



LEGAL DESCRIPTION

LOT 2, DP301351
346 MORVEN FERRY ROAD
LOT AREA 18.0450 Ha
CERT TITLE REF: 5890
VAL. NUMBER: 2907132308

LOT 8
DP 22550

LOT 1
DP 23902

LOT 1
DP 301351
336 MORVEN FERRY ROAD

SECTION 33
BLOCK VIII
SHOTOVER SD

MORVEN FERRY ROAD

EXISTING BUILDING PLATFORM
RURAL GENERAL ZONE
POP 51 & S2 DECISIONS; ZONE
ZONE/WAKATIPU BASIN RURAL
AMENITY ZONE

EXISTING SHED AND STOCK YARDS

EXISTING OVERHEAD POWER LINES

LOT 2
DP 301351
RT5890
18.045HA

LOT 10
DP22550

EXISTING FENCE LINE
TOP OF BANK

EXISTING 4WD TRACK TO PROPOSED
NEW DWELLING

PROPOSED DWELLING
EXISTING FENCE LINE

INTERNAL BDY

CROWN LAND BLOCK VIII
SHOTOVER SURVEY DISTRICT

KAWARAU RIVER BELOW



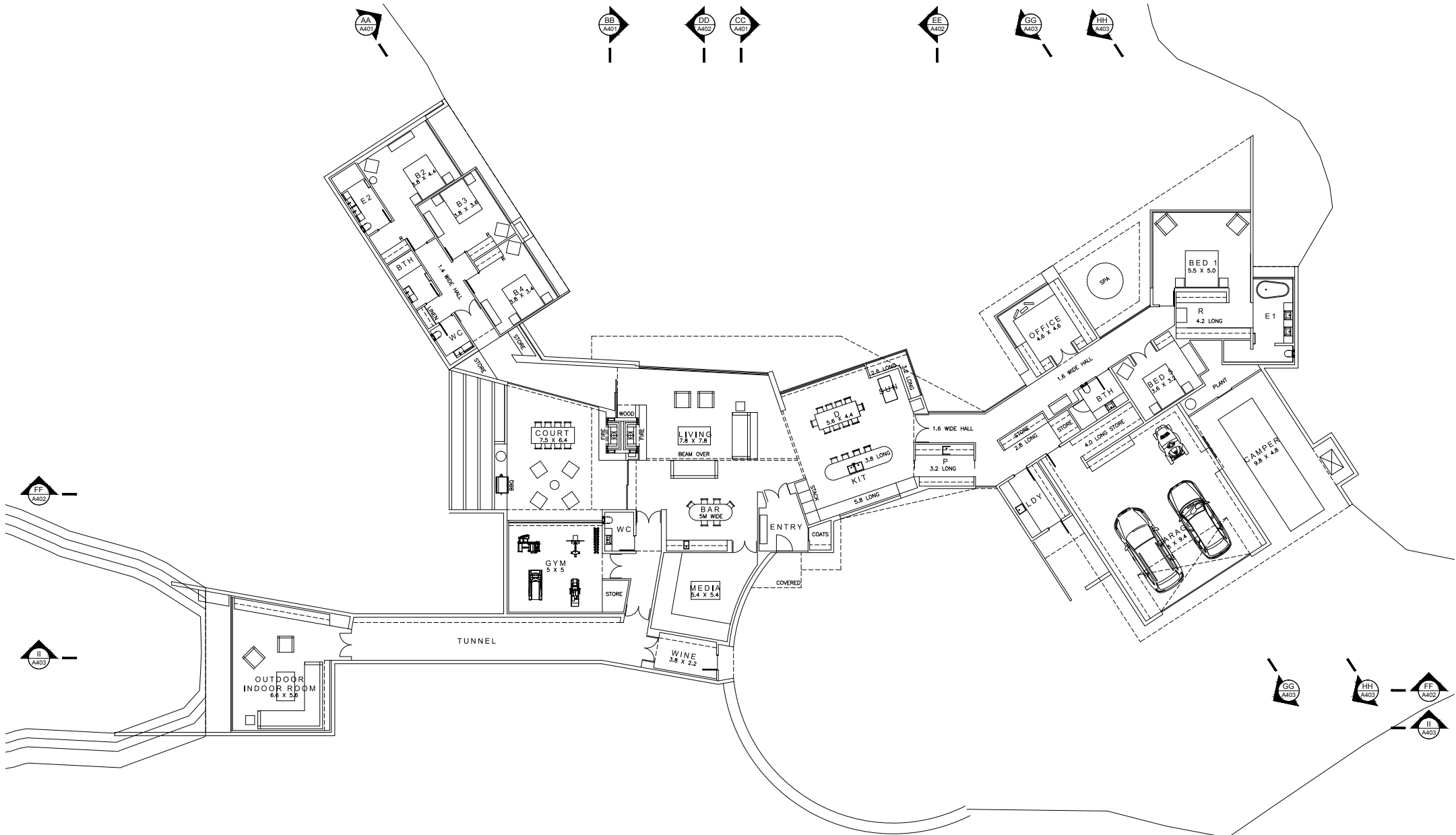
Level 1, 18 Belder Avenue,
Morrville, P O BOX 2432,
Christchurch
New Zealand
Tel: +64 3 265 1111
Email: info@heai.co.nz
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ISSUE	AMENDMENTS	DATE	INITIAL	ISSUE	AMENDMENTS	DATE	INITIAL

DESIGNED:	HADEN ENSLIE	JUNE 2020
DRAWN:	HE	JUNE 2020
CHECKED:		
CAD REF:	2020 : 2021 HENSMAN	
CONSULTING ENGINEER:		

PROPOSED DWELLING 346 MORVEN FERRY ROAD ARROW JUNCTION, QUEENSTOWN
LOCATION PLAN

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Date:	23/06/20
Scale:	1:1500
Job No:	22 2021
Sheet No:	C101
Issue:	D



ISSUE	AMENDMENTS	DATE	INITIAL	ISSUE	AMENDMENTS	DATE	INITIAL

DESIGNED:	HADEN ENSLIE	JUNE 2020	PROPOSED DWELLING
DRAWN:	HE	JUNE 2020	346 MORVEN FERRY ROAD
CHECKED:			ARROW JUNCTION, QUEENSTOWN
CAD REF:	2020 : 2021 HENSMAN		FLOOR PLAN
CONSULTING ENGINEER:			
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Date: 23/06/20			
Scale: 1:100			
Job No:	22 2021	Sheet No:	A101
Issue:	D		

Appendix B – Engineering Logs

Test Pit Log

Project:	346 Morven Ferry Road	Project Number:	GL21-067
Site Location:	Arrow Junction	Client:	Robertson


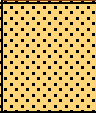
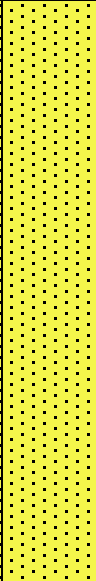

Test Pit Number:	TP101	Sheet 1 of 1
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Depth (m)	Water Level	Geological Unit	Sample	Soil Rock Description	Legend	Depth
0.5		Topsoil		Sandy SILT, with some organics dark brown. Soft to firm, damp. Sand fine grained.		0.5
1.0						1.0
1.5						1.5
2.0				Sandy SILT, with some organics light greyish brown. Soft to firm, damp. Sand fine grained.		2.0
2.5				End of Pit		2.5
3.0						3.0
3.5						3.5

Date Excavated: 19 November 2021	Equipment: 1.8T tracked excavator with 400mm tooth bucket
Logged By: PF	Contractor: Earthwroks & Drainage Ltd

<p>Geotago Ltd Arrow Junction Queenstown 9371 New Zealand</p>  <p>T: +64 272 699 736 E: pete@geotago.nz W: www.geotago.nz</p> <p>Engineering Geology & Geotechnics</p>	Notes:
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Test Pit Log

Project:		346 Morven Ferry Road		Project Number:		GL21-067	
Site Location:		Arrow Junction		Client:		Robertson	
Test Pit Number: TP102							Sheet 1 of 1
Depth (m)	Water Level	Geological Unit	Sample	Soil Rock Description	Legend	Depth	
—		Topsoil		Sandy SILT with roots and rootlets, dark brown. Damp.		—	
0.5		Glacial Till		Sandy SILT, light greyish brown, loosely packed, damp. Sand fine grained		0.5	
1.0				Silty sandy GRAVEL / Gravelly SAND, light greyish brown. Loose to tightly packed, damp. Sand fine to medium coarse. Gravels fine to medium coarse occasionally coarse, subangular to subrounded. Increasing in density from 1.5m		1.0	
1.5							1.5
2.0						2.0	
2.5				End of Pit		2.5	
3.0							
3.5						3.0	
Date Excavated: 19 November 2021				Equipment: 1.8T tracked excavator with 400mm tooth bucket			
Logged By: PF				Contractor: Earthwroks & Drainage Ltd			
Geotago Ltd Arrow Junction Queenstown 9371 New Zealand  T: +64 272 699 736 E: pete@geotago.nz W: www.geotago.nz				Notes:			

Test Pit Log

Project:	346 Morven Ferry Road	Project Number:	GL21-067
Site Location:	Arrow Junction	Client:	Robertson

Test Pit Number:	TP103	Sheet 1 of 1
------------------	-------	--------------

Depth (m)	Water Level	Geological Unit	Sample	Soil Rock Description	Legend	Depth
		Topsoil		Sandy SILT with roots and rootlets, dark brown. Damp.		
0.5		Glacial Till		Sandy SILT, light greyish brown, loosely packed, damp. Sand fine grained		0.5
1.0						1.0
1.5				Silty GRAVEL light bluish grey. Tightly packed, damp. Gravels fine to coarse, subangular to angular highly weathered schist.		1.5
2.0				End of Pit - Hard Digging		2.0
2.5						2.5
3.0						
3.5						3.0


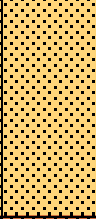
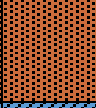

Date Excavated: 19 November 2021	Equipment: 1.8T tracked excavator with 400mm tooth bucket
Logged By: PF	Contractor: Earthwroks & Drainage Ltd

<p>Geotago Ltd Arrow Junction Queenstown 9371 New Zealand</p>  <p>T: +64 272 699 736 E: pete@geotago.nz W: www.geotago.nz</p> <p>Engineering Geology & Geotechnics</p>	Notes:
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Test Pit Log

Project:	346 Morven Ferry Road	Project Number:	GL21-067
Site Location:	Arrow Junction	Client:	Robertson

Test Pit Number:	TP104	Sheet 1 of 1
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Depth (m)	Water Level	Geological Unit	Sample	Soil Rock Description	Legend	Depth
		Topsoil		Sandy SILT with roots and rootlets, dark brown. Damp.		
0.5		Glacial Till		Sandy SILT, light greyish brown, loosely packed, damp. Sand fine grained		0.5
1.0				Silty GRAVEL light bluish grey. Tightly packed, damp. Gravels fine to coarse, subangular to angular highly weathered schist.		1.0
		Schist		Moderately weathered blue grey Schist, moderately weak, foliated (Rakaia terrane)		
1.5				End of Pit		1.5
2.0						2.0
2.5						2.5
3.0						
3.5						

Date Excavated: 19 November 2021	Equipment: 1.8T tracked excavator with 400mm tooth bucket
Logged By: PF	Contractor: Earthwroks & Drainage Ltd

<p>Geotago Ltd Arrow Junction Queenstown 9371 New Zealand</p>  <p>T: +64 272 699 736 E: pete@geotago.nz W: www.geotago.nz</p>	Notes:
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Test Pit Log

Project:	346 Morven Ferry Road	Project Number:	GL21-067
Site Location:	Arrow Junction	Client:	Robertson

Test Pit Number:	TP105	Sheet 1 of 1
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Depth (m)	Water Level	Geological Unit	Sample	Soil Rock Description	Legend	Depth
—		Topsoil		Sandy SILT with roots and rootlets, dark brown. Damp.		—
0.5		Glacial Till		Silty GRAVEL light bluish grey. Tightly packed, damp. Gravels fine to coarse, subangular to angular highly weathered schist.		0.5
1.0	1.0					
1.5	1.5					
2.0	2.0					
2.5				End of Pit		2.5
3.0						
3.5						3.0

Date Excavated: 19 November 2021	Equipment: 1.8T tracked excavator with 400mm tooth bucket
Logged By: PF	Contractor: Earthwroks & Drainage Ltd

<p>Geotago Ltd Arrow Junction Queenstown 9371 New Zealand</p>  <p>T: +64 272 699 736 E: pete@geotago.nz W: www.geotago.nz</p> <p>Engineering Geology & Geotechnics</p>	Notes:
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Test Pit Log

Project:	346 Morven Ferry Road	Project Number:	GL21-067
Site Location:	Arrow Junction	Client:	Robertson


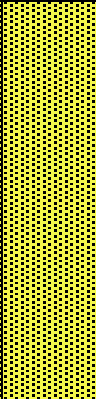


Test Pit Number:	TP106	Sheet 1 of 1
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Depth (m)	Water Level	Geological Unit	Sample	Soil Rock Description	Legend	Depth
—		Topsoil		Sandy SILT with roots and rootlets, dark brown. Damp.		—
0.5		Glacial Till		Sandy SILT, light greyish brown, loosely packed, damp. Sand fine grained		0.5
1.0			106 at 1.7m			1.0
1.5						1.5
		Schist		Moderately weathered blue grey SCHIST, moderately weak, foliated (Rakaia terrane)		
2.0				End of Pit		2.0
2.5						2.5
3.0						
3.5						3.0

Date Excavated: 19 November 2021	Equipment: 1.8T tracked excavator with 400mm tooth bucket
Logged By: PF	Contractor: Earthwroks & Drainage Ltd

<p>Geotago Ltd Arrow Junction Queenstown 9371 New Zealand</p>  <p>T: +64 272 699 736 E: pete@geotago.nz W: www.geotago.nz</p>	Notes:
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Test Pit Log

Project:		346 Morven Ferry Road		Project Number:		GL21-067		
Site Location:		Arrow Junction		Client:		Robertson		
Test Pit Number:		TP107					Sheet 1 of 1	
Depth (m)	Water Level	Geological Unit	Sample	Soil Rock Description	Legend	Depth		
—		Topsoil		Sandy SILT with roots and rootlets, dark brown. Damp.		—		
0.5		Glacial Till		Silty SAND with some gravel, light brown. Loosely to tightly packed. Sand fine to medium coarse. Gravels fine to medium coarse subangular to subrounded. CLASS 3		0.5		
1.0			1.0					
1.5				Silty sandy GRAVEL / Gravelly SAND, light greyish brown. Loose to tightly packed, damp. Sand fine to medium coarse. Gravels fine to medium coarse occasional coarse, subangular to subrounded.		1.5		
2.0				End of Pit		2.0		
2.5						2.5		
3.0						3.0		
3.5						3.5		
Date Excavated: 19 November 2021				Equipment: 1.8T tracked excavator with 400mm tooth bucket				
Logged By: PF				Contractor: Earthwroks & Drainage Ltd				
 <p>Geotago Ltd Arrow Junction Queenstown 9371 New Zealand</p> <p>T: +64 272 699 736 E: pete@geotago.nz W: www.geotago.nz</p> <p>Engineering Geology & Geotechnics</p>				Notes: Effluent disposal area. On 14 degree slope facing due north				

Appendix C – Site & Soils Assessment

Onsite Wastewater Disposal Site & Soils Assessment



Use for Subdivision or Land Use Resource Consent

The design standard for waste water treatment and effluent disposal systems is AS/NZS 1547:2012. All references in this form relate to this standard.

Applications should provide sufficient information to demonstrate that all lots will be capable of accommodating an on-site system.

Site Description

Property Owner: Sharyn Robertson

Location Address: 346 Morven Ferry Road, Arrow Junction, Queenstown

Legal Description (eg Lot3 DP1234) : Lot 2 DP 301351

List any existing consents related to waste disposal on the site: None

General description of development / source of waste water: _____

Residential dwelling comprising four bedrooms, with media and gym rooms

The number and size of the lots being created: 1 Residential lot of >5ha.

Site Assessment (refer to Tables R1 & R2 for setback distances to site features)

Land use Rural lifestyle and pasture

Topography Low to moderate slopes of 5-15 degrees

Slope angle 15 degrees in area of identified effluent disposal area

Aspect Open aspect to the north west and north in the area of the disposal site

Vegetation cover Paddock and pasture

Areas of potential ponding None

Ephemeral streams None

Drainage patterns and overland paths None

Flood potential (show with return period on site plan) None

Distance to nearest water body >100m laterally and 130m vertically

Water bores with 50m (reference ORC Maps) None

Other Site Features _____

Slope stability assessment details – summarise any areas unsuitable for waste water irrigation.
(Attach report if applicable): _____

No stability issues on site

(Highest potential) Depth to ground water:

Summer _____ >15m

Winter _____ >15m

Information Source Interpretation of ground conditions and geomorphology

What is the potential for waste water to short circuit through permeable soils to surface and / or ground water?

No

Soil Investigation (Appendix C)

Field investigation date: 19 November 2021

Number of test pit bores (C3.5.4): Total of seven with one specific for WW assessment

Soil investigation addendum to be attached that includes a plan showing test pit or bore location, log results and photos of the site profile.

If fill material was encountered during the soil investigation state how this will impact on the waste water system:

No fill encountered on site

Average depth of topsoil: 300mm

Indicative permeability (Appendix G) : 0.5 to 1.5 m/d (Table L1, Class 3 Soils)

Percolation test method (refer to B6 for applicability) : _____
(attach report if applicable)

Soil Category (Table 5.1)	Soil Texture (Appendix E)	Drainage	Tick One
1	Gravel and sands	Rapid	
2	Sandy loams	Free	
3	Loams	Good	x
4	Clay loams	Moderate	
5	Light clays	Moderate to slow	
6	Medium to heavy clays	Slow	

Reasons for placing in stated category:

Soil logging of six test pits. presence of silts and sands will provide some attenuation within the soil matrix

Loading rate, DLR (Table L1): 30

Explanation for proposed loading rate: _____

Class 3 Soils (good draining sandy gravels) - Application of secondary treatment effluent

Recommendations from site and soils assessment

- Specify any design constraints
- Specify any areas unsuitable for location of the disposal field
- Specify any unsuitable treatment and/or disposal systems
- Propose suitable mitigation to enable successful effluent treatment

Use of secondary treated effluent

Use in ground irrigation or conventional discharge bed or trenches

Soil category based on the underlying silty sandy gravels

Attachments Checklist

- Copy of existing consents
- Soil investigation addendum
- To scale site plan, the following must be included on the plan:
 - Buildings
 - Boundaries
 - Retaining Walls
 - Embankments
 - Water bodies
 - Flood potential
 - Other septic tanks / treatment systems
 - Water bores
 - Existing and proposed trees and shrubs
 - Direction of ground water flow
 - North arrow

Note that an Otago Regional Council (ORC) consent may also be required to discharge domestic waste water to land if any of the following apply:

- Daily discharge volume exceeds 2,000 litres per day
- Discharge will occur in a groundwater protection zone
- Discharge will occur within 50 metres of a surface water body (natural or manmade)
- Discharge will occur within 50 metres of an existing bore/well
- Discharge will result in a direct discharge into a drain/water ace/ground water
- Discharge may runoff onto another persons' property

If any of these apply then we recommend that you correspond with the ORC;

Otago Regional Council
"The Station" (upstairs)
Cnr. Camp and Shotover Streets
P O Box 958
Queenstown 9300

Tel: 03 442 5681

I believe to the best of my knowledge that the information provided in this assessment is true and complete. I have the necessary experience and qualifications as defined in Section 3.3 AS/NZS 1547:2012 to undertake this assessment in accordance with the requirements of AS/NZS 1547:2012:

Company:	Geotago Ltd
Email:	pete@geotago.nz
Phone number:	0272 699 736
Name:	Dr Peter Forrest
Signature:	
Date:	4 December 2021

Queenstown Lakes District Council
Private Bag 50072
10 Gorge Road
QUEENSTOWN 9348

Phone: 03 441 0499
Fax: 03 442 4778
Email: services@qldc.govt.nz
Website: www.qldc.govt.nz

Appendix D - Site Photographs

Test Pit 101 - Pit



Test Pit 101 - Arisings



Test Pit 102 - Pit



Test Pit 102 - Arisings



Test Pit 103 - Pit



Test Pit 103 - Arisings



Test Pit 104 - Pit



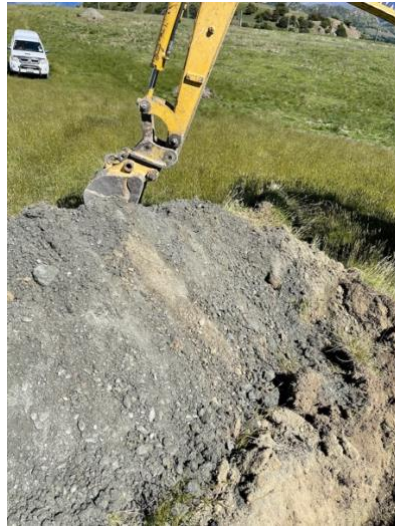
Test Pit 104 - Arisings



Test Pit 105 - Pit



Test Pit 105 - Arisings



Test Pit 106 - Pit



Test Pit 106 - Arisings



Test Pit 107 – Effluent Disposal Area



Test Pit 107 - Arisings



TP107 Clast



TP107 Particle size

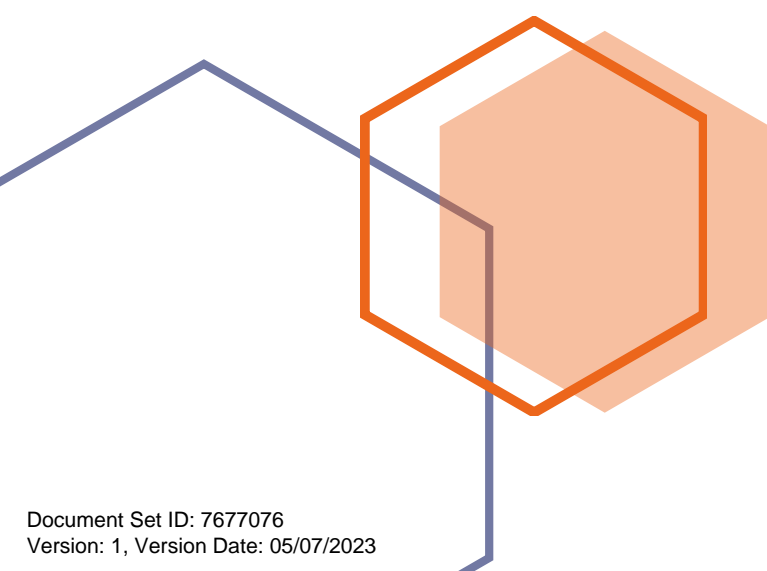




Environmental Management Plan (Rev B)

346 Morven Ferry Road

July 2023



Document Control	
Title	Environmental Management Plan
Address	346 Morven Ferry Road, Arrow Junction
Consent Number	TBC
Client	Sharyn Robertson
Our Reference	23060
Prepared by	 Tom Grandiek (BAppSc, CEnvP) Senior Environmental Consultant 
Reviewed by	 Quinn McIntyre (MSc, CEnvP) Principal Environmental Consultant 

Document Control			
Revision	Revision Date	Revision Details	Prepared by
A	24/05/2023	Prepared for client	TG
B	03/07/2023	Updated in response to QLDC peer review	TG

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Appendix 2	Calculations for Erosion and Sediment Controls
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Appendix 7	Complaints Register
Appendix 8	Environmental Non-Conformance Register
Appendix 9	Water Quality Monitoring Results Form
Appendix 10	Archaeological Discovery Protocol

Disclaimer

EnviroSCOPE has exercised due skill, care, and attention in preparing this EMP on the basis of their understanding of the subject site through their own site visits as well as information provided by the client and its consultants. EnviroSCOPE has no control over the physical actions, detailed design, equipment, services, and methodologies undertaken by the client or other third parties tasked with implementing EnviroSCOPE’s instructions or recommendations. EnviroSCOPE does not accept any responsibility for any environmental incidents or other defects of control measures if there is any departure or variance from the measures detailed in this EMP and any supporting documentation.

Emergency Contacts

Contact made with any of the following shall be undertaken with due consultation of the Environmental Representative or Project Manager.

Element	Emergency Contact	Details
Pollution incident	Otago Regional Council (ORC) Spill Hotline	0800 800 033 compliance@orc.govt.nz
Environmental complaint	Environmental Representative	TBC
Discovery of contaminated land	Environmental Representative	
Unexpected heritage finds	Environmental Representative	
Human remains	New Zealand Police	111
Fire including bushfire	Fire and Emergency New Zealand (FENZ)	111
Public utilities	Queenstown Lakes District Council (QLDC)	(03) 441 0499 rcmonitoring@qldc.govt.nz
Internal contacts	Project Manager	TBC
Internal contacts	Environmental Consultant	Tom Grandiek Enviroscope 027 2633 113

1.0 INTRODUCTION

1.1 Purpose and Scope

On behalf of Sharyn Robertson, Enviroscope has prepared this Environmental Management Plan (EMP) for the formation of an access, landscaping and construction of a dwelling at 346 Morven Ferry Road. This EMP aims to reduce the effects of the project's construction activities on the environment and sensitive receptors.

This EMP is prepared according to the Queenstown Lakes District Council (QLDC) *QLDC Guidelines for Environmental Management Plans, June 2019* (EMP Guidelines). It is considered to have a 'High' environmental risk level as per the risk categories outlined in the EMP Guidelines.

This document will also ensure that the project aligns with the objectives and policies of the Otago Regional Council's (ORC) Plan Change 8, specifically Topic 7: Part G: Sediment from earthworks for residential development.

The purpose of this EMP is to be an effective and practical reference manual for construction personnel that applies to all project activities during the construction phase and includes the following:

- Strategies to manage environmental aspects and risks, based on associated best practice.
- Provides for contingency planning.
- Provides a framework for monitoring, reporting, review and continual improvement.
- Defines roles and responsibilities.
- Procedures to investigate and resolve environmental non-conformances and initiate corrective and preventative actions.

An overview of the project and sequencing can be found in the construction methodology at Section 2.0.

1.2 Site Overview

The site is located at the southern end of Morven Ferry Road, sitting on an elevated slope above the Kawarau River. To the south of the building platform, a cliff face drops steeply down to the Kawarau River and to the west, sharply drops towards Morven Ferry Road. The site has been used historically for agricultural purposes, with exotic grass species the dominating vegetation across the site.

This is shown in **Figure 1** below.



Figure 1: Location of the site (Source: QLDC GIS)

1.2.1 Soils and Geotechnical Summary

A geotechnical report has been prepared by Pete Forrest of geotago dated November 2021 which details site investigations and reports on the geotechnical conditions including drainage potential. The report notes that apart from the thin layer of surficial topsoil, the site is underlain by weathered glacial till overlying the weathered surface of the Rakaia terrane schist. The weathered glacial till material comprises sandy SILT, silty SAND with some gravels and silty sandy GRAVELS.

Groundwater was not encountered in any of the test pits. Given the elevated site position compared to nearby surrounding surface water bodies, the groundwater is anticipated to be relatively deep, such that it will not interfere with earthworks.

1.2.2 Summary of Earthworks

A total of approximately 17,300 m³ of cut of fill material will be excavated over an area of 12, 800 m². The driveway will follow an existing access and will require some earthworks to reach suitable grade. Landscape mounding will be formed from the cut off the building platform to provide screening of the dwelling. The extent of earthworks is depicted on the Erosion and Sediment Control (ESCP) drawing in [Appendix 1](#).

1.3 Associated Resource Consents

This EMP has been prepared to ensure that all relevant conditions of associated resource consents are addressed. Provided the project undertakes its operations in accordance with this EMP, it will comply with the relevant conditions. The resource consents associated with this project are given in **Table 1**.

Table 1: Associated resource consents

Resource Consent Number	Related Council	Activity Description	Date of Decision Issue
TBC			

1.4 Suitably Qualified and Experienced Professional

This EMP has been prepared by Tom Grandiek of EnviroSCOPE Limited. Tom is a certified Environmental Professional (CEnvP) and holds a Bachelor of Applied Sciences degree, majoring in Environmental Management. He spent five years working in RMA compliance with local government. Tom has extensive experience in the preparation and monitoring of EMPs and ESCPs.

Tom meets the criteria of a Suitably Qualified and Experienced Professional (SQEP) for the purposes of preparing this EMP and overseeing the environmental aspects of this project.

2.0 CONSTRUCTION METHODOLOGY

2.1 Sequencing of Works

The following sequencing will ensure the earthworks are undertaken efficiently while ensuring good environmental outcomes. This is a preliminary staging methodology and may be subject to change based onsite conditions encountered during construction. This methodology shall be read in conjunction with the Erosion and Sediment Control Plan (ESCP) attached as **Appendix 1**. All dimensions and design schematics are provided in **Appendix 1** for the contractor's reference.

Preliminary works and site establishment - (prior to as-built confirmation)

- Ensure the current EMP is available onsite.
- Complete site induction with Environmental Consultant.
- Establish site laydown.
- Form decanting earth bunds. Install floc sock at inlet of both DEB's. Refer to **Appendix 2** for sizing dimensions.

Access earthworks

- Progressively form the access from the bottom of the property up. Install culverts as per Engineer design initially, to convey any clean water flows from upslope, under the access. Install Dirty water diversion channel within road alignment as the access is progressively formed.
- Install check dams and drop out pits progressively. Refer to **Appendix 1** for design details.
- Install sections of silt fencing below prominent areas of fill.
- Once design levels are reached, apply aggregate base to the access and compact to stabilise.
- Fill should be topsoiled and seeded to vegetate quickly.
- Cuts are likely to be exposed schist rock with minimal erosion risk. If erosion is present, consider lining cut batters and or seeding at direction of SQEP.

Building platform earthworks

- Check all erosion and sediment controls are operating effectively. Keep overland flow paths clear of machinery and debris.
- Install silt fences at base of landscape mound.
- Install drop out pits.
- Undertake cut of building platform. Excess cut is utilised to form landscape mounds. Form landscape mounds individually in a progressive manner.
- Once mound is formed, topsoil and re-seed to vegetate.
- If significant rainfall event is forecast, a lined bund can be proactively installed below the DEB. Compact suitable material to a height of 500mm and line a spillway at a reduced 100mm level.

Landscaping and revegetation

- Undertake final landscaping and revegetation of any remaining exposed areas.

Decommissioning

- Remove erosion and sediment control devices once stabilisation has occurred across the entire site. This is generally defined as 80% vegetative cover.

2.2 Hours of Operation

Construction activities and the associated hours of operation shall comply with *NZS 6803:1999 Acoustics - Construction Noise Guidelines*. Site works may be undertaken between 0730 and 1800 hours, Monday to Saturday. No works are to be undertaken on Sundays or Public Holidays. However, this does not preclude any emergency works or works required for incident investigation or response. Additional detail relating to noise-producing activities are to be undertaken in accordance with Section 7.0 of this EMP.

3.0 EMP IMPLEMENTATION

3.1 Environmental Roles and Responsibilities

3.1.1 Project Manager

The Project Manager is responsible for the effective implementation of the EMP and has overall responsibility for the environmental performance of the project. Duties include:

- Ensuring adequate resources are in place to implement the EMP.
- Ensuring all staff and sub-contractors operate within the guidelines of the EMP.
- Ensuring that an EMP is prepared and that environmental standards, processes and procedures meet relevant resource consent conditions.
- Overseeing the successful implementation, monitoring and review of the EMP.
- Ensuring that inspections are carried out in accordance with the relevant EMP.
- Restricting or stopping any activity that has the potential to or has caused adverse environmental effects.
- Providing notification and reporting of Environmental Incidents to Council and other environmental reports as required by The Guidelines.
- Delegating authority of the above responsibilities.

3.1.2 Environmental Representative

The Environmental Representative supports the Project Manager in the day-to-day implementation of the EMP. Duties include:

- Ensuring the installation of environmental controls as per the EMP.
- Undertaking environmental site inspections.
- Overseeing the maintenance and improvement of defective environmental controls.
- Providing environmental inductions to all staff and sub-contractors.
- Assisting the project leadership in attending to Environmental Incidents and Complaints.

The Environmental Representative shall be familiar with environmental risks associated with the project, the EMP and best practice erosion and sediment control principles and practices.

3.1.3 Environmental Consultant

The Environmental Consultant (SQEP) will provide technical environmental management advice as required. Key tasks include delivering the Site Environmental Induction to core staff and providing as-built confirmation of erosion and sediment controls to Council. The Environmental Consultant shall undertake monthly monitoring of the site and submit Monthly Environmental Reports to QLDC and ORC.

3.1.4 All Staff and Sub-Contractors

All staff and sub-contractors have a responsibility to undertake all activities in accordance with the requirements of this EMP. This includes reporting any activity that has the potential to or has resulted in an Environmental Incident to the Project Manager or Environmental Representative.

3.2 Site Environmental Induction

All staff and subcontractors shall attend an Environmental Induction to ensure they are aware of the project’s environmental risks as well as their responsibilities to help manage these risks. Prior to ground-disturbing activities, the Environmental Consultant will deliver the induction to core staff. During the project, the Environmental Representative will induct sub-contractors and new staff.

The site induction handout is attached as **Appendix 3** and all persons inducted will be recorded on the Induction Register attached as **Appendix 4**.

3.3 Environmental Inspections

Table 3 outlines the regular environmental inspections to be undertaken.

Table 3: Environmental inspections

Environmental Inspection	Timing	Purpose
Weekly Inspection	Every seven days	<p>A comprehensive environmental inspection will:</p> <ul style="list-style-type: none"> • Confirm that all environmental controls are present, functional, and adequate. Ensure flock socks are operational and have adequate levels of the chemical compound available. • Identify any activities that may cause an environmental incident or actual or potential environmental effects. • Identify maintenance requirements for implemented management measures. <p>All weekly inspections shall be recorded on the Weekly Site Inspection form attached as Appendix 5.</p>

Environmental Inspection	Timing	Purpose
Pre-Event Inspection	Prior to a significant rain event ¹	To ensure that erosion and sediment controls are present, functional, and adequate for forecast rain event. This inspection will inform any preventative work required and may result in the Rapid Response Procedure being implemented (see Section 4.6).
Rain Event Monitoring	During a significant rain event	To ensure that: <ul style="list-style-type: none"> • Erosion and sediment control devices continue to function correctly and inform any necessary emergency responses. • Sediment retention devices are functioning effectively and have capacity available. • No dirty² water is crossing the boundary of the site. Observations and remediation measures taken will be recorded in a daily job diary.
Post-Event Inspection	Immediately following a significant rain event	Any observations and corrective actions should be recorded in a daily job diary.

3.4 Monthly Environmental Inspection and Reporting by SQEP

The Environmental Consultant (SQEP) will monitor the site monthly to ensure that the EMP is correctly implemented, identify any unforeseen issues arising and advise on alternative environmental solutions.

The Environmental Consultant (SQEP) will also submit a Monthly Environmental Report to QLDC and ORC within five working days of the end of each month. The report will include the following information:

- Updates to the EMP and the Erosion and Sediment Control Plan (ESCP) during the month.
- Number of weekly and pre and post-rain event site inspections completed.
- Summary of corrective actions undertaken.
- Positive environmental outcomes achieved and opportunities.

¹ A significant rain event is defined as any rain event that can generate overland flow, noting that this varies seasonally.

² 'Dirty water' is defined as water that exceeds the maximum allowable water quality value outlined in the Discharge Criteria at Section 5.2.

3.5 Environmental Incident Management

Environmental incidents shall be responded to as soon as the project team becomes aware of them occurring. The response will generally involve oversight by the Environmental Consultant and will involve:

- Immediate cessation of the activity that caused the incident.
- Investigation into the cause of the incident.
- Initial response to bring the incident under control.
- Implement any remediation works.

The Project Manager shall notify QLDC and ORC of the details of any Environmental Incident within 12 hours of becoming aware of the incident. Notification will be through a phone call to Council monitoring staff (see Emergency Contacts on page four).

The Project Team shall provide an Environmental Incident Report within ten working days of the incident occurring. The Incident Report form is attached as **Appendix 6**.

3.6 Complaints Procedure

Any complaint received will be recorded and an investigation will be carried out. The complainant will be provided with a response acknowledging receipt of the complaint and outlining corrective actions to be implemented. After the investigation, any necessary corrective actions will be carried out and a follow-up of the original complaint is to be conducted to ensure the actions implemented have been effective.

All complaints will be recorded on the Complaints Register attached as **Appendix 7**.

3.7 EMP Non-Conformance and Corrective Actions

EMP non-conformances found during site inspections, monitoring or as a result of environmental incidents or complaints shall be recorded in the EMP Non-Conformance Register. The non-conformance register attached as **Appendix 8** will detail when corrective actions are due, how they are to be carried out and the close out date.

The non-conformance register ensures that issues do not escalate or are missed, as well as, providing a clear record of evidence that can be used to defend any potential complaint or formal enforcement action.

3.8 Records and Registers

The records listed below will be collated onsite. If a request is made by a QLDC and ORC official, the records shall be made available to the official within 24 hours of the request being made.

- Environmental Induction Register - **Appendix 4**.
- Weekly Environmental Inspection Form - **Appendix 5**.
- Environmental Incident Reports - **Appendix 6**.
- Complaints Register - **Appendix 7**.
- EMP Non-Conformance Register - **Appendix 8**.
- Water Quality Monitoring Results - **Appendix 9**.

3.9 EMP Updates

The EMP will be regularly reviewed throughout the project to ensure the document remains fit for purpose and to drive continual improvement. This may be initiated by:

- Significant changes to the construction methodology.
- Improvements identified as a result of an Environmental Incident or Corrective Action.
- Where directed by QLDC and/or ORC's Monitoring and Enforcement team.

All EMP updates will be managed through the document control table on page one and shall be submitted to QLDC and ORC for acceptance.

4.0 EROSION AND SEDIMENT CONTROL MEASURES

4.1 Performance Criteria

Design, install and maintain erosion and sediment controls in accordance with industry best practices. Generally, *Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016* (Auckland Council Guideline Document GD2016/005).

4.2 Erosion and Sediment Control Principles

Erosion and sediment control ('ESC') devices shall be installed, maintained and decommissioned in accordance with the following principles:

- Erosion and sediment controls are integrated with construction planning.
- Construction is staged to minimise the duration and area of exposed soil open at any one time.
- A 'treatment train' approach so that the sediment retention devices operate as efficiently and effectively as possible.
- Separation of 'clean' and 'dirty' water with clean water to be diverted around the site to minimise the volume of dirty water needing management onsite.
- The extent and duration of soil exposure is minimised.
- Controls are always maintained in proper working order.
- Progressively stabilise and revegetate disturbed or completed areas.
- The site is monitored, and erosion and sediment control practices are adjusted to maintain the required performance standard.
- Soil erosion is minimised as far as reasonable and practical.
- Avoidance of sediment discharge off-site and protection of receiving environments.

4.3 Guidance on Erosion and Sediment Control Devices

The effective control of surface water shall be achieved through the utilisation of carefully selected erosion and sediment control devices to achieve a specific purpose. These guidelines for the devices employed on this project shall be read in conjunction with the ESCP attached as **Appendix 1** of this document.

4.3.1 Site Definition

At the commencement of the project, the following components onsite will be clearly defined as detailed in **Table 5**.

Table 5: Site definition specifications

Site component	Method of Demarcation
Designated site access	Installation of stabilised access/signs
Internal 'no-go' areas (protected or sensitive areas)	Bunting or flagging tape with waratahs

4.3.2 Stabilised Entranceway

The stabilised access will be located Morven Ferry Road as indicated on ESCP-001 attached as **Appendix 1**. The stabilised entranceway will be constructed in accordance with the schematic diagram in ESCP-004, **Appendix 1** (complete guidelines on pages 60-65 of GD05).

4.3.3 “Clean Water” Diversion Bunds

Clean water diversion bunds will be used to capture and divert clean water from the undisturbed surfaces above the exposed works site. The purpose of these devices is to separate clean and dirty water and minimise the size of the contributing catchment. Most flows convey via the identified overland flow paths on the site with limited contributing catchments. Sections above the driveway access cut may allow for sections of clean water diversion bunds to be installed during construction but are not initially considered practical to install. During the initial phase of earthworks, the Environmental representative and SQEP can determine if additional diversions are required and install accordingly.

These devices shall be constructed in accordance with the specifications noted in the schematic diagram in ESCP-005, **Appendix 1** (complete guidelines on pages 38-42 of GD05). Full calculations are included in **Appendix 2**.

4.3.4 “Dirty Water” Diversion Channels and Bunds

Dirty water diversion channels (DWDC) will be installed to capture and carry sediment-laden stormwater to the sediment treatment devices. The DWDC will follow the access road and replicate the swale being formed in the inside of the access. An additional DWDC is provided below the building platform to contain flows of the surface and direct to the decanting earth bund.

DWDCs will be constructed in accordance with the schematic diagram in ESCP-005, **Appendix 1** (complete guidelines on pages 43-46 of GD05). Full calculations are included in **Appendix 2**.

4.3.5 Check Dams

Rock check dams will be deployed primarily to reduce the velocity of concentrated flows in the DWDCs. They will also act to capture some coarse sediment. Sections of the formed access occur on relatively higher grades and check dams are encouraged to reduce channel erosion. The check dams will be constructed in accordance with the schematic diagram in ESCP-007, **Appendix 1** (complete guidelines on pages 50-54 of GD05).

4.3.6 Drop-Out Pits

Drop-out pits will be used within the DWDCs to provide some sediment retention for small catchment areas where other controls cannot be effectively installed.

- To allow the heavier coarse sediments to drop out, preventing them from entering the sediment retention devices, and reducing loads on these devices.
- Geotechnical investigations have indicated that soakage is likely present in some areas of subsoil and drop out pits can be utilised to provide additional storage in high infiltration soils.

Drop-out pits will be constructed in accordance with the image reference in ESCP-006, **Appendix 1** (complete guidelines on page 45 of GD05).

4.3.7 Culverts

Culverts are proposed to be installed along intervals of the driveway access. These are to be installed in accordance with the final engineer design specifications. During construction of the driveway, culverts are to be installed initially within flow paths to convey clean water flows under the formed access. I

Geofabric and rock shall be placed at the outlet to prevent scour from the higher velocity water exiting the culvert. Culverts shall be constructed in accordance with the schematic diagram in ESCP-006, **Appendix 1**.

4.3.8 Decanting Earth Bund

Two decanting earth bunds (DEB) are proposed to be used to capture flows from the building platform and large portion of the driveway access to allow sediment to settle out of the water column. The DEB for the building platform accommodates a 5000 m² which is acknowledged exceeds the GD05 recommended 3000 m² area. However, the DEB has been sized for that contributing catchment and the ability to construct a sediment retention pond in this area is not feasible, due to shallow schist rock. Due to reduced sediment load from the schist rock base present on the upper terraces of the site, and the storage capacity provided, this option is considered appropriate in this circumstance. An additional contingency stabilised bund behind the DEB can be formed to provide additional retention and to reduce discharge velocities from the DEB down the flow path. This is demonstrated in **Appendix 1**.

The second DEB is located off the access and is sized to accommodate a 2000 m² contributing catchment and has been sized in accordance with best practice specifications.

Full design specifications based on GD05 including depth, width and length are given in **Appendix 2**. The DEB's will be constructed in accordance with the schematic diagram in ESCP-008, **Appendix 1** (complete guidelines on pages 106-112 of GD05).

4.3.9 Chemical Treatment

Floc socks are proposed to be utilised initially at the entrance to the DEB's to reduce entrained sediments. Floc socks have been selected in the first instance due to the relatively small contributing catchments and ease of maintenance for the on-site contractor during construction. As noted in the Geotech report, apart from the thin layer of surficial topsoil, the site is underlain by weathered glacial till overlying the weathered surface of the Rakaia terrane schist. Generally, the sediment load from schist rock is low, comparative to high silt and clay content subsoils where more robust chemical treatment is necessary. With a reduced sediment load, floc socks are considered an appropriate form of chemical treatment initially.

Frequent monitoring and checks of the floc socks are necessary to ensure the integrity and efficacy of the socks are maintained. A visual inspection of the socks is to be completed weekly as documented with **Appendix 5** and pre and post rainfall events.

If a more robust form of chemical treatment is deemed necessary based on site observations, a Chemical Treatment Management Plan (CTMP) shall be prepared.

4.3.10 Standard Silt Fence

Standard silt fences will be used to capture potential sheet flows from the landscape mounds across site, as well as the toes of areas of fill along the access. Due to topography, silt fences are the only suitable sediment control around the bases of the mounds, to capture sheets flows alongside flow paths.

The silt fence will be installed in accordance with the schematic diagram in ESCP-009, **Appendix 1** (complete guidelines on pages 112-119 of GD05).

4.3.11 Super Silt Fence

Super silt fences may be used to capture potential sheet flows from the larger landscape mounds during construction. This solution has been selected due to slope in some areas which allows for super silt fence as an appropriate method. Super silt fence will be installed in accordance with the schematic diagram in ESCP-010, **Appendix 1** (complete guidelines on pages 120-125 of GD05).

4.3.12 Temporary Stockpiles

Stockpiles may be formed as part of earthworks. It is recognised that the location of stockpiles will change with the progress of the earthworks. Stockpiles shall be constructed in accordance with the schematic diagram in ESCP-011, **Appendix 1**.

4.3.13 Progressive Rehabilitation

Progressive stabilisation of earthworks is to occur promptly as areas are finished to minimise the area of exposed soil and thus the generation of sediment-laden water. Landscape mounds are to be formed in a progressive manner, with mounds being rapidly stabilised once formed. Prior to final landscaping, this can comprise temporary grassing, turfing or clean aggregate.

4.4 As-Built Verification

The Environmental Consultant will provide the Council with as-built confirmation to verify that the erosion and sediment controls have been installed in accordance with the approved ESCP.

4.5 Maintenance of Erosion and Sediment Control Devices

Ongoing maintenance of the site shall be undertaken as follows:

- Clean out sediment of erosion and sediment control as soon as 20% capacity has been reached.
- Any mucked-out sediment shall be stockpiled, dried and reused as planting media for revegetation.

4.6 Rapid Response Procedure for Significant Rain Events

The Environmental Representative will stay vigilant of weather forecasts. If a significant rain event is imminent, all works will cease in sufficient time for staff to inspect and maintain erosion and sediment control devices and undertake any stabilisation

required. Observations will continue through the rain event to ensure the functioning of erosion and sediment control devices.

4.7 Decommissioning and Removal

Erosion and sediment control devices will remain in place until ‘stabilisation’ of the site has been achieved. This is generally defined as 80% vegetative cover as depicted in **Figure 2**.

It is noted that the removal of controls may result in minor soil exposure. Any soils exposed during decommissioning will be stabilised with either grass, mulch or other appropriate erosion control.

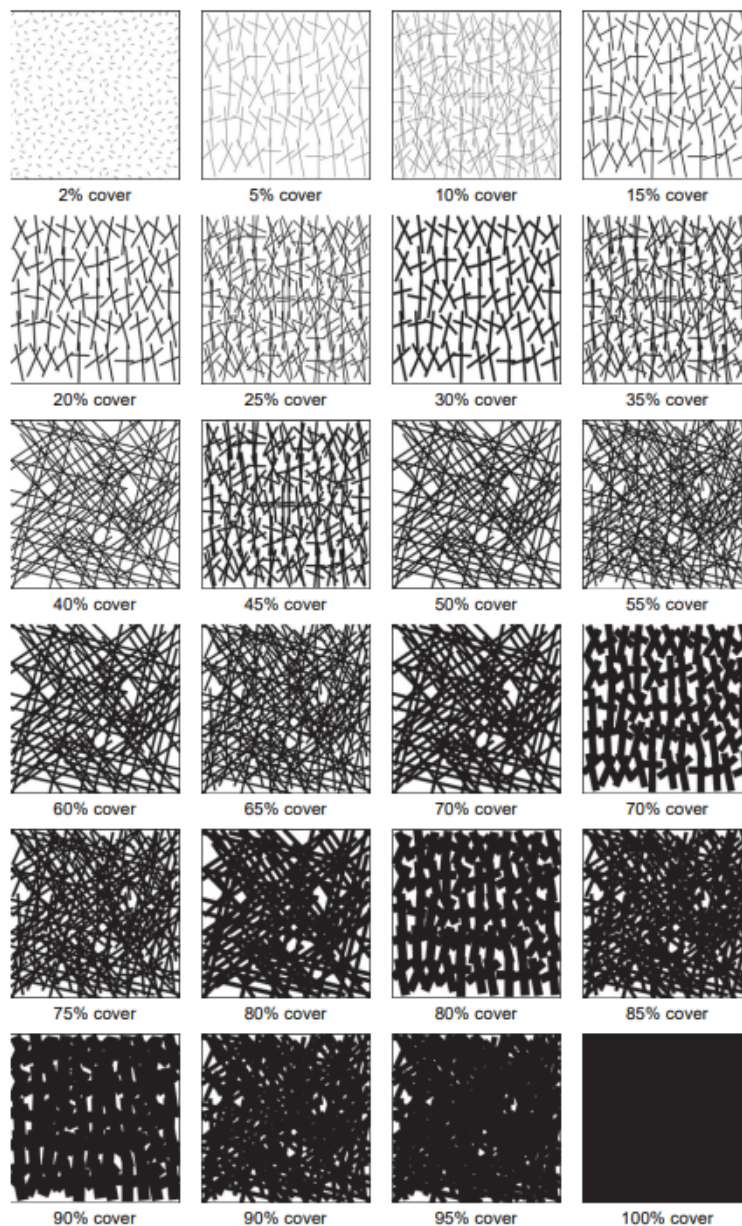


Figure 2: Visual cover estimation (Source: Catchments and Creeks Pty Ltd)

4.8 Inspections and Monitoring

Details of inspections and monitoring are stated in Section 3.3.

4.9 Contingency Measures

The following contingency measures in **Table 6** shall be deployed as required.

Table 6: Erosion and sediment control contingency measures

Issue	Contingency Measure
Sediment-laden stormwater flowing across the site boundary	Undertake measures to stop the flow immediately. Ensure controls are installed according to the ESCP. Contact the Environmental Consultant (SQEP) who will initiate the incident response.
Controls do not appear to be working as intended	Contact Environmental Consultant (SQEP) to inspect, advise and revise ESCP as required.
The site is inappropriately exposed prior to imminent rain event	Cease works and shift effort to checking erosion and sediment controls and stabilisation via the Rapid Response Procedure outlined in Section 4.6.
Sediment retention devices are near capacity and more rain is forecast	Contact the Environmental Consultant (SQEP) immediately for advice.
Abatement notice issued by Council	Contact the Environmental Consultant (SQEP) immediately to advise on methods to meeting abatement notice requirements within the time stated by the abatement notice.

4.10 Erosion and Sediment Control Incident

An erosion or sediment control incident is considered to have occurred where performance criteria outlined in Section 4.1 is not met. The incident procedures outlined in Section 3.5 shall commence.

5.0 WATER QUALITY MANAGEMENT

Surface water bodies (rivers, streams, lakes and wetlands) provide important habitats for many species of plants, fish, birds and animals, some of which are endemic and/or threatened. To protect these values, water quality must be safeguarded, and the natural flow of the watercourse maintained to the greatest possible extent. Where flow must be reduced or diverted, mitigation is required to ensure the values of the watercourse are not degraded.

5.1 Receiving Waterbodies

The Kawarau River is 100 metres to the south of the site and approximately 130m below the site. The building platform is located at the top of the site and risk of runoff towards the Kawarau River is unlikely, with the site sloping away from the river. Two minor overland flow paths move down slope to the east towards an existing water race that intercepts the base of the property. There are no identified waterways within the site boundaries.



Figure 3: Waterways within and in proximity to the site

5.2 Legislative Considerations

The Kawarau River is protected by Water Conservation (Kawarau) Order 1997 due to the following outstanding amenity and intrinsic values which are afforded by waters in their natural state. With natural and physical qualities and characteristics that contribute to.

- people’s appreciation of pleasantness of waters:
- aesthetic coherence:
- cultural and recreational attributes:
- biological and genetic diversity of ecosystems:
- essential characteristics that determine the ecosystem’s integrity, form, functioning, and resilience

5.2 Performance Criteria

Any waters flowing across the site boundaries will meet the criteria in **Table 7**.

Table 7: Water quality discharge criteria

Parameter	Discharge Criteria
Turbidity	≤ 100 NTU ³
<i>Or...</i>	
Comparative Visual Clarity (mm) ⁴	TBC
<i>If turbidity or visual clarity is exceeded, test for...</i>	
Total Suspended Sediment (TSS)	≤ 50 mg/L
pH ⁵	5.5 – 8.5
Hydrocarbons or tannins	No visible trace

³ Turbidity can be instantly measured using a nephelometer. This is considered desirable as opposed to testing TSS which requires laboratory testing and can take several days. Turbidity can be inferred from the relationship with TSS via linear regression. If the specified turbidity value is not met, a water sample will be collected and sent for TSS laboratory testing.

⁴ In the absence of a turbidity measure, visual clarity can be inferred from the relationship with turbidity via linear regression. If the specified visual clarity value is not met, a water sample will be collected and sent for TSS laboratory testing.

⁵ pH to be tested only when chemical treatment is undertaken.

Parameter	Discharge Criteria
Waste	No waste or litter is visible

5.3 Management Measures

The following measures will be deployed to ensure the protection of water quality:

- Erosion and sediment controls will be implemented and maintained in accordance with the Erosion and Sediment Control Measures in Section 4.0.
- Refuelling, servicing and storage of hydrocarbons will be in accordance with the relevant procedures in the Chemicals and Fuels Management in Section 10.0.
- All concrete washing is to be undertaken in the designated concrete wash-out pit as per the design specifications in **Appendix 1**.
- All plant and equipment onsite will be inspected regularly to ensure they are of an acceptable standard.
- Stockpiling of any organic, erodible or hazardous material onsite is not to be placed within close proximity of a watercourse/major drainage line, unless appropriate controls are in place.
- All chemical treatment of sediment-laden water will be undertaken in accordance with an approved Chemical Treatment Management Plan.

5.4 Monitoring

Water quality will be monitored in accordance with **Table 8**.

Table 8: Water quality monitoring measures

Sampling Scope	
Objective	To confirm that all controlled and uncontrolled water flowing from the site meets the Discharge Criteria referred to in Section 5.2.
Spatial boundaries	All water that enters and exits the site from rainfall or overland flow.
Frequency	At the time water flows cross the boundary of the site. Where a Significant Rain Event occurs through the night, monitoring shall be undertaken the following morning.
Sampling Design	
Water Quality Criteria	As outlined in the Discharge Criteria referred to in Section 5.2.
Sampling Locations	At boundaries of the site where any water is flowing, specifically the following point discharges: <ul style="list-style-type: none"> • DEB outlets.

Sampling Method	<ul style="list-style-type: none"> • TSS – Registered laboratory • Turbidity (NTU) – Nephelometer • pH – pH meter – only if utilising chemical treatment • Gross pollutants – visual observations • Tannins – visual observations (any unusual darkening of waters?) • Hydrocarbons – visual observations (is there any oily film⁶ on surface or smell?)
Quality Control	Any water quality meter will be calibrated according to manufacturer instructions. All observations will be recorded and analysed.
Recording	
Recording Results	All results will be entered into a spreadsheet and kept onsite (form attached as Appendix 9).
Actions	
Non-conformances	Any exceedances observed will be reported to the Project Manager/ Environmental Consultant who will investigate and ensure appropriate corrective actions are implemented immediately.

5.5 Contingency Measures

The following contingency measures in **Table 9** shall be adopted if required.

Table 9: Water quality contingency measures

Issue	Contingency Measure
Exceedance of water quality criteria	<ul style="list-style-type: none"> • Contact the Project Manager and Environmental Consultant (SQEP) immediately. • Works will cease or be modified to remove further risk of contamination. • QLDC and ORC will be verbally notified. • The Environmental Incident procedure will commence. • Remedial measures will be implemented and the Environmental Incident will be closed out by the Environmental Consultant (SQEP), with a copy of an Environmental Incident report to the Project Manager, QLDC and ORC.

⁶ Some bacteria produce a naturally occurring film on the water surface. Bacteria films breaks apart in angular shapes when disturbed whereas hydrocarbon film separates as globules.

5.6 Water Quality Incidents

A water quality incident is considered to have occurred where the water quality performance criteria outlined in Section 5.2 is breached. The incident procedures outlined at Section 3.5 shall commence.

6.0 DUST MANAGEMENT

Dust from construction activities, vehicle movements and stockpiles can contribute to sediment runoff and create a nuisance to the public, neighbouring properties, adjoining roads and service infrastructure. The key risks associated with dust occur during the bulk earthworks phase of the project.

There are a range of activities that may produce dust onsite including:

- General disturbance of soil (particularly during drier months).
- Inappropriate staging that does not seek to minimise the extent of exposed soil.
- Vehicle movements along haul roads.
- Sediment-tracking onto surrounding roads.
- Stockpiling of topsoil or subsoil.
- Slow or ineffective revegetation procedures.

6.1 Sensitive Receptors

The site is located within the Wakatipu Basin and due to the surrounding topography and alpine environment, wind direction and speed can be changeable. The project shall ensure the site is prepared appropriately to manage potential dust effects.

6.2 Performance Criteria

The project must ensure that reasonable and practical measures are taken to avoid dust moving across the boundaries of the site at all times.

6.3 Management Measures

The following measures will be deployed to ensure dust generation onsite is minimised:

- Stage works where possible to minimise soil exposure extents and timeframes.
- Revegetate disturbed areas progressively throughout construction.
- Dust suppression of exposed areas and stockpiles by water trucks or other methods (e.g., k-lines) approved by the Environmental Representative.⁷
- If dust activities cannot be controlled during high winds, works will cease until favourable conditions return.
- Only designated access points and haul routes are to be used.
- Site access to be constructed in accordance with GD05 (detail at Section 4.3.2).
- All site access and surrounding roads to be swept clean regularly.
- To avoid spillage risks, trucks will not be overloaded.
- All trucks must have tail gates up and swept or cleaned prior to entering external roads.

⁷ Ensure a consented water take permit is approved by the local authority. If taking water from lakes and or rivers, ensure that the permitted volume of water is taken.

- Stockpile heights are to be minimised where possible (< three metres) unless they are covered (e.g. an erosion blanket, chemical sealant, temporary cover crop or mulched).
- Long-standing stockpiles (greater than six weeks) shall be appropriately stabilised.

6.4 Monitoring

Site staff will maintain continual vigilance for any increases in wind to ensure measures are deployed prior to dust crossing site boundaries. Weekly Environmental Inspections and the Monthly SQEP Environmental Inspections will also ensure that the management measures described above are sufficient and performing effectively.

6.5 Contingency Measures

The contingency measures in **Table 10** shall be adopted if required.

Table 10: Dust contingency measures

Issue	Contingency Measure
Excessive dust creation from soil disturbance	<ul style="list-style-type: none"> • Increase frequency of water truck spraying or increase irrigation. • Spray down excavation areas and activities where excavator bucket is operating. • Cease excavation during high winds, particularly if wind direction is likely to impact sensitive receivers.
Excessive dust creation from hauling operations	<ul style="list-style-type: none"> • Cover or spray loads causing dust impacts. • Apply skim of aggregate over the haul road surface.
Excessive dust creation from stockpiles	<ul style="list-style-type: none"> • Spray stockpiles with water or apply a temporary polymer. • Hydro-mulch, seed or stabilise stockpiles, cover stockpiles with geofabric. • Locate stockpiles further away from sensitive receptors.
Abatement notice issued by Council	Contact the Environmental Consultant (SQEP) immediately to advise on methods to meeting abatement notice requirements within the time stated by the abatement notice.

6.6 Dust Incident

A dust incident is considered to have occurred where:

- Dust is observed crossing the boundary into sensitive receptors or,
- A justified complaint is received regarding dust emissions across the boundary of the site.

The incident procedures outlined at Section 3.5 shall commence.

7.0 NOISE AND VIBRATION MANAGEMENT

Noise and vibration generated during construction has the potential to impact sensitive receivers by reducing comfort, impeding communication, causing cosmetic damage to structures and damaging household possessions.

The following assessment and management measures are intended for standard construction equipment that is not expected to induce noise or vibration beyond the maximum limits in the QLDC District Plan. Where upper noise and vibration levels of district plans will be breached, an Acoustic Specialist may need to be engaged to assist with the management of these nuisance effects.

Potential noise and/or vibration effects may be generated by the following:

- Excavation and earth moving plant
- Light vehicles near sensitive receptors
- Ancillary plant and equipment
- Compaction equipment
- Rock breaking
- Reversing alarms

7.1 Sensitive Receptors

Due to the rural nature of the site, there are no immediate nearby receptors likely to be impacted by noise and vibration effects.

7.2 Performance Criteria

1. Construction activities shall meet relevant noise limits specified under Rule 36.5.13 of the Queenstown Lakes Proposed District Plan. This rule requires Construction sound at any point within the site must comply with the limits specified in Tables 2 and 3 of *NZS 6803:1999 Acoustics - Construction Noise*, when measured and assessed in accordance with that standard (see **Table 11** below).
2. Construction activities shall meet relevant vibration limits specified under Rule 36.5.10 of the Queenstown Lakes Proposed District Plan. This rule requires vibration from any activity must not exceed the guideline values given in *DIN 4150-3:1999 Effects of vibration on structures* on any structures or buildings on any other site.
3. Construction activities shall be undertaken in accordance with the permitted hours of operation outlined at Section 2.2 above.

Table 11: Upper limits in dB(A) for construction work noise in residential areas for more than 20 weeks

Time of Week	Time Period	$L_{Aeq(t)}$	L_{Amax}
Weekdays	0630 – 0730	55 dB	75 dB
	0730 – 1800	70 dB	85 dB

	1800 – 2000	65 dB	80 dB
Saturdays	0630 – 0730	45 dB	75 dB
	0730 – 1800	70 dB	85 dB

Table 12: Vibration Thresholds for Structural Damage (PPV mm/s)

	Short Term			Long-Term	
	At Foundation			Uppermost Floor	Uppermost Floor
Types of Structures	0 to 10 HZ	10 to 50 Hz	50 to 100 HZ	All Frequencies	All Frequencies
Commercial/Industrial	20	20 to 40	40 to 50	40	10
Residential	5	5 to 15	15 to 20	15	5
Sensitive/Historic	3	3 to 8	8 to 10	8	2.5

Note: When a range of velocities is given, the limit increases linearly over the frequency range.

7.3 Management Measures

The following measures will be deployed to ensure noise and/or vibration associated with the project are appropriately mitigated:

- Notify surrounding sensitive receptors prior to commencing particularly noisy or vibration inducing activities.
- Where practicable, select lower noise producing equipment or use lower noise generating alternatives.
- Regularly service equipment to ensure plant is running optimally.
- Plant and equipment to be fitted with noise control/attenuation devices as appropriate and maintained and operated in accordance with manufacturer’s specifications.
- Revving of engines will be limited. All plant and vehicles will be turned off when not in use and if safe to do so.
- The use of audible alarms on mobile equipment will be limited, and two-way communication will be used.
- Undertake activities that may lead to noise or vibration effects, during reasonable and practical hours.

7.4 Monitoring

All earthworks activity will be closely monitored by the operator to ensure that noise and vibration remains within the required limits. If monitoring finds the activity cannot comply with performance criteria, an Acoustic Specialist may need to be engaged to assess the project and provide appropriate mitigation measures and monitoring. Weekly Environmental Inspections and Monthly SQEP Environmental Inspections shall include an assessment of the site to determine the effectiveness of noise and vibration management controls.

7.5 Contingency Measures

The following contingency measures in **Table 13** shall be adopted if required.

Table 13: Noise and vibration contingency measures

Issue	Contingency Measure
Noise and/or vibration complaint received	Manage the complaint in accordance with the Environmental Complaints procedure in Section 3.6.
Exceedance of performance requirement criteria	The Environmental Consultant (SQEP), in consultation with the Environmental Representative, will investigate and implement actions to reduce noise and/or vibration levels to below criteria levels.
Ongoing noise and/or vibration issues	Where noise or vibration emissions consistently exceed the performance criteria despite the site staff's best efforts, an Acoustic Specialist will be engaged to assist.
Abatement notice issued by Council	Contact the Environmental Consultant (SQEP) immediately to advise on methods to meeting abatement notice requirements within the time stated by the abatement notice.

7.6 Noise and Vibration Incident

A noise or vibration incident is considered to have occurred when a justified complaint is received and on investigation is found to exceed the performance criteria. The environmental incident procedures outlined in Section 3.5 shall commence.

8.0 CULTURAL HERITAGE MANAGEMENT

The loss or damage of cultural heritage items could be caused by construction activities. The damage or loss of artefacts can lead to the loss of culturally or historically significant items and information.

Examples of cultural heritage items include:

- Koiwi tangata (human skeletal remains).
- Waahi taoka (resources of importance).
- Waahi tapu (places or features of special significance).
- Māori artefact material.
- A feature or archaeological material predating 1900.
- Unidentified archaeological or heritage site.

8.1 Location of Known Cultural Heritage Significance

A search of QLDC's database indicates there are no known items of cultural or heritage significance on the site.

8.2 Performance Criteria

- The protection of cultural heritage artefacts and places in accordance with the *Heritage New Zealand Pouhere Taonga Act, 2014*.
- Strict adherence to Heritage New Zealand's *Archaeological Discovery Protocol* (attached as **Appendix 10**) in the case of unexpected finds.

8.3 Management Measures

All works on this project will be undertaken in accordance with the obligations of the *Heritage New Zealand Pouhere Taonga Act, 2014*.

8.4 Monitoring

Weekly inspections shall include a visual assessment of the site to ensure that no new significant artefacts have been encountered. However, operators must remain vigilant for such encounters as they occur.

8.5 Accidental Finds

If any unknown artefacts are uncovered, the project will work to Heritage New Zealand's *Archaeological Discovery Protocol* (attached as **Appendix 10**).

9.0 CHEMICALS AND FUELS MANAGEMENT

Hazardous substances can endanger both human health and the environment. Used incorrectly they can cause catastrophic accidents, such as fires and explosions, and serious harm to people who are exposed to them.

9.1 Sensitive Receptors

Key sensitive environmental receptors include staff members working on the site and the Kawarau River.

9.2 Performance Criteria

- Chemicals and fuels are stored and used in a manner that avoids contamination of site and surrounding environment.
- All spills are cleaned up immediately and the contaminated soils/waters disposed of appropriately.

9.3 Management Measures

The following measures will be deployed to ensure chemicals and fuels associated with the project are appropriately managed.

- All hazardous substances to be stored, transported and used according to the safety data sheet requirements.
- Storage of chemicals and fuels shall be located as far as practicably possible from waterways and concentrated flows.
- Refuelling of vehicles and plant onsite will occur in the designated refuelling bay as shown in **Appendix 1**.
- All concrete washing is to be undertaken in the designated concrete wash-out pit as per the design specifications in **Appendix 1**.
- One 240 L Oil and Hydrocarbon spill kit and one 240 L Chemical spill kit will be located in close proximity to the location of liquid hazardous materials storage and refuelling areas.
- The volumes of the hazardous substances listed in **Table 14** will not be exceeded.

Table 14: Maximum volumes of chemicals and fuels

Chemicals and Fuels	Maximum Volume	Storage Location
Diesel	1,500 L	Fuel tank or Jerry cans in lockable container
Unleaded Fuel	100 L	Jerry cans in lockable container
Oil	10 L	Packaging in lockable container
Lubricant (WD40 or similar)	Six Cans	Packaging in lockable container
Grease	5 L	Packaging in lockable container
Spot marking paint	2 L	Packaging in lockable container

9.4 Monitoring

Weekly Environmental Inspections and Monthly SQEP Environmental Inspections shall include a visual assessment of the site to determine the effectiveness of chemicals and fuels management.

9.5 Contingency Measures

The following contingency measures in **Table 15** shall be adopted if required.

Table 15: Chemicals and fuels contingency measures

Issue	Contingency Measure
Spills response	<ul style="list-style-type: none"> • Stop works in proximity to the spill and assess the safety of all personnel. • Take immediate action to contain the spill to prevent discharge into stormwater drains or natural waterways. • Use spill kits to contain and treat the spill. • Notify Environmental Consultant to advise on next steps. • If necessary, notify the Regional Council spill response unit. • Remove contaminated material to a suitable contained location for remediation/disposal (require any necessary approvals/permits from ORC). • The spill kits shall be replaced by an approved supplier.
Inappropriate storage	<ul style="list-style-type: none"> • Upgrade facility. • Clean-up of storage area. • Notify and train staff.
Inappropriate handling/transport	<ul style="list-style-type: none"> • Notify and train staff through toolbox meetings on the appropriate handling and transport methods.
Inadequate spill kit materials	<ul style="list-style-type: none"> • Order more materials. • Investigate types of chemicals onsite and consult a supplier for advice on appropriate equipment. • Develop or revise spill material monitoring and ordering system.
Inappropriate disposal of chemicals or fuels	<ul style="list-style-type: none"> • Provide appropriate disposal facilities or service providers. • Notify and train staff.
Inaccurate or insufficient records	<ul style="list-style-type: none"> • Advise staff and update records. • Monitor through inspections.

9.6 Chemicals and Fuels Incident

A chemicals and fuels incident is considered to have occurred where:

- A spill more than five litres has occurred.
- A situation is discovered where a spill of more than five litres would likely have occurred before it happens where the management measures listed above have not been followed.

The environmental incident procedures outlined at Section 3.5 shall commence.

10.0 WASTE MANAGEMENT

Waste from construction activities can create a nuisance to the public, neighbouring properties, and adversely affect flora and fauna.

10.1 Sensitive Receptors

Key sensitive environmental receptors include staff members working on the site and the Kawarau River.

10.2 Performance Criteria

- Non-recyclable waste generation is minimised, and the site and surrounds are kept free from waste at all times.
- Wastes shall be stored safely and in an organised manner until recycling, reuse, or disposal.

10.3 Management Measures

The following measures will be deployed to ensure waste management associated with the project is appropriately mitigated:

- The Waste Management Hierarchy philosophy will be implemented, as illustrated in **Figure 4**.

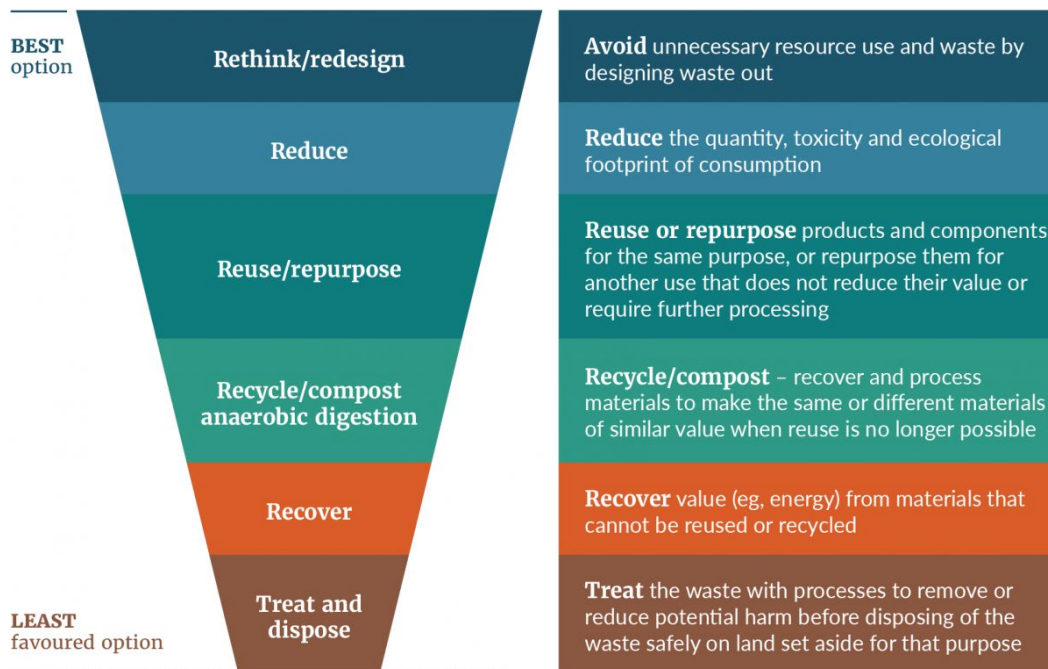


Figure 4: The Waste Hierarchy (Source: Ministry for the Environment).

- Measures will be implemented to ensure the site is maintained in a safe, clean and tidy state.
- Where possible, waste shall be segregated into labelled bins with lids: General, Hazardous and Recyclables.
- Wastes onsite shall be suitably contained and prevented from migrating offsite.

- The waste is to be contained so it doesn't contaminate soil, surface or ground water, create unpleasant odours or attract vermin.
- Any material dropped in or adjacent to open drains shall be recovered immediately after it occurs.
- Waste storage is not permitted in or near drainage paths.
- The burning of waste is strictly prohibited.
- No wastes shall be disposed of onsite.
- Wastes shall be removed from site regularly and at completion of works.

10.4 Monitoring

Site staff will be briefed on waste processes prior to works commencing and shall maintain continual vigilance for excess waste around the site and following appropriate disposal procedures. Weekly Environmental Inspections and Monthly SQEP Environmental Inspections shall include a visual assessment of the site to determine the effectiveness of waste management controls.

10.5 Contingency Measures

If waste items are accumulating or are stockpiled, the following contingency measures will be adopted:

- Arrange for collection by approved licensed contractor.
- Provide additional bins with lids if available.
- Remove waste offsite as soon as possible.

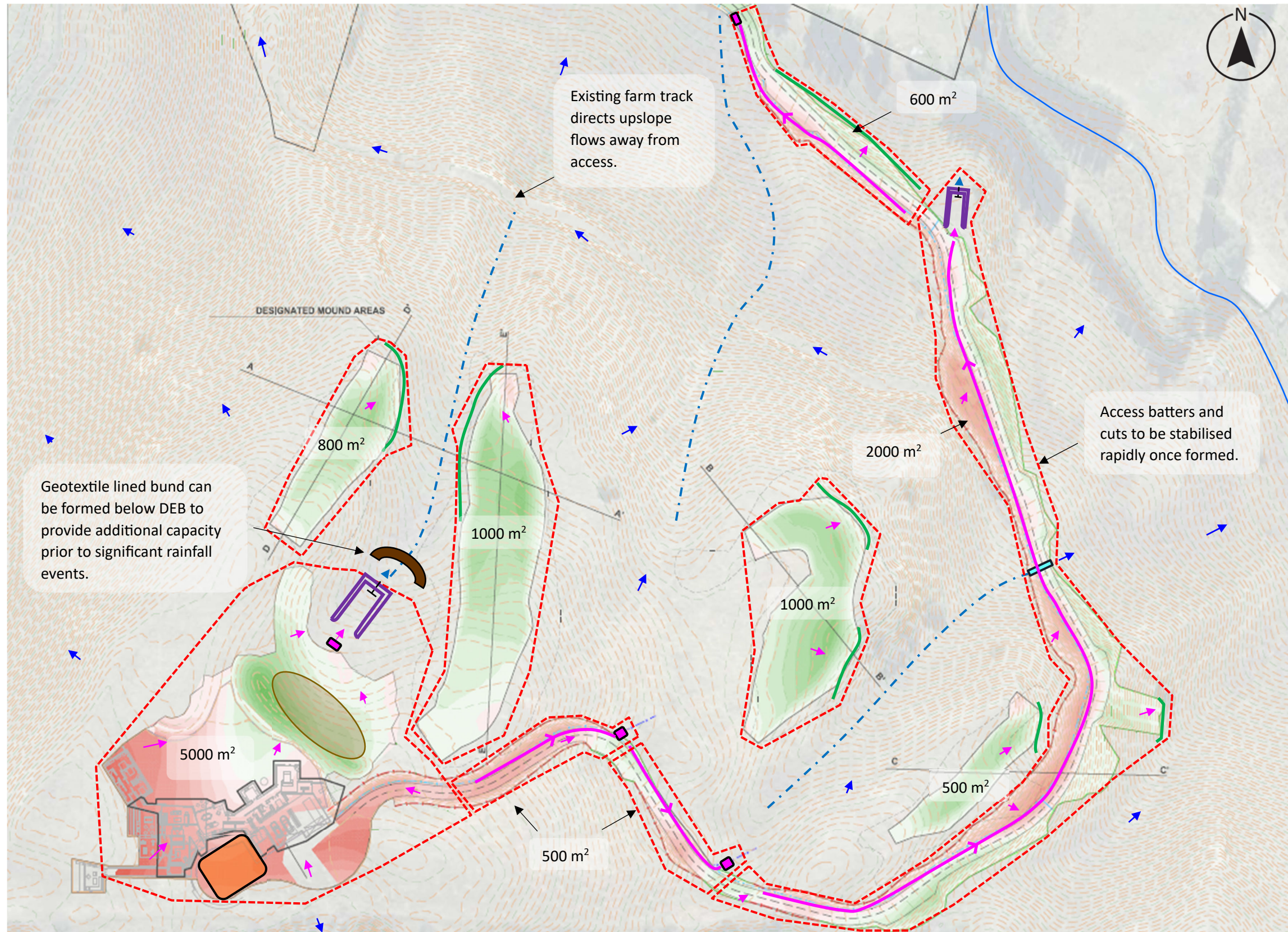
10.6 Waste Incident

A waste incident is considered to have occurred where:

- Waste from the site is found within a sensitive environment or where it may reasonably migrate to a sensitive environment,
- A complaint is received regarding inappropriate management of waste and on investigation is warranted.

The environmental incident procedures outlined at Section 3.5 shall commence.

APPENDIX 1 Erosion and Sediment Control Plan Drawing

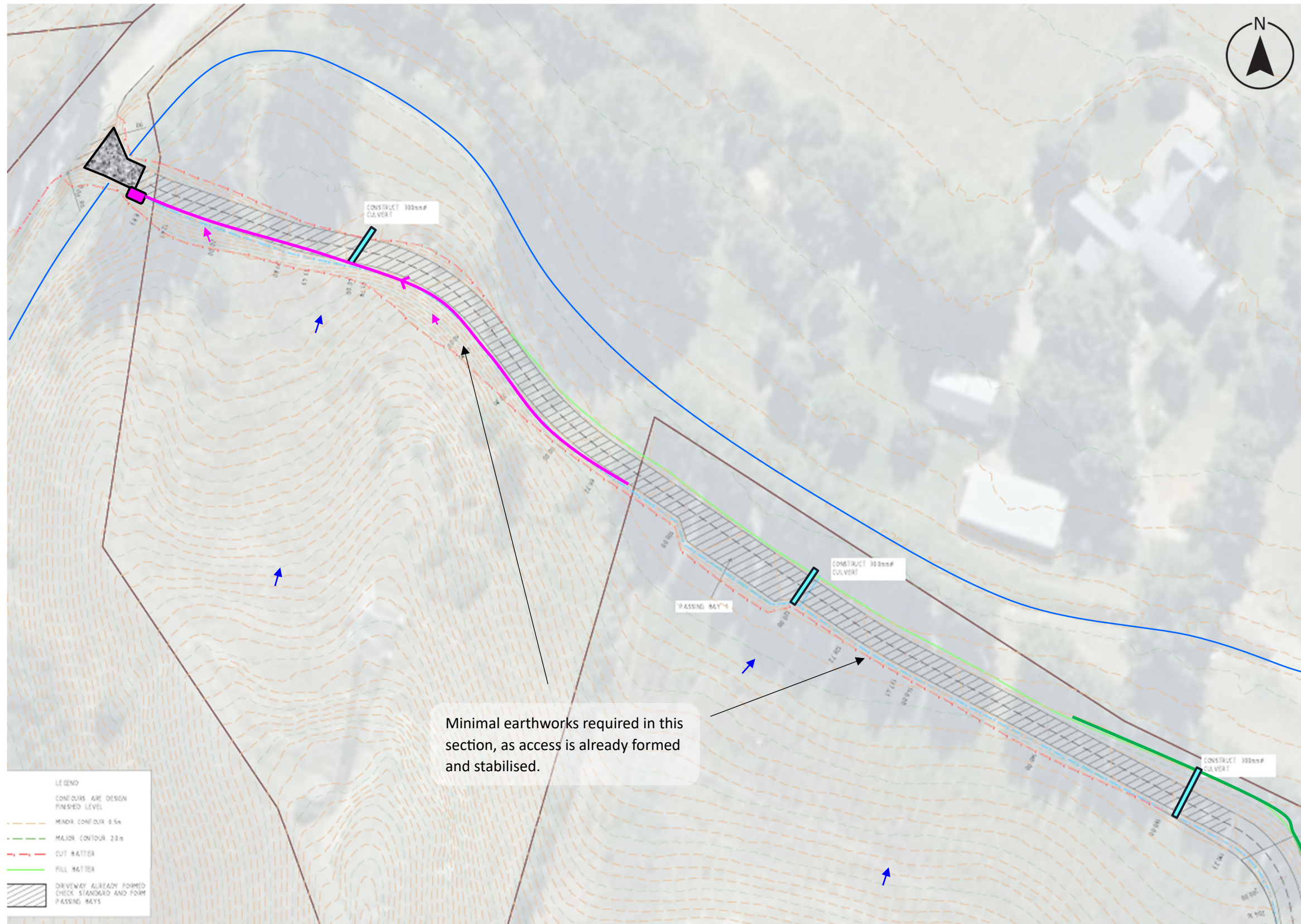


Legend	
	Stabilised access
	Clean water overland flow
	Dirty water overland flow
	Clean water diversion channel
	Dirty water diversion channel
	Irrigation race
	Earthworks catchment
	Overland flow path
	Laydown area
	Silt fence
	Culvert – Final engineer design
	Drop out pit
	Decanting Earth Bund
	Topsoil stockpile

Notes

- This plan is to be read in conjunction with the Environmental Management Plan document prepared by Enviroscope.
- All locations of erosion and sediment control (ESC) devices are indicative and exact placement to be confirmed onsite.
- ESC devices to be installed maintained in accordance with Auckland Council's 'Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05) and manufacturer's instructions where relevant.
- All devices are to be inspected daily and pre and post-rain event to ensure they are fully functional.
- Landscaping mounds to be formed progressively and stabilised rapidly once formed.
- Road base to be stabilised with compacted aggregate base, fill and cuts re-seeded once formed.
- Engineer design culverts installed initially to convey clean water flow paths during construction.

	Project: 346 Morven Ferry Road				
	Description: Erosion and Sediment Control Plan Drawing				
	Drawn	Approved	Date	Drawing No.	Revision
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Legend	
	Stabilised access
	Clean water overland flow
	Dirty water overland flow
	Dirty water diversion channel
	Irrigation race
	Laydown area
	Silt fence
	Culvert – Final engineer design
	Drop out pit

Notes

- This plan is to be read in conjunction with the Environmental Management Plan document prepared by Enviroscope.
- All locations of erosion and sediment control (ESC) devices are indicative and exact placement to be confirmed onsite.
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- Landscaping mounds to be formed progressively and stabilised once formed.
- Road base to be stabilised with compacted aggregate base, fill and cuts re-seeded once formed.
- Culverts installed initially to convey clean water flow paths.

LEGEND
CONTOURS ARE DESIGN FINISHED LEVEL
MINOR CONTOUR 0.5m
MAJOR CONTOUR 2.0m
CUT HATCH
FILL HATCH
DRIVEWAY ALREADY FORMED CHECK STANDARD AND FORM PASSING BAYS

Minimal earthworks required in this section, as access is already formed and stabilised.

	Project: 346 Morven Ferry Road				
	Description: Erosion and Sediment Control Plan Drawing				
Drawn	Approved	Date	Drawing No.	Revision	
TG	QM	24/05/2023	ECSP – 002	A	



Figure one: Existing stabilised section of access. Adjacent water race.



Figure two: Building platform is located at top of the hill in a flat depression.

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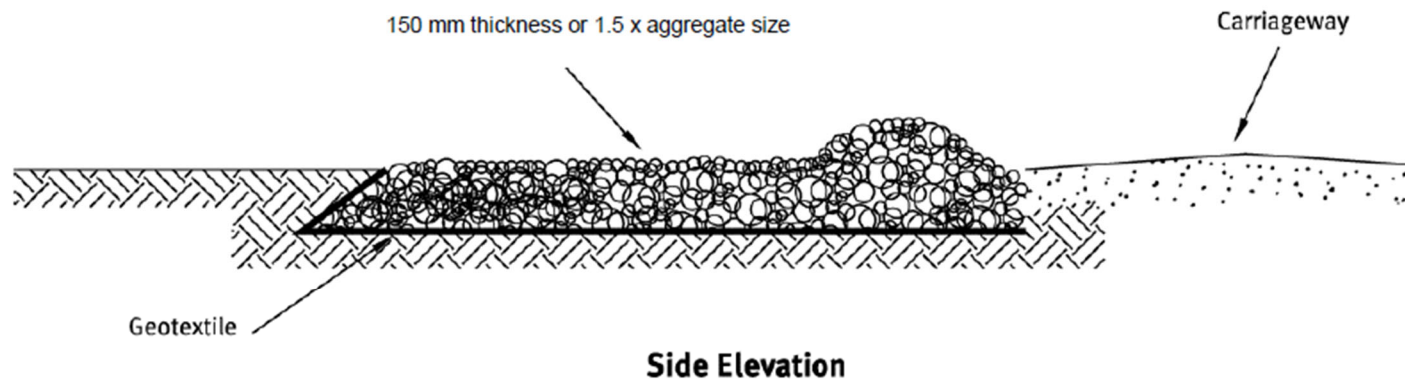
Project: 346 Morven Ferry Road

Description: Site photos

Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 003	A

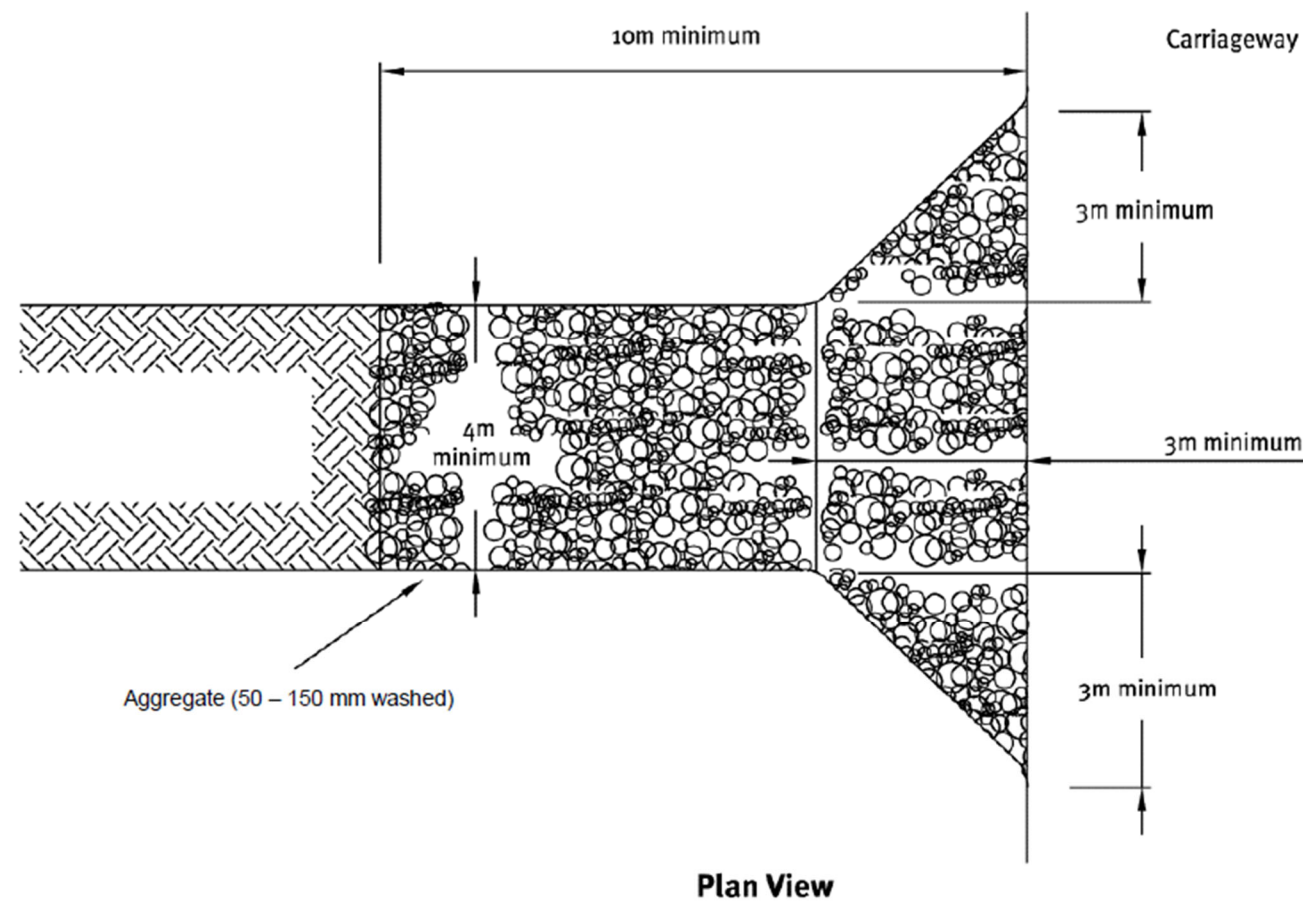
STABILISED ACCESS

(Page 60 from GD05)



Design Parameter	Specification
Aggregate size	50-150 mm washed aggregate
Minimum thickness	150 mm
Minimum length	10 m
Minimum width	4 m

- Additional aggregate may need to be added to the stabilised entranceway throughout the project to maintain the thickness.
- Any sediment that has been tracked onto the surrounding roads must be swept away at regular intervals.



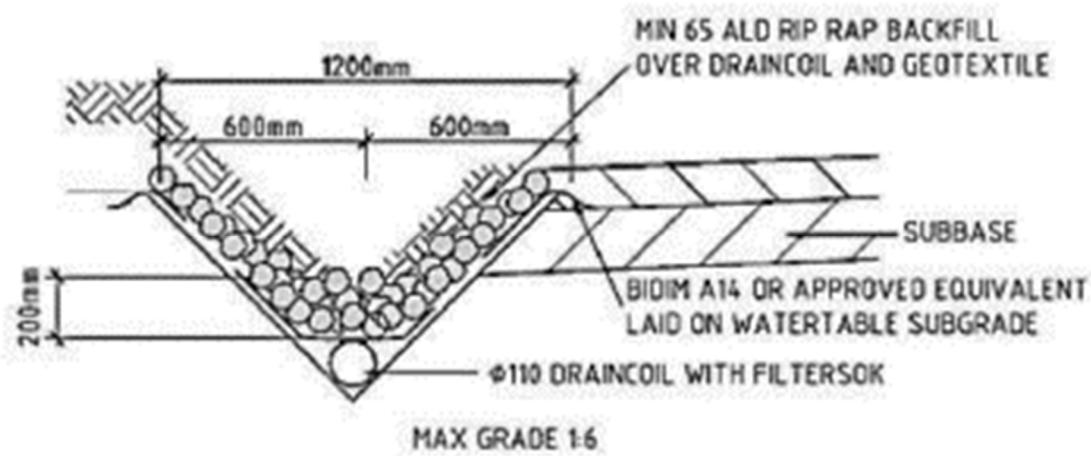
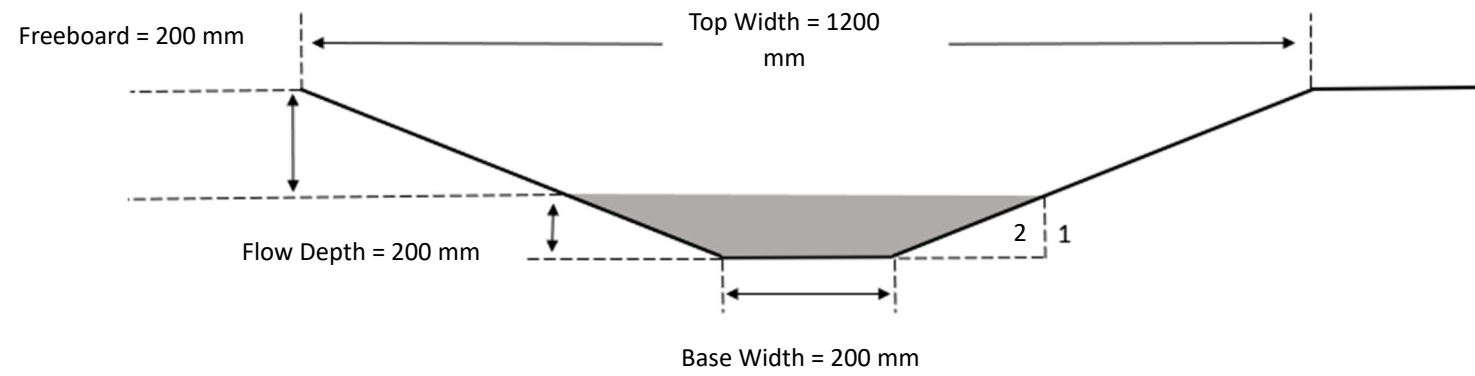
Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 004	A

DIRTY WATER DIVERSION CHANNEL

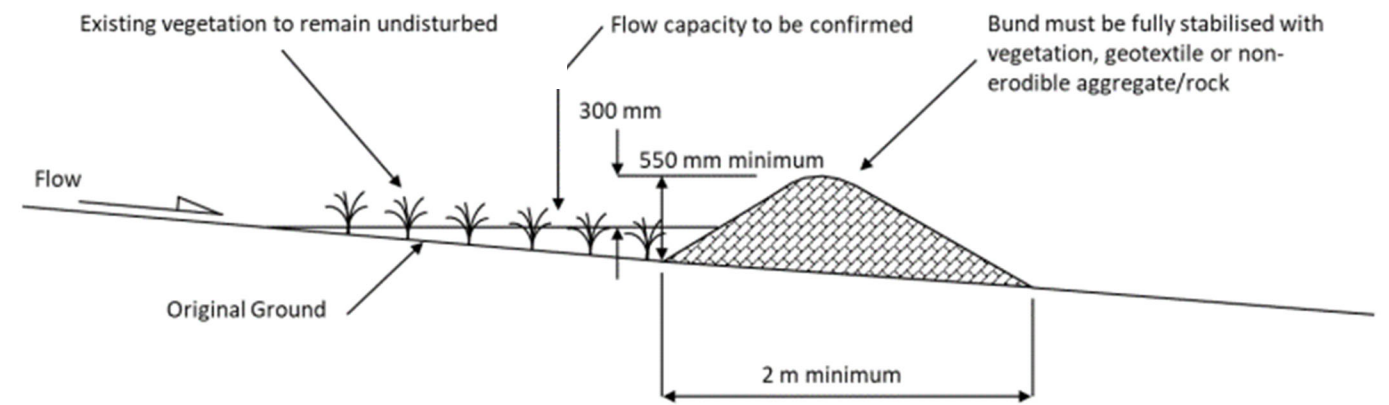
(Pages 43-46 from GD05)



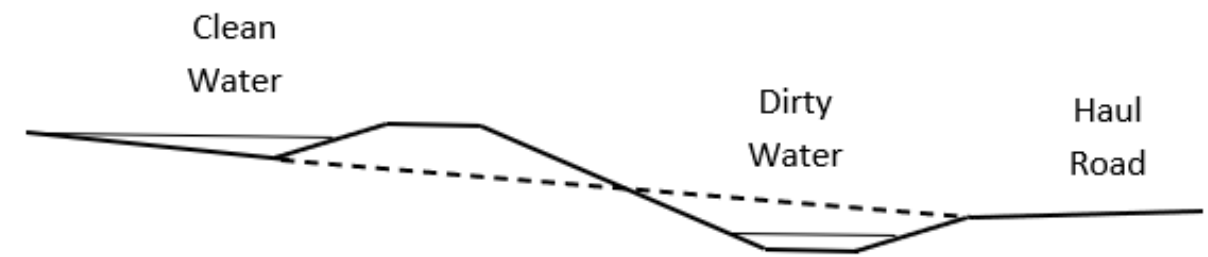
- This will be formed to match access design swale.
- Check dams required on slope.
- Trapezoidal shape
- Full calculations are included in [Appendix 2](#).

'CLEAN WATER' DIVERSION BUND

(Page 38-43 from GD05)



COMBINED CLEAN AND DIRTY WATER DIVERSION BUND



- Ensure bund is well compacted and stabilised.
- Monitor the inlet and outlet for scour.
- Ensure there are no areas of ponding or blockages along the length of the bund.



Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 005	A

DROP-OUT PIT

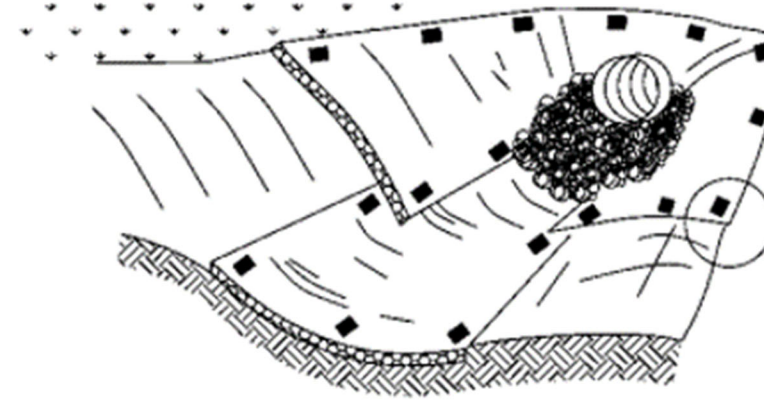
Page 45 from GD05



- Drop out pits should be one metre deep by one-metre-wide cube.
- As a contingency measure, drop out pits can be increased in size and lined to prevent any scour of the pit.

TEMPORARY CULVERT

(Diagram from TP90 – now GD05)



- To be non-perforated concrete, PVC or plastic drainage coil.

TRAFFICABLE SWALE

Image from Enviroscope



- Trafficable swales should be constructed by mounding and compacting soil diagonally across the road to direct water in the direction required.
- Vehicles should be able to cross trafficable swales often.
- Rock-lining may need to be added if the swale structure is continuing to degrade by trafficking.



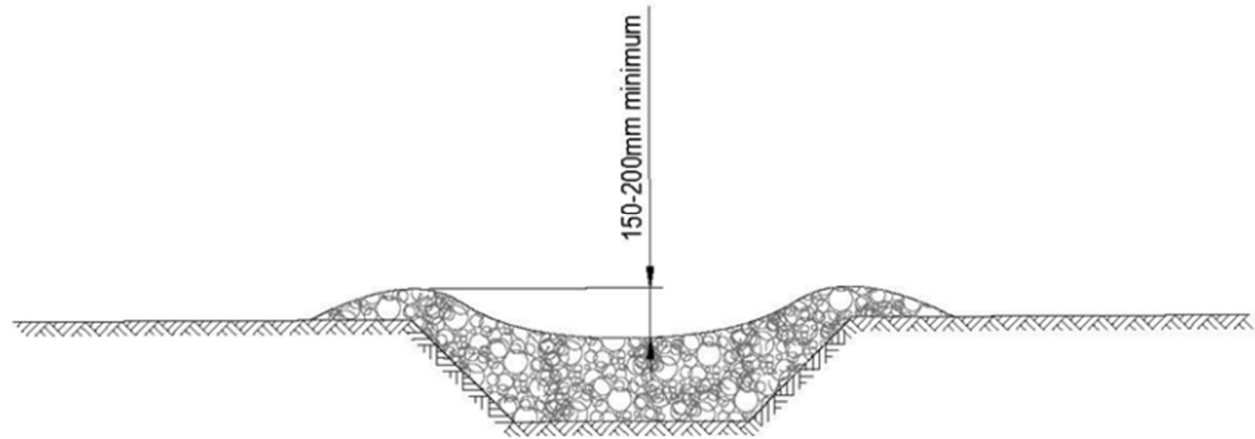
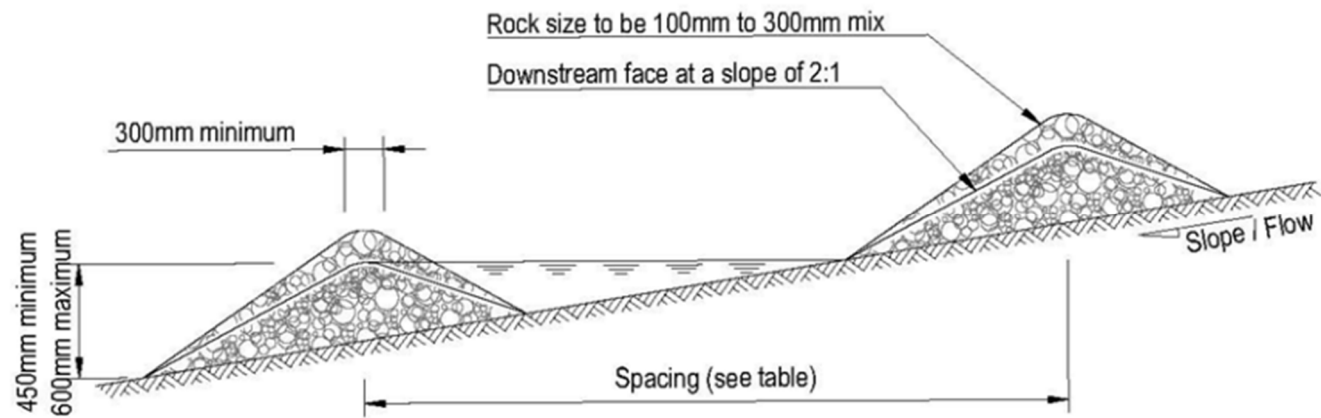
Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 006	A

CHECK DAMS

(Page 50-54 from GD05)



Slope of site (%)	Spacing (m) of dams with a 450 mm centre height	Spacing (m) of dams with a 600 mm centre height
Less than 2%	24	30
2- 4%	12	15
4- 7%	8	11
7- 10%	5	6
Greater than 10%	Unsuitable – use stabilised channel or specific engineered design	Unsuitable – use stabilised channel or specific engineered design



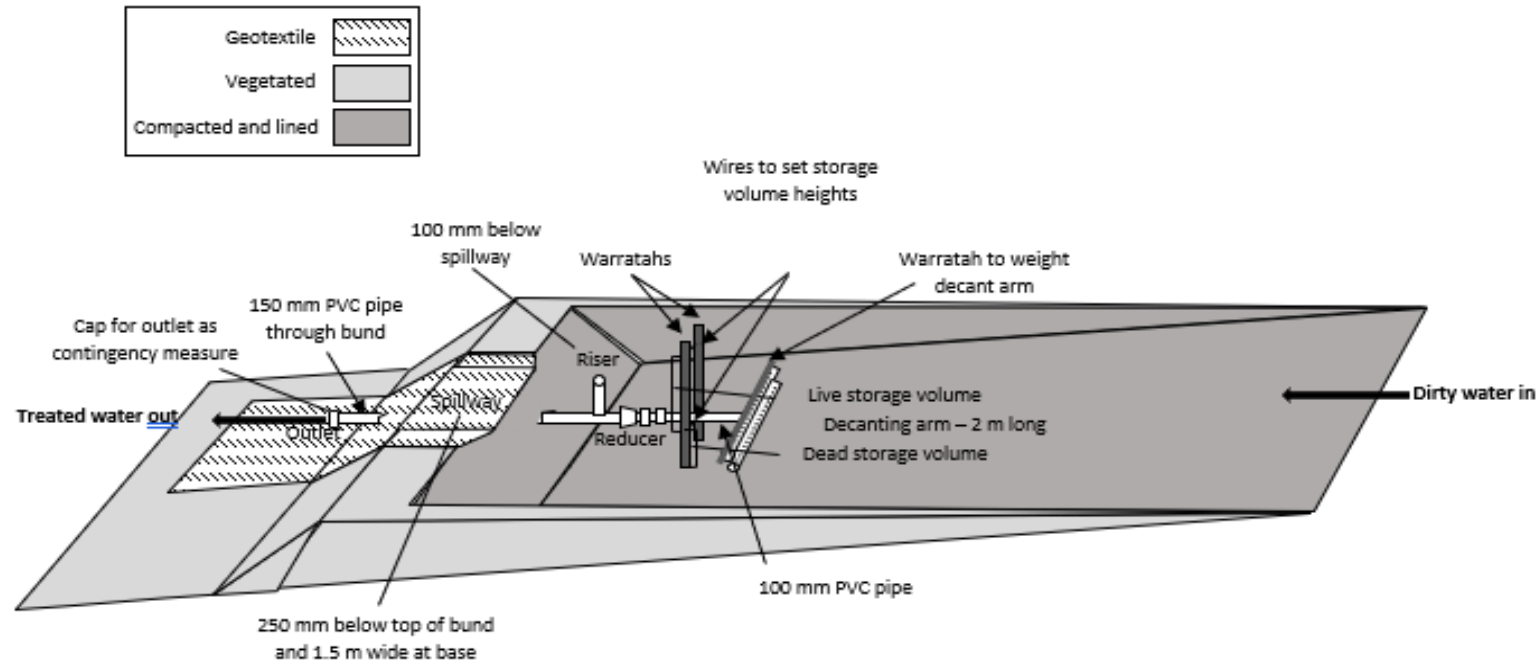
Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

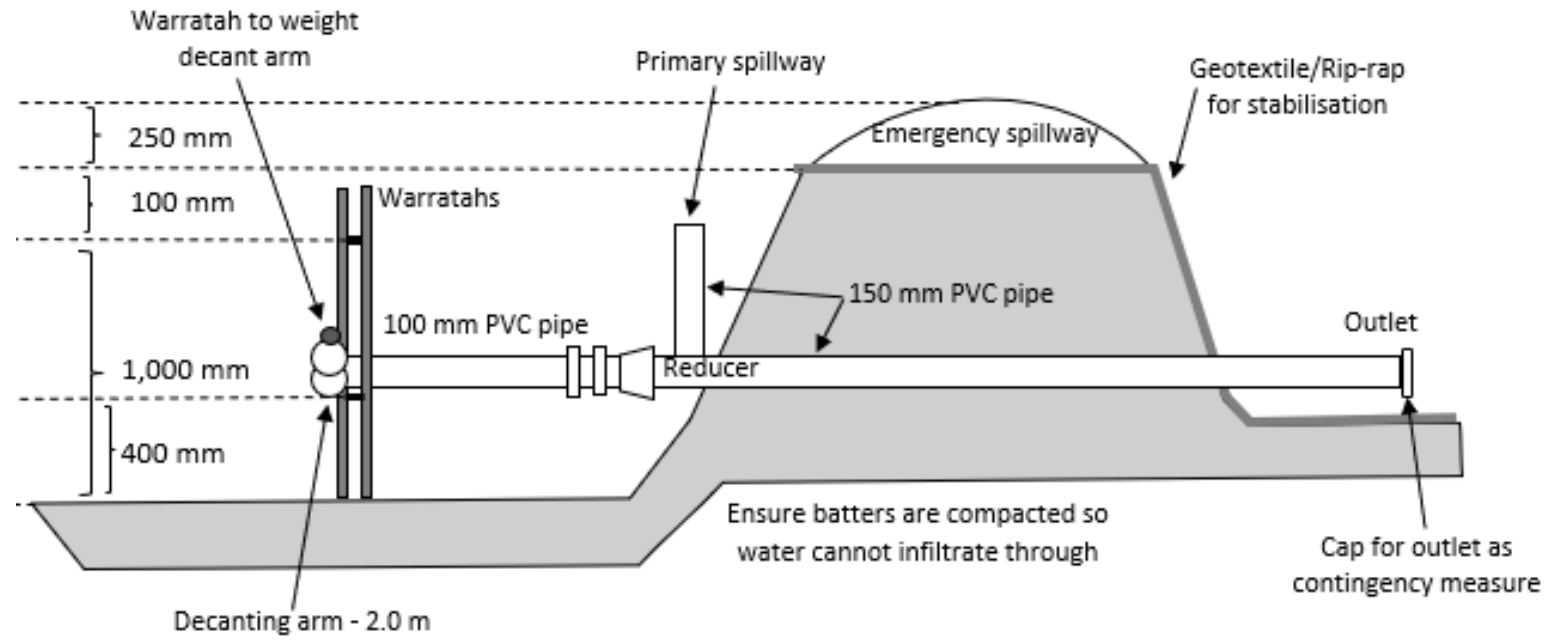
Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 007	A

DECANTING EARTH BUND

Page 106-112 from GD05



- See Appendix 2 for full calculations.



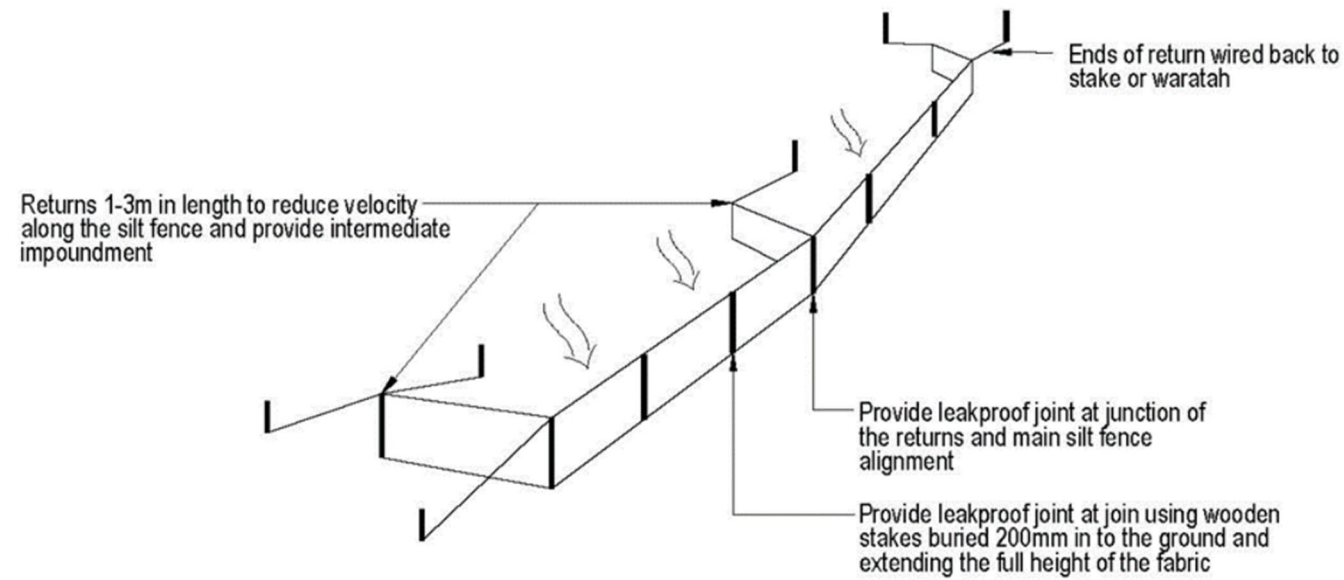
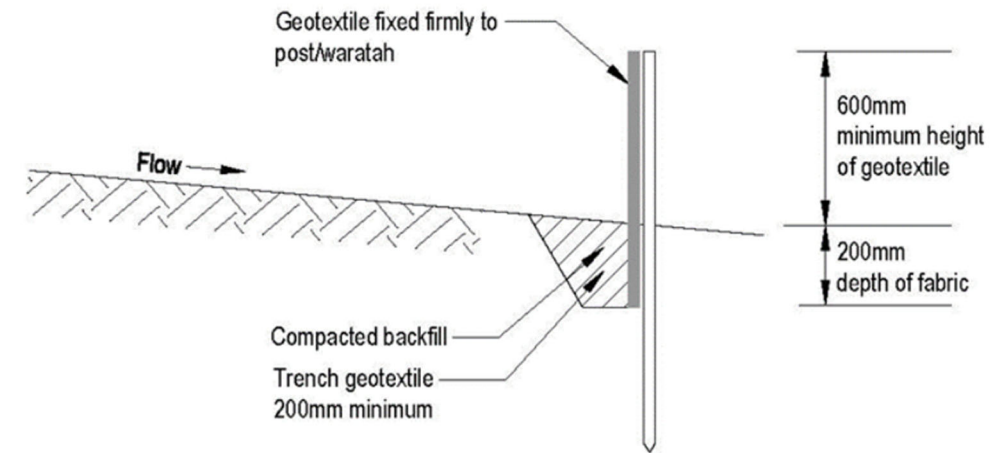
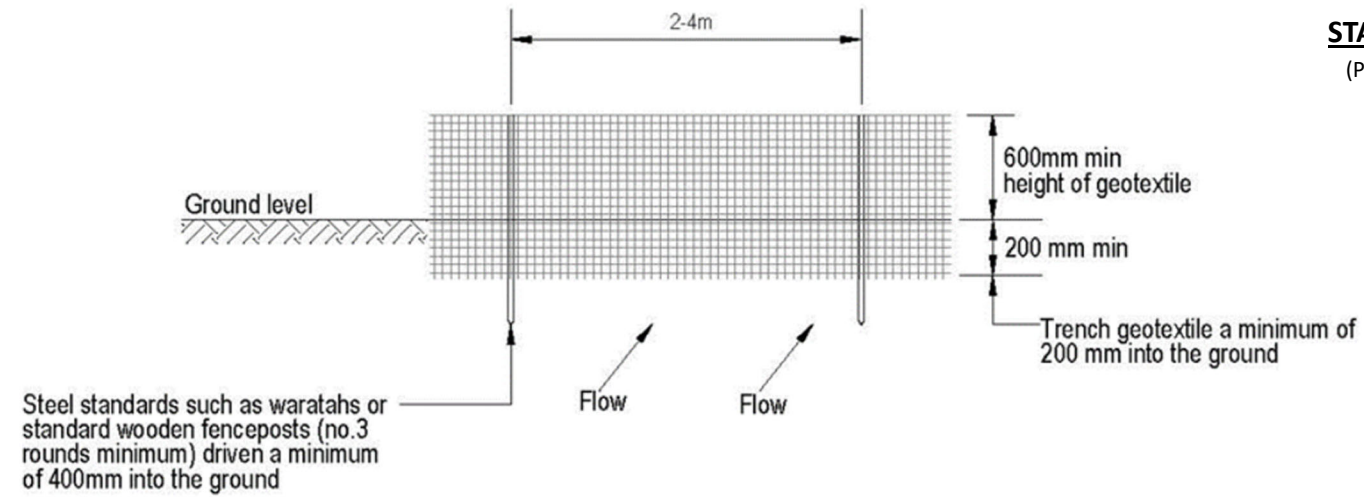
Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

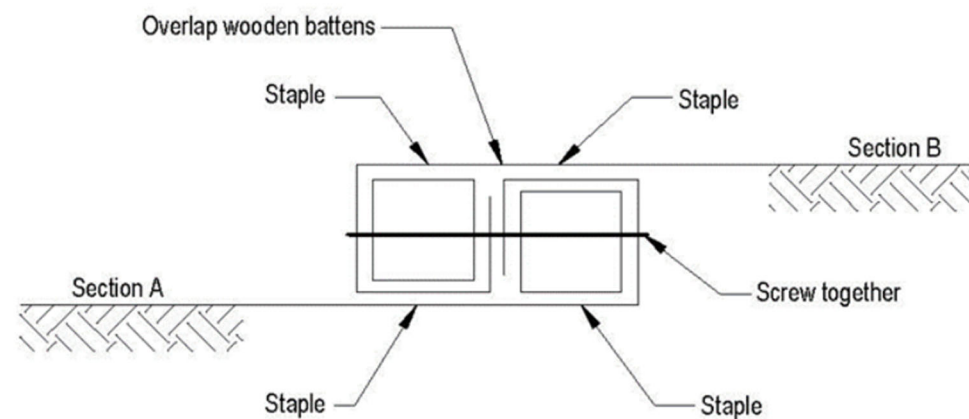
Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 008	A

STANDARD SILT FENCE

(Page 112-119 from GD05)



Slope steepness (%)	Slope length (m) (maximum)	Spacing of returns (m)	Silt fence length (m) (maximum)
Less than 2%	Unlimited	N/A	Unlimited
2- 10%	40	60	300
10- 20%	30	50	230
20- 33%	20	40	150
33- 50%	15	30	75
Greater than 50%	6	20	40



- Ensure the silt fence is 'keyed' into the ground to form a good seal at ground level to capture water and avoid undermining.
- Silt fences should be 600 mm above ground level and 200 mm below ground level.
- Supporting waratahs should be placed at 2-4 m intervals.
- Returns should be formed at either end facing upslope to contain flows.
- It is also important that silt fences are installed along the contour of the slope to prevent ponding of water in a concentrated area of the fence.
- To be mucked out once 20% capacity reached.

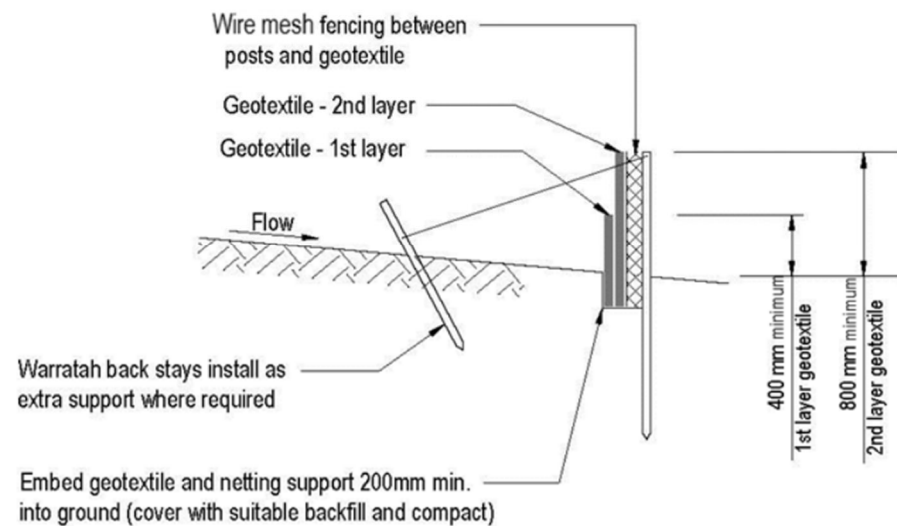
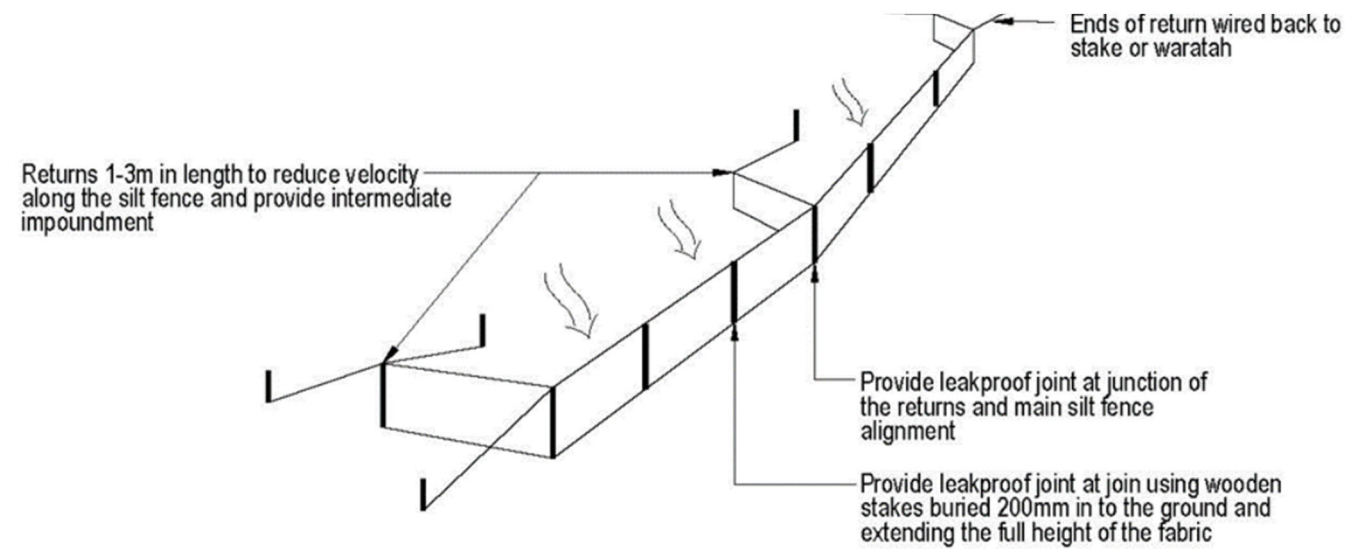
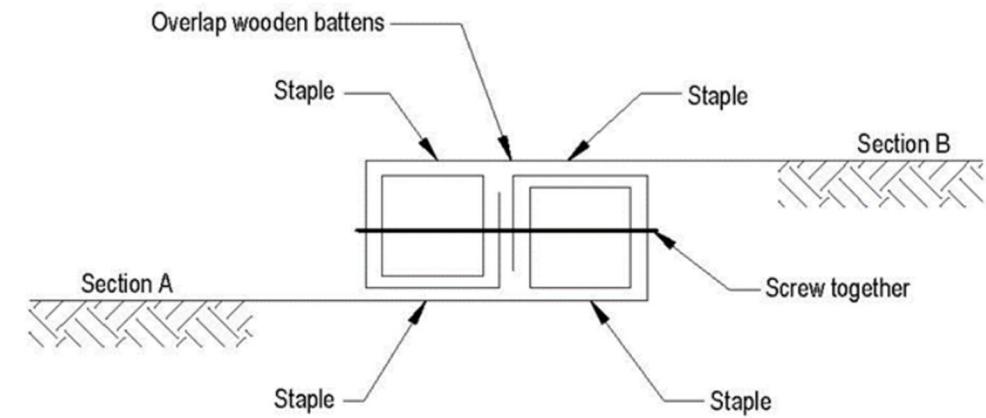
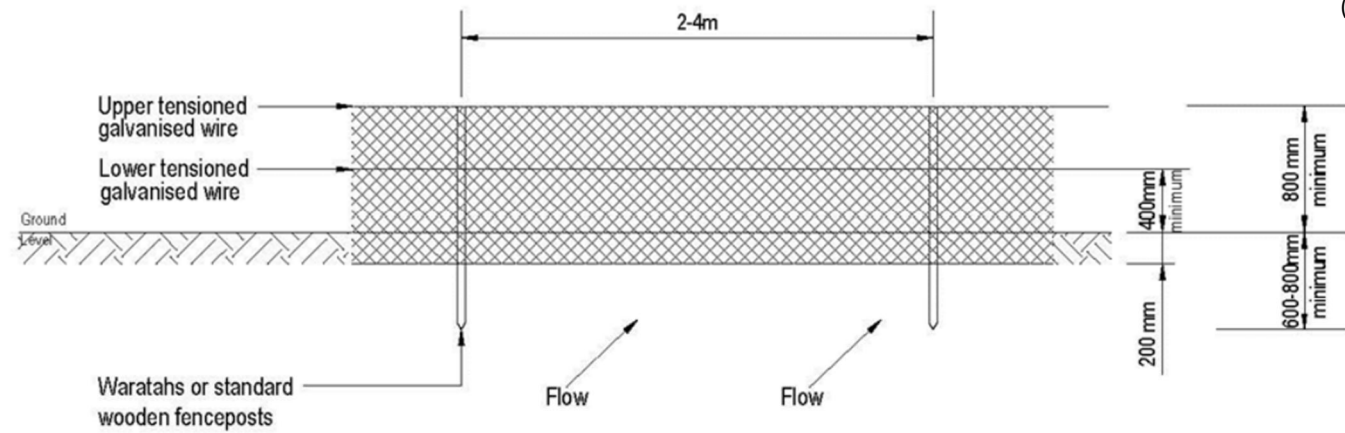
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Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 009	A

SUPER SILT FENCE
(Page 120-125 from GD05)



Slope steepness (%)	Slope length (m) (maximum)	Spacing of returns (m)	Silt fence length (m) (maximum)
0- 10%	Unlimited	60	Unlimited
10- 20%	60	50	450
20- 33%	30	40	300
33- 50%	30	30	150
Greater than 50%	15	20	75

- The super silt fence should be 800 mm above ground level and a minimum of 200 mm below ground level.
- The anchoring of the silt fence should ensure stability and the double layered geotextile should provide for drop-out prior to any water filtering through the upper portions of the fabric.
- It is imperative that the front face of the fence follows the contour as close as possible to ensure the designed holding capacity is achieved and to avoid creating pressure points on the fence.
- Supporting waratahs should be placed at 2-4 m intervals.
- Returns will be installed very ten metres along the silt fence.
- Stays to be installed with silt fence to provide additional structural support.

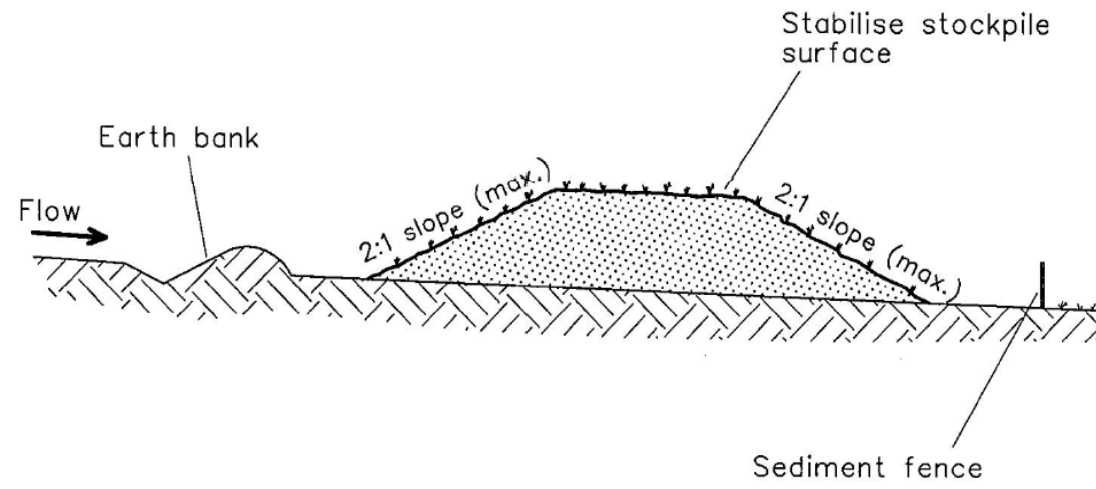


Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 010	A

TEMPORARY STOCKPILES



- Temporary stockpiles should be a maximum height of two metres to mitigate wind effects and to preserve the quality of the topsoil as future planting media for revegetation.
- If the stockpile is to be left insitu for a period of 12 weeks or more it shall be seeded with grass or erosion control matting to provide erosion and dust protection.
- A silt fence should be installed on the downslope of the stockpile.



Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

Drawn	Approved	Date	Drawing Number	Revision
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REFUELING BAY



- Locate the hardstand as far as practicably possible from waterways and concentrated flows.
- Ensure spill kit is located nearby.

CONCRETE WASHOUT PIT



- The concrete wash out pit consists of a plastic-lined bunded pit constructed with fill or straw bales.
- After concrete washout any water shall be left to evaporate.
- Cured concrete is to be disposed of within the plastic sheet to a licensed facility.

SPILL KITS



WASTE



- Where possible, waste shall be segregated into labelled bins.
- Wastes on site will be suitably contained and prevented from escaping off site. This may include covering skip bins during high winds.
- Waste storage is not permitted in or near drainage paths.
- Wastes will be removed from site when bin is full.



Project: 346 Morven Ferry Road

Description: Erosion and Sediment Control Plan - Schematics

Drawn	Approved	Date	Drawing Number	Revision
TG	QM	24/05/2023	ECSP - 012	A

APPENDIX 2 **Calculations for Erosion and Sediment Controls**

DECANTING EARTH BUND CALCULATIONS - HOUSE PLATFORM



Specification	Value	Value 2	Value 3	Units	Source / Notes / Reference
Site Details					
Contributing catchment				0.50 ha	Survey Plan
Percentage volume factor				2.00 %	
GD05 theoretical DEB volume			100.00	m3	
DEB Specifications					
	Total Storage	Dead Storage (30%)	Live Storage (70%)		
Top length (A)	18.75	15.95	18.75	m	
Top width (B)	6.25	4.85	6.25	m	
Base length (a)	13.95	13.95	15.95	m	
Base width (b)	3.85	3.85	4.85	m	
Depth (h)	1.20	0.50	0.70	m	
Internal batter ratio= 1 to	1	1	1	ratio	Lined batters
Actual volume (v)	100.23	32.60	67.63	m3	
Width to length ratio	3:1	3.3:1	3:1	ratio	
Buffer	0.23%			%	
Percentage of total DEB	100.00%	32.52%	67.48%	%	
External batter ratio= 1 to	2	2	2	ratio	
Decant Details					
		Reduced Level (RL)			
RL at base of bund		426.70		m	TBC by surveyor on site.
Bottom of decanting arm range		427.20		0.50 m	TBC by surveyor on site.
Top of decanting arm range		427.90		1.20 m	TBC by surveyor on site.
T-bar diameter				0.15 m	
Decant arm length				2.00 m	
Decant rate				1.50 L/sec	0.3 L/sec/1,000 m2
Number of holes on T-bar				67 Holes	10 mm diameter holes to be evenly distributed on the decant
Primary Spillway Details					
		Reduced Level (RL)			
RL at primary spillway		427.90		m	0.1 m lower than emergency spillway invert
Outlet pipe diameter				150.00 mm	
Emergency Spillway					
		Reduced Level (RL)			
RL at emergency spillway invert		428.00		m	TBC by surveyor on site.
RL at emergency spillway crest		428.25		m	0.25 m higher than emergency spillway invert
Spillway width at invert				1.50 m	
Treatment Train Additions					
Drop out pit				Yes	
Floc sock				Yes	
RADS unit				No	
Baffles				No	
Check dams				Yes	

DECANTING EARTH BUND CALCULATIONS - DRIVEWAY

Specification	Value	Value 2	Value 3	Units	Source / Notes / Reference
Site Details					
Contributing catchment				0.20 ha	Survey Plan
Percentage volume factor				2.00 %	
GD05 theoretical DEB volume				40.00 m3	
DEB Specifications					
	Total Storage	Dead Storage (30%)	Live Storage (70%)		
Top length (A)	13.50	10.70		13.50 m	
Top width (B)	4.50	3.10		4.50 m	
Base length (a)	8.70	8.70		10.70 m	
Base width (b)	2.10	2.10		3.10 m	
Depth (h)	1.20	0.50		0.70 m	
Internal batter ratio= 1 to	1	1		1 ratio	Lined batters
Actual volume (v)	45.11	12.69		32.41 m3	
Width to length ratio	3:1	3.5:1		3:1 ratio	
Buffer	12.77%			%	
Percentage of total DEB	100.00%	28.14%		71.86%	%
External batter ratio= 1 to	2	2		2 ratio	
Decant Details					
		Reduced Level (RL)			
RL at base of bund		426.70		m	TBC by surveyor on site.
Bottom of decanting arm range		427.20		0.50 m	TBC by surveyor on site.
Top of decanting arm range		427.90		1.20 m	TBC by surveyor on site.
T-bar diameter				0.15 m	
Decant arm length				2.00 m	
Decant rate				0.60 L/sec	0.3 L/sec/1,000 m2
Number of holes on T-bar				27 Holes	10 mm diameter holes to be evenly distributed on the decant
Primary Spillway Details					
		Reduced Level (RL)			
RL at primary spillway		427.90		m	0.1 m lower than emergency spillway invert
Outlet pipe diameter				150.00 mm	
Emergency Spillway					
		Reduced Level (RL)			
RL at emergency spillway invert		428.00		m	TBC by surveyor on site.
RL at emergency spillway crest		428.25		m	0.25 m higher than emergency spillway invert
Spillway width at invert				1.50 m	
Treatment Train Additions					
Drop out pit				Yes	
Floc sock				Yes	
RADS unit				No	
Baffles				No	
Check dams				Yes	

DIVERSION CHANNEL CALCULATIONS - 346 Morven Ferry Road



Specifications	Value 1	Value 2	Value 3	Value 4	Value 5	Units	Reference/Notes
Site Details							
Contributing catchment						0.5 ha	Survey Plans
Design rainfall event						0.05 AEP	5% AEP as required by GD05
Time of Concentration							
Overland sheet flow path length (L)						525 m	
Hortons roughness value (n)						0.2	
Slope of surface (S)						18.0 %	
Time of Concentration (Tc)						11.9 minutes	
Rounded Tc to align with HIRDS						10 minutes	
Rational Method: $Q = (C \cdot I \cdot A) / 360$							
Area ground cover	Grass	Aggregate	Forest	Shrubs	Bare soil		
Proportion of catchment	0.2	0.2	0	0	0.6		
Runoff coefficient (C)	0.4	1	0.25	0.5	0.8		Manning's Roughness Coefficient (n)
Rainfall intensity (I)	44	44	44	44	44 mm		NIWA HIRDS, 10 min (Tc), 5% AEP
Catchment Area (A)	0.10	0.10	0.00	0.00	0.30 ha		
Qp (Peak runoff flow)	0.0049	0.0122	0.0000	0.0000	0.0293 m3/s		Rational Method: Q = CIA
Total Qp (Peak runoff flow)						0.0464	
Channel Design							
Manning's Formula Uniform Trapezoidal Channel Flow							
Bottom Width						200 mm	
Batter ratio= 1 to						2 ratio	
Manning's roughness coefficient of channel (n)						0.025	Earth channel
Channel slope						5 %	Slope=rise/run
Flow depth						200 mm	
Channel depth						500 mm	
Flow (Q)						0.2459 m3/s	
Buffer						429 %	
Top width						1200 mm	
Additional Controls							
Drop out pit						Yes	
Check dams						Yes	
Geofabric lining						No	

APPENDIX 3 Environmental Site Induction Handout

ENVIRONMENTAL SITE INDUCTION HANDOUT

Key Roles and Responsibilities

Role	Responsibilities
Project Manager	<p>The Project Manager is responsible for the effective implementation of the EMP and has overall responsibility for the environmental performance of the project. Duties include:</p> <ul style="list-style-type: none"> • Ensuring adequate resources are in place to implement the EMP. • Ensuring all staff and sub-contractors operate within the guidelines of the EMP. • Ensuring that an EMP is prepared and that environmental standards, processes and procedures meet relevant resource consent conditions. • Overseeing the successful implementation, monitoring and review of the EMP. • Ensuring that inspections are carried out in accordance with the relevant EMP. • Restricting or stopping any activity that has the potential to or has caused adverse environmental effects. • Providing notification and reporting of Environmental Incidents to Council and other environmental reports as required by The Guidelines. • Delegating authority of the above responsibilities.
Environmental Representative	<p>The Environmental Representative supports the Project Manager in the day-to-day implementation of the EMP. Duties include:</p> <ul style="list-style-type: none"> • Ensuring the installation of environmental controls as per the EMP. • Undertaking environmental site inspections. • Overseeing the maintenance and improvement of defective environmental controls. • Providing environmental inductions to all staff and sub-contractors. • Assisting the project leadership in attending to Environmental Incidents and Complaints. <p>The Environmental Representative shall be familiar with environmental risks associated with the project, the EMP and best practice erosion and sediment control principles and practices.</p>
All staff and sub-contractors	<p>All staff and sub-contractors have a responsibility to undertake all activities in accordance with the requirements of this EMP. This includes reporting any activity that has the potential to or has resulted in an Environmental Incident to the Project Manager or Environmental Representative.</p>

Key Environmental Locations

Environmentally sensitive receptors: Kawarau River and Irrigation race.

Key Resource Consent Conditions

All resource consent conditions to be complied with upon approval.

Limits of Clearing

The staging and sequencing of works is a key component to ensure that environmental effects of construction are appropriately managed. It is imperative that the sequencing outlined in Section 2.1 of the EMP is followed so that the site is stabilised in the most efficient manner.

All staff should be familiar with this sequence. Any potential changes to that sequence need to be approved by the Project Manager which will be discussed first with the Environmental Consultant.

Key Environmental Management Measures in EMP

Erosion and Sediment Control (Section 4 of EMP)

- Direction provided in Erosion and Sediment Control Plan (ESCP) in Appendix 1 of EMP.
- Separation of clean and dirty water is the most important principle to ensure that the contributing catchment of dirty water that needs to be treated is as small as possible.
- Progressive stabilisation (revegetation) of disturbed areas will ensure that the extent and duration of exposed soil is minimised. Keep it covered!
- All controls to be checked immediately before storm events to ensure they are in good-working order.
- Erosion and sediment control devices to remain in place until site is stabilised (defined as 80% vegetative cover).

Any works that disturb the controls outlined on the ESCP must be reinstated before moving to the next task.

Water Quality Management (Section 5 of EMP)

- Any water caught in the sediment devices to be re-used in dust suppression where possible and if required.
- Any observations of dirty water running offsite to be reported directly to the Project Manager.

Dust Management (Section 6 of EMP)

- Dust suppression should occur on any exposed soil on unsealed roads, this can be done using the water caught in the retention basin.
- Avoid all unnecessary vegetation clearing that exposes soil and work should be conducted in stages as this can increase the impact from dust in the event of strong winds.
- During high wind events and dust suppression is becoming difficult works must cease until more favourable weather conditions.
- Constant vigilance should be maintained onsite to ensure that dust is appropriately managed and weekly monitoring should be completed to ensure that management measures are effective.

Noise and Vibration Management (Section 7 of EMP)

- Noise producing works only be undertaken during the hours of 0730-1800 from Monday-Saturday and no works to be completed on Sundays or public holidays.
- Particularly noisy work should be completed during the middle of the day during business hours.
- Noise dampening should occur when possible.

- Weekly site inspections should be undertaken by the Environmental Representative to ensure the strategies in place are effective.

Historic Heritage Management (Section 8 of EMP)

- If any artefacts are found works must stop within 20 meters of the discovery and the site manager notified immediately.
- The site manager must then secure the area and notify the Heritage New Zealand Regional Archaeologist, who will advise when works can begin again.

Chemicals and Fuel Management (Section 9 of EMP)

- Chemicals and fuels are stored and used so not to cause contamination of works areas and surrounding environment.

Waste Management (Section 10 of EMP)

- Waste management on site will ensure wastes are stored safely and in an organised manner until recycling, reuse or disposal.

Environmental Incidents

The procedure for managing environmental incidents is outlined in Section 3.5 of the EMP, however these can be summarised as follows:

- Environmental incidents must be reported as soon as they occur, and the Project team must respond immediately to mitigate further environmental impacts.
- Investigation into the cause of the incident should be completed and a solution should be constructed to remediate the Environmental damage.
- The Project Manager must then notify the QLDC and/or the ORC of the details of the incident within 12 hours of being made aware of the incident.

Rapid Response for Storm Events

The procedure for rapid response to storm events is outlined in Section 4.6 of the EMP, however these can be summarised as follows:

- The Project Manager will observe and understand the **weather forecast** throughout the project to ensure appropriate preparation onsite.
- If a **significant storm** event is forecast all works should stop within an appropriate amount of time to inspect ESC devices and undertake any maintenance or site stabilisation required.
- The sediment controls should be in operating condition and fully functional.
- During the storm event the site should be monitored to sure the functioning of the ESC devices and maintained if required.

When storms are forecast it is crucial that tools are downed in time for the rapid response procedure to be implemented. This will help avoid environmental incidents, potential enforcement action and site shutdown.

APPENDIX 4 **Environmental Site Induction Register**

ENVIRONMENTAL SITE INDUCTION REGISTER

Name	Organisation	Date Inducted	Induction Delivered by	Signature

APPENDIX 5 **Weekly Environmental Site Inspection Form**

346 Morven Ferry Road



WEEKLY ENVIRONMENTAL SITE INSPECTION FORM

Environmental Representative:

Date:

Item	Yes	No	Comment			
General						
Is the EMP available onsite?	<input type="checkbox"/>	<input type="checkbox"/>				
Have any environmental incidents occurred during the week? If so, provide details	<input type="checkbox"/>	<input type="checkbox"/>	*If yes, complete environmental incident report.			
Complete description of weather for upcoming week – circle applicable						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Are there any rain events forecasted for the coming week?	<input type="checkbox"/>	<input type="checkbox"/>				
Have pre rain event inspections been completed?	<input type="checkbox"/>	<input type="checkbox"/>				
Have post rain event inspections been completed?	<input type="checkbox"/>	<input type="checkbox"/>				
Water Quality						
Is water quality monitoring occurring when water is flowing across the site boundaries?	<input type="checkbox"/>	<input type="checkbox"/>	*If yes, complete water quality monitoring form			
Is there visual evidence of sediment from the construction site entering waterways/drainage lines?	<input type="checkbox"/>	<input type="checkbox"/>				
Does water in sediment retention devices meet water quality criteria before being discharged?	<input type="checkbox"/>	<input type="checkbox"/>				
Do the floc socks have available PAC compound available and operational?	<input type="checkbox"/>	<input type="checkbox"/>	*If no, order new floc socks to replace existing.			
Erosion and Sediment Control						
Are works contained within the current stage and site boundaries?	<input type="checkbox"/>	<input type="checkbox"/>				
Are completed areas being progressively stabilised?	<input type="checkbox"/>	<input type="checkbox"/>				
Is there any new evidence of erosion?	<input type="checkbox"/>	<input type="checkbox"/>				
Are erosion and sediment controls installed as per the ESCP?	<input type="checkbox"/>	<input type="checkbox"/>				

346 Morven Ferry Road



Item	Yes	No	Comment
Is dirty water entering dirty water diversion channels during rain events?	<input type="checkbox"/>	<input type="checkbox"/>	
Do sediment controls have over 80% capacity?	<input type="checkbox"/>	<input type="checkbox"/>	
Cultural Heritage			
Have any finds of cultural significance been found?	<input type="checkbox"/>	<input type="checkbox"/>	
Noise and Vibration			
Have any complaints been received during the week?	<input type="checkbox"/>	<input type="checkbox"/>	*If yes, complete Complaints Register
Are nearby sensitive receptors being notified before significant noise and/or vibration causing activities?	<input type="checkbox"/>	<input type="checkbox"/>	
Are works only occurring within the hours of operation?	<input type="checkbox"/>	<input type="checkbox"/>	
Dust			
Have any complaints been received during the week?	<input type="checkbox"/>	<input type="checkbox"/>	*If yes, complete Complaints Register
Are works being staged to minimise soil exposure?	<input type="checkbox"/>	<input type="checkbox"/>	
Have completed areas been revegetated or stabilised?	<input type="checkbox"/>	<input type="checkbox"/>	
Is dust suppression of disturbed work areas and stockpiles occurring?	<input type="checkbox"/>	<input type="checkbox"/>	
Are works ceasing during high winds?	<input type="checkbox"/>	<input type="checkbox"/>	
Are only designated access points and haul routes being used?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the site access and surrounding roads swept clean of sediment?	<input type="checkbox"/>	<input type="checkbox"/>	
Contaminated Soils			
Have any contaminants been encountered?	<input type="checkbox"/>	<input type="checkbox"/>	
Chemicals and Fuels			
Are all hazardous substances on site stored, transported and used according to the safety data sheet requirements?	<input type="checkbox"/>	<input type="checkbox"/>	
Are vehicles and plant being refuelled in the refuelling bay?	<input type="checkbox"/>	<input type="checkbox"/>	
Is concrete washing being undertaken in the concrete wash-out pit?	<input type="checkbox"/>	<input type="checkbox"/>	
Is there an adequate supply of spill kits onsite? Have any used materials been replaced?	<input type="checkbox"/>	<input type="checkbox"/>	

Item	Yes	No	Comment
Waste			
Is the site in a safe, clean and tidy state?	<input type="checkbox"/>	<input type="checkbox"/>	
Are wastes segregated into labelled bins with lids?	<input type="checkbox"/>	<input type="checkbox"/>	
Are skip bins not overfilled?	<input type="checkbox"/>	<input type="checkbox"/>	
Is waste removed from open drains and drainage paths?	<input type="checkbox"/>	<input type="checkbox"/>	

Actions resulting from this inspection must be forwarded to the Project Manager any actions should be recorded in the Non-Conformance Register – Appendix 8.

Additional Comments:

Names and Signatures of inspection attendees:

APPENDIX 6 **Environmental Incident Report Form**

ENVIRONMENTAL INCIDENT REPORT FORM

Project Address:	Consent Number:
Brief 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 Queenstown Lakes District Council at RCMonitoring@qldc.govt.nz and Otago Regional Council at pollution@orc.govt.nz and compliance@orc.govt.nz. Call the QLDC Regulatory team immediately on 03 441 0499 and ORC's Pollution Hotline on 0800 800 033 for any serious or ongoing incidents that cannot be brought under immediate control.

Date and Time	Date: <u>xx/xx/xxx</u> Time: <u>xx:xx</u> hours
Description? Provide a brief and factual description of what happened during the incident, include relevant details such as: <ul style="list-style-type: none"> - The activity being undertaken when the incident occurred - The estimated distance to nearest waterway (include stormwater and dry courses) - The estimated distance to the nearest sensitive receiver Sketches/diagrams/photos may be referenced and appended to this report to aid in the description of the incident.	
Exact Location of the incident? Include address, landmarks, features, nearest tree, etc. Maps and plans can be attached.	
Quantity or volume of material escaped or causing incident? (provide and estimate quantity)	
Who identified the incident?	Contractor <input type="checkbox"/> Council <input type="checkbox"/> Community <input type="checkbox"/> Other <input type="checkbox"/>

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 Queenstown Lakes District Council been notified? Yes <input type="checkbox"/> No <input type="checkbox"/> Will be notified <input type="checkbox"/> Has the Otago Regional Council been notified? Yes <input type="checkbox"/> No <input type="checkbox"/> Will be notified <input type="checkbox"/>

Role of person making report: Project Manager / Site Supervisor / Environmental Representative / SQEP	
Name.....	Signature.....
Organisation.....	Date.....
Mobile phone number.....	

APPENDIX 7 **Environmental Complaints Register**

346 Morven Ferry Road



ENVIRONMENTAL COMPLAINTS REGISTER

Complaint #	Date and Time Received	Complainant details (name, address, phone number)	Details of Complaint	Investigation and Findings	Outcome	Close out Date

APPENDIX 8 **Environmental Non-Conformance Register**

APPENDIX 9 **Water Quality Monitoring Results Form**

WATER QUALITY MONITORING RESULTS FORM

Date	Monitoring Trigger		Location Description	
		Yes	No	Measurement
Is the clarity of the water more than 100 mm?		<input type="checkbox"/>	<input type="checkbox"/>	___ mm
Is turbidity less than 100 NTU?*		<input type="checkbox"/>	<input type="checkbox"/>	___ NTU
Is the pH of the water between 5.5-8.5?*		<input type="checkbox"/>	<input type="checkbox"/>	pH ___
Are total suspended solids less than 50 mg/L?*		<input type="checkbox"/>	<input type="checkbox"/>	___ mg/L
Are hydrocarbons visible?		<input type="checkbox"/>	<input type="checkbox"/>	
Are tannins visible in the water?		<input type="checkbox"/>	<input type="checkbox"/>	
Is there any waste in the water?		<input type="checkbox"/>	<input type="checkbox"/>	
Do the floc socks have available PAC compound available and operational?		<input type="checkbox"/>	<input type="checkbox"/>	
Description of any non-conformance and actions required:				
Include images of sampling location:				

*EnviroSCOPE can provide Water Quality Monitoring services to measure turbidity and pH. If 100 NTU is exceeded, collect a water sample to send to laboratory for TSS measurement.

APPENDIX 10 **Archaeological Discovery Protocol**



HERITAGE NEW ZEALAND
POUHERE TAONGA

Heritage New Zealand Pouhere Taonga Accidental Discovery Protocol

This protocol does not apply when an archaeological authority issued under the Heritage New Zealand Pouhere Taonga Act 2014 is in place.

Under the Heritage New Zealand Pouhere Taonga Act (2014) an archaeological site is defined as any place in New Zealand that was associated with human activity that occurred before 1900 and provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand. For pre-contact Māori sites this evidence may be but is not limited to, bones, shells, charcoal, stones etc. In later sites of European/Chinese origin, artefacts including but not limited to bottle glass, crockery etc. may be found, or evidence of old foundations, well, drains, or similar structures. Burials/kōiwi may be found in association with any of these cultural groups.

In the event that an unidentified archaeological site is located during works, the following applies;

1. Work shall cease immediately at that place and within 20m around the site.
2. The contractor must shut down all machinery, secure the area, and advise the Site Manager.
3. The Site Manager shall secure the site and notify the Heritage New Zealand Regional Archaeologist. Further assessment by an archaeologist may be required.
4. If the site is of Māori origin, the Site Manager shall notify the Heritage New Zealand Regional Archaeologist and the appropriate papatipu rūnaka of the discovery and ensure site access to enable appropriate cultural procedures and tikaka to be undertaken, as long as all statutory requirements under legislation are met (*Heritage New Zealand Pouhere Taonga Act, Protected Objects Act*).
5. If human remains (kōiwi) are uncovered the Site Manager shall advise the Heritage New Zealand Regional Archaeologist, NZ Police and the appropriate papatipu rūnaka and the above process under 4 shall apply. Remains are not to be moved until such time as papatipu rūnaka and Heritage New Zealand have responded.
6. Works affecting the archaeological site and any human remains (kōiwi) shall not resume until Heritage New Zealand Pouhere Taonga gives written approval for work to continue. Further assessment by an archaeologist may be required.
7. Where iwi so request, any information recorded as the result of the find such as a description of location and content, is to be provided for their records.
8. Heritage New Zealand Pouhere Taonga will advise if an archaeological authority under the *Heritage New Zealand Pouhere Taonga Act 2014* is required for works to continue.

It is an offence under S87 of the *Heritage New Zealand Pouhere Taonga Act 2014* to modify or destroy an archaeological site without an authority from Heritage New Zealand irrespective of whether the works are permitted or consent has been issued under the Resource Management Act.

Heritage New Zealand Pouhere Taonga Archaeologist contact details:

Nikole Wills
Regional Archaeologist Otago/Southland
Heritage New Zealand
PO Box 5467
Dunedin
Ph. +64 3 470 2364, mobile 027 240 8715
Fax. +46 3 477 3893
nwills@heritage.org.nz

NURAPLY 3PM LIGHT REFLECTIVE VALUES TECHNICAL NOTE

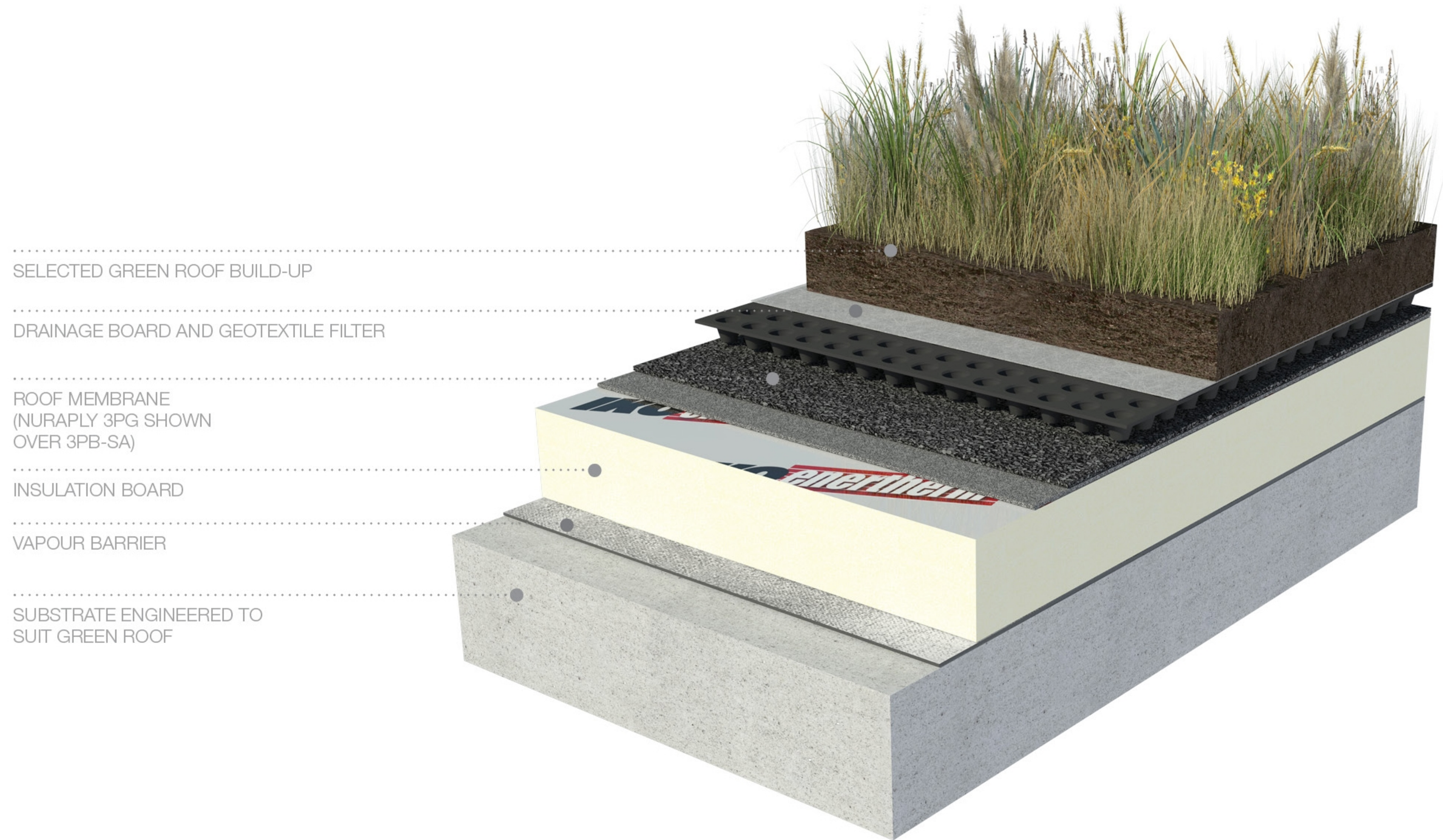
	Pure White	Green (indent only)	Slate	Charcoal
Solar Reflectance	0.65	0.30	0.30	0.10
Thermal Emittance	0.90	0.90	0.90	0.90
SRI	79	32	32	6
Roof surface temperature °C	52.6	70.4	70.4	80.1

The **Solar Reflectance Index** (SRI) is a measure of the constructed surface's ability to reflect **solar** heat, as shown by a small temperature rise. It is defined so that a standard black surface (**reflectance** 0.05, emittance 0.90) is 0 and a standard white surface (**reflectance** 0.80, emittance 0.90) is 100.

Light Reflectance Value (LRV) on the other hand, focuses solely on the total quantity of visible light that, when illuminated by a light source, is reflected by a surface in all directions and at all wavelengths. LRV runs on a scale from 0% (absolute black) to 100% (perfectly reflective white), with all other colours fitting within these extremes.

With LRV of 0%, black absorbs all light. Pure white, conversely, has a light reflectance of 100% and absorbs no light. LRV is an indicator of how the human eye sees a colour and of that colour's brightness. It's possible, therefore, to have colours that look the same and have the same or similar Light Reflectance Values, but which reach quite different temperatures in the sun. Equally, you could have two colours where one appears darker than the other, but both reach the same temperature when exposed to the sun.

The information in this product Technical Note is based on Nuralite Waterproofing Ltd experience and testing. It represents the latest information available at the time of printing, but no guarantee of its accuracy is made or implied, nor responsibility taken for use to which this information may be put. We reserve the right to alter or update information parameters and formulations at any time without notice.



»» **GREEN ROOF SYSTEM.** Typical build-up of semi-intensive green roof over Nuraply 3PG membrane and Nuratherm warm roof.

ENGINEERING DESIGN PLANS

LOT 2 DP 301351, 346 MORVEN FERRY ROAD

ENGINEERING DRAWINGS

EARTHWORKS, ROADING AND SERVICES
JOB No. 13905

FOR
SHARYN HENSMAN

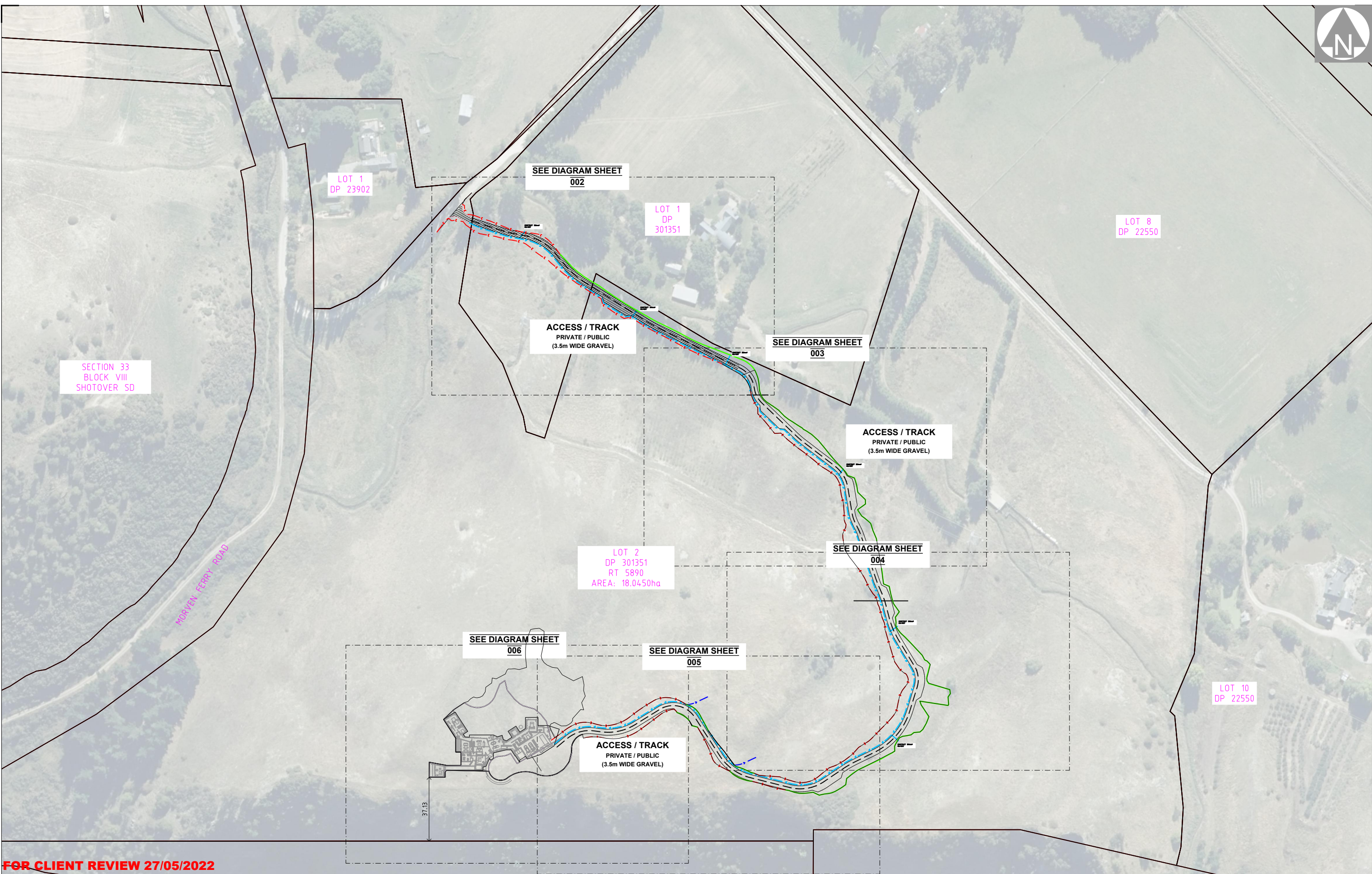
FOR CLIENT REVIEW 27/05/2022

SHEET INDEX

SHEET No	DRAWING TITLE	REVISION	SHEET No	DRAWING TITLE	REVISION	SHEET No	DRAWING TITLE	REVISION
SHEET 001	INDEX SHEET	C	-		-	-		-
SHEET 002	ROAD LAYOUT	-	-		-	-		-
SHEET 003	ROAD LAYOUT	-	-		-	-		-
SHEET 004	ROAD LAYOUT	A	-		-	-		-
SHEET 005	ROAD LAYOUT	C	-		-	-		-
SHEET 006	TYPICAL CROSS SECTION	-	-		-	-		-
SHEET 007	ACC 001 LONGSECTION	C	-		-	-		-
SHEET 008	ACC 001 CROSS SECTIONS	-	-		-	-		-
SHEET 009	ACC 001 CROSS SECTIONS	-	-		-	-		-
SHEET 010	ACC 001 CROSS SECTIONS	-	-		-	-		-
SHEET 011	ACC 001 CROSS SECTIONS	C	-		-	-		-
SHEET 012	ACC 001 EARTHWORKS VOLUME	D	-		-	-		-
SHEET 013	PROPOSED DWELLING CROSS SECTIONS	-	-		-	-		-
SHEET 014	PROPOSED MOUNDS CROSS SECTIONS	-	-		-	-		-
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PREPARED BY





FOR CLIENT REVIEW 27/05/2022

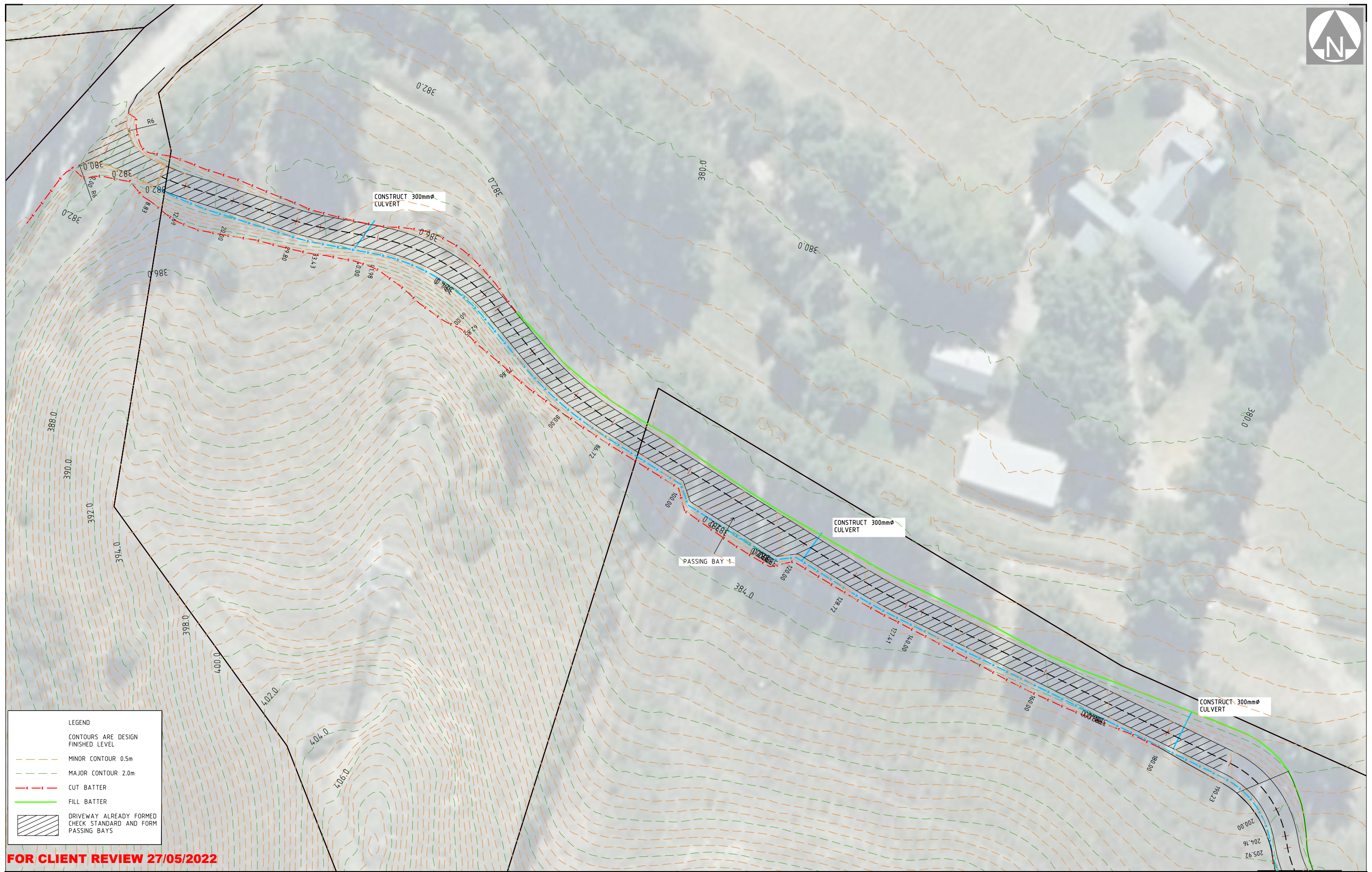

Clark Fortune McDonald & Associates
 Licensed Cadastral Surveyors - Land Development - Planning Consultants
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Rev.	Date	Revision Details	By
A	02.02.22	CHANGED ALIGNMENT CH 500 TO END	BM
B	15.03.22	ADDED CAR PARK/TURN AROUND AREA	BM
C	27.05.22	LOWERED CARPARK AND HOUSE TO 444.5m	BM

LOT 2 DP 301351, 346 MORVEN FERRY ROAD INDEX SHEET

Client	Surveyed	Signed	Date	Job No.	Drawing No.
SHARYN HENSMAN				13905	E001
	Drawn	Signed	Date <td>Scale</td> <td></td>	Scale	
	BM		30.11.21	1:1000 @ A1 1:2000 @ A3	
	Designed	Signed	Date <td>Datum & Level <td>Rev.</td> </td>	Datum & Level <td>Rev.</td>	Rev.
	BM		30.11.21	MSL	C

Notes:
All dimensions shown are in meters unless shown otherwise.
Any person using Clark Fortune McDonald drawings and other data accepts the risk of:
- Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions.
- Copywrite on this drawing is reserved.



LEGEND

CONTOURS ARE DESIGN FINISHED LEVEL

--- MINOR CONTOUR 0.5m

--- MAJOR CONTOUR 2.0m

- - - CUT BATTER

— FILL BATTER

▨ DRIVEWAY ALREADY FORMED CHECK STANDARD AND FORM PASSING BAYS

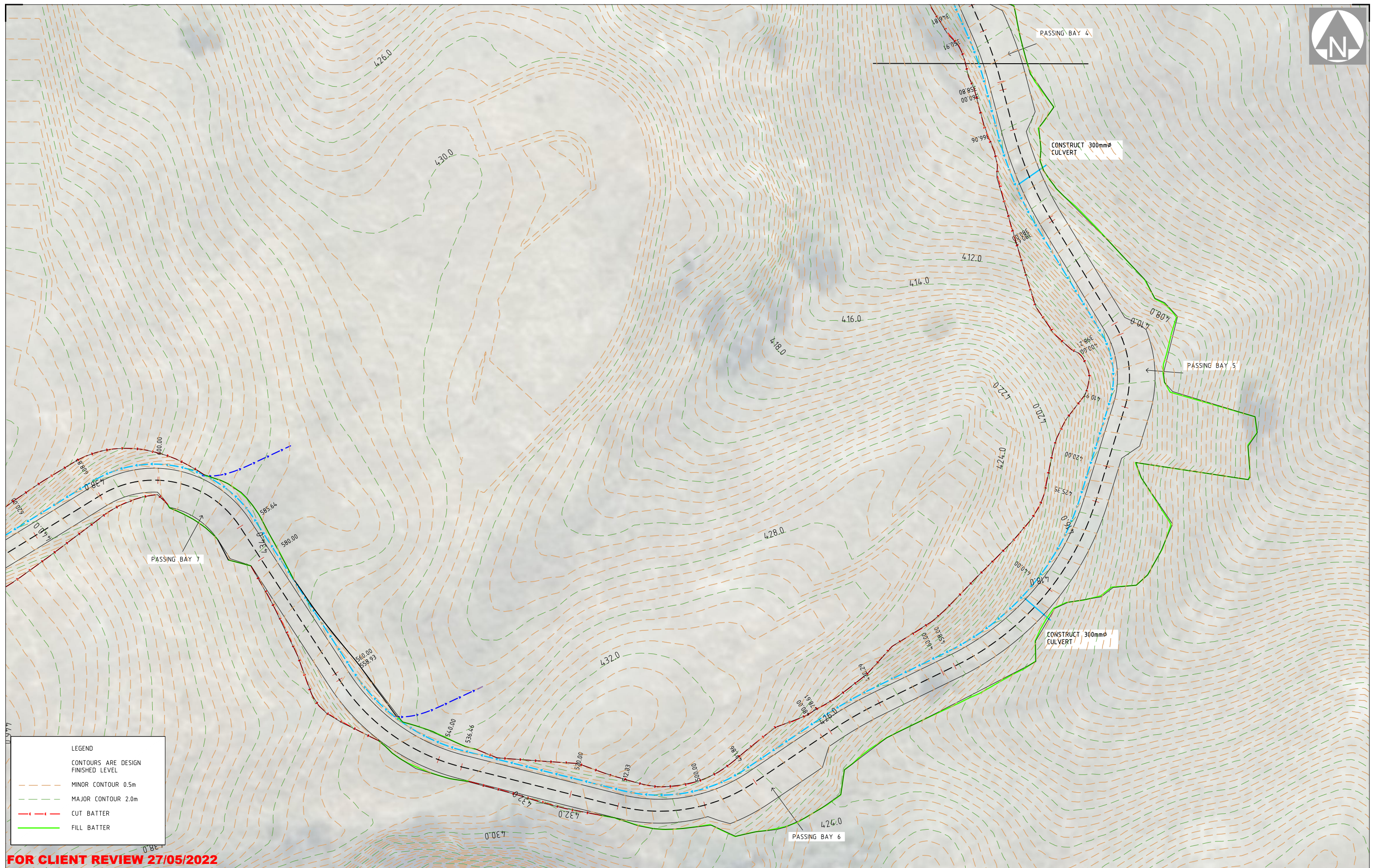
FOR CLIENT REVIEW 27/05/2022

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 Tel. (03)470-1582, Fax (03)470-1583, Email admin@cfma.co.nz

Rev.	Date	Revision Details	By
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
 ROAD LAYOUT**

Client	SHARYN HENSMAN			Surveyed	Signed	Date	Job No.	Drawing No.
							13905	E001
Notes:	Drawn	Signed	Date	Scale				
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	Designed	Signed	Date	Datum & Level	Rev.			
	BM		30.11.21	MSL	-			



LEGEND	
CONTOURS ARE DESIGN FINISHED LEVEL	
	MINOR CONTOUR 0.5m
	MAJOR CONTOUR 2.0m
	CUT BATTER
	FILL BATTER

FOR CLIENT REVIEW 27/05/2022

Clark Fortune McDonald & Associates
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 309 Lower Shotover Road, P.O.Box 553 Queenstown
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Rev.	Date	Revision Details	By
A	02.02.22	CHANGED ALIGNMENT CH 500 TO END	BM

LOT 2 DP 301351, 346 MORVEN FERRY ROAD ROAD LAYOUT

Client	SHARYN HENSMAN	Surveyed	Signed	Date	30.11.21	Job No.	13905	Drawing No.	E001 SHEET 004
Notes:	All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions. - Copywrite on this drawing is reserved.								
Drawn	BM	Signed		Date	30.11.21	Scale	### @ A1 1:500 @ A3	Datum & Level	MSL
Designed	BM	Signed		Date	30.11.21	Rev.	A		



LEGEND	
CONTOURS ARE DESIGN FINISHED LEVEL	
	MINOR CONTOUR 0.5m
	MAJOR CONTOUR 2.0m
	CUT BATTER
	FILL BATTER

FOR CLIENT REVIEW 27/05/2022

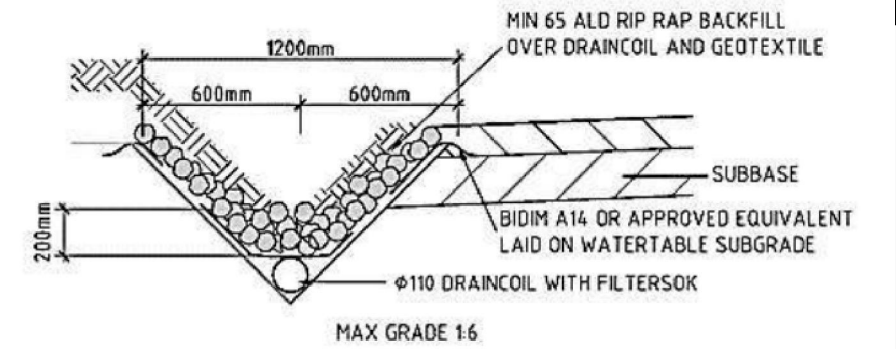
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Rev.	Date	Revision Details	By
A	02.02.22	CHANGED ALIGNMENT CH 500 TO END	BM
B	15.03.22	ADDED CAR PARK/TURN AROUND AREA	BM
C	27.05.22	LOWERED CARPARK AND HOUSE TO 444.5m	BM

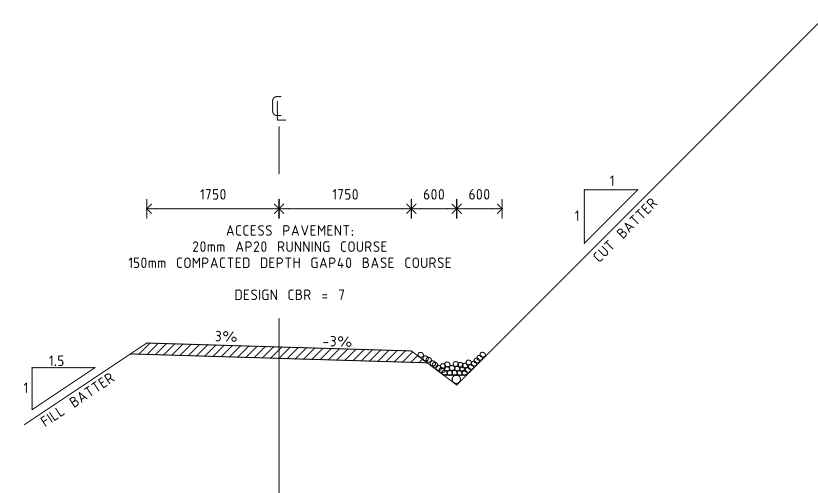
LOT 2 DP 301351, 346 MORVEN FERRY ROAD ROAD LAYOUT

Client	Surveyed	Signed	Date	Job No.	Drawing No.
SHARYN HENSMAN				13905	E001
	Drawn	Signed	Date <td>Scale</td> <td>Sheet</td>	Scale	Sheet
	BM		30.11.21	### @ A1	SHEET 005
	Designed	Signed	Date <td>Datum & Level <td>Rev. </td></td>	Datum & Level <td>Rev. </td>	Rev.
	BM		30.11.21	MSL	C

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TYPICAL RIP RAP GEOTEXTILE LINED SWALE
SCALE 1:20



ACC 001
TYPICAL CROSS SECTION

FOR CLIENT REVIEW 27/05/2022

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Rev.	Date	Revision Details	By
-	-	-	-

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ROAD TYPICAL CROSS SECTIONS**

Client	SHARYN HENSMAN	Surveyed	Signed	Date	Job No.	13905	Drawing No.	E001
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		Designed	Signed	Date	Datum & Level	MSL		Rev.
		BM		30.11.21				-

HORIZ CURVE DATA

VERT GEOMETRY GRADE (%)
 VERT GRADE LENGTH (m)
 VERT CURVE LENGTH (m)

DATUM R.L.320.00

DEPTH	C.L. FINISHED LEVEL	EXISTING G.L.	CHAINAGE
0.00	381.68	381.68	0.00
7.67	382.81	382.81	7.67
20.00	384.00	384.00	20.00
40.00	385.15	385.15	40.00
42.88	385.39	385.39	42.88
60.00	386.01	386.01	60.00
80.00	386.80	386.80	80.00
85.76	387.43	387.43	85.76
100.00	387.68	387.68	100.00
111.40	387.37	387.37	111.40
120.00	387.44	387.44	120.00
140.00	388.01	388.01	140.00
160.00	388.95	388.95	160.00
180.00	388.00	388.00	180.00
200.00	384.90	384.90	200.00
220.00	386.92	386.92	220.00
240.00	388.79	388.79	240.00
260.00	390.62	390.62	260.00
280.00	392.83	392.83	280.00
300.00	394.39	394.39	300.00
320.00	397.13	397.13	320.00
340.00	400.53	400.53	340.00
360.00	403.65	403.65	360.00
380.00	406.69	406.69	380.00
400.00	410.66	410.66	400.00
420.00	415.38	415.38	420.00
440.00	419.69	419.69	440.00
460.00	422.66	422.66	460.00
480.00	425.78	425.78	480.00
500.00	429.24	429.24	500.00
520.00	432.48	432.48	520.00
525.33	432.25	432.25	525.33
540.00	430.63	430.63	540.00
552.56	431.68	431.68	552.56
560.00	432.68	432.68	560.00
580.00	433.45	433.45	580.00
600.00	437.65	437.65	600.00

HORIZ CURVE DATA

VERT GEOMETRY GRADE (%)
 VERT GRADE LENGTH (m)
 VERT CURVE LENGTH (m)

DATUM R.L.373.00

DEPTH	C.L. FINISHED LEVEL	EXISTING G.L.	CHAINAGE
580.00	433.85	433.85	580.00
600.00	437.05	437.05	600.00
620.00	442.40	442.40	620.00
640.00	445.05	445.05	640.00
648.98	445.79	445.79	648.98
660.00	446.86	446.86	660.00
680.00	447.93	447.93	680.00
684.97	448.03	448.03	684.97

LONGSECTION - ACCESS 001

A1 HORIZ SCALE 1 : 1000
 A1 VERT SCALE 1 : 1000

LONGSECTION - ACCESS 001

A1 HORIZ SCALE 1 : 1000
 A1 VERT SCALE 1 : 1000

FOR CLIENT REVIEW 27/05/2022

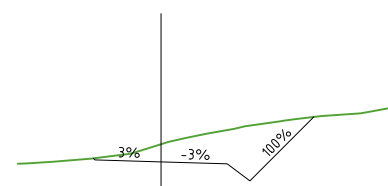
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Rev.	Date	Revision Details	By
A	02.02.22	CHANGED ALIGNMENT CH 500 TO END	BM
B	15.03.22	ADDED CAR PARK/TURN AROUND AREA	BM
C	27.05.22	LOWERED CARPARK AND HOUSE TO 444.5m	BM

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
 ACC 001 LONGSECTIONS**

Client	Surveyed	Signed	Date	Job No.	Drawing No.
SHARYN HENSMAN				13905	E001 SHEET 007
Drawn	Signed	Date	Scale	AS SHOWN	
BM		30.11.21			
Designed	Signed	Date	Datum & Level	Rev.	
BM		30.11.21	MSL	C	

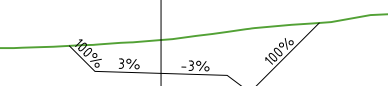
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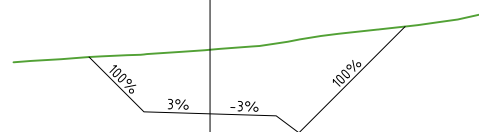
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CH 40



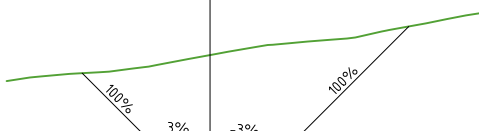
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CH 33.433



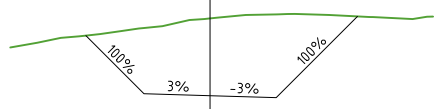
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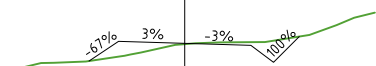
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CH 20



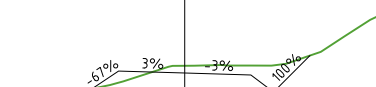
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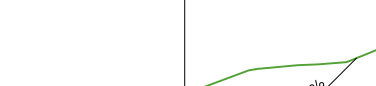
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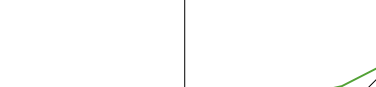
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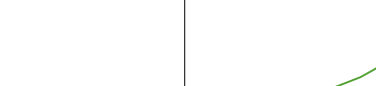
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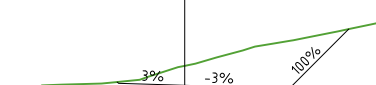
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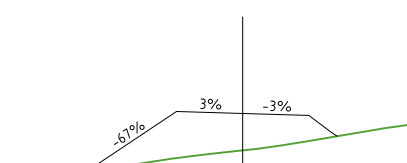
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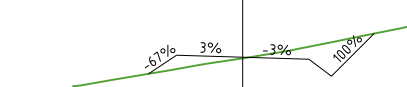
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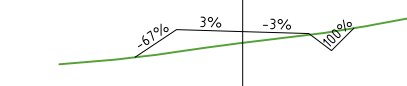
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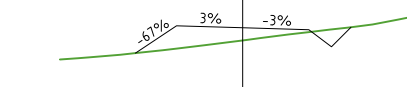
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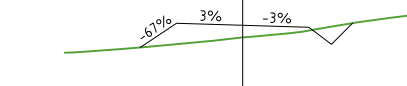
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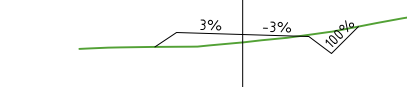
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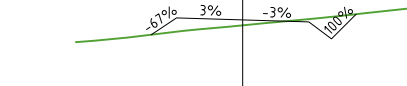
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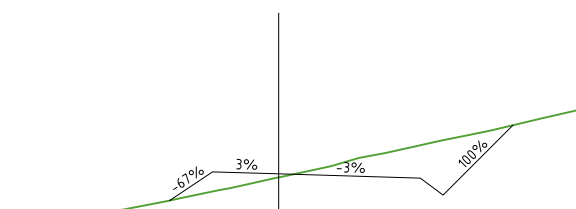
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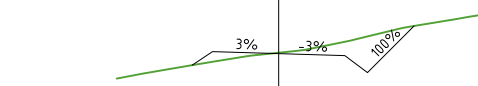
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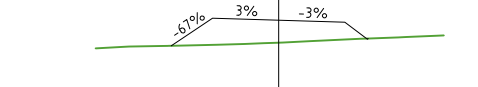
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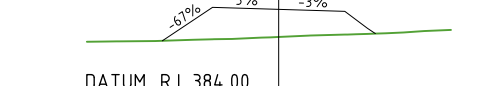
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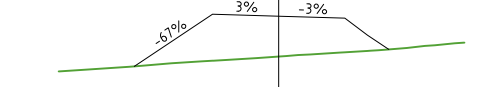
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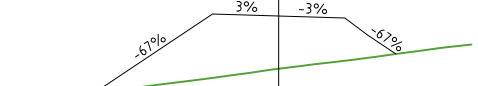
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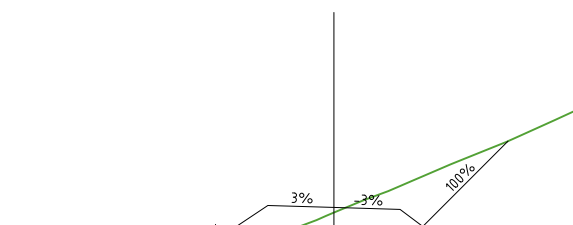
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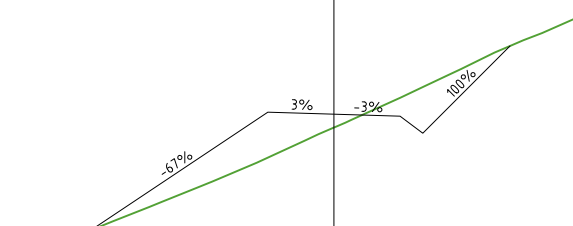
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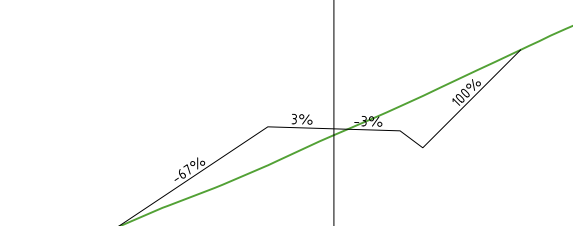
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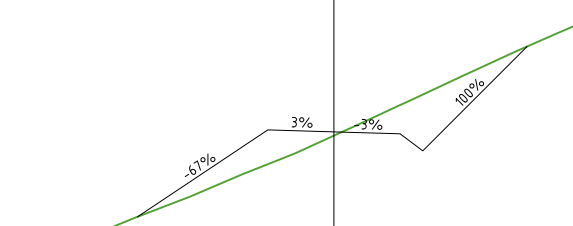
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DATUM R.L.384.00
CH 242.201



DATUM R.L.384.00
CH 240

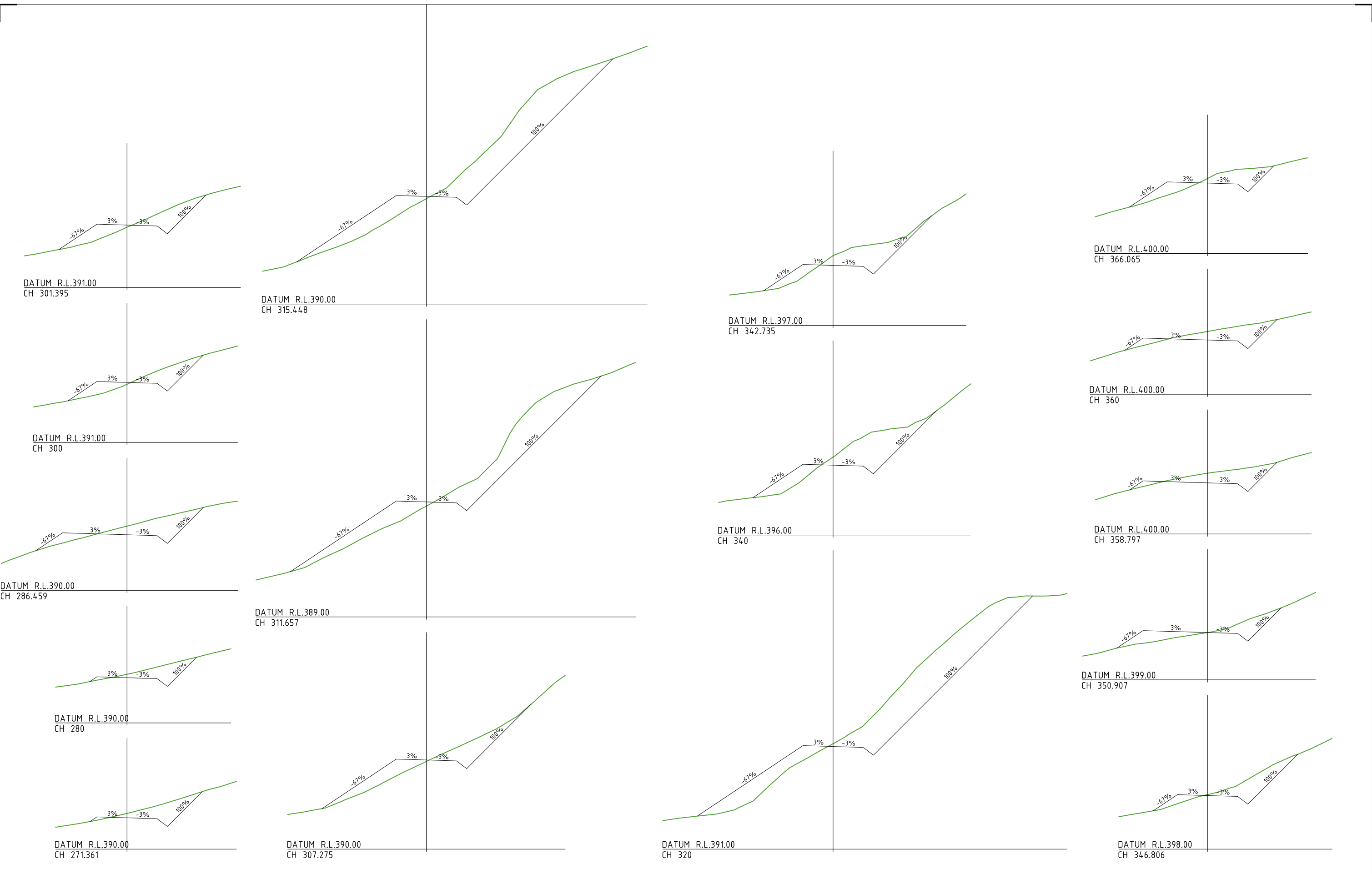
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Rev.	Date	Revision Details	By
-	-	-	-

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ACC 001 CROSS SECTIONS**

Client	SHARYN HENSMAN	Surveyed	Signed	Date	30.11.21	Job No.	13905	Drawing No.	E001 SHEET 008
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Drawn	BM	Signed	Signed	Date	30.11.21	Scale	### @ A1 1:2000 @ A3	Datum & Level	MSL
Designed	BM	Signed	Signed	Date	30.11.21	Datum & Level	MSL	Rev.	-

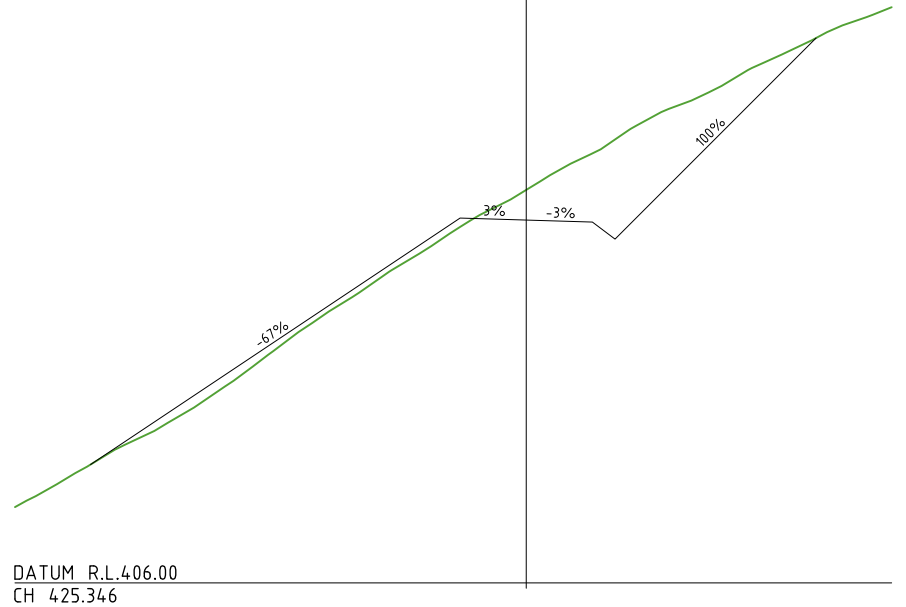
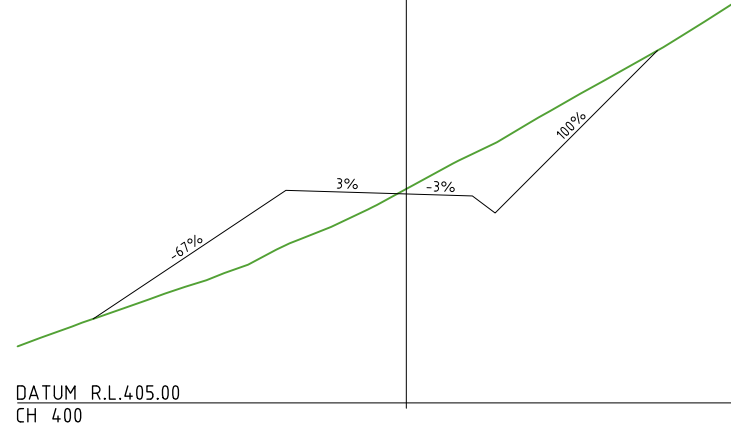
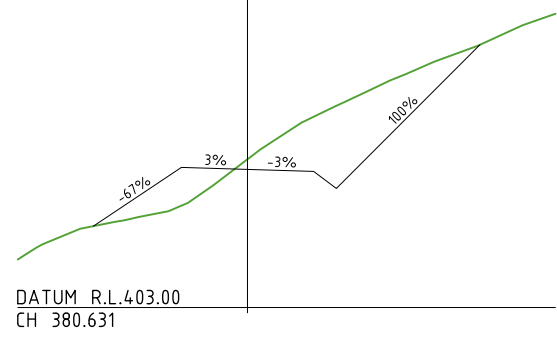
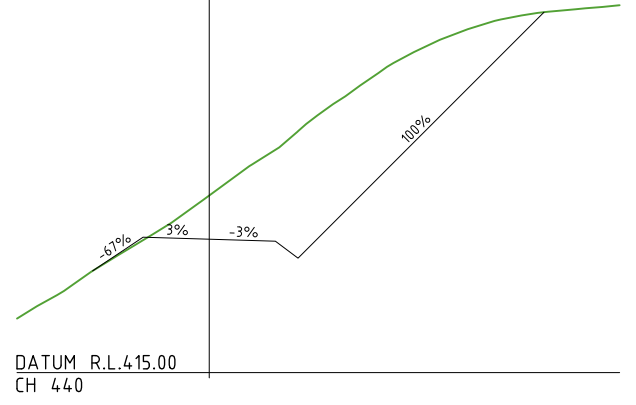
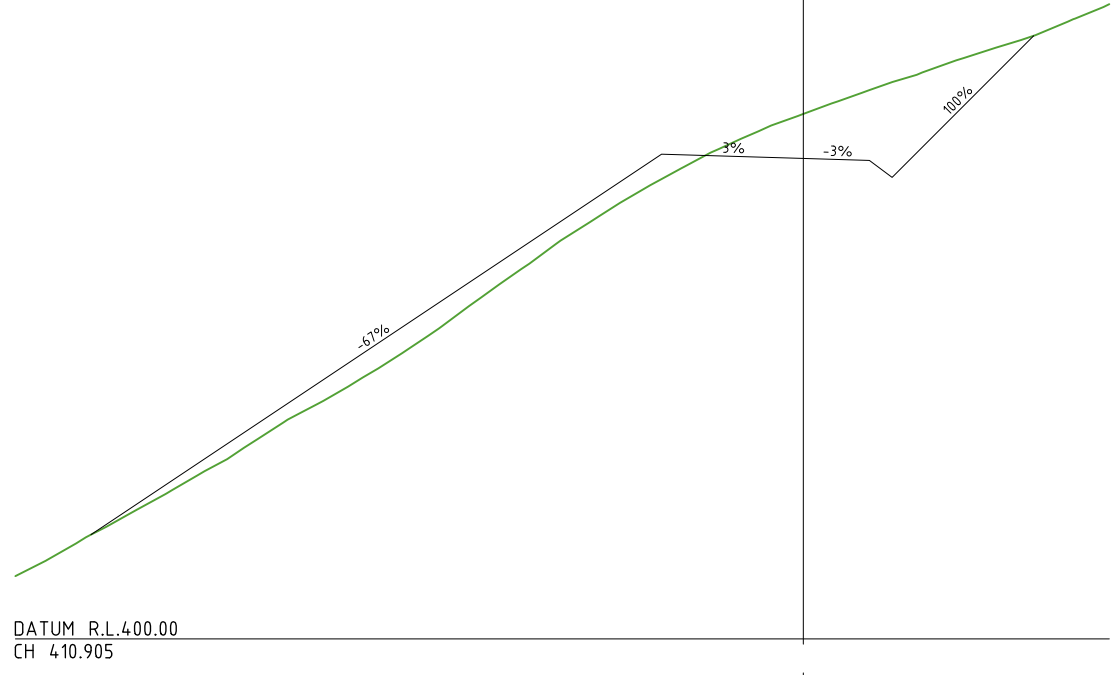
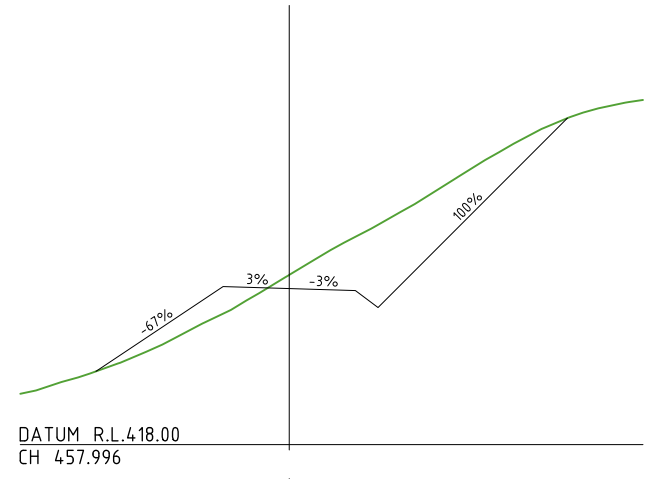
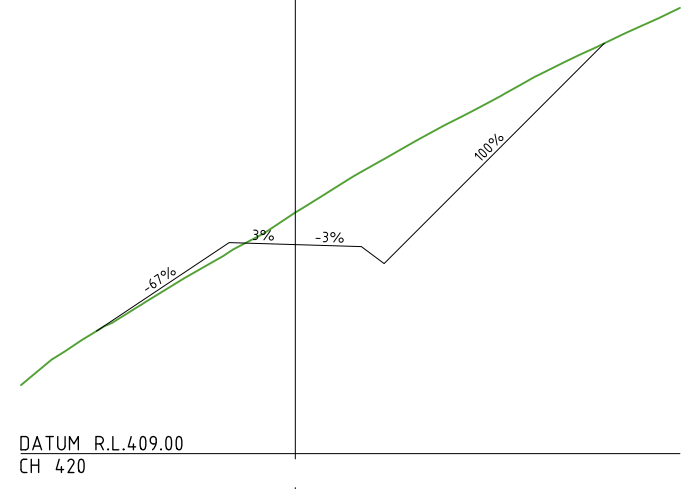
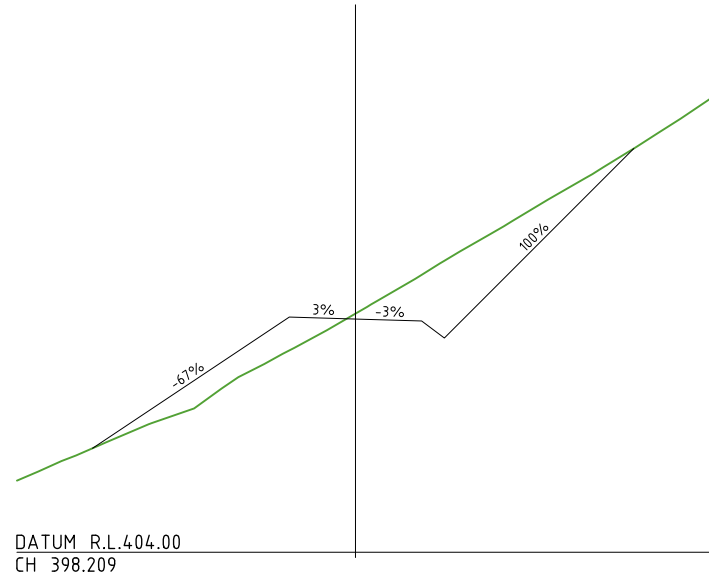


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Rev.	Date	Revision Details	By
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
 ACC 001 CROSS SECTIONS**

Client	SHARYN HENSMAN			Surveyed	Signed	Date	Job No.	Drawing No.
							13905	E001
Notes:	All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of:			Drawn	Signed	Date	Scale	### @ A1
- Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions.				BM		30.11.21	1:2000 @ A3	
- Copywrite on this drawing is reserved.	Designed	Signed	Date	Datum & Level	Rev.			
	BM		30.11.21	MSL	-			



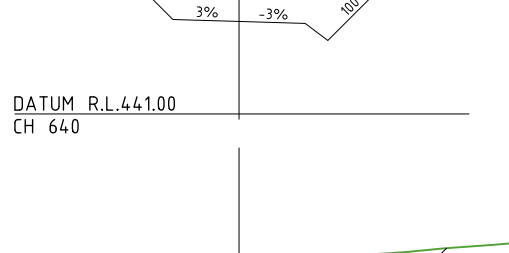
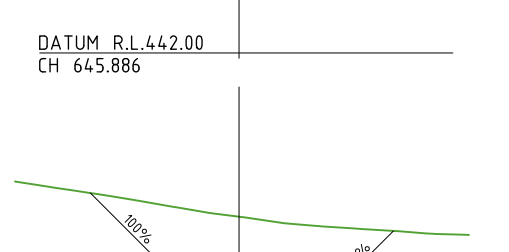
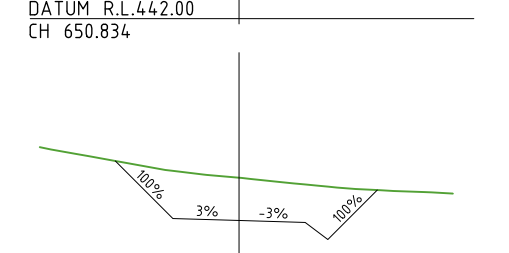
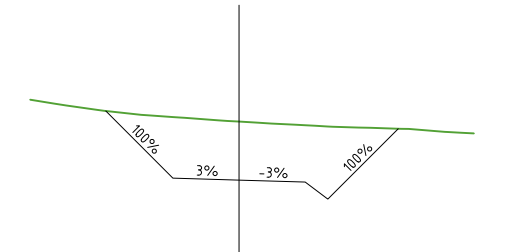
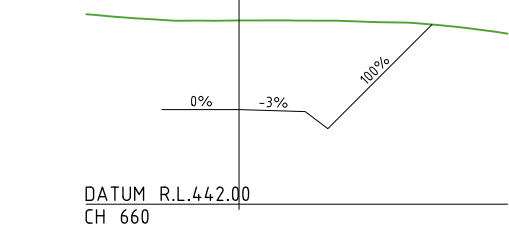
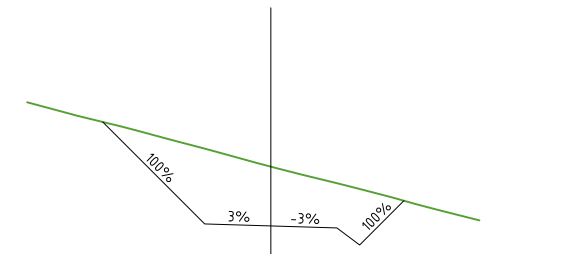
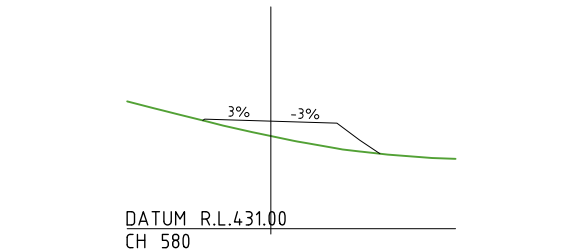
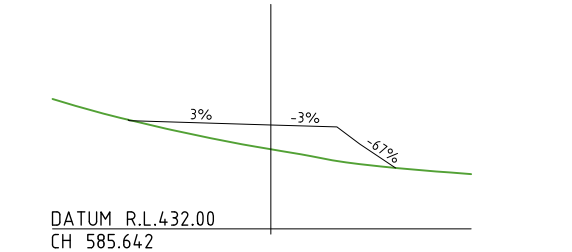
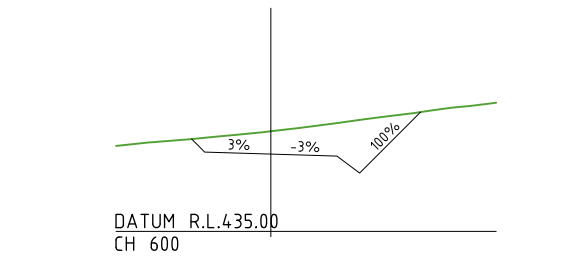
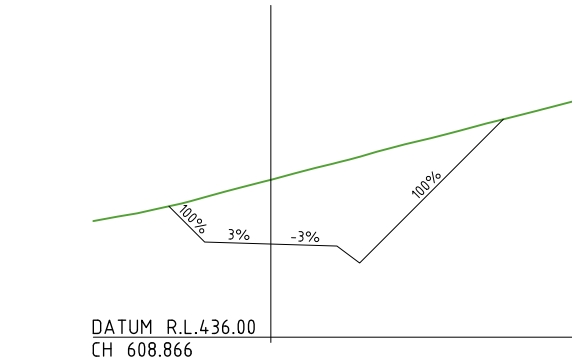
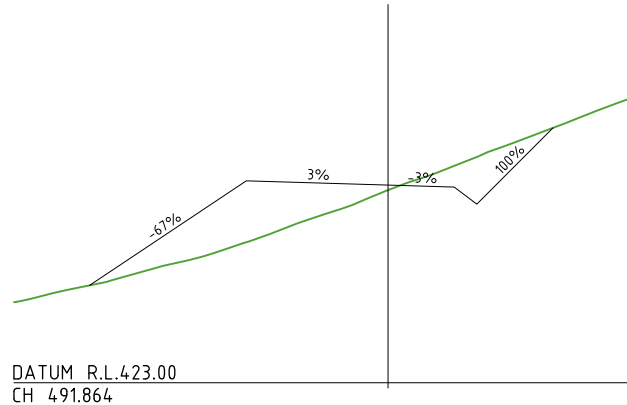
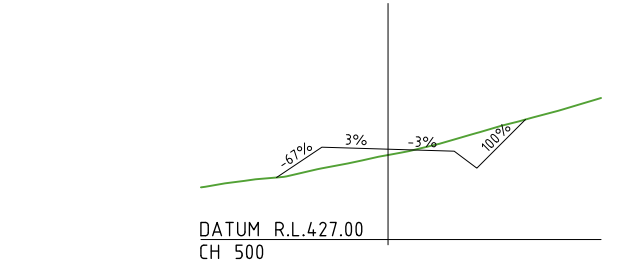
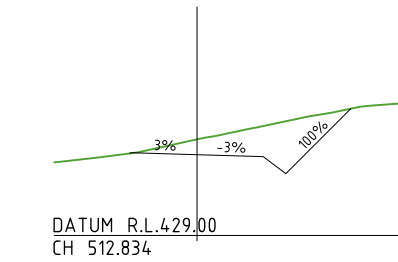
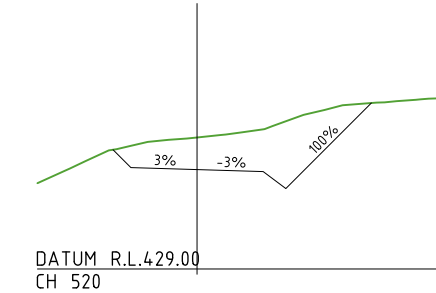
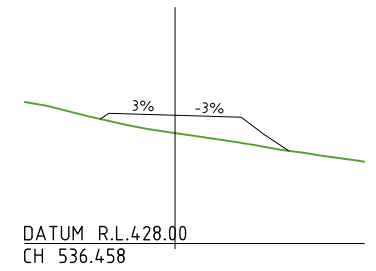
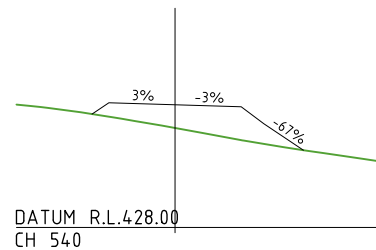
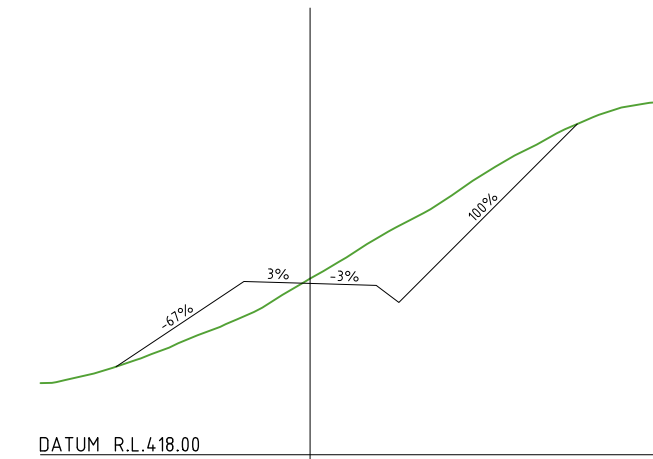
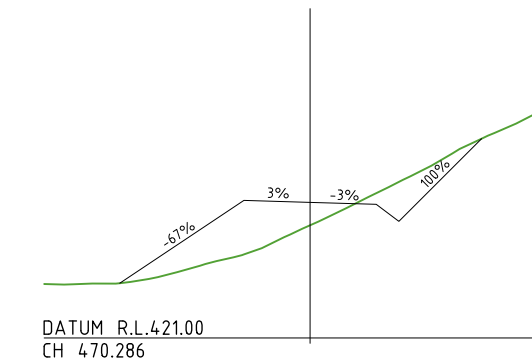
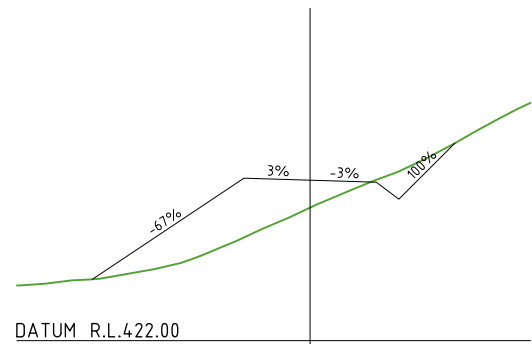
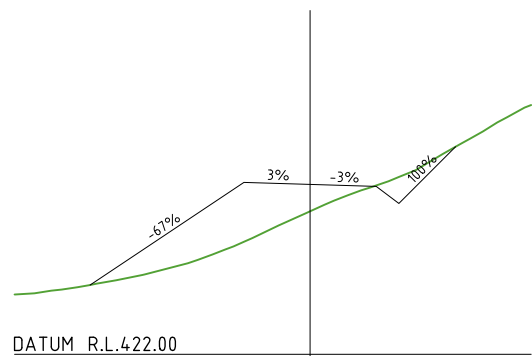
FOR CLIENT REVIEW 27/05/2022

Clark Fortune McDonald & Associates
 Licensed Cadastral Surveyors - Land Development - Planning Consultants
 309 Lower Shotover Road, P.O.Box 553 Queenstown
 Tel. (03)441-6044, Fax (03)442-1066, Email admin@cfma.co.nz
 21 Reece Crescent, P.O.Box 550, Wanaka
 Tel. (03)443-4448, Fax (03)443-4445, Email admin@cfma.co.nz
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Rev.	Date	Revision Details	By
-	-	-	-

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ACC 001 CROSS SECTIONS**

Client	SHARYN HENSMAN	Surveyed	Signed	Date	30.11.21	Job No.	13905	Drawing No.	E001
Notes:	All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions. - Copywrite on this drawing is reserved.								
Drawn	BM	Signed		Date	30.11.21	Scale	### @ A1 1:2000 @ A3	Datum & Level	MSL
Designed	BM	Signed		Date	30.11.21			Rev.	-



FOR CLIENT REVIEW 27/05/2022

Clark Fortune McDonald & Associates
 Licensed Cadastral Surveyors - Land Development - Planning Consultants
 309 Lower Shotover Road, P.O.Box 553 Queenstown
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 21 Reece Crescent, P.O.Box 550, Wanaka
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 Unit 6B, Level 1, 480 Moray Place, P.O. Box 5960, Dunedin
 Tel. (03)470-1582, Fax (03)470-1583, Email admin@cfma.co.nz

Rev.	Date	Revision Details	By
A	02.02.22	CHANGED ALIGNMENT CH 500 TO END	BM
C	27.05.22	LOWERED CARPARK AND HOUSE TO 444.5m	BM

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ACC 001 CROSS SECTIONS**

Client	SHARYN HENSMAN	Surveyed	Signed	Date	30.11.21	Job No.	13905	Drawing No.	E001 SHEET 011
Notes:	All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions. - Copywrite on this drawing is reserved.								
Drawn	BM	Signed	Signed	Date	30.11.21	Scale	### @ A1 1:2000 @ A3	Datum & Level	MSL
Designed	BM	Signed	Signed	Date	30.11.21				C



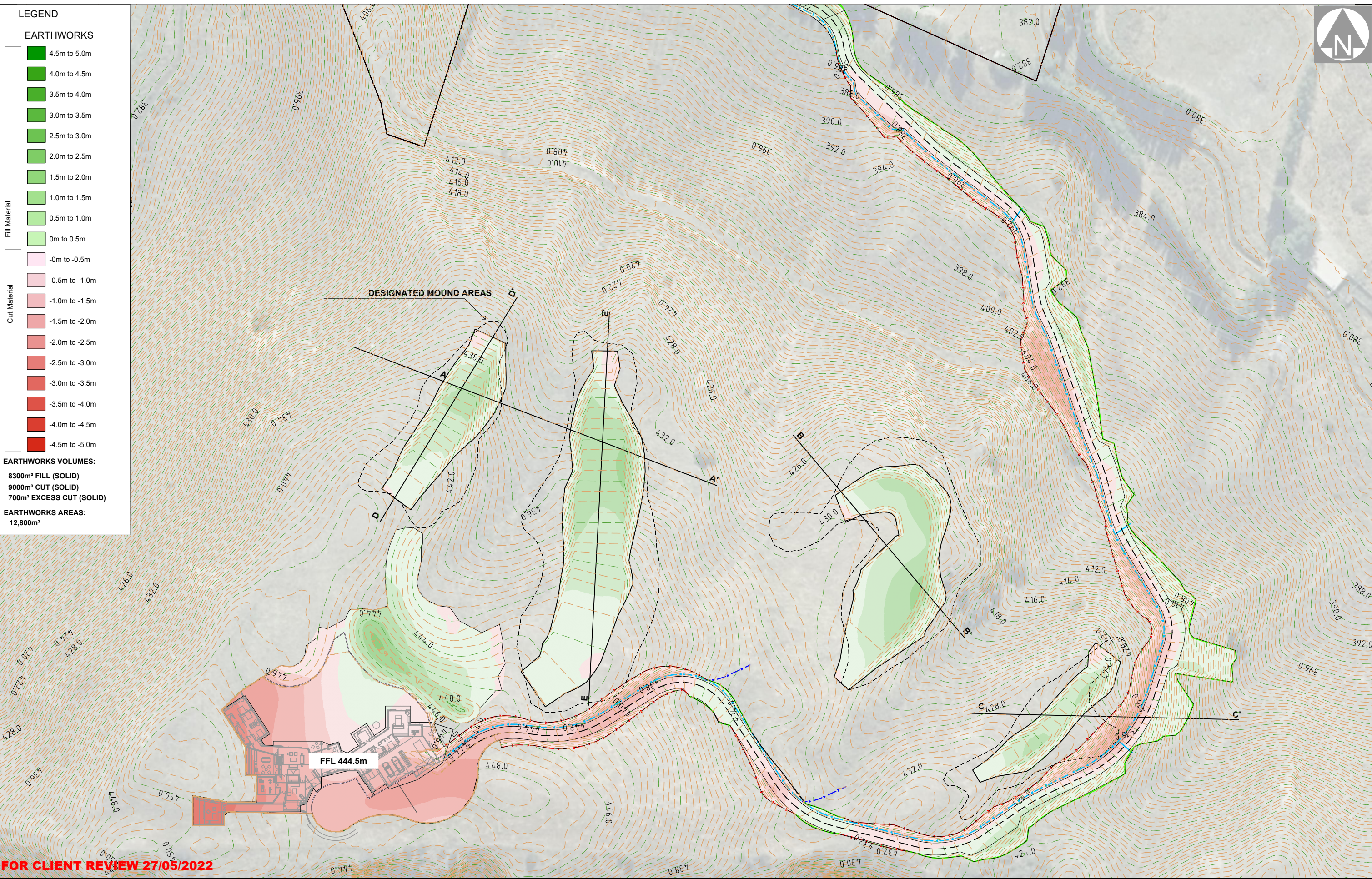
LEGEND

EARTHWORKS

- 4.5m to 5.0m
- 4.0m to 4.5m
- 3.5m to 4.0m
- 3.0m to 3.5m
- 2.5m to 3.0m
- 2.0m to 2.5m
- 1.5m to 2.0m
- 1.0m to 1.5m
- 0.5m to 1.0m
- 0m to 0.5m
- 0.5m to -1.0m
- 1.0m to -1.5m
- 1.5m to -2.0m
- 2.0m to -2.5m
- 2.5m to -3.0m
- 3.0m to -3.5m
- 3.5m to -4.0m
- 4.0m to -4.5m
- 4.5m to -5.0m

EARTHWORKS VOLUMES:
 8300m³ FILL (SOLID)
 9000m³ CUT (SOLID)
 700m³ EXCESS CUT (SOLID)

EARTHWORKS AREAS:
 12,800m²



FOR CLIENT REVIEW 27/05/2022

Shotover Design Limited trading as
Clark Fortune McDonald & Associates
 Licensed Cadastral Surveyors - Land Development - Planning Consultants

309 Lower Shotover Road, P.O.Box 553 Queenstown
 Tel. (03)441-6044, Fax (03)442-1066, Email admin@cfma.co.nz

21 Reece Crescent, P.O.Box 550, Wanaka
 Tel. (03)443-4448, Fax (03)443-4445, Email admin@cfma.co.nz

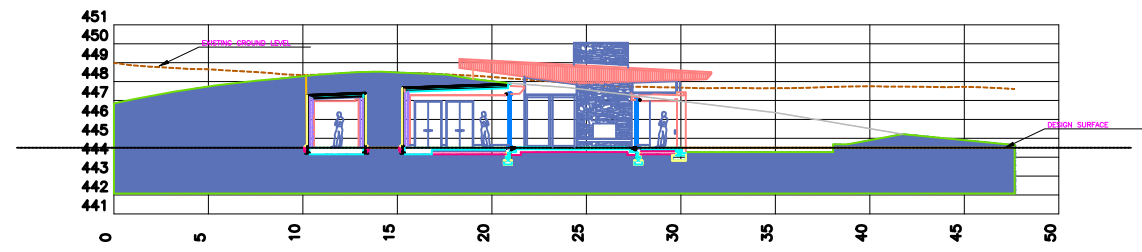
Unit 6B, Level 1, 480 Moray Place, P.O. Box 5960, Dunedin
 Tel. (03)470-1582, Fax (03)470-1583, Email admin@cfma.co.nz

Rev.	Date	Revision Details	By
A	02.02.22	CHANGED ALIGNMENT CH 500 TO END	BM
B	15.03.22	ADDED CAR PARK/TURN AROUND AREA	BM
C	27.05.22	LOWERED CARPARK AND HOUSE TO 444.5m	BM
D	09.02.23	MOUNDS ADDED	EO

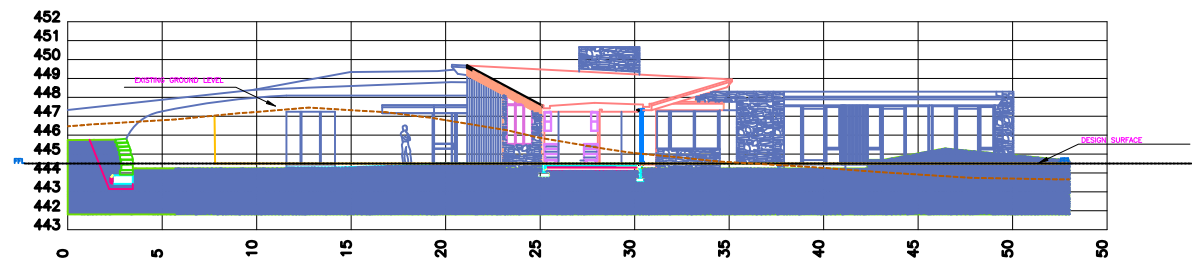
LOT 2 DP 301351, 346 MORVEN FERRY ROAD
EARTHWORKS PLAN

Client	SHARYN HENSMAN	Surveyed	Signed	Date	30.11.21	Job No.	13905	Drawing No.	E001
Notes:	All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions. - Copywrite on this drawing is reserved.					Scale	1:500 @ A1 1:1000 @ A3		
Drawn	BM	Signed		Date	30.11.21	Datum & Level	MSL	Rev.	D

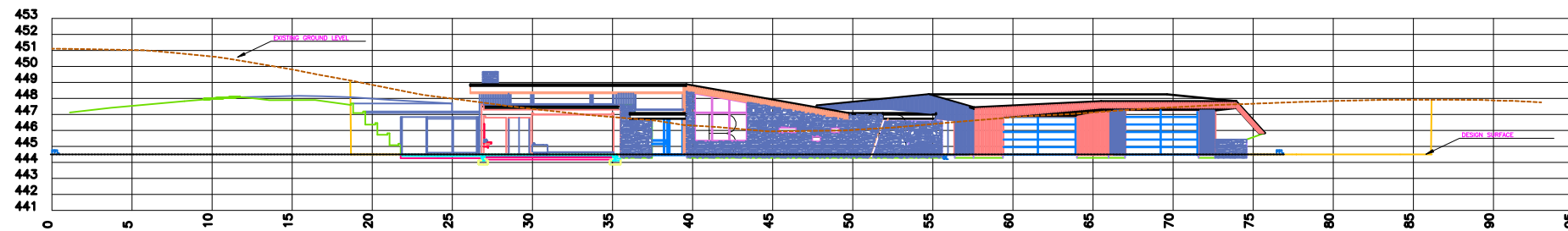
SECTION BB



SECTION CC



SECTION HH



FOR CLIENT REVIEW 27/05/2022

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Clark Fortune McDonald & Associates
 Licensed Cadastral Surveyors - Land Development - Planning Consultants

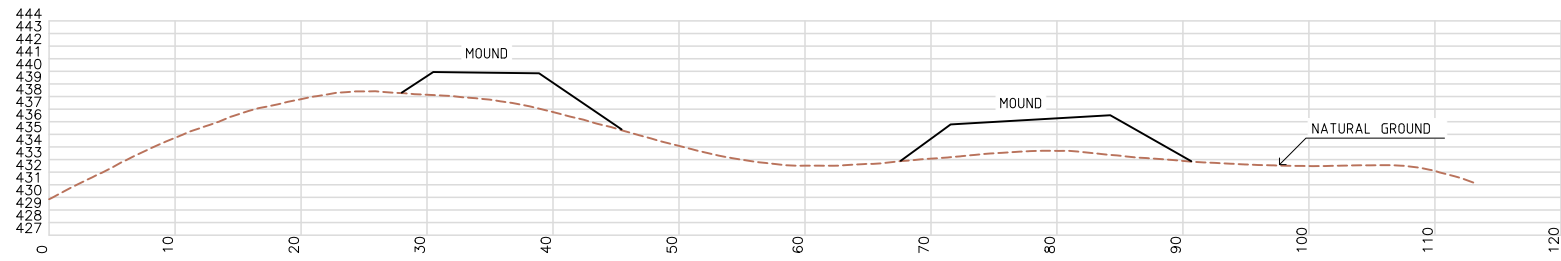
309 Lower Shotover Road, P.O.Box 553 Queenstown
 Tel. (03)441-6044, Fax (03)442-1066, Email admin@cfma.co.nz
 21 Reece Crescent, P.O.Box 550, Wanaka
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 Unit 6B, Level 1, 480 Moray Place, P.O. Box 5960, Dunedin
 Tel. (03)470-1582, Fax (03)470-1583, Email admin@cfma.co.nz

Rev.	Date	Revision Details	By
-	-	-	-

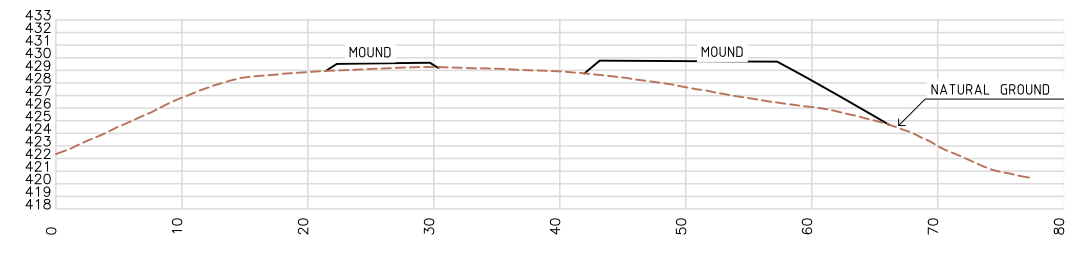
LOT 2 DP 301351, 346 MORVEN FERRY ROAD PROPOSED DWELLING CROSS SECTIONS

Client	SHARYN HENSMAN	Surveyed	Signed	Date	30.11.21	Job No.	13905	Drawing No.	E001 SHEET 013
Notes:	All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions. - Copywrite on this drawing is reserved.								
Drawn	BM	Signed	Signed	Date	30.11.21	Scale	1:200 @ A1 1:400 @ A3	Datum & Level	MSL
Designed	BM	Signed	Signed	Date	30.11.21	Datum & Level	MSL	Rev.	-

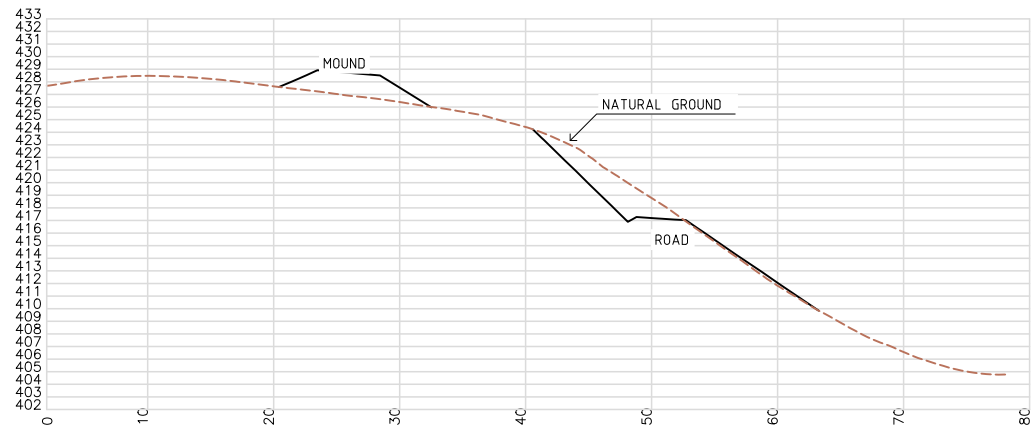
EARTHWORKS SECTION A - A'



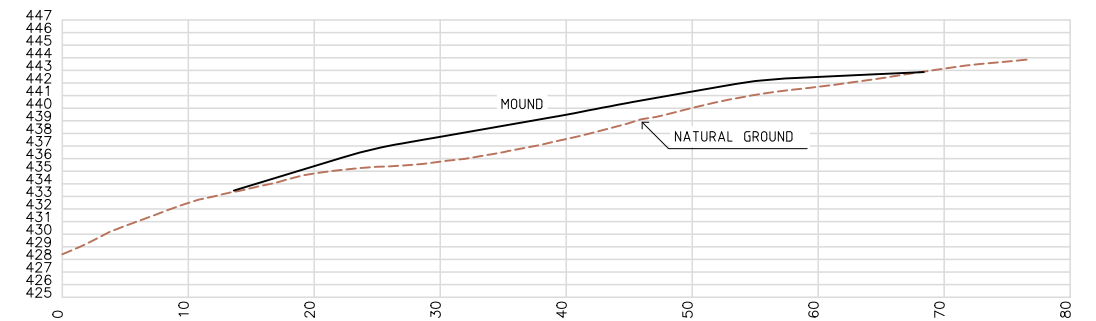
EARTHWORKS SECTION B - B'



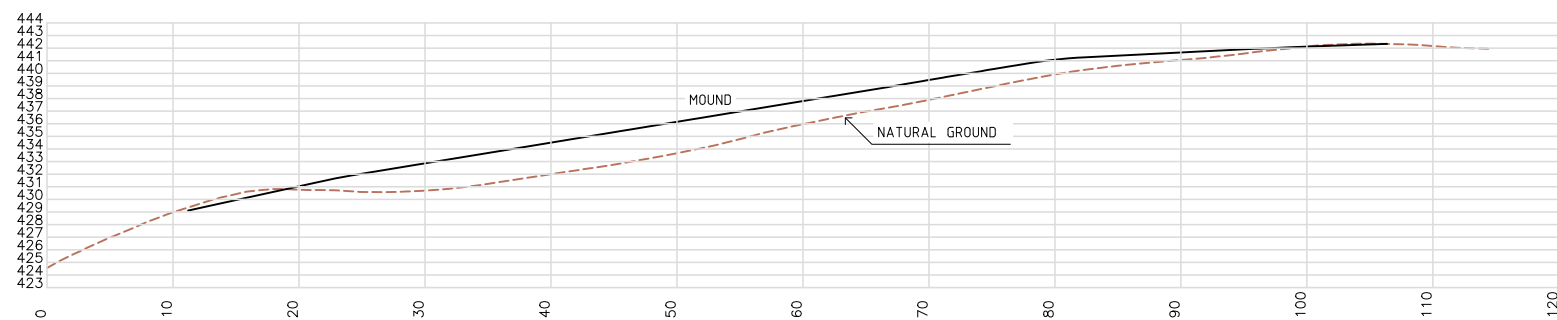
EARTHWORKS SECTION C - C'



EARTHWORKS SECTION D - D'



EARTHWORKS SECTION E - E'



FOR CLIENT REVIEW 27/05/2022

Shotover Design Limited trading as
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 Licensed Cadastral Surveyors - Land Development - Planning Consultants
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 Unit 6B, Level 1, 480 Moray Place, P.O. Box 5960, Dunedin
 Tel. (03)470-1582, Fax (03)470-1583, Email admin@cfma.co.nz

Rev.	Date	Revision Details	By
-	-	-	-

LOT 2 DP 301351, 346 MORVEN FERRY ROAD PROPOSED MOUNDS CROSS SECTIONS

Client	SHARYN HENSMAN	Surveyed	Signed	Date	30.11.21	Job No.	13905	Drawing No.	E001 SHEET 014
Notes:	All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions. - Copywrite on this drawing is reserved.								
Drawn	BM	Signed	Signed	Date	30.11.21	Scale	1:300 @ A1 1:600 @ A3	Datum & Level	MSL
Designed	BM	Signed	Signed	Date	30.11.21	Datum & Level	MSL	Rev.	-



AFFECTED PERSON'S APPROVAL



FORM 8A

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Sharyn Robertson

AFFECTED PERSON'S DETAILS

I/We MSL Quad Limited

Are the owners/occupiers of
351 Morven Ferry Road

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:
Construct a single level residential dwelling and undertake associated earthworks, landscaping and access construction.

at the following subject site(s):
346 Morven Ferry Road



I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.

I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

WHAT INFORMATION/PLANS HAVE YOU SIGHTED



I/We have sighted and initialled ALL plans dated and approve them.

27-5-22

[Handwritten signature]



APPROVAL OF AFFECTED PERSON(S)

The written consent of all owners / occupiers who are affected. If the site that is affected is jointly owned, the written consent of all co-owners (names detailed on the title for the site) are required.

A	Name (PRINT) <i>Gavin Woods</i>	
	Contact Phone / Email address <i>021950217 glwoods@extra.co.nz</i>	
	Signature <i>glwoods</i>	Date <i>6-8-22</i>

B	Name (PRINT) <i>Richard Kriletich</i>	
	Contact Phone / Email address <i>021 617 319</i>	
	Signature <i>[Signature]</i>	Date <i>6/8/22</i>

C	Name (PRINT)	
	Contact Phone / Email address	
	Signature	Date

D	Name (PRINT)	
	Contact Phone / Email address	
	Signature	Date

Note to person signing written approval

Conditional written approvals cannot be accepted.

There is no obligation to sign this form, and no reasons need to be given.

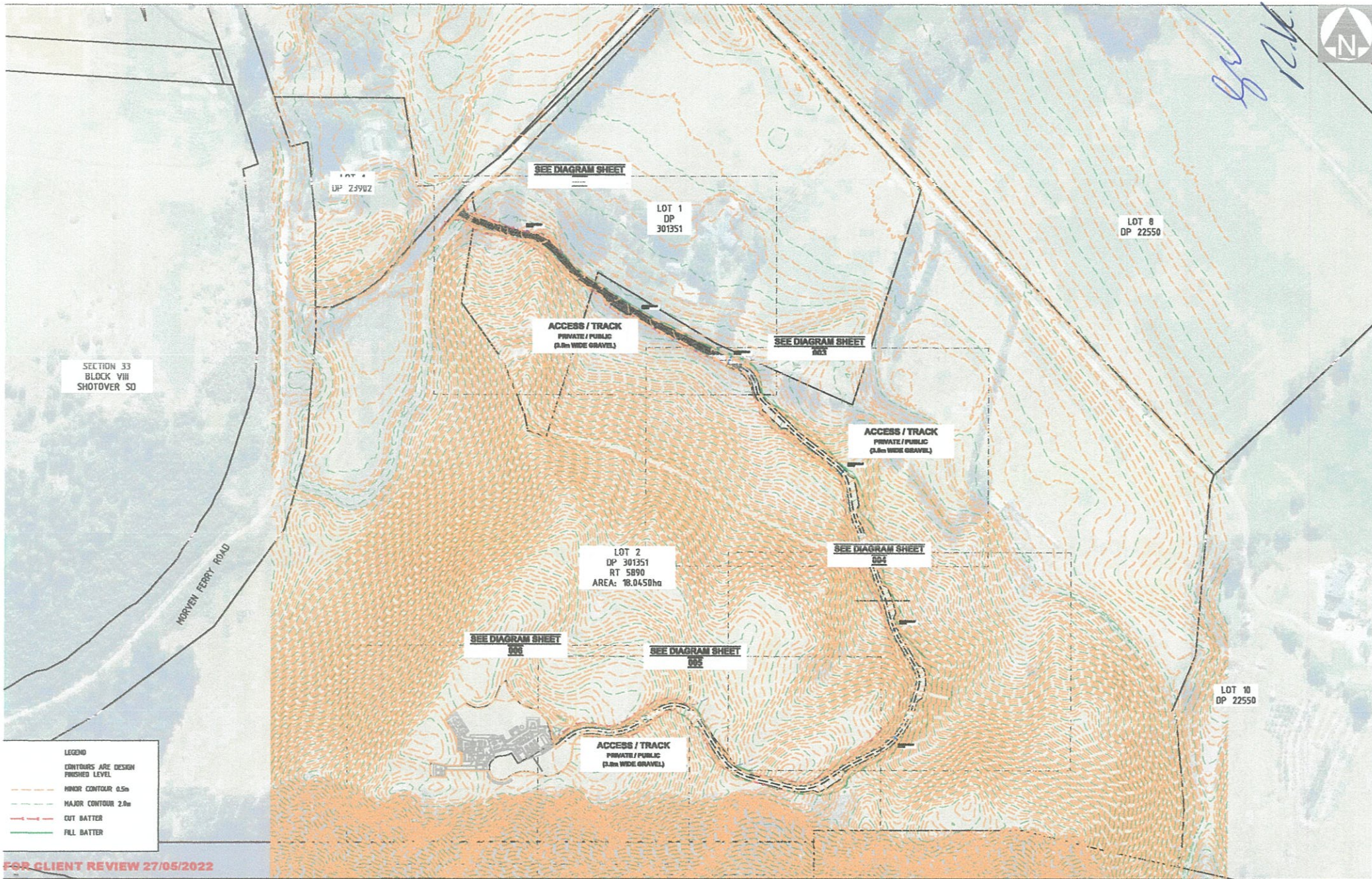
If this form is not signed, the application may be notified with an opportunity for submissions.

If signing on behalf of a trust or company, please provide additional written evidence that you have signing authority.



Queenstown Lakes District Council
Private Bag 50072, Queenstown 9348
Gorge Road, Queenstown 9300

P: 03 441 0499
E: resourceconsent@qldc.govt.nz
www.qldc.govt.nz



FOR CLIENT REVIEW 27/05/2022

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 21 Renca Crescent, P.O. Box 550, Wanaka
 Tel: (03) 443-4448, Fax: (03) 443-4445, Email: cwain@cfma.co.nz
 Unit 6B, Level 1, 480 Murray Place, P.O. Box 5760, Dunedin
 Tel: (03) 470-1587, Fax: (03) 470-1583, Email: admin@cfma.co.nz

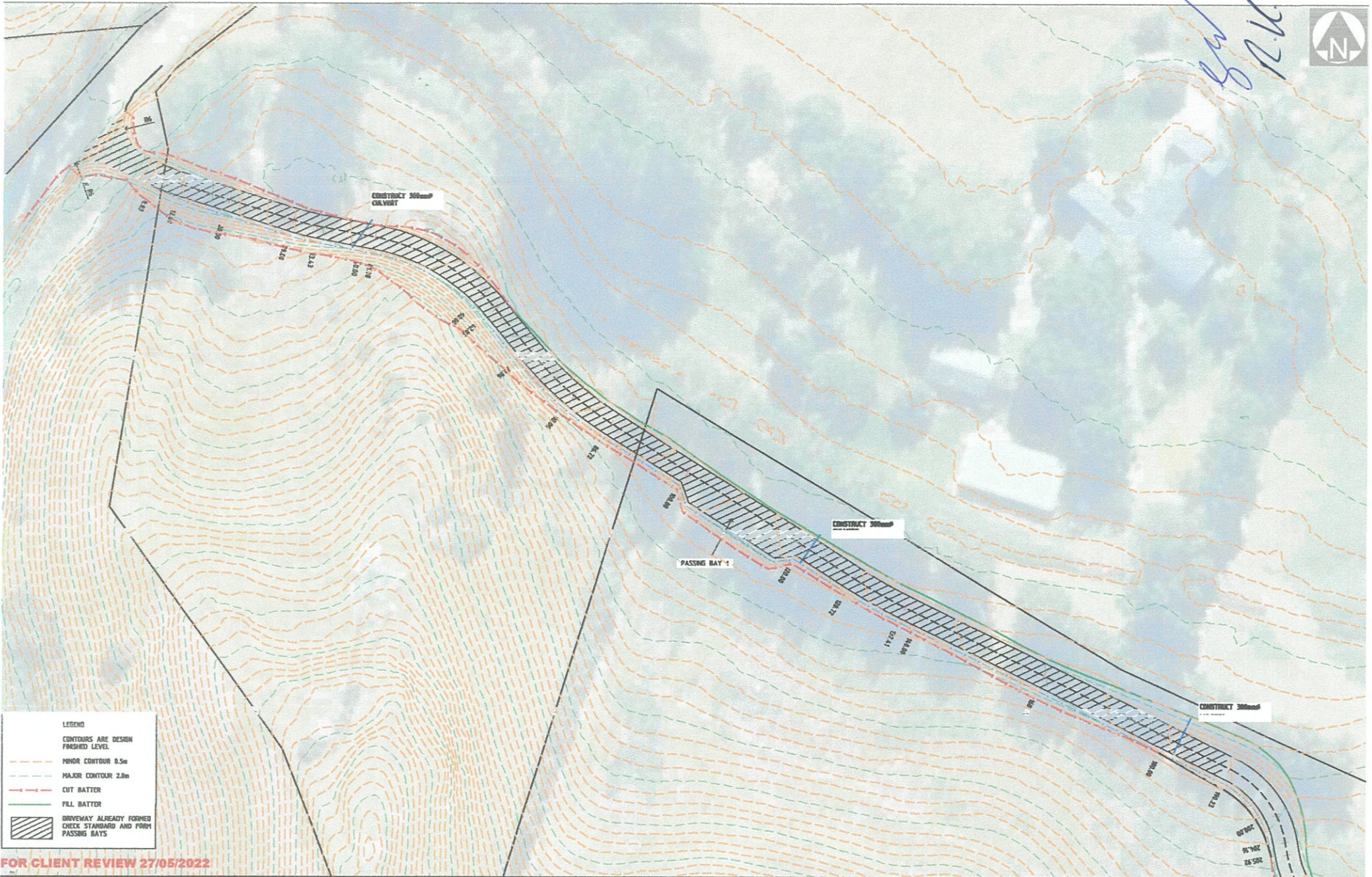
Rev.	Date	Revision Details	By
R	16.01.22	ATYWH CAR TRACK/TURN ARROUND ADVA	BM
L	24.05.22	LOWERED LAMP/ANK AND HOUSE TO 4.44.5m	BM

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
INDEX SHEET**

Client	Surveyed	Signed	Date	Job No.	Drawing No.
SHARLYN HILFORDMAN					
	Drawn	Signed	Date	Scale	1:1000 @ A1 1:2000 @ A3
	Designed	Signed	Date	Drawn & Level	MSL
<small>Notes: All dimensions shown are in meters unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without recording and checking them for accuracy against the original hard copy versions. - Copywrite on this drawing is reserved.</small>					Rev. C



Handwritten signatures and initials in blue ink.



LEGEND

- CONTOURS ARE DESIGN FINISHED LEVEL
- MINOR CONTOUR 0.5m
- MAJOR CONTOUR 2.0m
- CUT BATTER
- FILL BATTER
- DRIVEWAY ALREADY FORMED CHECK STANDARD AND FORM PASSING BAYS

FOR CLIENT REVIEW 27/05/2022

Rev.	Date	Revision Details	By

LOT 2 DP 301351, 346 MORVEN FERRY ROAD ROAD LAYOUT

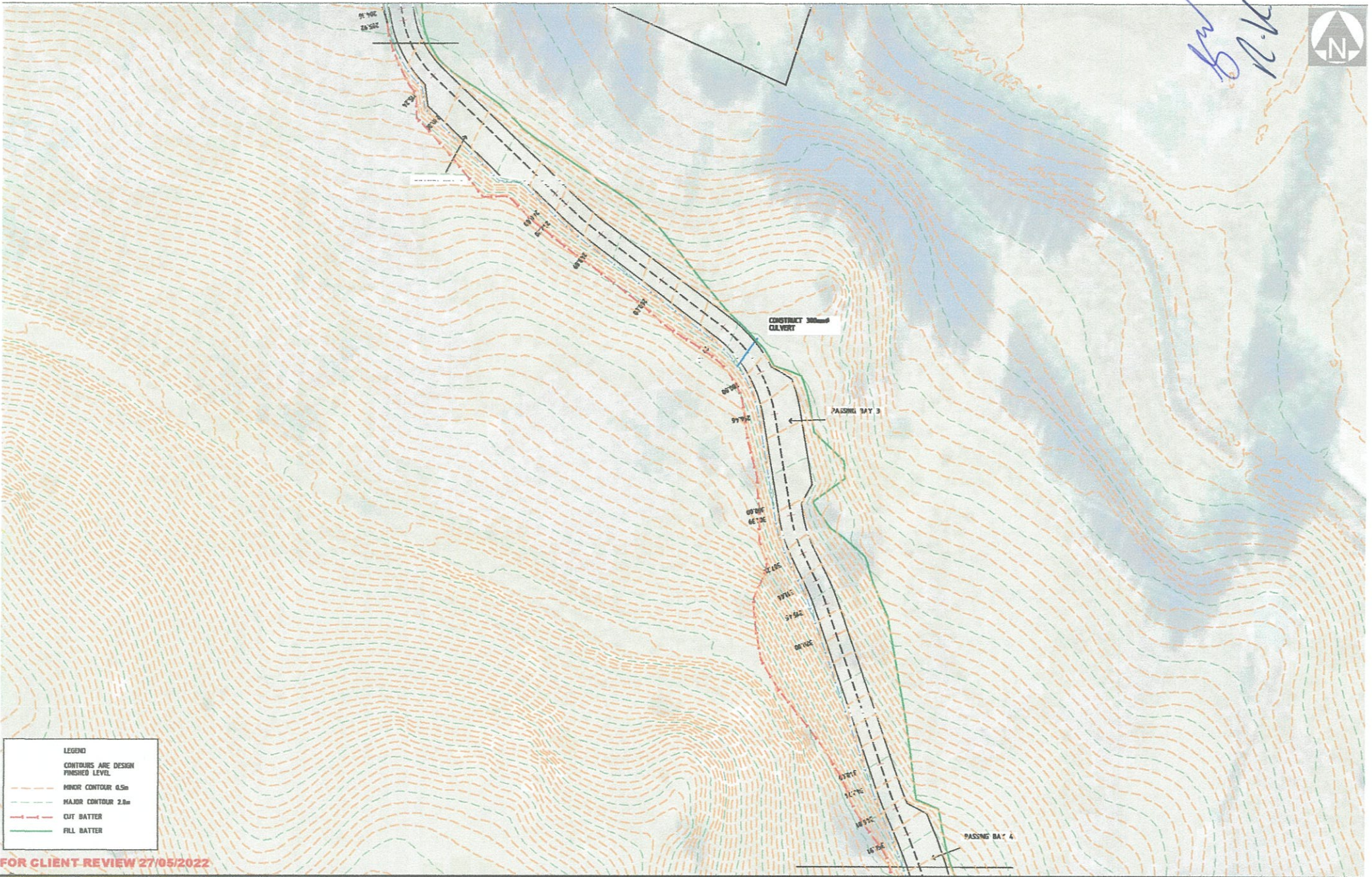
Client	Survived	Signed	Date	Job No.	Drawing No.
SHARLYN HENNINGAN					
Notes:	Drawn	Signed	Date	Scale	
All dimensions shown are in meters unless shown otherwise.			30.11.21	1:250 @ A1	
Any person using Clark Fortune McDonald drawings and other data warrants the risk of	Designed	Signed	Date	Drawn & Lined	Rev.
- Using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions.			30.11.21	MSL	-
- Copyright on this drawing is reserved.					

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 Licensed Civil Engineers - Land Development - Planning Consultants

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 Tel: (03) 443-4440, Fax: (03) 443-4445, Email: admin@cfma.co.nz
 Unit 6B, Level 1, 480 Moray Place, P.O. Box 5960, Dunedin
 Tel: (03) 470-1587, Fax: (03) 470-1588, Email: admin@cfma.co.nz



Handwritten signature and initials in blue ink.



LEGEND	
	CONTOURS ARE DESIGN FINISHED LEVEL
	MINOR CONTOUR 0.5m
	MAJOR CONTOUR 2.0m
	CUT BATTER
	FILL BATTER

FOR CLIENT REVIEW 27/05/2022

Clark Fortune McDonald & Associates
 Limited Civil and Surveying - Land Development - Planning Consultants

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 Tel: (03)470-1587, Fax: (03)470-1583, Email: admin@cfma.co.nz

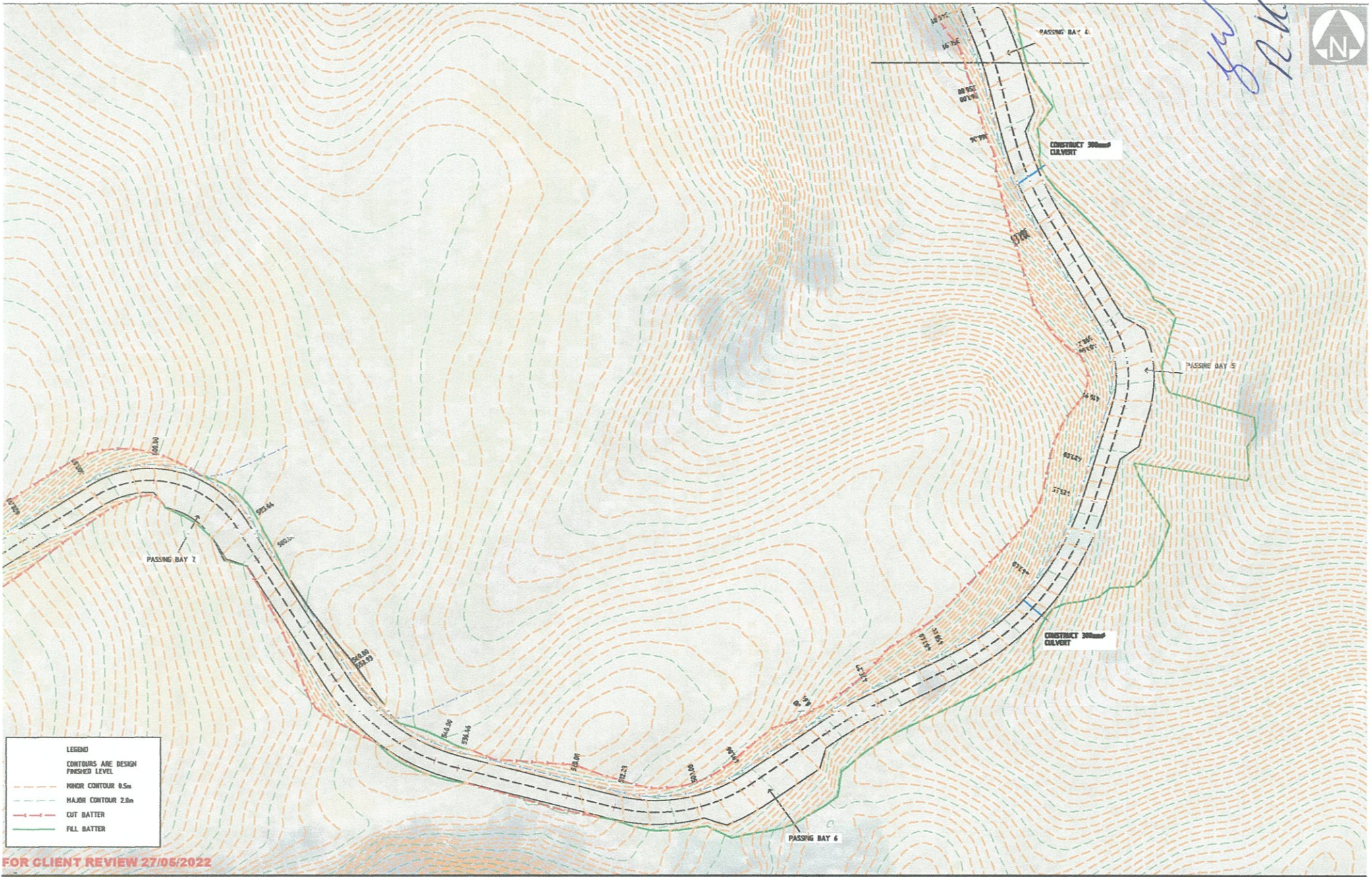
Rev.	Date	Revision Details	By

LOT 2 DP 301351, 346 MORVEN FERRY ROAD ROAD LAYOUT

Client	Drawn	Checked	Date	Job No.	Drawing No.
SHARON FINEGOWAN	BM	BM	30.11.21		1:250 @ A1 1:500 @ A3
Notes: - All dimensions shown are as written unless otherwise stated. - Any person using Clark Fortune McDonald drawings and other data accepts the risk of: - Using the drawings and other data in electronic form without recording and checking them for accuracy against the original hard copy versions. - Copyright in this drawing is reserved.	Designed BM	Signed BM	Date 30.11.21	Drawn & Level	Rev. MSL -



Handwritten initials: S.M. P.M.



LEGEND

- CONTOURS ARE DESIGN FINISHED LEVEL
- MINOR CONTOUR 0.5m
- MAJOR CONTOUR 2.0m
- CUT BATTER
- FILL BATTER

FOR CLIENT REVIEW 27/05/2022

Clark Fortune McDonald & Associates
 Urban & Rural Design & Planning
 300 Lower Shetover Road, P.O. Box 553 Queensland
 Tel: (02) 4414-6044, Fax: (02) 442-1066, Email: admin@cfma.co.nz
 21 Prince Consort, P.O. Box 550, Warralga
 Tel: (02) 443-4440, Fax: (02) 443-4445, Email: admin@cfma.co.nz
 Unit 6B, Level 1, 400 Moray Place, P.O. Box 2960, Dunedin
 Tel: 033470-1862, Fax: 033470-1583, Email: admin@cfma.co.nz

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
 ROAD LAYOUT**

Rev.	Date	Revision Details	By

Client	Drawn	Checked	Date	Scale	Sheet No.
SHARLYN HENNINGSEN	BH	BH	30.11.21	1:250 @ A1 1:500 @ A3	1 OF 1
Notes:	Designed	Signed	Date	Detail & Level	Rev.
All dimensions shown are as vectors unless shown otherwise. Any person using Clark Fortune McDonald drawings and other data except the rock cut. Using the drawings and other data in electronic form without recording and checking them for accuracy against the original hard copy versions. Copyright on this drawing is reserved.	BH	BH	30.11.21	MSL	A



Handwritten signatures and initials in blue ink.



LEGEND	
CONTOURS ARE DESIGN FINISHED LEVEL	
	MINOR CONTOUR 0.5m
	MAJOR CONTOUR 2.0m
	CUT BATTER
	FILL BATTER

FOR CLIENT REVIEW 27/05/2022

Clark Fortune McDonald & Associates
 303 Lower Shepherds Road, P.O. Box 553 Queensland
 Tel: (07)441-4044, Fax: (07)442-1966, Email: admin@cfma.co.nz
 21 Roscoe Crescent, P.O. Box 550, Warrakilla
 Tel: (02)443-4448, Fax: (02)443-4445, Email: admin@cfma.co.nz
 Unit 68, Level 1, 400 Moray Place, P.O. Box 5360, Dunedin
 Tel: (03)470-1562, Fax: (03)470-1589, Email: admin@cfma.co.nz

Rev.	Date	Revision Details	By
1	15/01/22	APPROX FAN PARK/TURN AROUND ASPFA	BN
2	27/05/22	LEWIS/HELI LAMP/PAK AND HOUSE 110 L44.5m	BN

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ROAD LAYOUT**

Client	Surveyed	Signed	Date	Job No.	Drawing No.
WHAKATŪ HELENGARU					
Drawn	Signed	Date	Scale		
BN		30.11.21	1:250 @ A1 1:500 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
BN		30.11.21	MSL	C	

Notes:
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 - Copyright on this drawing is reserved.

HORIZ CURVE DATA

VERT GEOMETRY GRADE (%)
VERT GRADE LENGTH (m)
VERT CURVE LENGTH (m)

DATUM R.L.320.00

DEPTH	C.L. FINISHED LEVEL	EXISTING G.L.	CHANGAGE
0.00	381.59	381.00	0.59
1.00	381.59	380.81	0.78
2.00	381.59	380.53	1.06
3.00	381.59	380.16	1.43
4.00	381.59	379.71	1.88
5.00	381.59	379.28	2.31
6.00	381.59	378.77	2.82
7.00	381.59	378.19	3.40
8.00	381.59	377.54	4.05
9.00	381.59	376.83	4.76
10.00	381.59	376.07	5.52
11.00	381.59	375.26	6.33
12.00	381.59	374.41	7.18
13.00	381.59	373.52	8.07
14.00	381.59	372.59	9.00
15.00	381.59	371.63	9.96
16.00	381.59	370.64	10.95
17.00	381.59	369.62	11.97
18.00	381.59	368.57	13.02
19.00	381.59	367.49	14.10
20.00	381.59	366.38	15.21
21.00	381.59	365.24	16.35
22.00	381.59	364.07	17.52
23.00	381.59	362.87	18.72
24.00	381.59	361.64	19.95
25.00	381.59	360.38	21.21
26.00	381.59	359.09	22.50
27.00	381.59	357.77	23.82
28.00	381.59	356.43	25.16
29.00	381.59	355.07	26.52
30.00	381.59	353.69	27.90
31.00	381.59	352.29	29.30
32.00	381.59	350.87	30.72
33.00	381.59	349.43	32.16
34.00	381.59	347.97	33.62
35.00	381.59	346.50	35.10
36.00	381.59	345.01	36.59
37.00	381.59	343.51	38.10
38.00	381.59	342.00	39.62
39.00	381.59	340.48	41.16
40.00	381.59	338.95	42.72
41.00	381.59	337.41	44.30
42.00	381.59	335.86	45.90
43.00	381.59	334.30	47.52
44.00	381.59	332.73	49.16
45.00	381.59	331.15	50.82
46.00	381.59	329.56	52.50
47.00	381.59	327.96	54.20
48.00	381.59	326.35	55.92
49.00	381.59	324.73	57.66
50.00	381.59	323.10	59.42
51.00	381.59	321.47	61.20
52.00	381.59	319.83	63.00
53.00	381.59	318.19	64.82
54.00	381.59	316.54	66.66
55.00	381.59	314.89	68.52
56.00	381.59	313.24	70.40
57.00	381.59	311.58	72.30
58.00	381.59	309.92	74.22
59.00	381.59	308.26	76.16
60.00	381.59	306.60	78.12
61.00	381.59	304.94	80.10
62.00	381.59	303.28	82.10
63.00	381.59	301.62	84.12
64.00	381.59	299.96	86.16
65.00	381.59	298.30	88.22
66.00	381.59	296.64	90.30
67.00	381.59	294.98	92.40
68.00	381.59	293.32	94.52
69.00	381.59	291.66	96.66
70.00	381.59	289.99	98.82
71.00	381.59	288.33	101.00
72.00	381.59	286.67	103.20
73.00	381.59	285.01	105.42
74.00	381.59	283.35	107.66
75.00	381.59	281.69	109.92
76.00	381.59	280.03	112.20
77.00	381.59	278.37	114.50
78.00	381.59	276.71	116.82
79.00	381.59	275.05	119.16
80.00	381.59	273.39	121.52
81.00	381.59	271.73	123.90
82.00	381.59	270.07	126.30
83.00	381.59	268.41	128.72
84.00	381.59	266.75	131.16
85.00	381.59	265.09	133.62
86.00	381.59	263.43	136.10
87.00	381.59	261.77	138.60
88.00	381.59	260.11	141.12
89.00	381.59	258.45	143.66
90.00	381.59	256.79	146.22
91.00	381.59	255.13	148.80
92.00	381.59	253.47	151.40
93.00	381.59	251.81	154.02
94.00	381.59	250.15	156.66
95.00	381.59	248.49	159.32
96.00	381.59	246.83	162.00
97.00	381.59	245.17	164.70
98.00	381.59	243.51	167.42
99.00	381.59	241.85	170.16
100.00	381.59	240.19	172.92

LONGSECTION - ACCESS 001

A1 HORIZ SCALE 1 : 1000
A1 VERT SCALE 1 : 1000

HORIZ CURVE DATA

VERT GEOMETRY GRADE (%)
VERT GRADE LENGTH (m)
VERT CURVE LENGTH (m)

DATUM R.L.373.00

DEPTH	EXISTING G.L.	CHANGAGE
0.00	433.45	0.33
1.00	433.45	0.33
2.00	433.45	0.33
3.00	433.45	0.33
4.00	433.45	0.33
5.00	433.45	0.33
6.00	433.45	0.33
7.00	433.45	0.33
8.00	433.45	0.33
9.00	433.45	0.33
10.00	433.45	0.33
11.00	433.45	0.33
12.00	433.45	0.33
13.00	433.45	0.33
14.00	433.45	0.33
15.00	433.45	0.33
16.00	433.45	0.33
17.00	433.45	0.33
18.00	433.45	0.33
19.00	433.45	0.33
20.00	433.45	0.33
21.00	433.45	0.33
22.00	433.45	0.33
23.00	433.45	0.33
24.00	433.45	0.33
25.00	433.45	0.33
26.00	433.45	0.33
27.00	433.45	0.33
28.00	433.45	0.33
29.00	433.45	0.33
30.00	433.45	0.33
31.00	433.45	0.33
32.00	433.45	0.33
33.00	433.45	0.33
34.00	433.45	0.33
35.00	433.45	0.33
36.00	433.45	0.33
37.00	433.45	0.33
38.00	433.45	0.33
39.00	433.45	0.33
40.00	433.45	0.33
41.00	433.45	0.33
42.00	433.45	0.33
43.00	433.45	0.33
44.00	433.45	0.33
45.00	433.45	0.33
46.00	433.45	0.33
47.00	433.45	0.33
48.00	433.45	0.33
49.00	433.45	0.33
50.00	433.45	0.33
51.00	433.45	0.33
52.00	433.45	0.33
53.00	433.45	0.33
54.00	433.45	0.33
55.00	433.45	0.33
56.00	433.45	0.33
57.00	433.45	0.33
58.00	433.45	0.33
59.00	433.45	0.33
60.00	433.45	0.33
61.00	433.45	0.33
62.00	433.45	0.33
63.00	433.45	0.33
64.00	433.45	0.33
65.00	433.45	0.33
66.00	433.45	0.33
67.00	433.45	0.33
68.00	433.45	0.33
69.00	433.45	0.33
70.00	433.45	0.33
71.00	433.45	0.33
72.00	433.45	0.33
73.00	433.45	0.33
74.00	433.45	0.33
75.00	433.45	0.33
76.00	433.45	0.33
77.00	433.45	0.33
78.00	433.45	0.33
79.00	433.45	0.33
80.00	433.45	0.33
81.00	433.45	0.33
82.00	433.45	0.33
83.00	433.45	0.33
84.00	433.45	0.33
85.00	433.45	0.33
86.00	433.45	0.33
87.00	433.45	0.33
88.00	433.45	0.33
89.00	433.45	0.33
90.00	433.45	0.33
91.00	433.45	0.33
92.00	433.45	0.33
93.00	433.45	0.33
94.00	433.45	0.33
95.00	433.45	0.33
96.00	433.45	0.33
97.00	433.45	0.33
98.00	433.45	0.33
99.00	433.45	0.33
100.00	433.45	0.33

LONGSECTION - ACCESS 001

A1 HORIZ SCALE 1 : 1000
A1 VERT SCALE 1 : 1000

FOR CLIENT REVIEW 27/05/2022

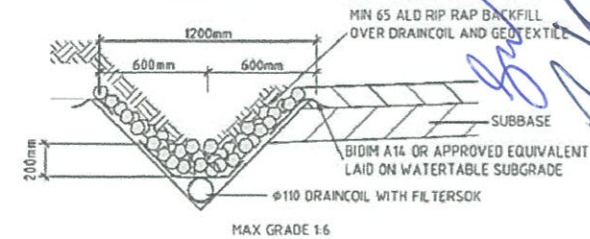
Clark Fortune McDonald & Associates
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**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ACC 001 LONGSECTIONS**

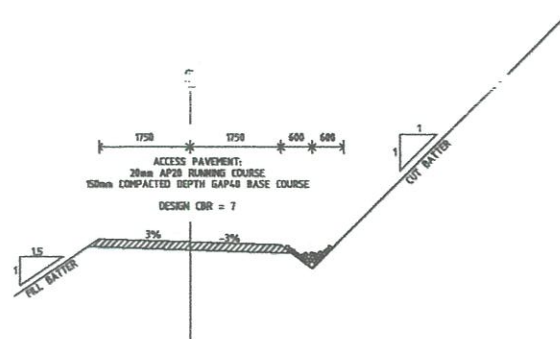
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SHARVIN HETIGMAN	DM	DM	30.11.21		MSHERY 007
	DM	DM	30.11.21		AS SHOWN
	DM	DM	30.11.21		MSL

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TYPICAL RIP RAP GEOTEXTILE LINED SWALE
SCALE 1:20



ACC 001
TYPICAL CROSS SECTION

FOR CLIENT REVIEW 27/05/2022

Clark Fortune McDonald & Associates
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21 Renca Crescent, P.O. Box 550, Wanaka
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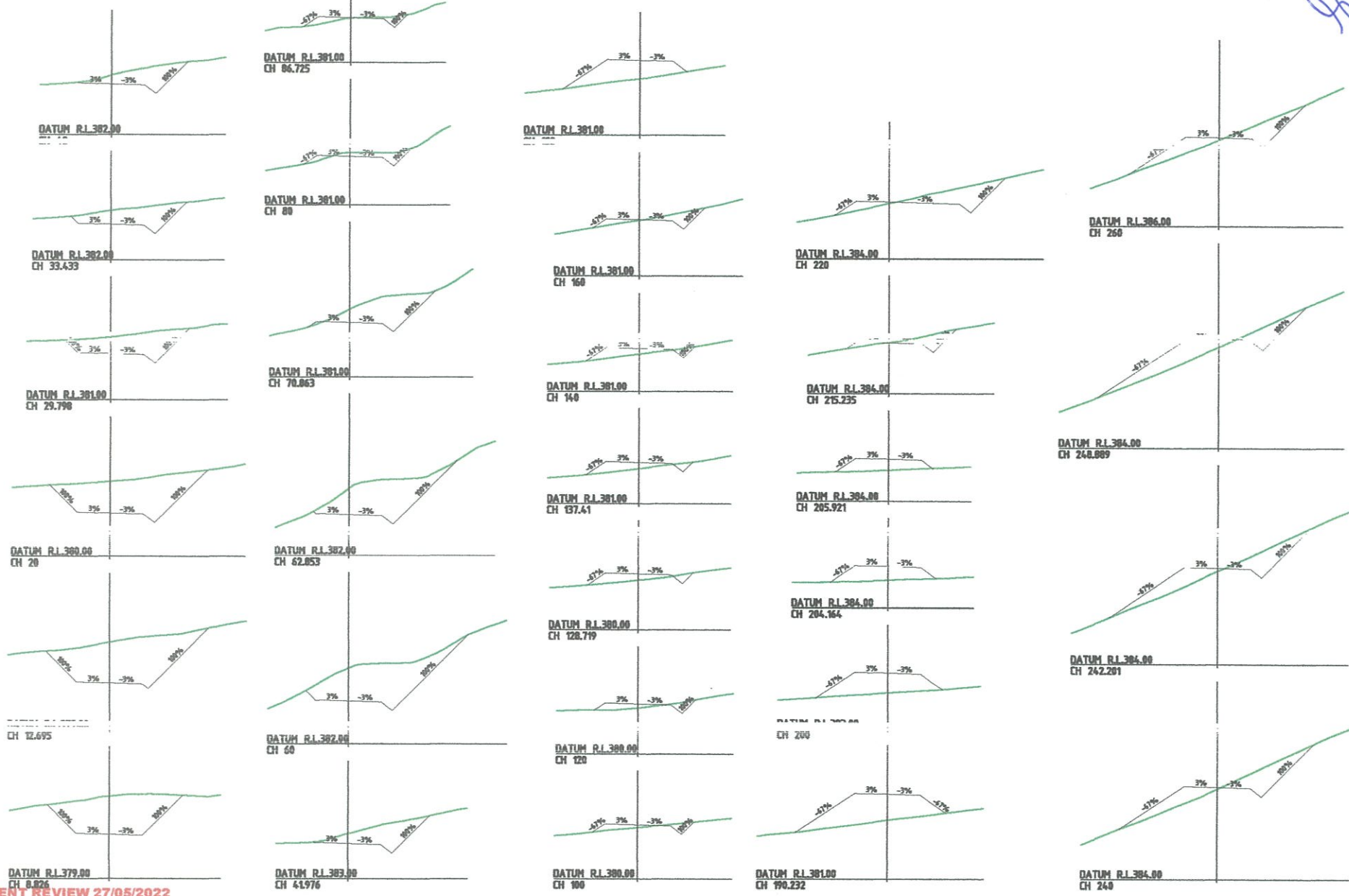
Unit 68, Level 1, 460 Moray Place, P.O. Box 6760, Dunedin
Tel (03) 479-1582, Fax (03) 479-1583, Email admin@cfma.co.nz

Rev.	Date	Revision Details	By
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ROAD TYPICAL CROSS SECTIONS**

Client	Surveyed	Signed	Date	Job No.	Drawing No.
SHARYN HENSMAN				13905	E001 SHEET 006
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	Designed BH	Signed	Date 30.11.21	Drawn & Laid MSL	Rev. -

Handwritten signature and initials



FOR CLIENT REVIEW 27/05/2022

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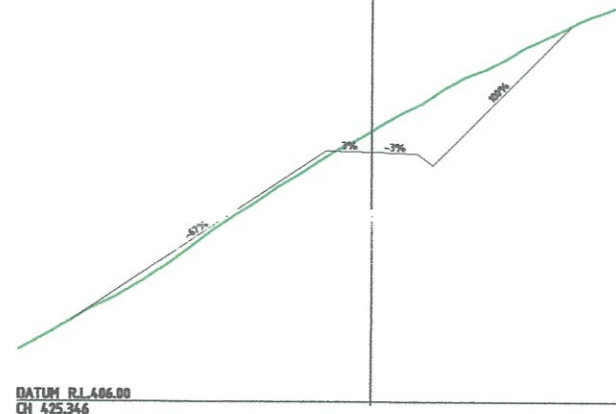
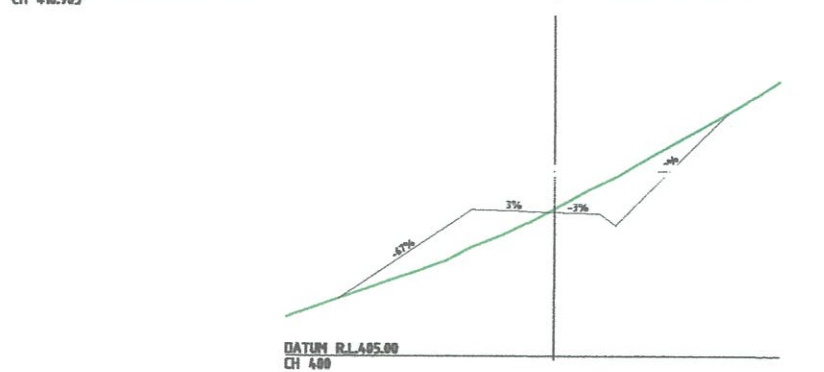
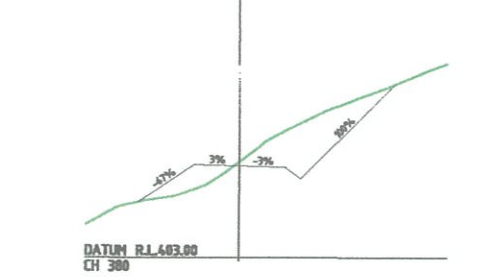
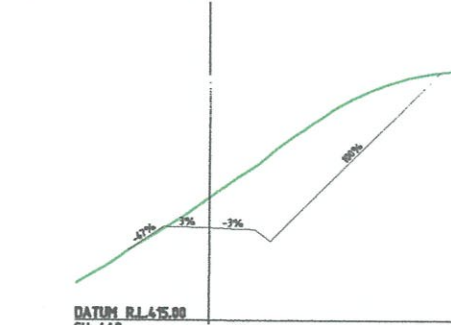
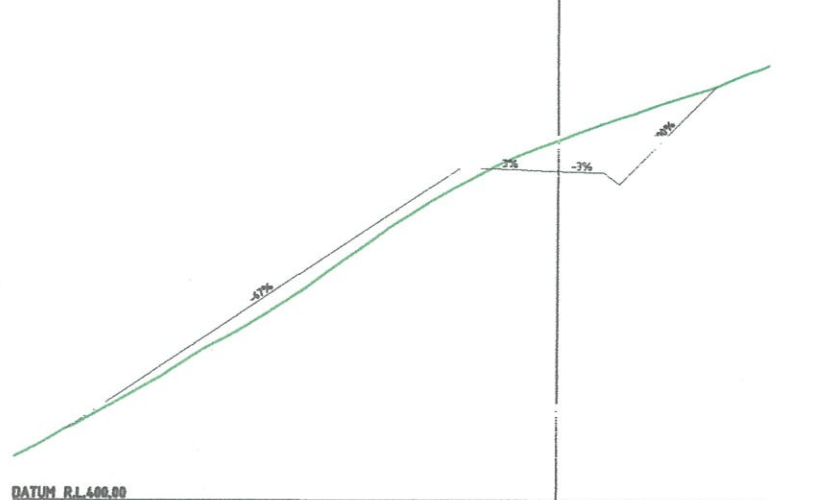
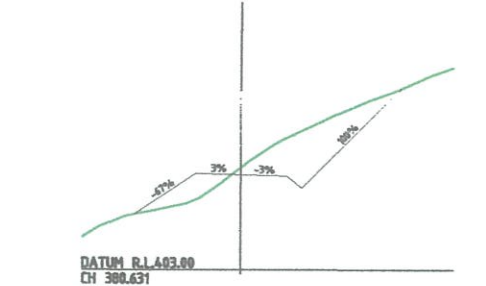
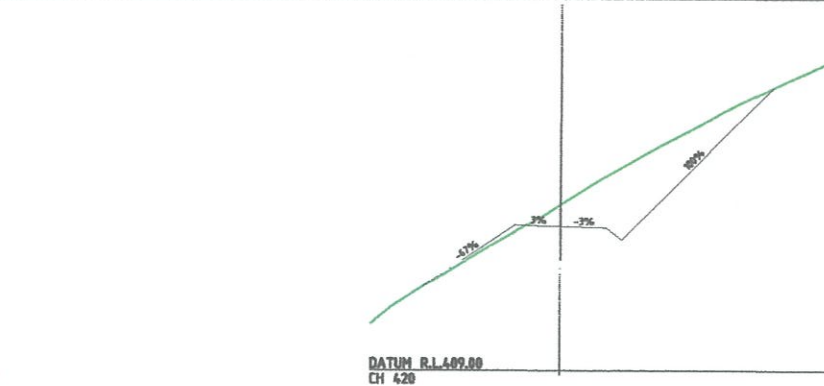
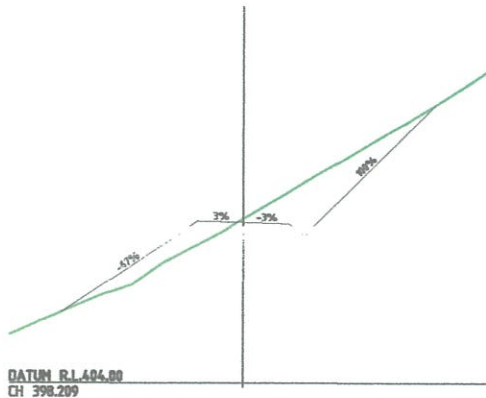
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Rev.	Date	Revision Details	By

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ACC 001 CROSS SECTIONS**

Client	Drawn	Checked	Date	Job No.	Drawing No.
SHAKYR HILFOWMAN	BM	BM	30.11.21		1:1000 @ A1 1:2000 @ A3
Notes:	Drawn	Checked	Date	Scale	
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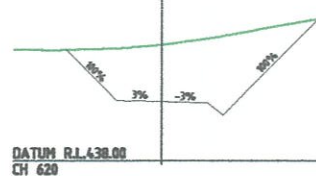
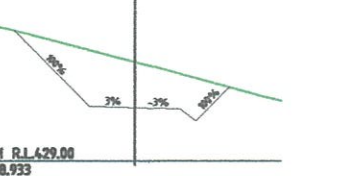
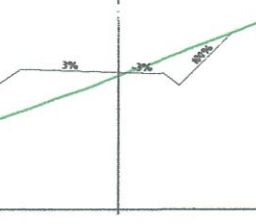
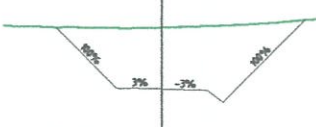
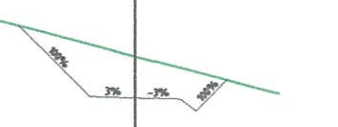
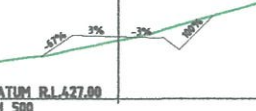
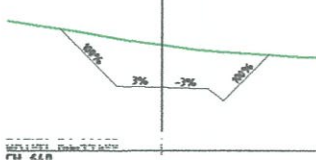
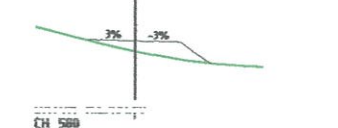
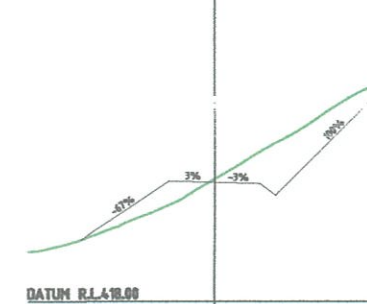
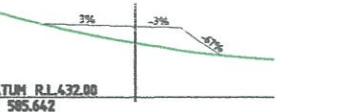
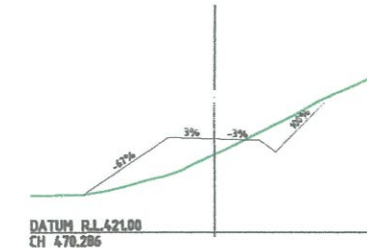
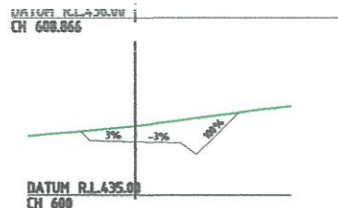
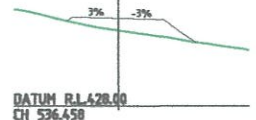
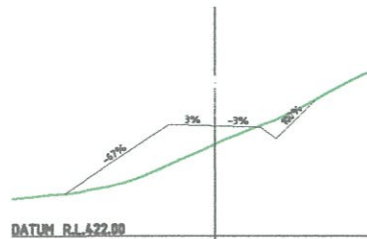
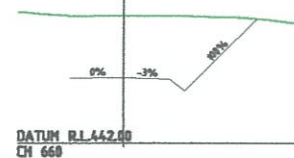
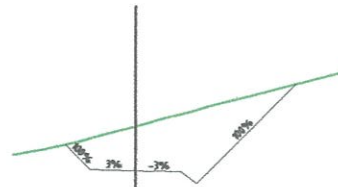
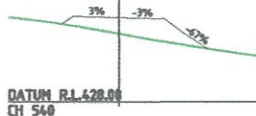
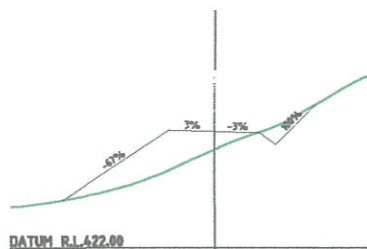
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Rev.	Date	Revision Details	By

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ACC 001 CROSS SECTIONS**

Client	Surveyed	Signed	Date	Job No.	Drawing No.
SPARKY HENSWAN					
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	BM		30.11.21	1:1000 @A1 1:2000 @A3	
	Designed	Signed	Date	Dates & Levels	Rev.
	BM		30.11.21	MSL	-

Handwritten initials: BW, R.V.



FOR CLIENT REVIEW 27/05/2022

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Rev.	Date	Revision Details	By
1	27/05/22	1. INITIAL DESIGN AND HOLD TO 644.5m	BM

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
ACC 001 CROSS SECTIONS**

Client	Surveyed	Signed	Date	Job No.	Drawing No.
SHARVYN HELFORDIAN					
Notes:	Drawn	Signed	Date	Scale	1:1000 @ A1 1:2000 @ A3
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	BM		30.11.21		C



LEGEND

EARTHWORKS

4.5m to 5.0m
4.0m to 4.5m
3.5m to 4.0m
3.0m to 3.5m
2.5m to 3.0m
2.0m to 2.5m
1.5m to 2.0m
1.0m to 1.5m
0.5m to 1.0m
0m to 0.5m
-0m to -0.5m
-0.5m to -1.0m
-1.0m to -1.5m
-1.5m to -2.0m
-2.0m to -2.5m
-2.5m to -3.0m
-3.0m to -3.5m
-3.5m to -4.0m
-4.0m to -4.5m
-4.5m to -5.0m

Fill Material

Cut Material

EARTHWORKS VOLUMES:
2750m³ FILL (SOLID)
6200m³ CUT (SOLID)

FOR CLIENT REVIEW 27/05/2022

Rev	Date	Revision Details	By
R	15.01.22	ADDED CAR PARK/TURN AROUND AREA	PM
L	27.05.22	LOWERED LAMP-POST AND HOUSE TO 444.5m	GM

**LOT 2 DP 301351, 346 MORVEN FERRY ROAD
EARTHWORKS PLAN**

Clark Fortune McDonald & Associates
Landscape Architects - Land Development - Planning Consultants

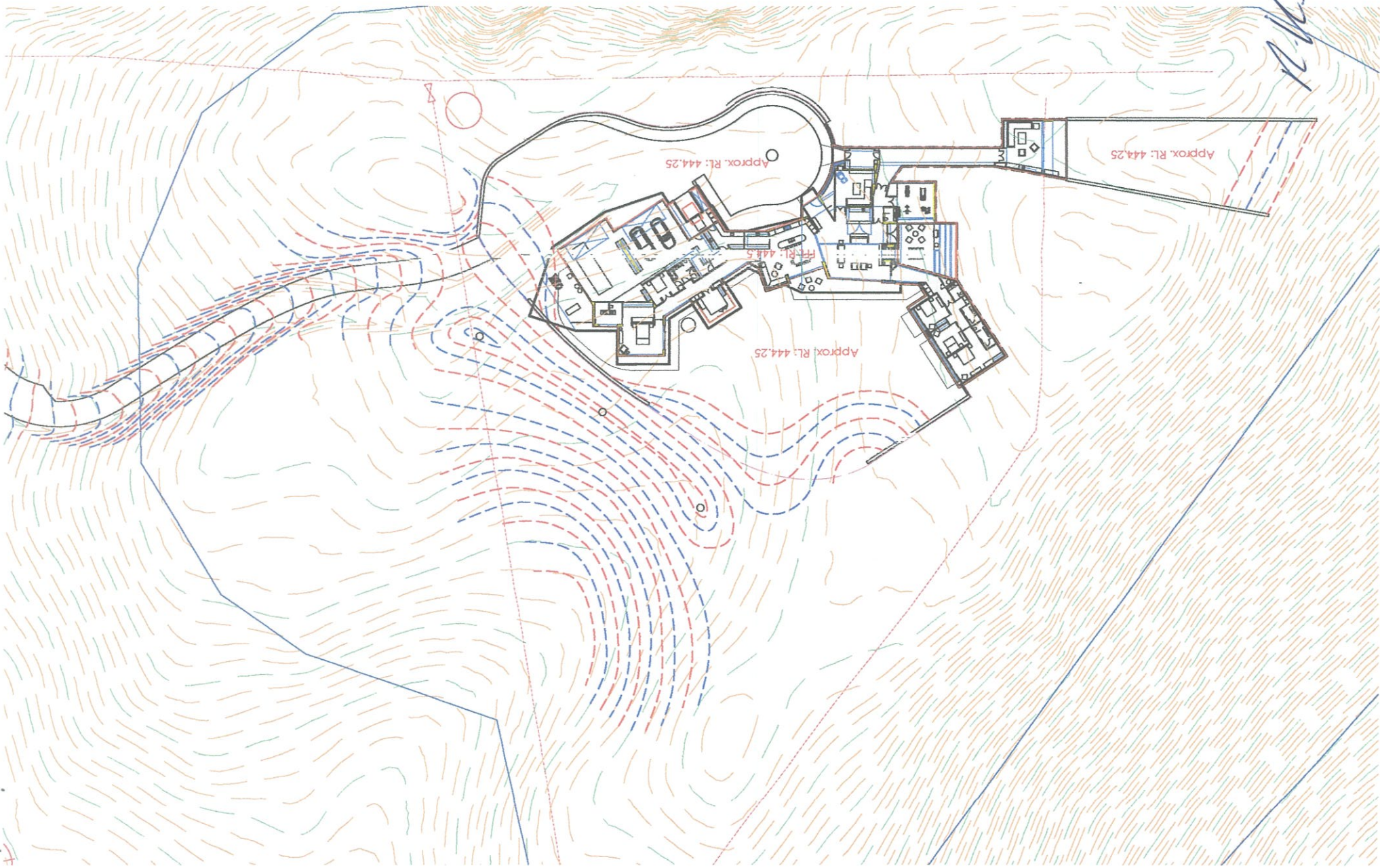
309 Lower Shotover Road, P.O. Box 503 Queenstown
Tel: (03)441-6044, Fax: (03)442-1066, Email: admin@cfma.co.nz
21 Raeta Crescent, P.O. Box 550, Wanaka
Tel: (03)442-4448, Fax: (03)443-4445, Email: admin@cfma.co.nz
Unit 68, Level 1, 480 Moray Place, P.O. Box 5360, Dunedin
Tel: (03)470-1897, Fax: (03)470-1583, Email: admin@cfma.co.nz

Client	Surveyed	Signed	Date	Auto No.	Drawing No.
SPARKYR FERGUSON	BH	Signed	30.11.21	1000	1000
Drawn	BH	Signed	30.11.21	Scale	1:500 @ A1 1:1000 @ A3
Designed	BH	Signed	30.11.21	Colour & Level	MSL

Notes:
All dimensions shown are in meters unless otherwise stated.
Any person using Clark Fortune McDonald drawings and other data without the date of the drawing is using the drawings and other data in electronic form without recording and checking them for accuracy against the original hard copy version.
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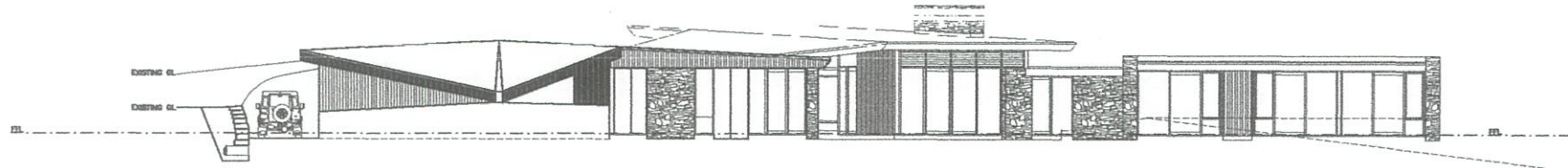
DRAFT



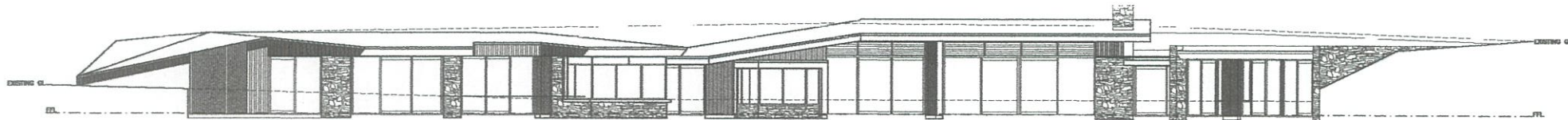
LEGEND	
MATERIAL	CONSTRUCTION
[Pattern]	ROOF/FIELD REGION FIBRE VERTICAL SHIP-LAP STAINED CEDAR WEATHERBOARD OVER 100MM CAVITY BATTEN OVER INSULATION OVER 75MM ECDPLYWOOD RIGID BRANER OVER FRAME
[Pattern]	200MM SENGED STONE VENEER TIED OVER 4.5 HANOKES FC SHEET OVER 100MM CAVITY OVER INSULATIVE STAIR FOL FACED RIGID INSULATION OVER 75MM ECDPLY OVER 140MM H1.2 TRUSS FRAME
[Pattern]	WARRANTY ARCHITECTURAL SERIES POWDER COATED ALUMINIUM DOUBLE GLAZED LOW E XCEL AIRDOOR GAS FILLED WINDOW ASSEMBLY INSTALLED LUNGE MOUNTAGE POWDER COATED GID ADAPTERS

Handwritten signature

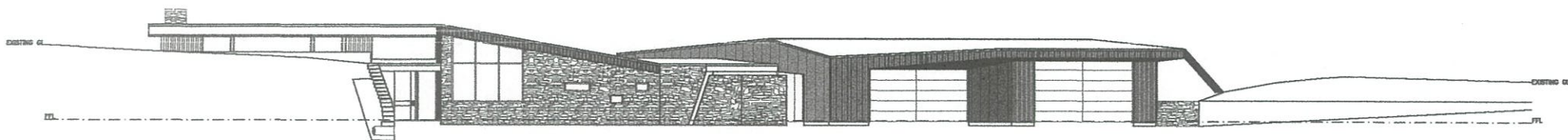
Handwritten initials



EAST ELEVATION
GROUND LINES REMOVED FOR CLARITY



NORTH ELEVATION
GROUND LINES REMOVED FOR CLARITY



SOUTH ELEVATION



Level 4, 48 Dufferin Street
Auckland, P O BOX 9252
Central
New Zealand
Tel: +64 9 250 1811
Email: info@heai.co.nz

NO.	DESCRIPTION	DATE	INITIALS	ISSUE	AMENDMENTS	DATE	INITIALS
1	CLIENT DEVELOPED DESIGN CHECK, ELEVATIONS	12/01	HEAL				
2	ISSUE FOOTPRINT SHIP F	02/02	HEAL				
3	CLIENT DEVELOPED DESIGN CHECK	26/02	HEAL				
4	CLIENT DEVELOPED DESIGN CHECK						

DESIGNED BY	HEAL	DATE	JUNE 2021
DRAWN	HEAL	CHECKED	HEAL
CAD REF	2020_2021_HENSMAN	CONSULTING ENGINEER	

PROPOSED DWELLING
346 MORVEN FERRY ROAD
ARROW JUNCTION, QUEENSTOWN

ELEVATIONS

DATE	23/09/20
SCALE	1:100
JOB NO.	22 2021
SHEET NO.	A301
ISSUE	C



AFFECTED PERSON'S APPROVAL



FORM 8A

Resource Management Act 1991 Section 95

RESOURCE CONSENT APPLICANT'S NAME AND/OR RM

Sharyn Robertson

PERSON AFFECTED PERSON'S DETAILS

I/We Gayle and Richard Pettit

Are the owners/occupiers of
336 Morven Ferry Road

DETAILS OF PROPOSAL

I/We hereby give written approval for the proposal to:
Construct a single level residential dwelling and undertake associated earthworks, landscaping and access construction.

at the following subject site(s):
346 Morven Ferry Road

- I/We understand that by signing this form Council, when considering this application, will not consider any effects of the proposal upon me/us.
- I/We understand that if the consent authority determines the activity is a deemed permitted boundary activity under section 87BA of the Act, written approval cannot be withdrawn if this process is followed instead.

WHAT INFORMATION/PLANS HAVE YOU SIGHTED

I/We have sighted and initialled ALL plans dated and approve them.