 100 mm must be followed. Where direct discharge is not viable, contaminated water will be channelled into the established SRP for comprehensive treatment prior to off-site discharge.

4.8 Heavy Rainfall Response and Contingency Measures

Erosion and sediment controls remain crucial during heavy rainfall events. To mitigate this risk, the appointed contractor must monitor weather patterns daily and ensure the maintenance and readiness of erosion and sediment controls ahead of forecasted rainfall. Following heavy rainfall, inspections of controls should be conducted promptly to identify and repair any damage.

In the event of heavy rainfall incidents, it is essential for the contractor to report these occurrences and maintain communication with Auckland Council as part of routine reporting procedures. Any serious incidents must be reported within 24 hours.

4.9 Monitoring and Maintenance

GD05 outlines indicative regimes for the maintenance of each proposed control, emphasising the importance of regular inspection and upkeep. It is recommended that each device undergoes inspection at least once a week and after every rainfall event to ensure correct operation. Additionally, regular removal of accumulated sediment from the device is important, with clearly identified disposal locations. Any damage to the devices must be promptly remediated to prevent further issues.

The contractor is expected to appoint a trained environmental manager to oversee the sediment controls and ensure compliance with maintenance protocols. This individual will play a vital role in supervising the implementation of maintenance procedures.

To facilitate accountability and compliance, the contractor must maintain comprehensive records of inspections and provide related reports upon request by the engineer. This documentation will serve as a crucial reference for monitoring the condition of sediment controls and addressing any maintenance requirements promptly.

Device-specific maintenance procedures are detailed in the table below, providing clear guidance for the ongoing upkeep of each control measure. By adhering to these maintenance protocols and procedures, the contractor can effectively manage sediment controls and mitigate potential environmental impacts throughout the project duration.

Table 2: Indicative Maintenance Procedures

Erosion and Sediment Control Measure	Indicative Maintenance Procedure	Frequency
Clean and Dirty Water Diversions	<ul style="list-style-type: none">• Conduct thorough inspections to identify tunnel gullies, water ponding and blockages; promptly reinstate any damaged components to ensure proper functionality.• Thoroughly examine inverts and outlets for any signs of scour and erosion, ensuring structural integrity and	Weekly and after every rainfall event

	<p>preventing potential damage.</p> <ul style="list-style-type: none"> • Ensure complete stabilisation cover is always maintained; promptly reinstate any areas requiring additional stabilisation to prevent erosion. • Regularly remove sediment deposits from the diversion channel to prevent overtopping caused by insufficient freeboard, thereby maintaining effective water flow management. 	
Sediment Retention Pond (SRP)	<ul style="list-style-type: none"> • Clean out before the accumulated sediment reaches 20% of the total SRP volume. • Clean SRP using high-capacity sludge pumps or using excavators loading sediment into sealed tip trucks or to a secured area adjacent to the SRP. • Maintain access to the forebay for sediment removal. • Clearly identify sediment disposal sites. 	Daily and before and after every rainfall event
Stabilised Construction Entrances and Wheel Washes	<ul style="list-style-type: none"> • Conduct inspections to ensure ongoing functionality, performing maintenance as necessary to uphold effectiveness. • Remove sludge from the sump before it reaches 20% capacity to prevent overflow. 	Weekly and after every rainfall event



	<ul style="list-style-type: none"> Reconstruct or resurface the construction entrance if surface contamination compromises its effectiveness, ensuring continued functionality. 	
Sheet Piles	<ul style="list-style-type: none"> Regularly conduct an inspection to identify signs of wear and tear before they escalate into major issues. Look for indications of metal corrosion, cracks and plant growth. Address minor issues promptly. Repair small holes, cracks and plant growth to prevent damage escalation. 	Monthly

5 Conclusions and Recommendations

The development of the Bombay CVSC carries the risk of sedimentation and erosion impacting the surrounding environment, particularly the adjacent wetland and the permanent stream. However, by implementing the control measures outlined in this Report, the project's environmental impact can be minimised to less than minor. This provisional Erosion and Sediment Control Plan, which lays the foundation for mitigating these effects, will be further refined and executed by the appointed contractor. The controls specified in the Contractor's ESC Plan must strictly adhere to the principles and guidelines outlined in Auckland Council's GD05. As such, it becomes the Contractor's responsibility to refine, submit, and obtain approval from the Council for their ESC Plan. Additionally, the Contractor has the flexibility to explore alternative ESC mechanisms, provided they can meet Council's approval criteria. This collaborative process ensures that environmental protection measures are effectively integrated into the project's implementation, aligning with regulatory standards and minimising adverse environmental impacts.

Appendix A

Drawings

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