Homestead Bay Development Construction Management Plan

Prepared for: RCL Homestead Bay Ltd

Stantec New Zealand

Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer	Independent Reviewer	Project Manager Final Approval
1	March 2025	Draft for Consent Application	Iain Banks	Patrick Leslie	Peter White	Peter White

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1 General

The purpose of the Construction Management Plan (CMP) is to provide guidance on the construction activities and considerations involved in the delivery of the Homestead Bay Development. The CMP has been prepared in draft to support the resource consent application process and will be finalised by the Consent Holder and certified by local authorities prior to construction commencing.

The key objectives of the CMP are as follows:

- To inform the draft construction management processes considered as part of Project delivery including project management plans, methodologies or intended sequencing which may apply to the Project.
- Identify the key environmental, health and safety, security and traffic management considerations and the potential effects of the construction work.
- Establish communication processes with potentially affected parties including local authorities, community groups, Iwi, commercial businesses, and adjacent residents

2 Scope of Works

The scope of work covers large scale civil construction of all infrastructure required to service the new development including:

- Set up of Environmental Controls
- Bulk Earthworks
- Bulk Infrastructure
    - Water Bores and Mains Supply Pipelines
    - Water Treatment Plant
    - Water Reservoirs
    - Wastewater pump station and Rising Mains
    - Waste Water Treatment Plant
    - Land Disposal of Treated Wastewater
- Roading Access off State Highway 6
- Upgrades to existing State Highway Infrastructure
- Stormwater Diversion Channels
- Internal Civil Infrastructure
    - 3 Waters piped networks
    - Utility services (Power, Telecom)
    - Roading network
    - Pedestrian/cycling network
    - Lighting
- Landscaping including Parks and Playground Facilities

3 Project Personnel

The overall contract procurement strategy for the project has yet to be confirmed, however, the key parties involved in the development are:

RCL Homestead Bay Ltd – Principal

Stantec New Zealand – Engineering Design Consultant and Engineer to Contract/Engineer's Representative

Patersons – Principals Surveyor

Remarkable Planning – Planning Consultant

Blakely Wallace Associates – Landscape Architects

Contractors – TBC for Earthworks and Civil Construction

4 Construction Methodology

The methodology for construction will generally be as per the following sequence for each stage of the development:

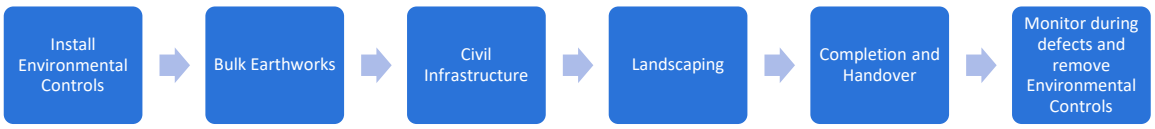


Figure 1 Works Sequence for each stage of Construction

An initial staging plan has been prepared for the full development and, whilst subject to change, provides the overall likely sequencing of how the land will be developed.

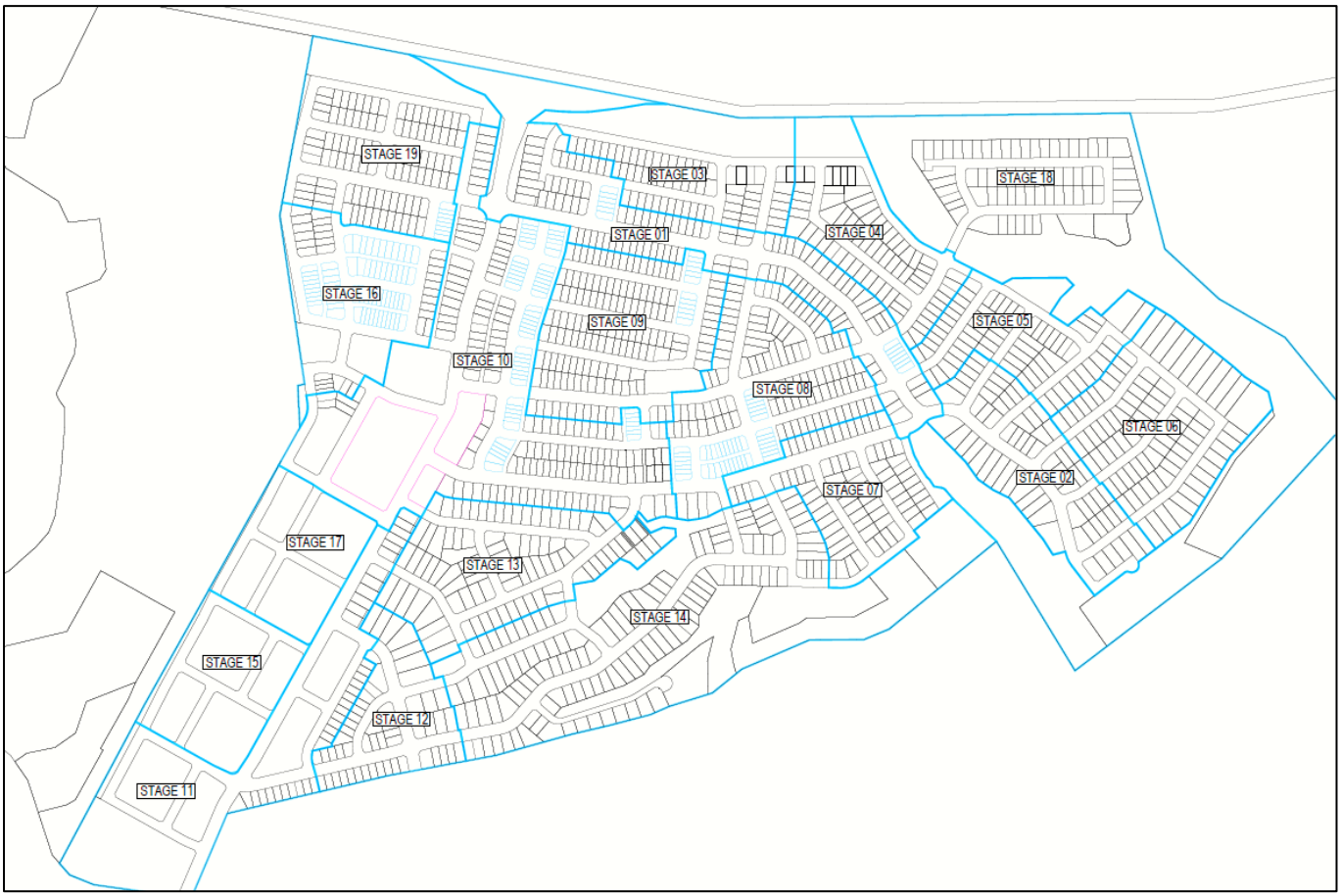


Figure 2 Homestead Bay Staging Plan

The likely order and scope of work is as follows:

Phase 1 - Initial Development Required to release titles in Stage 1

- Earthworks in Stages 1-6 combined
- State Highway Intersection Construction
- Highway Bund/Diversion Channel from Intersection South to Existing Southern Gully

- Pumps and Bulk Rising Main from Water Bore to Treatment Plant
- Wastewater Pump Station B and bulk rising main to Treatment Plant
- Water/Wastewater Treatment Plant
- Water Reservoirs and bulk Rising/Falling Mains
- Water Booster Pump Station for pumped zone areas
- Stage 1 Land Disposal Fields (Area 1)
- Civil Construction Stage 1 including stormwater outlet to existing gully

Phase 2 – Progressive Construction of Medium Term Stages

- Civil Construction Stage 2
- Civil Construction Stage 5
- Civil Construction Stage 6
- Earthworks Stage 7, 8, 9
- Civil Construction Stage 7 including wastewater pump station C
- Civil Construction Stage 8
- **Upgrade of Jack Hanley Intersection to Roundabout (Approximately 600 Lots/units Developed)**
- Civil Construction Stage 9
- Stage 2 Land Disposal Fields (Remainder Area 1 and Part Area 2)

Phase 3 - Medium to Long Term Stages

- Earthworks Stage 10, 11 Combined
- Detention Pond and outlet within Stage 11
- Highway Bund/Diversion Channel from Intersection North to Existing Northern Channel
- Northern Channel Upgrade
- Wastewater Pump Station A and bulk rising main to Treatment Plant
- Stage 10 Civil Construction
- Stage 11 Civil Construction
- **Connect internal network to Homestead Bay Rd (approximately 1200 units Developed)**
- Earthworks Stage 12, 13, 14 Combined
- Stage 12 Civil Construction
- Stage 13 Civil Construction
- **Upgrade Māori Jack Road Intersection to Roundabout (approximately 1400 Lots Developed)**
- Stage 14 Civil Construction
- Stage 3 Land Disposal Fields (part Area 2 plus part Area 3)

Phase 4 – Long Term Stages

- Earthworks Stage 15, 16, 17, 18, 19 Combined
- Detention Pond and outlet within Stage 16
- Stage 15 Civil Construction
- Stage 16 Civil Construction

- Stage 17 Civil Construction
- Highway Bund/Diversion Channel from Existing Southern Gully to Southern Boundary
- Box Culvert Access to Stage 18
- Stage 18 Civil Construction
- Stage 19 Civil Construction
- Stage 4, 5, 6 Land Disposal Fields (Part Area 3 plus Area 4)

5 Project Timeline

The draft project timeline is subject to change and will be dependent on a number of factors including demand for sections but is provisionally as follows:

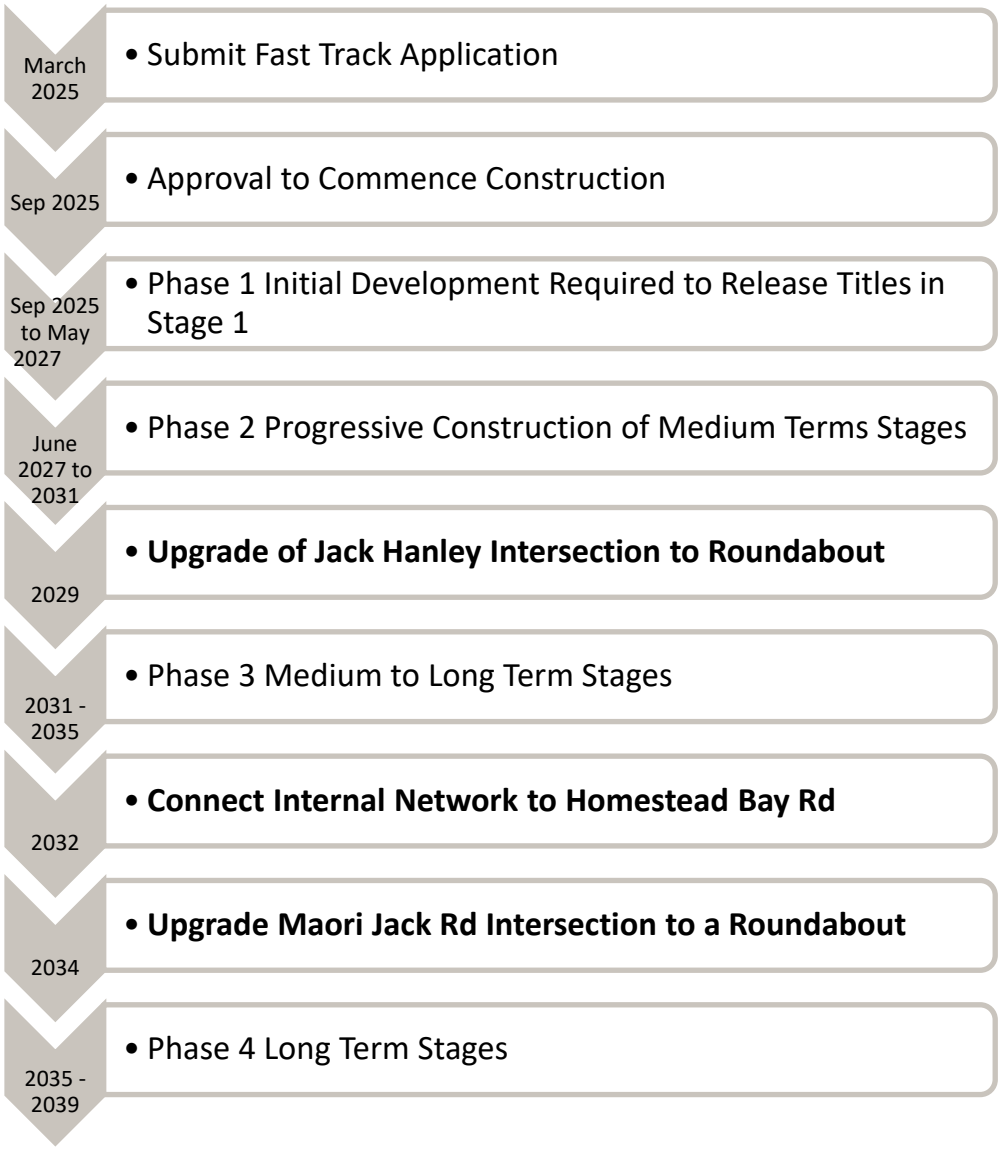


Figure 3 Draft Project Timeline

6 Environmental Management

6.1 Environmental Management Plans

Given the scale of the site and extent of earthworks planned, good environmental management is a key component of the development works. A high level Erosion and Sediment Control Plan (ESCP) of the likely controls is presented in Appendix A and a detailed Environmental Management Plan (EMP) and ESCP will be prepared and submitted to the relevant authorities prior to each stage of the development. These documents will be prepared by an SQEP and be in general accordance with the QLDC Guidelines for Environmental Management Plans, Auckland Council's Erosion and Sediment Control Guide for Land Disturbing Activities (GD05) where applicable and the Otago Regional Council Residential Earthworks in Otago A Guide for developers, landowners contractors and service providers.

The content of the EMP will generally be as per the following format and an example template is attached in Appendix B:

a) Administrative Requirements
   i. Weekly site inspections
   ii. Monthly environmental reporting
   iii. Independent audit by Suitably Qualified and Experienced Person
   iv. Notification and management of environmental incidents
   v. Records and registers
   vi. Environmental roles and responsibilities of personnel (including nomination of Principal Contractor)
   vii. Site induction

b) Operational Requirements
   i. Erosion and sedimentation, including an ESCP to be prepared by a SQEP
   ii. Water quality monitoring including sampling locations
   iii. Dust management
   iv. Chemical and fuel management

c) Sufficient detail to address the following matters:
   i. Location of specific sensitive environmental area
   ii. Specific erosion and sediment control works (locations, dimensions, capacity etc.)
   iii. Supporting calculations and design drawings
   iv. Catchment boundaries and contour information
   v. Details of construction methods
   vi. Timing and duration of construction and operation of control works
   vii. Processes in place if unexpected contaminated land is encountered
   viii. Contingency measures for snow and/ or frost events (in relation to chemical treatment)
   ix. Measures to avoid silt and/or sediment tracking onto roads and then to water for the duration of the earthworks, such as:
      - Providing stabilised entry and exit point(s) for vehicles
      - Providing wheel wash facilities; and

- Cleaning road surfaces using street-sweepers immediately where sediment has been tracked onto the road.

x. Details relating to the management of exposed areas; and

xi. Monitoring and maintenance requirements.

6.2 Site Management and Preparation

The overall strategy for site management is to split the site into stages related to how the development will be progressed from a servicing and sales perspective and where practical earthworks areas should be combined to make cut and fill operations as efficient as possible. Where possible site controls will be set up in a way that they can remain in place for multiple phases, including during house building, and then can be remediated at the end into final planned features e.g. enhanced reserve areas and/or longer term retention features for stormwater management. This will not be possible for all areas of the site and shorter term management will be necessary during earthworks and civil construction operations.

Following the requirements of the Environmental Management Plans the key components of Site Management will be:

- The extent of areas stripped at any one time shall be kept to manageable sizes to prevent excess risk of dust or dirty water runoff.
- Topsoil stripping and subsequent earthworks be undertaken only when a suitable interval of fair weather is expected.
- Uncontrolled fill and buried topsoil should be removed and replaced with a fill certified in accordance with NZS4431, or otherwise clearly demarcated for future use.
- Stockpiles will be kept in designated areas and managed to suitable sizes with safe batter slopes and sealed off or topsoiled and seeded if planned to remain in place for extended periods of time to prevent risk of dust.
- Since historic farmland activity was carried out within Homestead Bay low-volume uncontrolled fills are expected and have been identified in the Geotechnical investigations to date, so all uncontrolled fill material will need to be removed during bulk earthworks with supervision from a qualified geotechnical practitioner.
- Contaminated land has also been identified as being present and will be managed as discussed in section 6.7 below.

6.3 Management of Surface Water Runoff

Stormwater runoff during construction will ultimately discharge into Lake Wakatipu as clean diverted runoff or treated site runoff. This will be either via one of the existing large gullies in the southern portion of the site or the northern creek via the Jacks Point stream that outlets from Lake Tewa to Lake Wakatipu.

Due to the medium erodible nature of some of the soils present across the site the EMP and site control will be set out in a manner to manage site runoff to meet local authority discharge requirements and consents. The EMP will include a provision for management, control, and testing of all site runoff.

The following measures to manage stormwater runoff will be included in the EMP to be employed on site during construction:

- Positive grading to subgrade will be done to minimize ponding.
- Bunding around areas to minimize the amount of runoff generated on exposed surfaces.
- Channelling of sediment laden runoff to collection points for treatment.

- Sediment retention ponds with treatment facilities and testing locations will be installed to collect and treat all sediment laden runoff.
- Silt fences or other similar controls to act as filters, stabilizers and erosion prevention measures will be in place until sufficient vegetation is reached.
- Watering of exposed earth surfaces will be undertaken during dry conditions to prevent dust nuisance. Care will be taken to avoid excess watering that may promote erosion.

The location and type of control measures adopted will be outlined in the EMP's and installed when required during the construction progress of the site.

6.4 Noise

It is expected that conventional earthmoving equipment, such as excavators, trucks, rollers, plate compactors will be required during earthworks construction. Rock breakers are not expected to be required. The contractor will ensure that all works are undertaken in accordance with the noise limits set in any relevant conditions of consent, national standard or in the absence of a consented limit must comply with the district plan noise limits. The EMP will include provisions that for works exceeding 20 weeks the noise limits will be limited to 70dB with a max of 85dB.The EMP will include provisions to mitigate noise generation.

6.5 Dust

Soil materials at this site have the potential to generate dust. The earthworks contractor will take appropriate measures to control dust in accordance with QLDC requirements. Construction methodology, staging of works and limited works during forecasted wind events are all commonly used controls by the contractor to minimize the generation of dust. To manage conditions when dust is generated, regular damping will be undertaken. The EMP will include provisions for dust control during dry conditions.

6.6 Vibration

The site largely comprises a rural setting. Jacks Point residential buildings are located approximately 300 m from the northern boundary of the development, separated by Lot12 which is not proposed to have any major earthworks completed on it. Some residential buildings are also located to the south west of the development and the Lakeside Development is located south of Homestead Bay but is largely separated by the existing deep stormwater gully.

The residential buildings are separated by earth mounding and vegetated landscaping area, all items that will minimize any vibration disturbance from construction activities. Overall, the risk of vibration to neighboring properties is considered low. The EMP will include provisions to mitigate vibration during construction works.

6.7 Contaminated Land

A Preliminary Site Investigation (PSI) has been completed by WSP to assess the potential risk to human health from contaminants in the soil associated with historical site uses *(786 Kingston Road, Queenstown, Preliminary Site Investigation, dated 3 February 2025).*

The PSI has found that:

- Historical and current Hazardous Activities and Industrial List (HAIL) activities have taken place on the site.
- As a result, the *Resource Management (National Environmental Standard for Assessing and Manging Contaminants in Soil to Protect Human Heath) Regulations 2011 (NESCS)* apply
- Identified HAIL activities and the risk to human health and the environment are assessed as either

moderate or high risk. These are summarised below and in Figure 1:

- *HAIL sites with Moderate Risk to Human Health and Environment*
  - Fuel storage, workshops, washdown areas, and fire practice areas at the skydiving facilities (F1)
  - Chemical, fuel, or liquid waste storage tanks at the skydiving facilities (A17)
  - Possible landfilling north of the skydiving facilities (G3)
  - Fertiliser manufacture or bulk storage northeast of Lot 8 (A6)
  - Wastewater treatment and disposal field (G6)
- *HAIL sites with High Risk to Human Health and Environment*
  - Livestock dip or spray operations (A8)
  - Wastewater treatment and disposal field (G6). Note environmental risk assessed as moderate.

- Due to the assessed risk of HAIL sites, the proposed land use change from rural to urban is assessed to be a **discretionary activity**.
- **Since development is considered a discretionary activity, a Detailed Site Investigation (DSI) is required**

The recommendations from the PSI include:

- Submit the PSI report to the Consenting Authority (QLDC)
- Submit the PSI report to the Regional Authority (ORC) to enable an update of their HAIL database
- Complete a Detailed Site Investigation (DSI) to outline risks to human health and the environment along with required remediation works.
- Engage a suitably qualified and experienced practitioner (SQEP) if additional contaminated ground is encountered

It is expected that the outcome of the DSI will be that a Remediation Action Plan, that will form part of the overall EMP for each stage, will need to be prepared prior to earthworks commencing. This will detail the course of action to suitably manage and dispose of the contaminated waste in a safe and controlled manner.

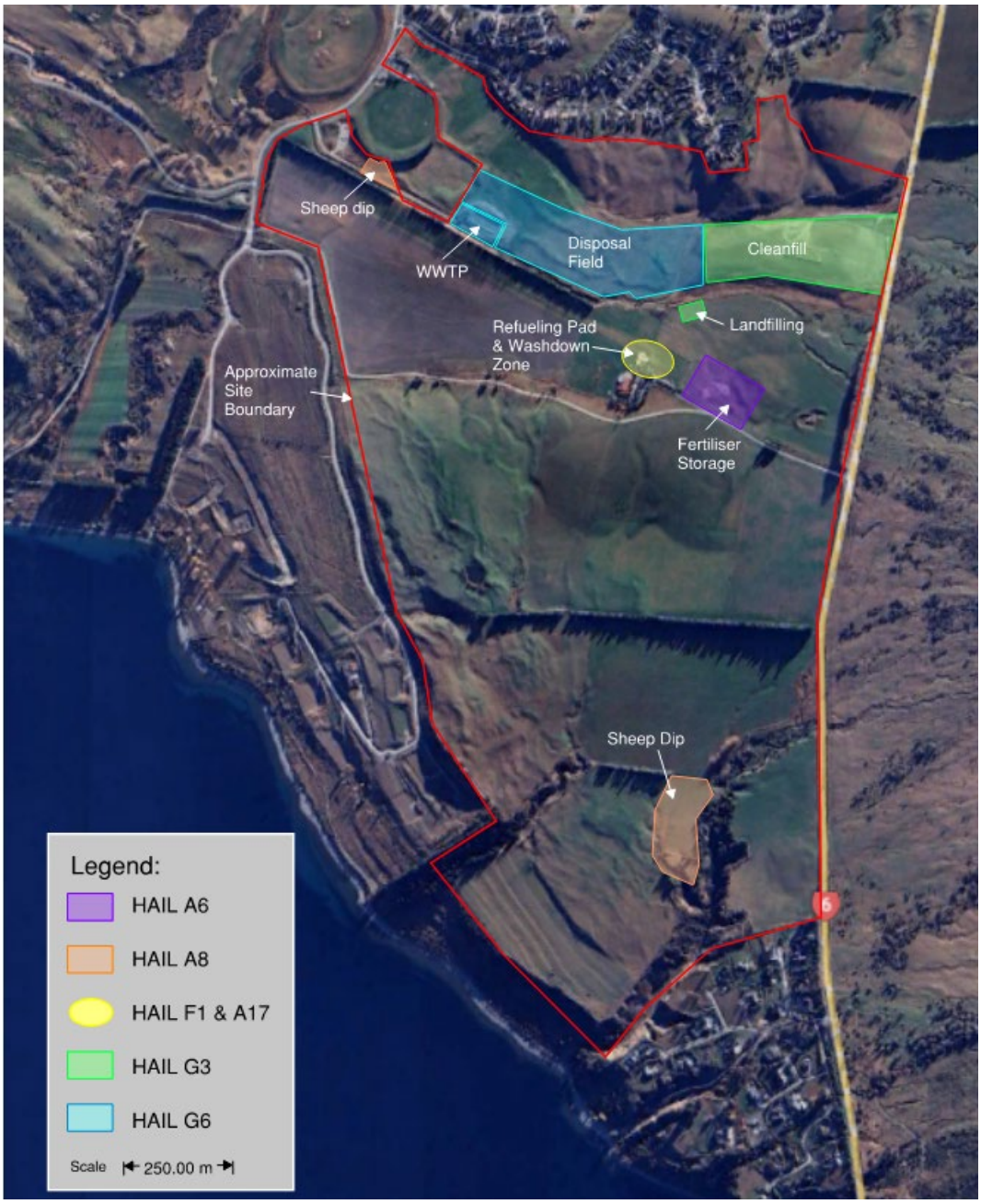


Figure 4 A Summary of the HAIL activities identified in the PSI Report

7 Health and Safety

The Contractor(s) will prepare a comprehensive Site Specific Health and Safety Plan which:

- Incorporates the relevant requirements of the key client and stakeholder Health and Safety (H&S) Plans
- Incorporates the Contractor's own H&S system, and applies to any subcontractors working on the Project; and
- Is tailored to suit the specific conditions and risks appropriate to the Project.

The objective is to have only one Project specific H&S Plan that applies to the Project and is administered and managed by the Contractor who is in control of the site.

The overall objective of the H&S Plan is to enable a safe working environment and avoid harm for all parties involved in the Project, and the public

The H&S Plan will be prepared – and will be maintained and managed – in accordance with the Health and Safety at Work Act 2015, and all other relevant health and safety legislation and regulations. The Health and Safety at Work Act 2015 requires the employer and employees to do all that is reasonably practicable to ensure the safety of staff whilst at work. This includes ensuring that:

- All persons are appropriately trained, skilled and/or supervised for their tasks
- All hazards are identified, notified, and managed to accepted industry and H&S standards
- Safety barriers and signage are provided as appropriate, and hazard registers and noticeboards are kept up to date and discussed at regular site toolbox meetings
- Appropriate personal protective equipment is worn at all times; and
- All visitors to the site are safe at all times.

RCL Homestead Bay Ltd will be responsible for ensuring that the site complies with the Health and Safety at Work Act 2015 and any relevant Health and Safety regulations. The H&S Plan will specify appropriate H&S management procedures including audits, incident reporting and actioning, and any corrective action as necessary to ensure the safety of all throughout the duration of the Project.

The information below is a list of typical project hazards which are anticipated to apply to the Project site. Any other hazards identified during the Project will be incorporated into the CMP as identified.

- Construction plant
- Open excavations
- Demolition
- Heavy trucks and other road-going vehicles including cars, trailers and campervans
- Underground and overhead services
- Earthworks
- Contamination
- Hazardous materials
- Explosive or flammable materials
- Noise and vibration
- Dust and fumes
- Craneage
- Trips, slips and falls

- Working at heights
- Working over water
- Confined spaces; and
- Foreign tourists and other unfamiliar public driving through site

8 Traffic Management

Management of Construction traffic can generally be split into three parts:

- access into and out of site,
- within site during earthworks and civil construction prior to any internal roading being accessed to the public
- within the development whilst parts of the roading network are accessible to the public.

The main access into and out of site will be from SH6, initially through the existing access to the NZone Skydive facility or the existing access to Lot 12. No large scale movement of earthworks materials into or out of site is expected and therefore access off the state highway will generally be limited to light vehicles, delivery trucks and road pavement material trucks. It is proposed that a new roundabout on the State Highway to access the development will be constructed in the early stages in order to provide a safe and efficient means of accessing the site. The alignment of this roundabout means that it can be built largely offline with two way flow maintained on the State Highway. Short term lane closures will likely be necessary for completion of the tie ins to the existing alignment but otherwise disruption to the State Highway will be minimal. Temporary site access and access to the Skydive facility will also need to be maintained during the construction of the roundabout. Fully detailed traffic management plans will be developed for this phase of works and submitted to the RCA for approval prior to works commencing,

Within site itself for phase 1 Earthworks all large scale plant will be brought to site and will work within specified areas with temporary haul roads constructed where necessary. This work can be completed with minimal traffic management other than clearly defining routes through the site for construction traffic, no public access will be allowed. The areas for movement of construction will change as the earthworks move between each stage of the development.

As the stages progress and roading construction advances from the roundabout south, basic traffic management will be necessary in order to ensure it is clear where public access is allowed and where entrances to site for construction traffic are. Standard traffic management plans will be prepared for these scenarios and submitted to the RCA for approval prior to works commencing. As the development fills up with houses and traffic increases more detailed traffic management may be necessary but in generally each stage will be clearly delineated and ideally fenced off to minimise the interaction with the travelling public. It is not expected that the construction traffic will need to access the site through Jacks Point and Homestead Bay Road but once the link to this road is created then general traffic and particularly builders construction traffic may access via this route.

Construction traffic for the treatment plant area and water reservoirs will be via the existing access to Lot 12 from the State Highway. This access was previously upgraded and considered suitable in its current condition to deal with the expected construction traffic for this phase of the project.

9 Site Security

Areas of the site will be securely fenced generally as per the proposed staging plan with deer fencing and access gates. Additional fencing is likely to be required in the early stages around the north western area of the development to limit the chances of public access to the site. A site compound will be established in a central location and will also be securely fenced and CCTV cameras installed. The site compound is likely to move as the development progresses.

10 Quality Control

Quality Management Plans will be prepared by each Contractor detailing how works will be constructed, monitored, tested, inspected and approved in accordance with the drawings, specifications, manufacturer's requirements and any specific consent conditions.

Independent on site inspections and construction monitoring will be completed by Stantec Representatives on behalf of RCL to ensure the works are completed to the required quality standards and in accordance with local authority requirements and national standards.

11 Communication

Communication will generally be internal between the main parties engaged by RCL. Any external communication shall be directed through the RCL Project Manager and no parties shall engage directly with the media or public without prior agreement from RLC.

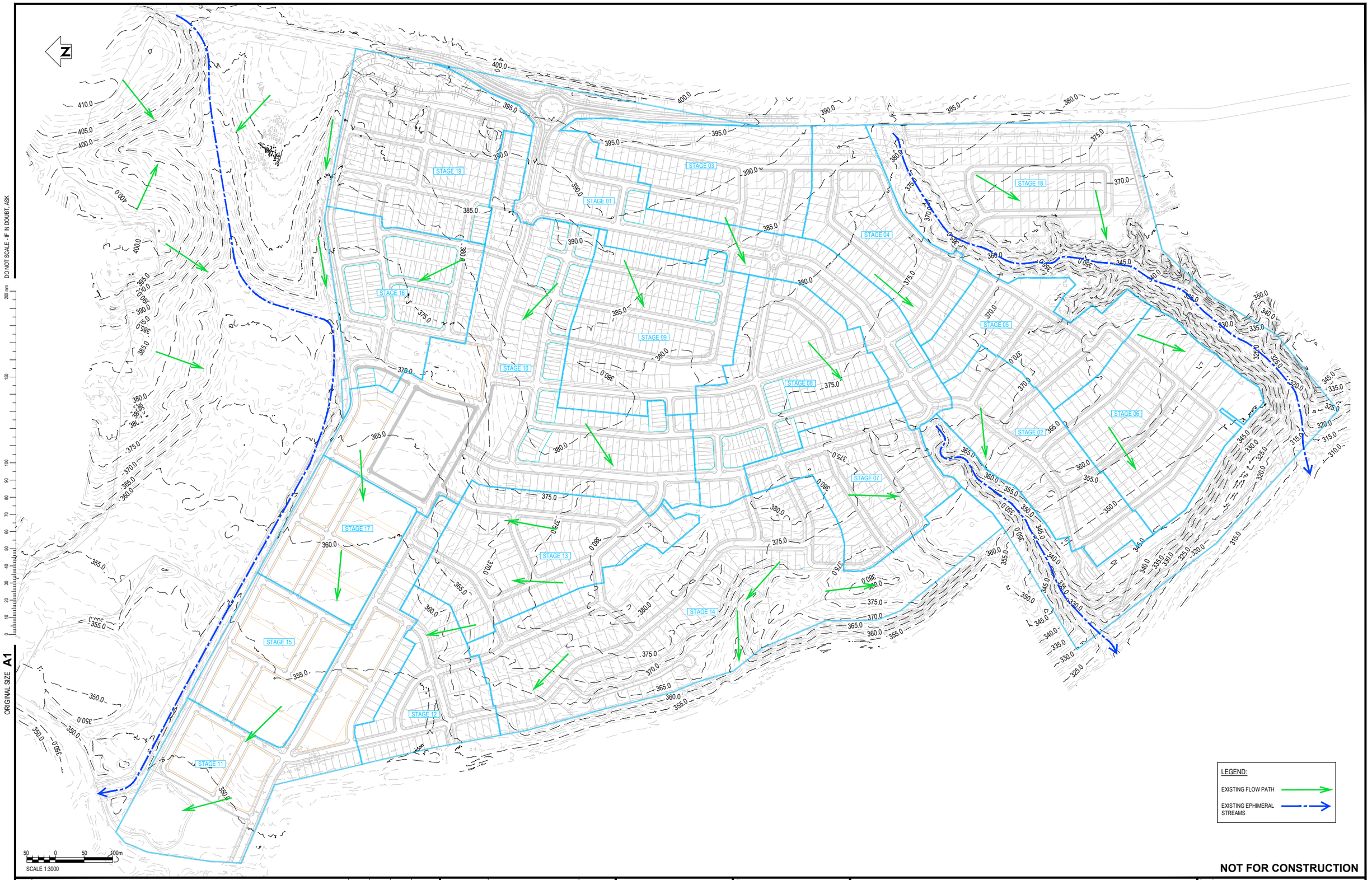
12 Risks

A full risk assessment will be completed for each stage of the project as it progresses, however, at this early stage the key risks that have been identified include:

- Timing of approval through the Fast Track process
- Engagement with stakeholders during the Fast Track process and potential for negative feedback which delays the consenting process
- Resourcing to complete all inputs through both design and construction
- Cost of material and construction affecting the financial viability of the project
- Demand for sales affecting the progress of future stages

Appendices

Appendix A Master Plan ESCP



DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
0	ISSUED FOR CONSENT	BG	PAT	PSW	11.04.25

SURVEYED	Patersons	08.24
DESIGNED	Iain Banks	02.25
DRAWN	Brent Grey	02.25
CAD REVIEW	Peter Thomson	11.04.25
DESIGN CHECK	Peter Thomson	11.04.25
DESIGN REVIEW	Peter White	11.04.25
APPROVED	Peter White	11.04.25
PROF REGISTRATION:		

Stantec

Client: rcl group

HOMESTEAD BAY SUBDIVISION, QUEENSTOWN
MASTER PLANNING

DRAFT EROSION AND SEDIMENT CONTROL PLAN
LAYOUT PLAN - ORIGINAL GROUND CONTOURS

Status Stamp: **FOR CONSENT**

Date Stamp: **11.04.2025**

Scales: 1:3000

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Rev.: 0

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LOCALISED TREATMENT FOR STATE HIGHWAY ROUNDABOUT AND INITIAL ROAD 1 CONSTRUCTION

MAIN SITE ACCESS OFF STATE HIGHWAY

CLEAN WATER BUNDS IN PLACE FOR CONSTRUCTION DIVERSION CHANNEL AS PART OF STAGE 1 WORKS

POTENTIAL SRP LOCATION FOR STAGE 18

LOCATION FOR SERIES OF SRP'S FOR STAGES 3, 4 AND 5, COULD BE LONGER TERM IN ASSOCIATION WITH SW OUTLET

POTENTIAL SRP LOCATION FOR STAGE 6, COULD REMAIN UNTIL HOUSES ARE BUILT IF LOTS HELD BACK

LOCALISED SILT FENCES AND BUNDING FOR CONSTRUCTION OF TREATMENT FACILITY AND WATER RESERVOIRS

CHANNEL TO BE CONSTRUCTED IN STAGES AND DURING DRIER MONTHS TO MINIMISE RISKS OF RUN-OFF DURING CONSTRUCTION

FINAL DETENTION BASIN USED AS INTERIM SRP FOR STAGE 16 AND 19, CAN POTENTIALLY STAY FUNCTIONING UNTIL HOUSES ARE BUILT

FINAL DETENTION BASIN USED AS INTERIM SRP FOR STAGE 11 TO 17, CAN POTENTIALLY STAY FUNCTIONING UNTIL HOUSES ARE BUILT

POTENTIAL LOCATION FOR SRP'S THAT COULD REMAIN IN PLACE FOR ALL STAGES FROM 10, 12, 13 AND 14 INCLUDING HOUSE BUILD

SECONDARY SITE ACCESS FROM HOMESTEAD BAY ROAD

EXTENT OF EARTHWORKS (TYP.)

SILT FENCES AND BUNDS TO BE USED ALONG BOUNDARIES TO PREVENT WATER LEAVING SITE

INDIVIDUAL SRP'S FOR EACH STAGE 7-10 LIKELY REQUIRED BUT AS EARTHWORKS / CIVILS COMPLETE SECONDARY SRP LOCATION COULD BE UTILISED WHILST HOUSES ARE BEING BUILT

LOCALISED TREATMENT WITH SRP LIKELY NEEDED FOR PART OF STAGE 14 WHIST GULLY IS BEING FILLED. REST OF STAGE 14 CAN BE DIVERTED NORTH OR SOUTH

SECONDARY LOCATION FOR SRP'S AND POTENTIAL FOR LONG TERM USE WITH OUTLET OF SW SYSTEM WHILST HOUSES ARE BEING BUILT

INITIAL LOCATION FOR SRP'S IN STAGE 1 (LIKELY SERIES OF THEM, ~2-3, AT DIFFERENT LEVELS)

LOCALISED SILT FENCES AND DROP OUT PITS FOR CONSTRUCTION OF ACCESS ROAD AND WATER BORE INFRASTRUCTURE

POTENTIAL SRP LOCATION FOR STAGE 2 ALTHOUGH GRADIENTS ARE MORE CHALLENGING HERE

STAGE 01 · STAGE 02 · STAGE 03 · STAGE 05 · STAGE 06 · STAGE 07 · STAGE 08 · STAGE 09 · STAGE 10 · STAGE 11 · STAGE 12 · STAGE 13 · STAGE 14 · STAGE 15 · STAGE 16 · STAGE 17 · STAGE 18 · STAGE 19

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NOT FOR CONSTRUCTION

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ORIGINAL SIZE A1

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Stantec

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HOMESTEAD BAY SUBDIVISION, QUEENSTOWN
MASTER PLANNING

DRAFT EROSION AND SEDIMENT CONTROL PLAN
MASTERPLAN LAYOUT ON FINISHED GROUND CONTOURS

Status Stamp: **FOR CONSENT**

Date Stamp: **11.04.2025**

Scales: 1:3000

Drawing No.: 310104425-00-000-D2011

Rev.: 0

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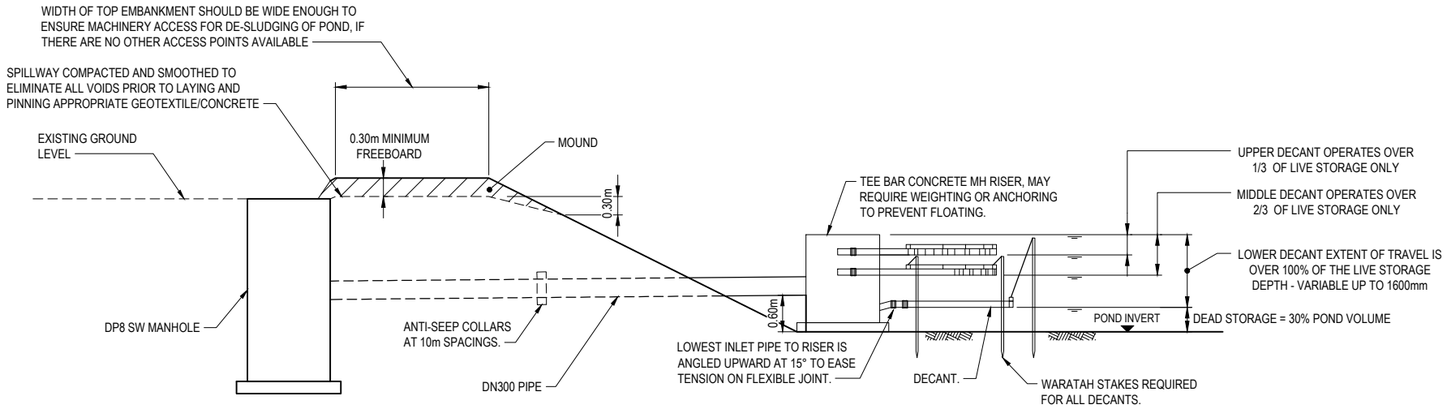
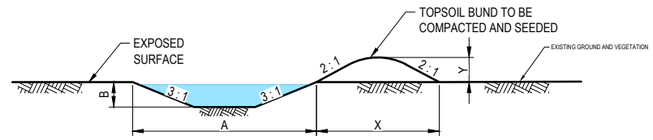
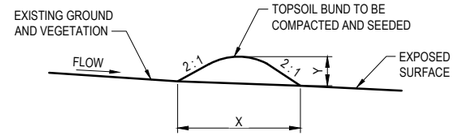


POND OUTLET DETAIL
SCALE 1 : 50

NOTES:
1. REFER TO THE EMP REPORT FOR ALL LETTERED DIMENSIONS SHOWN ON THIS SHEET.



DIRTY WATER CHANNEL
SCALE 1 : 50



CLEAN WATER / PERIMETER BUND
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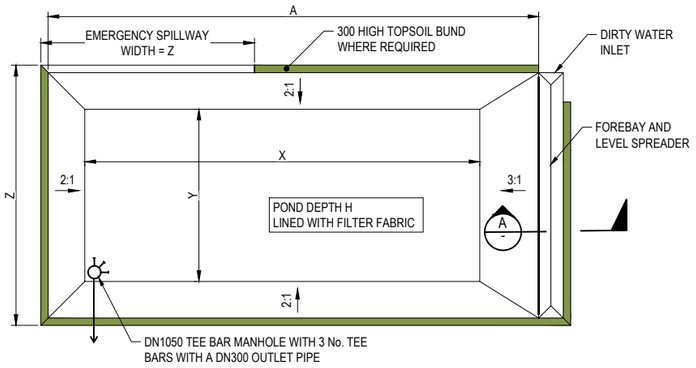

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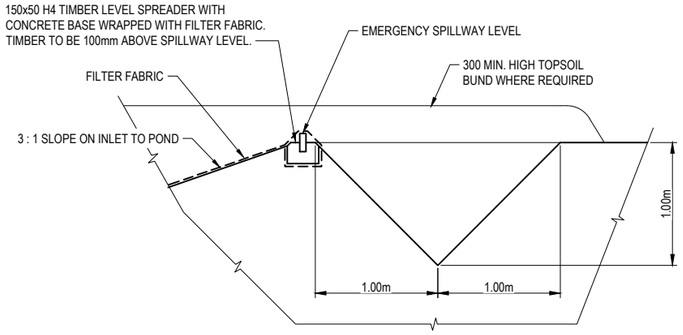

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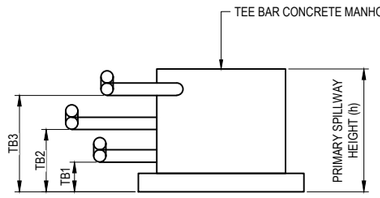

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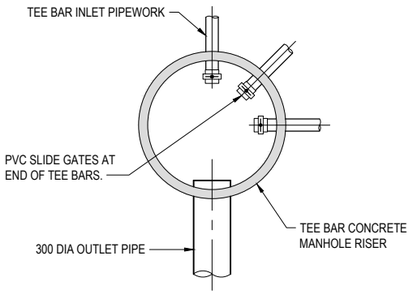

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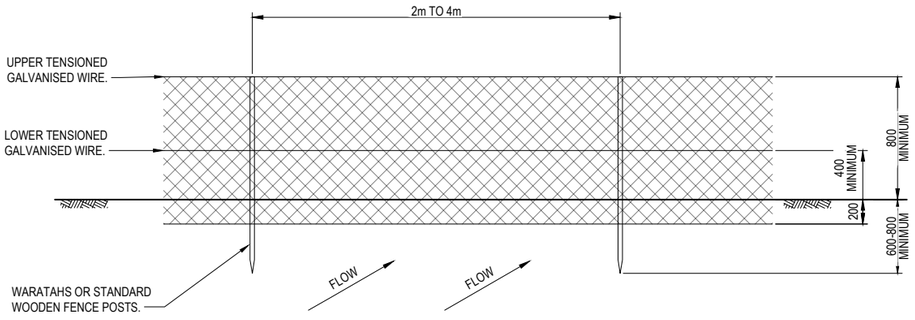

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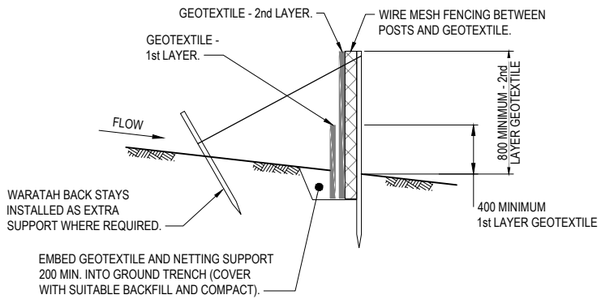

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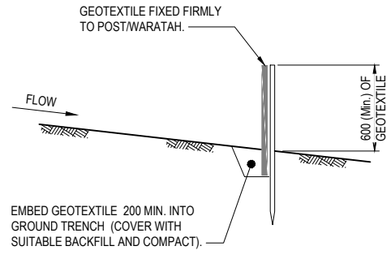

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SCALE 1:100 SCALE 1:50 SCALE 1:25 SCALE 1:10

NOT FOR CONSTRUCTION

DO NOT SCALE - IF IN DOUBT, ASK
ORIGINAL SIZE A1

REV	REVISIONS	BG DRN	PAT CHK	PSW APP	11.04.25 DATE
0	ISSUED FOR CONSENT				

SURVEYED	Patersons	08.24
DESIGNED	Patrick Leslie	02.25
DRAWN	Brent Grey	03.25
CAD REVIEW	Peter Thomson	11.04.25
DESIGN CHECK	Iain Banks	11.04.25
DESIGN REVIEW	Peter White	11.04.25
APPROVED	Peter White	11.04.25
PROF REGISTRATION:		

Stantec

Client: rcl group

HOMESTEAD BAY SUBDIVISION, QUEENSTOWN
MASTER PLANNING

DRAFT EROSION AND SEDIMENT CONTROL PLAN
TYPICAL CONSTRUCTION DETAILS

Status Stamp: **FOR CONSENT**
Date Stamp: **11.04.2025**
Scales: AS SHOWN
Drawing No.: 310104425-00-000-D2012
Rev.: 0

PLOTTED: 10/04/2025 3:23:05 pm
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Appendix B Template EMP

ENVIRONMENTAL MANAGEMENT PLAN
Homestead Bay Development
Stage XX

PREPARED FOR RCL HOMESTEAD BAY LTD | Date XX

Stantec

Revision Schedule

Rev No	Date	Description	Signature of Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
1						
2						
3						

Quality Statement

The conclusions in the report are Stantec's professional opinion, as of the time of the report, and concerning the scope described in the report. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. The report relates solely to the specific project for which Stantec was retained and the stated purpose for which the report was prepared. The report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorised use or reliance is at the recipient's own risk.

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PROJECT MANAGER	PROJECT TECHNICAL LEAD

PREPARED BY

_____ .....

CHECKED BY

_____ .....

REVIEWED BY

_____ .....

APPROVED FOR ISSUE BY

_____ .....

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STATUS Final | Project No 310101105

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Abbreviations

Enter Abbreviation	Enter Full Name
SRP	Sediment retention pond
QLDC	Queenstown Lakes District Council
EMP	Environmental Management Plan
ESCP	Erosion and sediment Control Plan
ORC	Otago Region Council
GD05	Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region
SQEP	Suitably Qualified and Experienced Person
TSS	Total Suspended Solids
NTU	Nephelometric Turbidity
ARI	Annual Reoccurrence Interval

1 Introduction

This Environmental Management Plan (EMP) outlines the administrative/operational procedures and practices that are to be implemented to manage, remedy, and mitigate potential environmental effects, ensure the health and wellbeing of all employees on site, and adhere to all statutory requirements whilst undertaking earthworks and civil works associated with the construction of stage XX of Homestead Bay Development.

The contents of this EMP outlines Queenstown Lakes District Council (QLDC) and Otago Regional Council (ORC) requirements for the earthworks activities and will be discussed in the site inductions/toolbox meetings to ensure all parties are aware of the requirements. This will ensure that QLDC and ORC's environmental views are appropriately protected, and the resource consents adhered to.

This EMP report is to be read in conjunction with the Erosion and Sediment Control Plan (ESCP) and together both sections shall be referred to as 'the EMP'.

2 Level of Risk

The works associated with stage XX can be categorized as high-risk based on QLDC's Guideline for Environmental Management Plans. The extent of the works is approximately XX ha of area. The work area it divided into localized areas, XX as follows….. By dividing it up this will ensure runoff can be collected and treated separately and effectively.

3 Site and Work Description

3.1 Location

Describe location of Stage

Insert Location Plan

Figure 3-1: Extents and extents of work covered by previous EMP

3.2 Existing Features

3.2.1 Stage XX – Existing Stormwater Overland Flow Paths

Describe existing overland flow paths

Insert Plan of flow paths

Figure 3-2: Existing flow paths – orientated north.

3.2.2 Ground Condition

Describe ground conditions

4 Administrative Requirements

4.1 Environmental Roles

The environmental roles are outlined in Table 4-1 below.

Table 4-1: Environmental Roles

Contactor's Site Manager	**Earthworks stage - XX**

Environmental Representative	P: XX	
	Civils stage – XX	
	P: XX	
	Earthworks stage - XX	
	P: XX	E:
	Civils stage – XX	
	P: XX	E:
Environmental Advisors and Engineers	**Iain Banks SQEP – Stantec**	
	P:027 4807528	E: iain.banks@stantec.com
	Patrick Leslie – Stantec	
	P: 027 964 1667	E: patrick.leslie@stantec.com
Clients Representative	**Dan Wells**	
	P: 021 942 911	E: dan@rclgroup.com.au
Queenstown Lake District Council (QLDC)	**Monitoring Department**	
	P: 03 441 0499	E: RCMonitoring@qldc.govt.nz
Otago Regional Council (ORC)	**Compliance hotline**	
	P: 0800 474 082 P: 03 474 0827	E: compliance@orc.govt.nz
	Pollution Hotline	
	P: 0800 800 033	E: pollution@orc.govt.nz

The Client's Engineers are responsible for ensuring the Contractors and Environmental Representative are upholding the requirements of this document. Compliance inspections will be undertaken monthly or as required to ensure all measures are in working order. As part of the inspection an overall assessment will be completed to assess if environmental measures can be improved and to ensure the site is being managed effectively to prevent the risk of an environmental incident during work.

For the position of a Suitably Qualified and Experienced Person (SQEP), Iain Banks of Stantec is a Chartered Professional Engineer with a background in civil construction and transportation projects. For the last 8 years Iain has been responsible for overseeing construction and site monitoring of the Hanley's Farm Development including overseeing works in streams and land disturbance activities of the previous stages. Based on this, Iain meets the definition of a SQEP for a high-risk site as defined in the QLDC Guideline for Environmental Management Plans. Assisting with tasks onsite will be another employee of Stantec, Patrick Leslie, who has been working under the guidance of Iain for the last 6 years.

The Clients Representative role in environmental management is to ensure the clients best interests are heard and adhered to while ensuring the progress is to the clients liking. They will be involved with all large changes that require approval from the client while providing feedback to the client about the site and any environmental issues.

The Contractor's Site Manager is responsible for ensuring the site operates in a safe and effective manner while ensuring all Contractor obligations outlined in the document are upheld. This includes items like implementation of the Environmental Management Plan while ensuring work is undertaken in a timely manner and in accordance with the specification of the project. They are also responsible for assisting the Site Representative with the management of any accidental discovery/environmental incident in accordance with this EMP and the relevant sections below.

The Environmental Representative is responsible for implementation of environmental controls and administrative activities.

They will:

- Ensure installation of environmental controls as per the EMP.
- Undertake environmental site inspections of the project.
- Oversee the maintenance and improvement of defective environmental controls.
- Undertake environmental incident reporting.
- Undertake environmental monitoring.
- Keep project leadership informed of environmental performance of the project.
- Inform staff of procedures and constraints applicable to managing specific environmental issues
- Providing environmental inductions to all staff and sub-contractors
- Attending to environmental incidents and complaints.

The Environmental Representative should be familiar with:

- Environmental aspects of the project
- Environmental Management Plan
- Best practice erosion and sediment control from:
  - Guidance Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05); and/or
  - Erosion and Sediment Control Toolbox for Canterbury on Environment Canterbury website; and/or
  - Best Practice Erosion and Sediment Control, International Erosion Control Association Best Practice Guidelines.
  - QLDC Guidelines for Environmental Management Plans
  - Otago Regional Council Residential Earthworks in Otago A Guide for developers, landowners contractors and service providers

4.2 Hours of Operations

Hours of operating for works will be in accordance with the applicable QLDC resource consent hours of operation and limited to the following:

- Monday to Saturday (inclusive): 7.30 am to 6:00 pm.
- Sunday and public holiday: No Activity

In addition, no heavy vehicles are to enter or exit the site and no machinery will start operating earlier than 7.30am. All activity on the site is to cease by 6:00pm.

4.3 Site Inductions

The Contractor will deliver a project specific site induction to all persons upon entering the site, a separate document has been prepared for this purpose. The environmental site induction includes a summary of all items included in this EMP and ESCP and specifically covers:

- The basic roles and responsibilities for environmental management and each person's responsibility while onsite.
- Specific locations within the site of environmental significance or risks, including exclusion zones and sensitive environmental receptors.
- An outline and discussion covering the conditions of resource consents.
- The limit of clearing and earthworks for each stage of works (as indicated on the ESCP.
- Environmental management measures required and how they should look.
- Procedures of notifying of potential environmental incidents.
- Procedures for managing environmental management measures during wind and rain events.

The Contractor is responsible for maintaining a register signed by those inducted. The register shall have, but not be limited to, the name of the inductee, date inducted, and the name of the induction facilitator. An example of an environmental site induction registers is included in Appendix C.

The Contractor's Health and Safety Advisor will conduct a weekly site health and safety meeting with the employees on site, minutes of these meetings will be kept on site and will also be available to view if requested. Weekly client meetings will discuss relevant health and safety issues that have been highlighted in the weekly toolboxes and other observations from site works.

4.4 Monitoring

4.4.1 Ongoing Monitoring

The Contractor's Environmental Representative and staff will monitor ongoing site activities to ensure compliance and that there are no adverse effects on sensitive environment receptors like the neighboring residential development of Jacks Point is experienced.

Noise levels will be measured if a valid complaint is received. This will ensure compliance with the standard and levels referenced. It should be noted that a valid complaint means a complaint the administering authority considers is not frivolous, nor vexatious nor based on mistaken belief.

Vibration's monitoring will be measured if a valid complaint is received. This will ensure compliance with the standards outlined below.

Wind condition will be monitored during the works, especially if there is large area of exposed land in direct contact with the wind. During periods of high wind, the Environmental Representative is to advise the Site Manager of the conditions and suggest changes to the work program to minimize dust generation or ensure additional dust prevention measures are implemented.

Weather conditions during works will be monitored. Severe changes in the weather may require action to be taken. Any person onsite who notices signs of uncontrolled sediment runoff because of rain shall notify the Environmental Representative or Site Manager immediately. The Environmental Representative, and if required Stantec, shall rectify the situation and update the EMP.

4.4.2 Weekly, Pre and Post Rainfall Events

The Contractor's Environmental Representative and, if requested, Stantec shall undertake and document weekly inspections of the environmental management controls of the site for the purpose of monitoring the following:

- Verifying that the management measures are present, functional, and adequate.
- Observing the site for actual or potential adverse environmental effects.
- Identify maintenance requirements for implemented management measures.
- Verifying preparedness for adverse weather conditions where rain and/or wind is forecast.
- Observing any visual evidence of dust travelling beyond the boundaries of the site and evidence of dust fallout from the works on adjacent vegetation or buildings.

The Contractor's Environmental Representative is responsible for monitoring the weather forecasts and prior to any significant forecast rain (such as a 20mm over a 12hr period) and post rainfall events when there is flow of water being discharged from site, they shall undertake a site inspection of the environment management controls. If maintenance or alteration is required, this will be undertaken prior to the forecasted rain fall event. They shall document the inspection using the form in Appendix F

The Contractor shall undertake corrective actions to rectify issues identified by the site inspections. Each weekly inspection shall be recorded including date, observations, and any corrective actions. Appendix G has a template for the weekly site inspection form.

Between the weekly and post-rain event inspections, the site personnel shall also undertake a daily pre-start inspection to ensure that no new environmental issues have arisen, or mitigation measures have been compromised from the previous day's work. Observations should be recorded in a works diary.

4.4.3 Monthly

Stantec shall monitor the site monthly to ensure that the site is complying with its EMP, identify any new environmental risks arising that could cause an environmental effect and suggest alternative solutions that will result in more effective and efficient management. The outcome of these inspections will be reported and included in the monthly environmental report referred to below. Appendix I has an example of a monthly inspection form to be completed at the specified date and for inclusion in the monthly environmental report.

The Contractor shall complete and submit a monthly environmental report to QLDC and ORC. The monthly environmental report will be submitted to QLDC's Regulatory Department and ORC compliance within five working days of the end of each month. It will include exception reporting and statements actively addressing but not limited to the following that occurred during the reporting month:

- Updates to the EMP and the Erosion and Sediment Control Plan (if required).
- Weekly Site Inspections – number of inspections completed, and summary of corrective actions undertaken if any. Any area where replacement or rework of control features occurred will be noted.
- Monitoring reporting – summary of monitoring and whether non-conforming results were obtained.
- Positive environmental outcomes achieved, and opportunities identified by the Contractor.
- Stantec inspection report.

4.5 Incidence Reporting and Management

The Contractor will report to QLDC, ORC and Stantec within 12 hours via email of any environmental incident where an EMP has failed leading to an environmental nuisance or harm offsite. Once the immediate risk from the environmental incident is alleviated, the Contractor and Stantec will investigate the cause of the breach and/or adverse environmental effects. After which, identification and implementation of corrective actions will be undertaken.

The Contractor will provide any incident report to the Stantec, ORC and QLDC within 10 working days. Appendix D has a reporting template that is to be used when completing an environmental incident report.

Definition of environmental nuisance or harm off site can be found in the QLDC Guideline for Environmental Management Plans, June 2019.

Any environmental issues reported to the site manager, such as noise and vibration issues will result in works stopping until appropriate response measures have been agreed upon between the Stantec and the Site Manager and recorded in the Contractors incident register.

After any identification of incident or failure, the source/cause is to be immediately located and the following measures implemented:

- Build-up of sediment off the site – the material will be collected and disposed of in a manner that will not cause ongoing environmental nuisance or harm; then on-site EMP measures amended (if required), to reduce the risk of further sedimentation.
- Excessive sediment build-up on the site – collect and dispose of material, then amend up-slope drainage and/or erosion control measures as appropriate to reduce further occurrence.
- Severe or excessive erosion – investigate cause, control up-slope water movement, re-profile surface, cover dispersive soils with a minimum 100mm layer of non-dispersive soil, and stabilise with erosion control blankets and vegetation as necessary.
- Off-stream erosion – fill eroded areas, vegetate, and install velocity control measures.
- In-stream erosion – consult Stantec.
- Poor vegetation growth or soil coverage – plant new vegetation. Newly planted and previously planted areas may require supplementary watering and replanting. Additionally, erosion protection matting can be used to help ensure slope stability until growth is achieved.
- Sediment fence failure – replace and monitor more frequently. Regular failures may mean that the sediment fence location, alignment, or installation may need to be amended.
- Source of incidents is not a part of works – notify Stantec, ORC and QLDC of the source location.

4.6 Records and Registers

The Contractor is responsible for keeping all onsite records up to date. Environmental records will be made available upon request, immediately if the request is made by a QLDC or ORC Officer onsite and within 24 hours if requested by a QLDC or ORC Officer offsite.

Records and registers to be managed onsite shall include the following:

- Environmental induction attendance register (Appendix C).
- Environmental incident reports and associated corrective actions undertaken (Appendix D).
- Complaints register and associated corrective actions undertaken (Appendix E).
- Daily diary entries (including pre-start inspection observations).
- Post-rain event inspection observations and corrective actions (Appendix F).
- Weekly site inspection checklists (Appendix G).
- Monitoring results (e.g. water quality) (Appendix J).
- EMP non-conformance register (based on weekly inspection results or otherwise identified) and associated corrective actions taken (Appendix H).

4.7 Complaints Process

While it is hoped the environmental measures outlined in this document will prevent complaints from surrounding residents and the wider community, complaints or concerns can be reported via two channels:

- Via QLDC – https://www.qldc.govt.nz/do-it-online/make-a-complaint/
- Via ORC - https://www.orc.govt.nz/managing-our-environment/waste-and-hazardous-substances/pollution/report-pollution or the ORC hotline which is managed 24 hours a day 0800 800 033.

If the complaint is related to project management reference should be made to Section 4.1 of this EMP for contact details.

Once a valid complaint is received the Contractor's Environmental Representative or Site Manager will investigate the cause of the complaint, speak with the complainant (if available), consult with Stantec and work on a solution to prevent future complaints of the same nature. All valid complaints shall be registered on the complaints register as shown in Appendix F .

5 Operational Controls

5.1 Dust Minimization and Control

5.1.1 Performance Requirements

The Contractor shall always take reasonable and practicable management measures to avoid dust moving beyond the boundaries of the site.

5.1.2 Sensitive Receivers

Based on site visits and investigation it was concluded that the following dust sensitive receivers are present on and off site:

- Residences of Jacks Point.
- Vehicles using SH6
- Residences to the south
- Workers on site.

5.1.3 Dust Sources and Controls

Works could create adverse environmental effects in relation to dust including earthworks operations like excavation, transporting, compacting, and seeding soil during the course of works.

Based on prior knowledge the prevailing wind direction is from the south to southwest coming off the lake. It is a light to moderate wind most of the time but has been known to have some strength to it as long as it is not obstructed by objects. The measures below will be used to help prevent dust generation.

If visible dust clouds are seen approaching the site boundaries or deemed to have potential to cause a nuisance, water carts will be actioned to minimize dust generation, haul roads will be doused, and earthworks will cease if required. The Contractor will provide a standby operator available to control dust outside of working hours or if forecasted winds are expected.

Measures to be utilized onsite to prevent dust generation or manage the dust generated include:

- Suspension of works during high winds: During periods of high wind, vehicle movements and construction activities may need to be reduced or suspended to minimize potential dust nuisance.
- Water supply: confirm water supply location (likely from bores on site). Alternatively, the sediment retention pond (s) may have water available for use (refer to Appendix A).
- Avoid steep cut faces: Steep cut faces disrupt the wind and cause swirling effects, which generate more dust than off a flat surface. The earthworks will be excavated down in layers rather than deeper cut faces where appropriate.
- Topsoil shall be pre-wetted prior to stripping if ground conditions are particularly dry, this reduces the amount of dust generated by excessively dry ground conditions.
- Application of hydro seed: Depending on the type of hydro seed employed various binding materials can be added to the hydro seed mix to more effectively bind the topsoil surface to create a crust which is able to stay in place over a prolonged period if required.
- Application of dust suppressant: Depending on the area of application a dust suppressant can be applied to exposed surfaces to help reduce the creation of dust.
- Scale back operations to an area that can be controlled for dust when conditions are windy: Depending on wind conditions some operations might be scaled back or shifted to a different part of the site to avoid generation of dust.
- Re-topsoil finished areas as soon as possible and re-grass: Following completion of bulk earthworks topsoil is to be placed and dampened down to form a crust with immediate grass seeding. As new ground is opened for cut to fill operation the stripped topsoil will be placed over completed areas so that there is a progression of completed areas and open areas being worked on.

The Contractor will rectify any instance where dust from site is found to be off site and causing an issue. It could be sweeping the dust off the road to prevent the situation getting worse.

5.2 Noise

5.2.1 Performance Criteria

The Contractor shall always take reasonable and practicable management measures to avoid and mitigate effects from noise associated with construction works.

The Contractor shall ensure that all works are undertaken in accordance with the noise limits set in any relevant conditions of consent or in the absence of a consented limit must comply with the noise limits. For clarification with works exceeding 20 weeks, the noise limits are limited to 70dB with a max of 85dB.

For all sites the contractor shall review the EMP, update and implement additional management measures:

- In response to a justifiable complaint caused by construction works
- When changes in the equipment/work method, intensity, location.

5.2.2 Noise Management

Noise generation activities include vehicle movement throughout site and excavation on site from equipment like water carts, excavators and haul trucks. All equipment used on site shall be regularly maintained and must only output acceptable construction noise. Construction noise is inevitable as part of the construction. However, construction noise will only be generated during the hours of operation permitted in the resource consent.

All practical steps shall be taken to minimize noise particularly when working adjacent to an existing residential area. It is noted that the proposed works are fairly separated from any such areas except for vehicle movements past existing houses within Jacks Point.

If a suitable complaint is received the Environmental Representative should monitor from the site compound and site boundary. A suitably qualified person should be engaged with an appropriate noise monitoring device to test the noise levels. Measurements will be taken at a height of 1.2 to 1.5 metre and 1 metre from any wall to align with the standards.. If levels are above the noted requirements, then additional investigation should be taken.

5.3 Vibration

The Earthworks may create severe vibration as operations such as rock installment is required for the works on site.

The Environmental Representative can monitor vibration levels using a suitable accelerometer typically found in today's smart phones or a vibration monitoring app like "Vibration Meter". If a justified complaint is received a qualified vibration monitor and expert will be engaged to measure and report what vibration levels are onsite.

5.3.1 Performance Criteria

Stantec undertook an inspection of the site, and it was identified that the nearest vibration sensitive receptor is the residence at Jacks Point. The vibration is deemed to be low risk with suitable distance form machines, bunds, and channels in place to disrupt the vibration. The construction staff will be informing the homeowner of every step of work to ensure clear communication is continued as in previous stages.

5.3.2 Vibration Management

To avoid exceeding the guidelines of British Standard – Code of Practice for noise and Vibration Control on Construction and Open Sites (BS5228.2:2009), vibration monitoring at the site boundary will undertake to ensure the vibration levels do not exceed 10 mm/s. Given the distance to the vibration sensitive receptor from the works site and the ongoing residential construction within the area any vibration levels closer to the residences could be caused by an outside source not associated with these works.

Table 5-1: Guidance on Effects of Vibration Levels (from British Standards BS5228.2:2009)

Vibration Level	Effect
0.14 (mm/s)	Vibration might be just perceptible in the most sensitive situations for vibration frequencies associated with construction and maintenance. At lower frequencies, people are less sensitive to vibration
0.3(mm/s)	Vibration might be just perceptible in residential environments but unlikely to be felt by a person
1.0(mm/s)	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10(mm/s)	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

5.3.3 Effects on Structures

For the purpose of this EMP, a structure includes infrastructure and utilities like pump stations, electrical and telecommunications facilities and utilities such as water mains and sewers.

The vibration will be monitored and DIN 4150-3:1999 Structural vibration – Part 3: Effects of vibration on structures will provide a comparative benchmark for preventing damage that could adversely affect the structures serviceability and give the Contractor a level to measure against if required. This standard has been adapted by New Zealand providing guideline vibration levels for assessing building damage risk.

The DIN 4150-3 (1999) guideline values for evaluating short-term and long-term vibration on structures are given in Table 5-2.

Table 5-2: Summary of Building Damage Criteria in DIN 4150.3:1999 (Source Deutsch Institut für Normung, 1999)

Type of structure	Short term vibration				Long term vibration
	PPV at the foundation at a frequency of:			PPV at horizontal plane of the highest floor (mm/s)	PPV at horizontal plane of the highest floor (mm/s)
	1 – 10 Hz (mm/s)	1 – 50 Hz (mm/s)	50 – 100 Hz (mm/s)		
Commercial/industrial	20	20-40	40-50	40	10
Residential/school	5	5-15	15-20	15	5
Historical/Sensitive	3	3-8	8-10	8	2.5

For the works associated with the Conveyance Channel, it would be classed as long-term vibration according to the definition given in the standard. Works similar to rock breaking can be categorized as short-term vibration in the respected vibration frequencies of the equipment.

To avoid exceeding the guidelines of DIN 4150.3:1999, vibration monitoring at the site boundary will be undertaken to ensure the vibration levels do not exceed 10 mm/s. Given the distance to the vibration sensitive receptor are from the earthworks site and the ongoing residential construction within the area, any vibration levels closer to the residential area could be caused be outside sources not associated with the works.

If a valid vibration complaint relating to structure damage from Conveyance Channel work is received, the Environmental Representative will undertake vibration measurements at the location of the damage and compare to the levels above. Previous monitoring on the nearby Hanley's Farm Development have only shown levels of 1.5mm/s at the site boundary. These observations were observed when heavy compaction rollers were operating within 10m of the boundary so not every complaint will be considered as valid.

A valid complaint will be considered if one of the following minor damages is evident. In DIN 4150.3:1999, These effects are deemed 'minor damage':

- Cracks form in plastered surfaces of walls not due to house construction work.
- Existing cracks in the building become enlarged with proof of the change in crack sizes. Proof of existing cracks prior and post damage is required.
- Partitions become detached from load bearing walls or floors.

The Contractor will undertake the following action if required:

- The Contractor shall be responsible for identifying any additional sensitive environmental receptors and critical facilities, infrastructure and utilities likely to be impacted by construction vibration. This may include things like residential housing or critical infrastructure susceptible to failure with excessive vibration.
- The earthworks shall cease if at any time a justifiable complaint is received regarding effects from vibration associated with earthworks activities within the work area.
- The issue will be investigated and if required alternative measures and/or operational changes will be made to resolve, mitigate, and avoid another complaint of vibration.
- If these concerns cannot be resolved between the parties, a suitably qualified professional shall be engaged to assess vibration associated with the earthworks and determine any adverse effect on land and buildings beyond this site. This assessment shall outline whether the works comply with BS5228.2:2009 or DIN 4150-3:1999 or a similar internationally accepted standard and if there is a non-compliance identified include recommendations on what changes to construction methodology are required to comply.

5.4 Contaminated Soil on Site

Contaminated Soil has/has not been identified within this stage of the works. Removal and management of soil within the areas identified is to managed in accordance with the Remediation Action Plan.

If any further contaminated soil is discovered works shall immediately cease and the Site Supervisor and Environmental Representative shall be informed, who shall then notify ORC. The process outlined in the National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health are then to be reviewed and applied. A SQEP in contaminated land would be brought on site to assist and determine the best solution to deal with unexpected, contaminated soil. At minimum, the soil shall be dug out placed in a road truck, covered, and carted off site for disposal at an appropriate facility.

5.5 Chemicals and Fuels

During the works associated with the development, the Contractor will have diesel brought onsite for the purpose of fueling equipment during works. Trailer mounted tanks will be used to refuel equipment. Bulk fuel storage will be at the works compound as shown in the ESCP. If fuel storage is relocated to another area the EMP will be updated to reflect this.

Because of the potential environmental risk having these substances on site, the Contractor will have spill kits onsite. These are kits specially for diesel spill as this is the critical chemical stored onsite during day works. These kits can be found in the utility vehicles (30L mobile general-purpose spill kit) and the site office (240L oil and hydrocarbon spill kit).

Fuel storage is more than 30m from any watercourse at the site office, this is to prevent a spill effecting the water quality in the surrounding watercourses.

To contain any spill that may occur during refueling the machinery will be stationary on a disposable material base that can be removed after the earthworks containing any spill that may have occurred.

To prevent storage failure, no storage container is to be used on site if it leaks or has a fault resulting in leaking of fuel. Containment vessels are typically doubled skinned to prevent leaks and the contactor can use such vessels as that are rated for fuel storage.

In the rare event fuel is leaked on site, the Contractor will use appropriate measures to contain, remove, and dispose of the spill.

Where any incident of fuel is found leaking from site, the Environmental Representative shall investigate and complete an environmental incident report (refer to Appendix D).

5.6 Waste

5.6.1 Performance Criteria

The Contractor shall ensure the following criteria is always met:

- All waste is removed from site.
- No waste shall be burnt onsite.
- Bins are provided in common areas at all times. Bins shall be fitted with lids and serviced prior to being filled.
- The site should be free of litter and no litter should leave the boundary of the site nor can enter any waterway within the site.

5.6.2 Management

Waste containment locations can be found at the site compound with adequate rubbish facilities so that the site remains litter free at all times. Waste is to be removed from site on a regular basis. Where possible recyclable materials shall be separated and disposed of at the Frankton Transfer Station.

5.7 Water Quality

5.7.1 Performance Criteria

Stage XX currently sheet flows to XX (refer to Figure 3-2). The construction of stage XX will direct stormwater secondary flows like what is occurring now (refer to Figure 5-1). The ESCP will protect the receiving environment during construction (refer to the supporting plans in the ESCP).

Insert snapshot of secondary flow paths

Figure 5-1: Proposed finished ground secondary flow paths (orientated north).

The following water quality parameters shall be met:

- Total Suspended Solids (TSS) – no more than 50 mg/L TSS
- pH – within 5.5 – 8.5.
- Hydrocarbons, tannins, and paint – no visible trace.
- Waste – no visible litter or waste from site.
- Tubridy reading of no more than 100 NTU.

5.7.2 Testing

5.7.2.1 Suspended Solids

Rather than measuring TSS through the filtration testing method which causes delays in getting information back to site, turbidity, or Nephelometric Turbidity (NTU) will be measured onsite using nephelometer. With this said samples shall be taken at the same time as the nephelometer reading and the Contractor shall undertake lab testing to determine the correlation for the NTU from the total suspended solids.

5.7.2.2 PH Testing

PH testing will be undertaken with litmus paper when suspended solids samples are taken. If inadequate water is available for testing no testing shall be undertaken until a forecasted storm events occurs.

5.7.2.3 Timing of Testing

A visual inspection of the discharge from the stormwater devices will be completed as part of the weekly inspection and post rainfall events to ensure compliance. If water is discharging from the sediment pond outlet(s) water will be tested. If no water is discharging, then the next sample is taken during the time water is discharging from the ponds and noted. Results will be included in the monthly report.

5.7.3 Non-conformant

If water is found to not meet the requirements outlined in section 5.7.1 or the consent, a new sample is to be retested to confirm it is in accordance. The additional sample must be taken within 5 working days of the original sampling. Where one or more of the limits set out in section 5.7.1 are exceeded on two consecutive sampling occasions and these results are confirmed, an incident report is to be prepared. This will include the water quality parameter that exceeded the criteria above and level that was recorded noting the sample location. The table in Appendix J shall be used to detail this information. If any sediment or erosion control devices has failed, this information will need to be included along with the

incident report to identify what failed and what was done to rectify the failure. If a rain event had occurred which contributed to the non-conformance, the depth of rain recorded at the nearest meteorological station should be obtained. This information should then be used to determine the Annual Recurrence Interval (ARI) of the rain event (i.e. 2-year, 5-year or 20-year). This information along with the cause and implement corrective actions to prevent re-occurrence of monitoring non-conformances should be included as part of the non-conformance reported to QLDC and ORC.

5.8 Indigenous Vegetation and Protected Trees

Within the site there is no indigenous vegetation or trees requiring protecting as the previous land use was originally farmland or farm sheds. Any existing vegetation that is removed will be replaced with new trees, plants and grass as part of the development.

5.9 Cultural Heritage

If the Contractor discovers iwi tangata (human skeletal remains), waahi taoka (resources of importance), waahi tapu (places or features of special significance) or other Maori artefact material, the consent holder shall without delay:

- Notify QLDC, ORC, Tangata whenua and Heritage New Zealand Pouhere Taonga and in the case of skeletal remains, the New Zealand Police
- Stop work within the immediate vicinity of the discovery to allow a site inspection by the Heritage New Zealand Pouhere Taonga and the appropriate runanga and their advisors, who shall determine whether the discovery is likely to be extensive, if a thorough site investigation is required, and whether an Archaeological Authority is required.

Any tangata discovered shall be handled and removed by tribal elders responsible for the tikanga (custom) appropriate to its removal or preservation. Site work shall only recommence following consultation with QLDC, ORC, Heritage New Zealand Pouhere Taonga, Tangata whenua, and in the case of skeletal remains, the New Zealand Police, provided that any relevant statutory permissions have been obtained.

If the Contractor discovers any feature or archaeological material that predates 1900, or heritage material, or disturbs a previously unidentified archaeological or heritage site, the Contractor shall follow the Accidental Discovery Protocol found in Appendix K

All persons working on the site will be made aware of the above-mentioned protocols, this will be covered off during site inductions.

5.9.1 Contact Detail

Heritage New Zealand Regional Archaeologist:

Rebecca Benham
Regional Archaeologist Otago/Southland
Heritage New Zealand
PO Box 5467, Dunedin
Ph: +64 3 470 2364, M: 027 240 8715
E: rbenham@heritage.org.nz

5.10 Temporary Fire Control

Fire extinguishers are located in all marked vehicles and machinery. There will also be additional fire extinguishers in the site office. A number of the Contractor's staff on site are fire fighters with the New Zealand Volunteer Fire Service and are trained to handle an incident that could arise. A water cart will be present on site that can assist if required.

Fire and emergency procedures will be outlined in the site health and safety policy. The site emergency procedure will be displayed on the wall of site office. All persons inducted to site will be made aware of the first aiders on site and the means of fire control.

5.11 Site Security

The main access to site will have signs which will clearly mark the safe vehicle route for parking within the site.

All machinery will be parked and secured at the end of each day.

Deliveries will be made to the site office and the Site Manager will liaise with the delivery company to ensure appropriate drop off times. Documents of sensitive nature in regard to the project will be kept in the contractor office or the site office if required by the consent.

Temporary orange net fencing will be installed, along with appropriate signage, for boundaries between public areas and the construction site where it is deemed to be a risk of public entry.

6 Erosion and Sediment Control Plan

6.1 Erosion and Sediment Control Principles

The following erosion and sediment control plan has been prepared based on designing, installing, maintaining, and decommissioning in accordance with the following principles:

- Erosion and sediment controls are integrated with construction planning and operation.
- Effective and flexible erosion and sediment control plans are developed based on soil, site slope, weather, construction conditions and the receiving environment.
- The extent and duration of soil exposure is minimised.
- Water movement through the site is controlled – in particular clean water is diverted around the site and 'dirty' and 'clean' water is kept separated as far as is practicably possible.
- Soil erosion is minimised as far as reasonable and practical (to the satisfaction of QLDC and ORC)
- Disturbed areas are promptly stabilised.
- Sediment retention on site is maximised (i.e. must meet the discharge criteria for suspended sediment)
- Controls are always maintained in proper working order.
- The site is monitored, and erosion and sediment practices adjusted to maintain the required performance standard.
- Avoidance of discharges, especially sediment off site.

The site must perform in a way that any releases from site must not cause scour at the area of discharge. Water must only be released at the discharge point nominated within the ESCP and as deemed acceptable by ORC. Any modification to discharge point must be accepted by ORC.

The erosion and sediment controls shall be sufficient to achieve the water quality criteria for discharge in accordance with section 5.7.1 water quality performance criteria, provided resource consent has been obtained for the earthwork's activity. Otherwise, the performance criteria shall be in accordance with the currently active Operative and Proposed District Plan.

The contractor shall remove temporary controls when permanent measures are in place and/or site stabilization (defined as at least 80% revegetation cover) has occurred.

6.2 Details of Works

Earthworks will be conducted first which involves excavation, shaping and forming the finish shape. The proposed lots will be topsoiled and grassed. After the general earthworks are complete the drainage and services will be installed. When all underground services are done the road construction will begin to seal off the exposed services and topsoiling of berms will finish off the works.

6.3 Reference Documents

- Guidance Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05),
- Erosion and Sediment Control Toolbox for Canterbury - https://www.esccanterbury.co.nz/
- Best Practice Erosion and Sediment Control, International Erosion Control Association Best Practice Guidelines.
- Otago Regional Council Residential Earthworks in Otago A Guide for developers,

6.4 Erosion Controls

6.4.1 Non-Structural Control Measures

6.4.1.1 Staged Construction

To ensure the site can be managed the areas to be opened will progress in a staged manner to effectively manage the stormwater in and around the area of works.

Update with details of order of works within the stage

6.4.1.2 Minimizing Disturbance

To reduce the amount of water that requires treatment, catchment sizes have been limited to a manageable size for the intended operation, draining to local low points that are existing. The area of stage XX has been split into XX

catchments. Operations during earthworks will focus on stripping areas, cutting/filling, then soiling back over to grass it and move to another area. This way the amount of exposed subgrade is limited, manageable and able to be sealed off quickly if required.

6.4.2 Water Management

6.4.2.1 Clean Water Management

Homestead Bay has a sloped terrain on the east side of the site, therefore stormwater from uphill needs to be diverted around the site where possible. Clean water perimeter bunds will be used to divert water around areas of work to natural flows paths away from site.

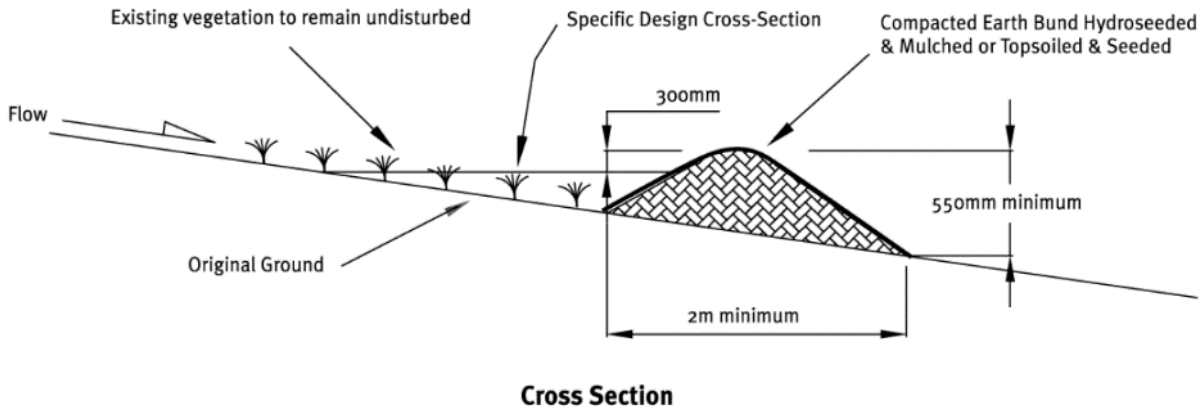


Figure 6-1: Clean water perimeter bund (Source: Auckland Council Guideline Document 2016/005, October 2018)

6.4.2.2 Dirty Water Management

During works, dirty water channels will be used to convey dirty water to ponds and contain dirty water runoff within the site. Other areas of site where water requires diverting are as shown on the plans attached in Appendix A

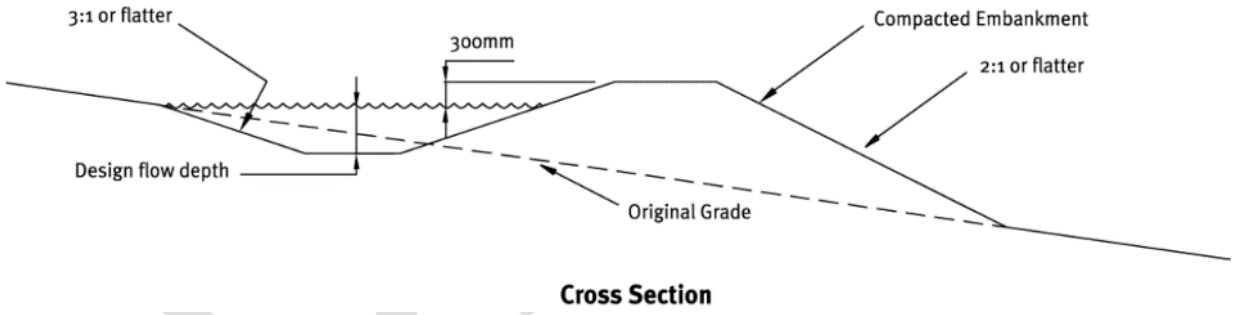


Figure 6-2: Dirty water diversion channel (Source: Auckland Council Guideline Document 2016/005, October 2018)

6.4.2.3 Stockpiles

Any stockpiles onsite are to be located within the catchment areas therefore any runoff from them will be collected and treated onsite.

6.4.3 Vehicle Access

Access to stage XX will be via XX. To prevent sediment getting tracked onto the road network, sedimentation mats will be set up. Examples of the mats are shown below (Figure 6-3).

Figure 6-3: Example of sedimentation mats

6.4.4 Soils and Surface Stabilization

6.4.4.1 Topsoil and Seed

As earthworks progress exposed areas where work is no longer required will be covered with a layer of topsoil from the available stockpile, spread and seeded.

Any area where heavy rain has caused topsoil or grass to erode will require respreads and reapplication, to prevent further erosion.

6.5 Sediment Control

6.5.1 Sedimentation Retention Ponds

XX sedimentation and retention ponds will be constructed for stage XX. The purpose of the first pond is…. The second pond will be established for ….

insert plan of sediment pond locations

Figure 6-4: Sediment pond locations

6.5.1.1 Ponds

To align with GD05 the stormwater ponds need to be 300m^3 of storage per ha for a maximum of 5 ha of contributing catchment. Appendix B has all the required calculation for the pond sizing.

The pond will require a forebay of 2 metres wide 1 metre deep installed across the front with a level spreader to distribute the flows into the pond. A bund of 0.5m height will allow the dirty water channels to run alongside the pond where needed. This will also allow the emergency spillway to be in line with the minimum requirements of GD05.

6.5.1.2 Decanting Tee Bar System

For the most effective discharge of water from a sediment retention pond a decanting tee bar system has been selected. Figure 6-5 shows an example of the tee bar system which is a suitable dewatering device and has been used in previous stages. Figure 6-5 is an off the shelf system from Cirtex for a 110m tee-bar decant system.

To maintain 30% dead storage in the pond the lowest tee bar is placed at a height appropriate to achieve this this requirement.

The tee bars can be installed on a pully system to prevent water from discharging from the pond if there is a requirement to use the top clean water for dust suppression. If pulleys are used it allows the lower decanter to be raised as sediment is deposited.

Figure 6-5: Sediment Retention Pond outlet example

6.5.1.3 Primary Spill Way

The northern pond has a catchment area of between 3 - 5 ha therefore a 1050 mm concrete manhole riser will be used as a primary spillway with a 300mm outlet. The southern pond as a catchment area of less than 1.5ha therefore the minimum requirement is a 150mm upstand as per GD05 details for a sediment retention pond less than 1.5ha.

6.5.1.4 Emergency Spill Way

The emergency spill way for both ponds have been designed to be located at a height of 300mm above the primary spillway. As the topography around the ponds is not perfectly flat the emergency outlets have been designed to be the full width of the pond increasing the amount of water the emergency spillway can discharge with effecting the surrounding area.

A schematic of the pond spillways can be found in Appendix A plans.

6.5.1.5 Use of Flocculent

Flocculant is to be used in the ponds given the range of soil found onsite. Testing, handling, and storage of flocculate will be in accordance with the site-specific Chemical Treatment and Management Plan.

For cold temperatures where ice and snow will form onsite the ponds are to be isolated form discharging freely overnight and check to ensure the water quality is achieved, ponds are in good condition and able to operate efficiently.

6.5.2 Silt Fences

Super silt fences will be able to control the sediment runoff from some areas while maintaining a sheet flow like current overland flow. Therefore, super silt fences will be installed in areas where there is a suitable grass buffer and adequate space to install a suitable super silt fence. This will help reduce the amount of sheet flows that are concentrated for treatment.

The current ESCP only proposes to have 2 super silt fences where directing the water to the pond is unable to be achieved.

6.5.3 Stockpile Management

Stockpile locations shall be within the catchment areas so any runoff for them can be treated before discharging from site. Long term piles will have vegetation cover to prevent dust generation.

6.6 Installation Sequence for Stage XX

To ensure best practices are upheld and the control of any sediment or erosion is contained the order in which control measures are installed is critical. The following is the likely installation sequence to achieve the best outcomes:

- Build access into site.
- Build ponds.
- Build bunds and cut off drains.
- stage 1 works, excavation and truck offsite waste. Backfilling holes with fill material.
- Stage 2 Cut to fill, soil and seed areas.
- Stage 3 Cut to fill, soil and seed areas
- Stage 4 is infrastructure and roading where drainage, water, power and chorus are installed.
- Build roads.
- Hydro seed completed berms.
- Removal of ponds
- Removal other controls and silt fences.

6.7 Managing Significant Rain Events

In line with the monitoring requirements daily checks of weather forecasts must be undertaken. Where significant rain events (20mm over 12h hours) are forecasted specific checks of the site are to be completed to ensure all control measures are in place and working adequately. Where necessary works shall stop in advance of the event and all areas of the site shall be made secure including stabilizing cut and fill areas, stockpiles etc. Additional measures such as localized bunding of trenches shall be formed to further protect critical assets within the site. The site foreman shall ensure the site is safe and adequately protected prior to leaving for the day in advance of any forecast rain event.

6.8 Post Construction Controls and Decommissioning

Upon final completion and once at least 80% of the site is stabilized and covered with vegetation the environmental controls shall be removed. This will include infilling of the ponds with suitable engineered fill and shaping to the final surface level.

7 Updates

The EMP will be updated when the work program progress and an update is required, or when an issue is identified and needs to be rectified. With weekly and monthly inspections of the site measures, significant issues will be updated in the EMP immediately and minor issues will be coved with the monthly environmental report to be submitted to Council.

Additional updates of the EMP will happen if directed by ORC or QLDC's Monitoring Department.

All updates shall be represented in the revision panel at the beginning of the report.

All staff and sub-contractors will be notified of any change to the EMP and the new responsibilities and requirements.

Appendices

We design with community in mind

Appendix A Erosion and Sediment Control Plans

Appendix B Calculations

B.1 Pond Sizing

Stage XX North Pond

- Catchment area = 4.5 ha
- Slope length = 300m
- Slope grade = approximately 4.5 degrees sloping to the west at the steepest point
- Best practice requires 300m^3 per hectare.

Stage XX South Pond

- Catchment area = 1.1 ha
- Slope length = 50m
- Slope grade = approximately 1 degree
- Best practice requires 300m^3 per hectare.

Insert plan of pond location

Figure 7-1: Pond location (approximate),

Pond Volume:

Pond Stage XX North: 4.5ha *300m^3 = 1350m^3

Pond Stage XX South: 1.1ha * 300m^3 = 330m^3

Pond Shape:

Size of pond is required to be 3-5 times as long as wide with a max depth of 2 meters.

The size of the pond is an inverted truncated pyramid with a side slope of 2:1 to 3:1 to fit with the natural shape of the ground.

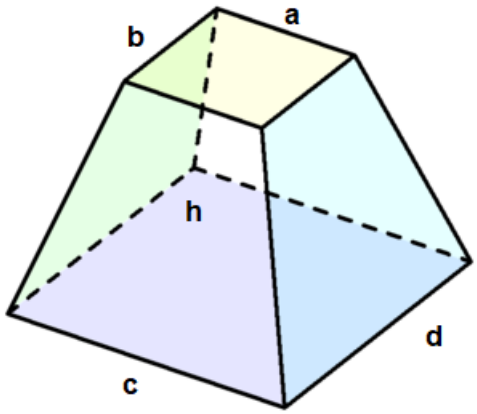


Figure 7-2: Truncated Pyramid

Example calculation for North Pond with a length to width ration of 4 and targeted depth of 1.5m

$$V = \frac{1}{6} * h * (a * b) + (a + c) * (b + d) * (c * d)$$

$$5a = b, \qquad c = a + (h * 2 + h * 2), \qquad d = 5a + (h * 3 + h * 2)$$

$$1350 = \frac{1}{6} * 1.5 * (a * 5a) + (2a + 6) * (5a + 5a + 7.5) * \big((a + 6) * (5a + 7.5)\big)$$

$$a = 9$$

Table 7-1: Pond sizing

	Base Width (y)	Base Length (x)	Top Width (Z)	Top Length (A)	Depth (h)	Volume
North Pond	9m	63m	18m	72m	1.5m	1377m³
South Pond	4m	44m	10m	50m	1m	332m³

B.2 Tee Bar Spacing

Pond 1: 30% Dead storage = 0.3 x 1377m³ = 413.1 m³

Pond 2: 30% Dead storage = 0.3 x 332m³ = 99.6m³

Table 7-2: Tee bar spacing

	Bottom Tee bar (m) TB1	Mid Tee bar (m) TB2	Top Tee bar (m) TB3
North Pond	0.6m	0.94m	1.24m
South Pond	0.42		

* Measurement is from the base of the pond to the tee bar

B.3 Dirty Water Bund

Runoff

Catchment area (A_c)= 4.5 ha

20-year AEP (i) = 21.9mm/h

Coefficient (C) = 0.7 Bare impermeable clay with no interception channels or run-off control (worse case)

$$Q = \frac{CiA_c}{360}$$

$$Q = \frac{4.5 * 0.7 * 21.9}{360}$$

$$Q = 0.191\ m^3/s$$

Dirty Bund Sizing

Width of channel (a) = 2.5m.

Depth of channel (b) =0.1m.

Shape of channel = trapezoid 3:1 batters.

Longitudinal slope of bund = 0.5%.

Slope of banks 33.3% (1 in 3).

Freeboard = 0.3.

Figure 7-3 shows the channel sizing. The channel with no freeboard and has the capacity to convey 191 l/s. Figure 7-4 shows the sizing of the channel with 300mm freeboard, this will be the size of the channel that will be constructed.

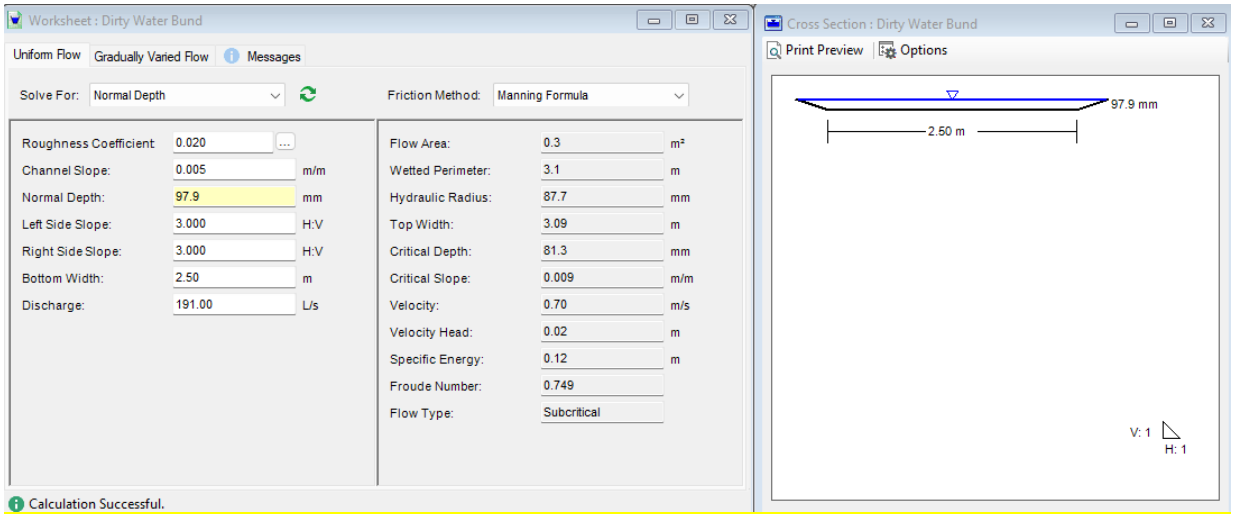


Figure 7-3: Channel sizing no freeboard.

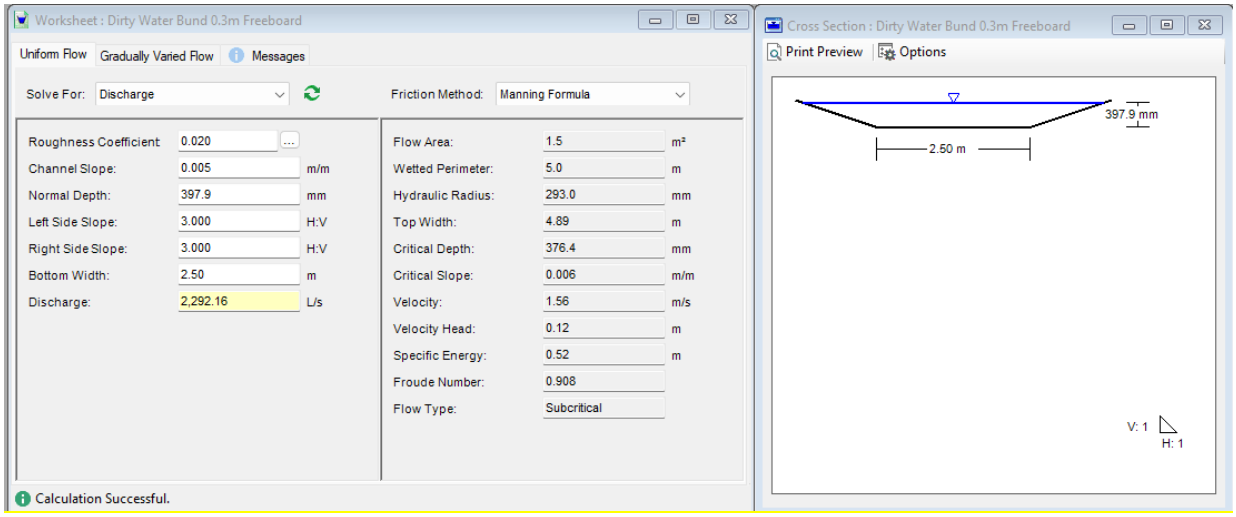


Figure 7-4: Channel sizing 300mm freeboard.

Stage XX culvert size

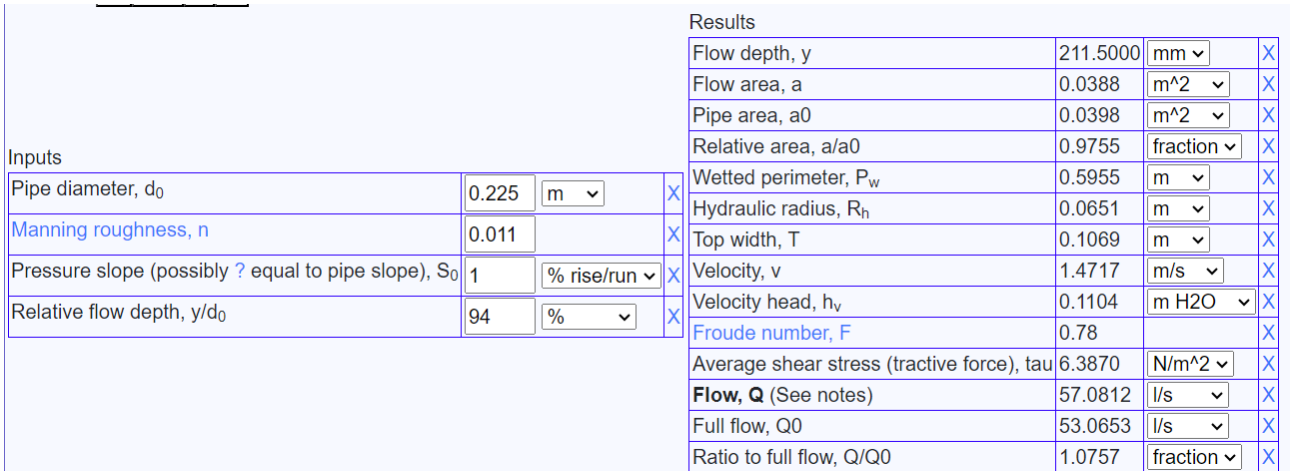
Catchment = 1.1ha

$$Q = \frac{CiA_c}{360}$$

$$Q = \frac{1.1 * 0.7 * 21.9}{360}$$

$$Q = 0.047\ m^3/s$$

For 47l/s to flow thought he pipe the minimum pipe size need is 225mm. as shown below in Figure 7-5



Inputs

Pipe diameter, d_0	0.225	m	X
Manning roughness, n	0.011		X
Pressure slope (possibly ? equal to pipe slope), S_0	1	% rise/run	X
Relative flow depth, y/d_0	94	%	X

Results

Flow depth, y	211.5000	mm	X
Flow area, a	0.0388	m^2	X
Pipe area, a0	0.0398	m^2	X
Relative area, a/a0	0.9755	fraction	X
Wetted perimeter, P_w	0.5955	m	X
Hydraulic radius, R_h	0.0651	m	X
Top width, T	0.1069	m	X
Velocity, v	1.4717	m/s	X
Velocity head, h_v	0.1104	m H2O	X
Froude number, F	0.78		X
Average shear stress (tractive force), tau	6.3870	N/m^2	X
Flow, Q (See notes)	57.0812	l/s	X
Full flow, Q0	53.0653	l/s	X
Ratio to full flow, Q/Q0	1.0757	fraction	X

Figure 7-5: Stage XX south culvert sizing

Stage XX clean water culvert

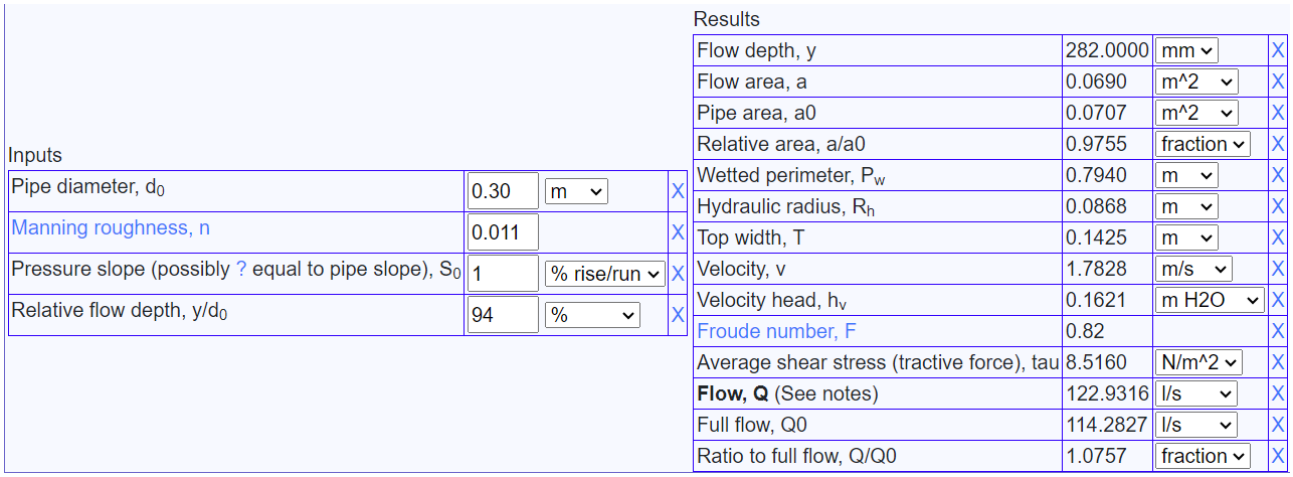
Catchment = 1.5ha

$$Q = \frac{CiA_c}{360}$$

$$Q = \frac{1.1 * 0.7 * 21.9}{360}$$

$$Q = 0.064\, m^3/s$$

To achieve adequate flow through the culvert the next size up from the DN225 will be needed. This is a DN300mm PVC pipe which has the capacity for 122L/s, more than the required 64l/s



Inputs

Pipe diameter, d_0	0.30	m	X
Manning roughness, n	0.011		X
Pressure slope (possibly ? equal to pipe slope), S_0	1	% rise/run	X
Relative flow depth, y/d_0	94	%	X

Results

Flow depth, y	282.0000	mm	X
Flow area, a	0.0690	m^2	X
Pipe area, a0	0.0707	m^2	X
Relative area, a/a0	0.9755	fraction	X
Wetted perimeter, P_w	0.7940	m	X
Hydraulic radius, R_h	0.0868	m	X
Top width, T	0.1425	m	X
Velocity, v	1.7828	m/s	X
Velocity head, h_v	0.1621	m H2O	X
Froude number, F	0.82		X
Average shear stress (tractive force), tau	8.5160	N/m^2	X
Flow, Q (See notes)	122.9316	l/s	X
Full flow, Q0	114.2827	l/s	X
Ratio to full flow, Q/Q0	1.0757	fraction	X

Figure 7-6: Stage XX north culvert sizing

Appendix C Environmental Induction Register

Name	Date	Company	Inductor

Appendix D Environmental Incidence Report Form

Project Address:	QLDC/ORC Consent Number (if applicable): RM BC
Project Description:	

Instructions

Complete this form for all environmental incident that cause contaminants (including sediment) or environmental nuisance to leave the site. Be succinct, stick to known facts and do not make assumptions. Once completed submit to the personnel outlining section 4.1

Incident details

Date and Time	Date:	Time:	AM	PM
Description Provide a brief and factual description of what happened during the incident, include relevant details such as: • The estimated distance to the nearest waterway • (include storm water and dry courses) • The estimated distance to the nearest sensitive rec • The activity being undertaken when the incident occurred Sketches/diagrams/photos may be reference and attached to this report to aid in the description of the incident				
Exact location of the incident Include address, landmarks, features, nearest intersection etc. Maps and plans can be attached to the incident report if appropriate				
Quantity or volume of material escaped or causing incidence				
Who identified the incident				

What immediate actions/control measures were taken to rectify or contain the incident?

What initial corrective action will be taken to prevent similar incidents recurring in the near future?

Has the Otago Regional Council been notified? Yes / No / N/A

Approvals:

Environmental Representative/Person making report

Name…… Signature……..

Organisation…… Date……..

Mobile phone number……

Site Supervisor

Name…… Signature……..

Organisation…… Date……..

Mobile phone number……

Appendix E Complaints Register

Complainant	Contact details	Date	Issue	Area of concern	Action required	EMP change required

Appendix F Post Forecasted Rain Event Inspection Form

LOCATION

INSPECTOR(S) **DATE:**

Legend: ✓ - OK × - Not OK/ potential problem N/A - Not applicable

Item	Consideration	Assessment
1	Existing road sumps have filter clothes in working order and are not blocked with sediment.	
2	Entry/exit measures clear of excessive sediment deposition.	
3	Up-slope “clean” water is being appropriately diverted around the site without causing erosion.	
4	Drainage paths are free of soil scour and sediment deposition.	
5	Sediment fences are free from damage, secure and in working order.	
6	Sediment-laden stormwater is not able to get around the silt fences or other sediment devices.	
7	All sediment devices have no sediment build up reducing the effectiveness of the device	
8	The sediment pond has sedimental settling out prior to discharge such water.	
9	All reasonable and practicable measures are being taken to control sediment runoff from the site.	
10	All Erosion and Sediment Control measures are in proper working order.	

Remedial action taken:	**Location**
Reason:	

Appendix G Weekly Site Inspection Checklists

LOCATION

INSPECTOR(S) **DATE:**

Legend: ✓ - OK × - Not OK/ potential problem N/A - Not applicable

Item	Consideration	Assessment
1	Public roads clear of sediment from this works. (Note and photograph if other works is causing issues)	
2	Entry/exit measures clear of excessive sediment deposition.	
3	Entry/exit rock have adequate space to trap sediment.	
4	Existing road sumps have filter clothes, are not blocked with sedimental and in adequate working order.	
5	The site is clear of litter and unconfined rubbish.	
6	Rubbish bins are not over-following or require emptying	
7	Adequate stockpiles of emergency sediment and erosion control materials are onsite.	
8	Site dust is being adequately controlled.	
9	Appropriate drainage and sediment controls have been installed prior to new areas being cleared or disturbed.	
10	Up-slope “clean” water is being appropriately diverted around/through the site without causing erosion.	
11	Drainage paths are free of soil scour and sediment deposition.	
12	No areas of exposed soil need erosion control.	
13	Earth batters are free of erosion.	
14	Long-term soil stockpiles are protected from wind, rain and stormwater flow with appropriate drainage and erosion controls.	
15	Sediment fences are free from damage.	
16	Sediment-laden stormwater is not simply flowing “around” the sediment fences or other sediment traps.	
17	All sediment traps are free of excessive sediment deposition.	
18	The settled sediment layer within a sediment retention pond is clearly visible through the water prior to discharge of such water.	
19	All reasonable and practicable measures are being taken to control sediment runoff from the site.	
20	No new areas of uncontrol site runoff in need of control measures	
21	Stabilised surfaces have topsoil and grass seed	
22	The site is adequately prepared for forecasted storms.	
23	All Erosion and Sediment Control measures are in proper working order.	

Rain fall record:

RAINFALL (mm)	DATE:

Remedial action taken:	**Location**
Reason:	
Remedial action taken:	Location
Reason:	

Appendix H EMP Non-Conformance Register

Date	Non conformance	Reason	Resolution	EMP require update

Appendix I Monthly Checklist

LOCATION

INSPECTOR(S) **DATE:**

Legend: ✓ - OK × - Not OK/ potential problem N/A - Not applicable

Item	Consideration	Assessment
1	Appropriate Contactor site inspections of EMP controls carried out such that all control measures are being maintained adequately and checked weekly.	
2	Site inspections and monitoring are being carried out at appropriate times and intervals. (i.e. weekly, pre and post rain events)	
3	Are environmental sensitive receptors outline in the approved EMP are being adequately protected	
4	Are all conditions of consent related to environmental management being satisfied?	
5	Was the full perimeter of the work site inspected?	
6	Are all reasonable and practicable measures being taken to minimize environmental harm?	
7	Adequate drainage and sediment controls exist at site entry/exit points.	
8	Adequate drainage, erosion and sediment controls have been placed around the site compound.	
9	Site compound area and car park gravel/stabilized where necessary to control erosion and sediment.	
10	Appropriate drainage and sediment controls are installed prior to new areas being cleared or disturbed.	
11	Site personnel appear to be aware of ESC requirements and have ready access to the Erosion and Sediment Control Plan. (Check induction registers as well)	
12	Haul roads are stabilized.	
13	Sediment deposition is not observed on external roads by operations associated with this works. (Note if other works is causing this issue)	
14	Fuel appropriately stored on site.	
15	Spill kits available on-site where appropriate.	
16	Adequate litter and waste receptors exist on-site.	
	Topsoil and Stockpiles	
17	Topsoil stripped and stockpiled prior to major earthworks.	
18	Stockpiles located at least 5m away from top of watercourse banks.	
19	Long-term soil stockpiles adequately protected against wind and rain.	
20	Adequate sediment controls placed down-slope of stockpiles.	
21	Stockpile sediment control is appropriate for the soil type and site conditions.	
22	Adequate drainage controls placed up-slope of stockpiles. (i.e. diversion channels)	
23	Topsoil is being replaced at an adequate depth.	
	Drainage	
24	Drainage Control measures are consistent with the EMP.	
25	Drainage Control measures are being adequately always maintained in proper working order.	
26	Up-slope “clean” water is being appropriately diverted around/through the site in a non-erosive manner.	
27	Stormwater runoff diverted away from unstable slopes.	

28	Flow diversion channels/banks stabilized against erosion.	
29	Dirty Water Drains: → Adequate depth/width. → Adequate flow capacity is being maintained. → Stabilised against soil scour.	
30	Channel Linings (mats/cloth): → Lining is well anchored. → Mats/cloth overlap in direction of flow. → Lining is appropriate for flow conditions. → No damage to the mat/cloth by lateral inflows.	
Erosion		
31	Erosion control standard is consistent with the EMP and QLDC requirements.	
32	Soil erosion is being controlled to a standard consistent with the level of environmental risk.	
33	Disturbance to existing ground cover is being minimized as much as possible	
34	Earth batters are free of erosion.	
35	Dust problems are being adequately controlled.	
36	Erosion Control measures are being adequately always maintained in proper working order.	
37	All disturbed areas are adequately stabilised given: → Erosion hazard risk. → Degree of downstream sediment control. → Days since earthworks were finalised.	
Sediment controls		
38	Sediment is being controlled to a standard consistent with QLDC / ORC requirements	
39	Sediment Control is consistent with the approved EMP	
40	Sediment Control is appropriate for the soil type.	
41	Sediment Control measures are being adequately always maintained in proper working order.	
42	Collected sediment is being disposed of in an appropriate manner.	
43	Entry/Exit Points: → Control measures are appropriate for the site conditions. → Control measures are constructed appropriately → Excessive sediment removed from sediment traps. → Excessive sedimentation is not evident on roadway. → Stormwater drainage is controlled such that sediment is not being washed onto the adjacent roadway drainage network	
44	Sediment Fences: → Choice of fabric is appropriate. → Bottom of fabric is securely buried. → Fabric is appropriately overlapped at joints. → Fabric is appropriately attached to posts. → Support posts are at correct spacing → Sediment Fence does not cause flow diversion/bypass. → Sediment Fence has regular returns. → Lower ends of fence are returned up the slope. → Sediment Fences are free of damage. → All fences are free of excessive sediment deposition. → Fences are adequately spaced from toe of fill banks.	
45	Sediment Retention Ponds. → Pond geometry and layout match design details. → As built plans have been prepared. → The pond does not represent a safety risk.	

	→ De-watering is conducted in accordance with best practice. → Excessive sediment removed from pond. → Primary outlet structure is free from sediment blockage. → Emergency spillway has adequate scour control and/or grass length → Soil erosion is adequately controlled at inlet points. → The sediment settles prior to discharge such water.	
46	Site stabilization/revegetation is occurring in accordance with the EMP and work program.	
47	Exposed areas are adequately stabilized given the site conditions, environmental risk, and construction schedule.	
48	No newly seeded areas require reseeding.	
49	Grass seed is not being placed directly on compacted soil.	
50	Water application is appropriate for the site conditions.	
51	Revegetation is controlling soil erosion as required.	

Action summary

Item	Consideration	Yes or No
	Answer "Yes" if further action is required on site	
1	Do any existing control measures require modification?	
2	Are additional EMP measures required on the site?	
3	Are alternative EMP measures required on the site?	
4	Is a revised EMP required for the site?	
5	Is further water quality monitoring required?	
6	Do any EMP measures need repairs or de-silting?	
7	Is additional erosion control required?	
8	Will the underlying cause of any non-compliance need further investigation?	
9	Has any complaint been raised that need to be resolved?	
10	Have any non-conformance issue happened?	
	Date of next inspection	

Notes:

Appendix J Water Quality Reporting

Pond 1					
Date	Time	NTU	pH	Acceptable	Discharging

Appendix K Accidental Discovery Protocol

CREATING COMMUNITIES

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of belonging. That's why at Stantec, we always **design with community in mind**.

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Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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