Erosion & Sediment Control Plan

JOB NUMBER: 23-1883

Waikato Greenfield Racing Hub
PROJECT

Waikato Thoroughbred Racing Inc
CLIENT

SUBSTANTIVE APPLICATION – REV 1
16 September 2026

Erosion & Sediment Control Plan

23-1883 **Waikato Greenfield Racing Hub** **Corner Pencarrow, Hooker & Duncan Roads, Tamahere, Hamilton**



Prepared for: Waikato Thoroughbred Racing Inc **Project no:** 23-1883

Prepared by: **Simon Cathcart** | Environmental Manager

Reviewed by: **Callum Davison** | Civil Manager

Revision	Date	Status	Authorised by:
1	04/08/2026	Substantive Application – Fast Track	[redacted] **Simon Cathcart | Environmental Manager** **BSc, MSc (Hons), CEnvP, CPESC**

DISCLAIMER

This report has been prepared for our client and relates only to the proposal described therein and it is not to be used for any other project. No responsibility is accepted by BCD Group Limited or its directors, servants, agents, staff or employees for the accuracy of information provided by third parties and/or the use of any part of this report in any other context or for any other purpose.

TABLE OF CONTENTS

1	**Introduction**	**6**
1.1	Project Background	6
1.2	Purpose.	6
1.3	Regulatory Jurisdiction	6
1.4	Staging of ESCP through the delivery of the Project	7
1.5	Site Description	7
1.6	Integration with other Management Plans.	8
2	**Environmental Conditions**	**8**
2.1	Elevation and Topography	8
2.2	Geology	8
2.3	Soils	8
2.3.1	Investigation Procedure	8
2.3.2	Subsoil profile	8
2.3.3	Surficial Soils	9
2.3.4	Deeper Soils	9
2.4	Acid Sulphate Soil Risk	9
2.5	Groundwater and Dewatering	9
2.6	Slope Stability	10
2.7	Hydrology (Surface Water)	10
3	**Environmental Management Personnel**	**11**
4	**Erosion & Sediment Control Design**	**12**
4.1	Design Philosophy	12
4.2	Treatment Train	12
4.3	Management and Design Objectives	12
4.4	Erosion and Sediment Control Design Specifications	12
4.5	Appropriately experienced and qualified ESC designer.	12
5	**Sediment Controls**	**13**
5.1	Decanting Earth Bund (DEB)	13
5.2	Sediment Retention Pond (SRP)	13
5.3	Runoff diversion channels	14
5.4	Super Silt Fence (SSF)	15
5.5	Stabilised Construction Entranceways	16
6	**Location of Sediment Controls**	**17**
7	**Calculations**	**17**
8	**Dust Management**	**18**
8.1	Potential Project Dust Sources	18
8.2	Factors Influencing Dust Generation	18
8.3	Prevailing Winds	18
8.4	Dust Monitoring	19
8.5	Sensitive Receivers	19

DRAFT

8.5.1 Risk Profiles for Dust 19
8.6 Dust Impacts on Traffic 21
8.7 Dust Management Toolbox 23
8.7.1 Water Resources 23
8.7.2 Water Carts/Water Trailers 23
8.7.3 Surface applications of polymer stabilisers and hydroseed. 23
8.7.4 Hay mulch stabilisation. 24
8.7.5 Stockpile management. 24
8.7.6 Entranceways 25
8.7.7 Restrictions of work. 25
9 Compliance Management 26
9.1 Routine Internal Inspections 26
9.2 Monitoring Locations 26
9.3 Monitoring Methodology 26
9.4 Monitoring Frequency and Triggers 27
9.5 Records and Reporting 27
9.6 Maintenance Completed in a Timely Manner 27
9.7 Construction Management 27
9.7.1 Removal of Sediment Controls 27
9.8 As Built Documentation 28
9.9 Management Plan Amendments 28
9.10 Winter Works 28
9.11 Decommissioning of Erosion & Sediment Controls 28
10 Contingency Measures. 28
10.1 Heavy Rainfall. 28
10.1.1 Trigger thresholds and required response time (audits / inspections) 28
10.1.2 Pre rainfall preparedness (forecast heavy rain) 28
10.2 Dewatering 29
10.3 Incident Response 29
11 Report Limitations 29

DRAFT

Table of Appendices

A Location of Development Site

B Master plan of Development Site (Appendix M: Architectural Masterplan and Drawings – Fast-track Substantive Application Planning Assessment – Overall Summary)

C Change in levels – overall (Cut and Fill).

D Detailed topographic survey.

E Location of sediment controls (future update)

F Supporting Calculations (future update)

Tables

Table 1: Project Phases & the nature of ESCP content 7
Table 2: Property Details involved in the Waikato Thoroughbred Racing Hub 7
Table 3: Erosion & Sediment Control Roles & Responsibilities 11
Table 4: Risk Profiles for Dust 19
Table 5: Potential Sensitive Receiver Properties adjacent the Site 19

Figures

Figure 1: Surface Water Hydrological Connections. 10
Figure 2: Runoff Diversion Channel Design Details 14
Figure 3: Super Silt Fence (SSF) Design Details (Figure 25 from WRC Guidelines) 15
Figure 4: Stabilised Entranceway Design Details (Figure 13 from WRC Guidelines) 16
Figure 5: Wind directions in Tamahere 18
Figure 6: Sensitive receivers (closer than 200m from the proposed construction works) 22

Photos

Photo 1: Classic Decanting Earth Bund (DEB) 13
Photo 2: Classic Sediment Retention Pond (SRP) 14
Photo 3: Example of a Super Silt Fence (image courtesy of Cirtex Industries Ltd) 16
Photo 4: Example of a stabilised entranceway 17
Photo 5: Example of a Water Cart (Courtesy of Condor Civil Ltd) 23
Photo 6: Example of a Water Trailer (Courtesy of Metro Hire) 23
Photo 7: Hydroseed and polymer surface applications used to "lock down" and stabilise surfaces. 24
Photo 8: Surfaces can be covered with hay to stabilise them and reduce the risk of dust generation. 24
Photo 9: Use of geotextile fabric to stabilise stockpiles. 25

1 INTRODUCTION

1.1 Project Background

The purpose of the Project is to create a unique, world class greenfield racing hub designed for horse training, racing and other equine related activities, while bringing the expertise and strength of the local racing fraternity together in a centralised location. This enables the local racing industry to be more streamlined, competitive, sustainable and future focused while bringing potential international investment and creating a 'destination' for horse racing in New Zealand, also increasing tourism opportunities for the wider region. The Site location is show in Appendix A.

A key driver behind the proposed greenfield equine hub and racecourses is enabling the consolidation of four separate racecourse facilities (Te Rapa, Waipa and Cambridge thoroughbred courses, and the Cambridge harness track). These facilities duplicate assets and resources and, given their current condition require significant levels of upgrades and investment to provide fit-for-purpose facilities that meet the higher standards of the modern-day racecourse experience. The retirement of these areas also frees up significant tracts of land within existing urban areas for future development, increasing housing supply.

To support the development's financial viability and enhance the site's long-term vibrancy as a racing, entertainment, commercial and community precinct, the proposal includes a range of complementary activities on the remaining land. These include equine support services, rural residential housing developments, a retirement living community, a village centre and a bloodstock sales precinct. Masterplans for the Site are included in Appendix B. This plan shows:

Earthworks across the Site will be required for:

- Excavation of structural foundations, irrigation and stormwater ponds
- Stripping of topsoil and levelling/recontouring of the Site
- Development of roads and other surface infrastructure (3 waters
- Development of subsurface infrastructure.

Depths of excavations, earthworks staging and excavation methodologies are currently being developed. Initial estimations of earthworks volumes has cut and fill volumes at 646,498m^3 and 431,611m^3 respectively, with a maximum cut depth of 5.9m and a maximum fill depth of 6.7m. An additional 495,181m^3 of topsoil may be required to be removed. The final ground cover will vary across the Site and will include racetrack, grassed areas and impermeable surfaces (Refer Appendix C).

1.2 Purpose.

BCD Group have been engaged by Waikato Thoroughbred Racing (WTR) to produce an Erosion & Sediment Control Plan (ESCP) to manage potential environmental risks during earthworks at the properties located between Pencarrow Road, Hooker Road and Duncan Road, Tamahere, Hamilton (the Site). The purpose of this ESCP is to outline measures to prevent soil loss, manage runoff, and keep sediment from leaving a construction site and harming downstream environments.

1.3 Regulatory Jurisdiction

The Site falls under the regulatory jurisdiction of the Waikato District Council (WDC) and the Waikato Regional Council (WRC).

1.4 Staging of ESCP through the delivery of the Project

This ESCP is not intended to be used for construction there simply is not sufficient information available to develop a fit for purpose (fit for construction) Plan. A series of ESCP updates are anticipated as the project transitions through a series of phases . The nature of this phasing is illustrated in Table 1.

Table 1: Project Phases & the nature of ESCP content

Project Phases	ESC related activity on Site	Summary of ESCP Content
Substantive Application	• Investigative sampling/testing and survey.	• High level assessment of feasibility. • Mitigation and management approaches. • Not intended to be used for construction due to a lack of information available of construction methodologies, construction programme, contractor details.
Resource Consents issued (pre-construction)	• Soil sampling • Bench testing to inform the chemical treatment plan content (dosing rates, etc). • Finalisation of chemical delivery systems.	• Amendments to address specific ESC related resource consent conditions have haven't been anticipated. • Chemical Treatment Plan content incorporated.
Contractor Engagement & Appointment (pre-construction)	• Finalisation of specific location and sizing of controls with input from contractor (Sediment retention ponds, stabilised entranceways, perimeter bunds, diversion bunds, etc).	• Full ESCP inclusive of calculations, site -specific staging. • Location and sizing of all controls. • Full management detail.
Construction	• Construction commences.	• Approved ESCP ready for Construction.

1.5 Site Description

The site is located on multiple rural properties to the south-east of Hamilton City in the rural area of Tamahere and occupies approximately 165ha between Pencarrow Road, Hooker Road, Duncan Road the Waikato Expressway (Refer Appendix A). Table 2 identifies the properties involved.

Table 2: Property Details involved in the Waikato Thoroughbred Racing Hub

Attribute	Address	Legal Description (Area)
Address and legal description	37 Hooker Road & 38 Duncan Road, Tamahere, Hamilton	Section 2 SO 547526 [RT 1027516] 69.6 (ha)
	90 Duncan Road, Tamahere, Hamilton	Lot 2 DP 16925 [RT SA383/181] 14.2ha
	536 Pencarrow Road, Tamahere, Hamilton	Lot 2 DP 471383 [RT 650204] 18.5ha
	592 Pencarrow Road, Tamahere, Hamilton	Lot 1 DP 471383 [RT 650205] 23.8ha
	636 Pencarrow Road, Tamahere, Hamilton,	Section 49 SO 457609 [RT: 632409] 37.6ha
	644 Pencarrow Road, Tamahere, Hamilton	Section 46 SO 457609 [RT 632392] 13.5ha
Total Site Area	Approximately 165.5ha	

1.6 Integration with other Management Plans.

The ESCP has a delivery relationship with the following management plans:

- Chemical Treatment Management Plan
- Contaminated Site Management Plan (CSMP)
- Acid Sulphate Soil Management Plan (ASSMP)

Once resource consent conditions are confirmed the chemical treatment aspect of erosion and sediment control will be fully integrated into this ESCP.

When the CSMP and ASSMP have been finalised then this ESCP can be updated to identify, confirm, and detail the specific on-site operational management considerations to ensure the successful management of sediment treatment. This will include but not limited to:

- Management of chemical flocculant dosing rates within the context of potential acidic soil and water environments
- Management and monitoring of discharge standards.
- Trigger levels associated with discharge standards.
- Treatment and management of contaminated water associated with dewatering activities.

2 ENVIRONMENTAL CONDITIONS

2.1 Elevation and Topography

The Site is relatively flat and currently covered in grazing pasture. Soft undulations cover the property and increase to the north-western boundary adjacent Pencarrow Road. A detailed topographic survey has been completed (Refer Appendix D).

2.2 Geology

The published geology for the Site shows most of the Site is underlain with Late Pleistocene River deposits from the Hinuera Formation described as "cross-bedded pumice sand, silt and gravel with interbedded peat". There is an intrusion along the western boundary of the Site of early-middle Pleistocene River and igneous deposits of the Walton subgroup, described as alluvium dominated by primary and reworked, non-welded ignimbrite.

2.3 Soils

2.3.1 Investigation Procedure

The following investigations were undertaken by BCD to evaluate the subsurface conditions at the site on 10-14/11/2025. CPT data have not been attached and may be made available on request.

- 14 x hand augers (HA) up to 3m depth over area of the Site.
- 10 x cone penetrometer tests (CPT) up to 20m deep over the area of the Site.
- Soil permeability tests up to 2m depth for stormwater management.
- 10 x Piezometers were installed up to 3m deep.
- Three additional hand augers were undertaken on 18/12/2025.
- Four additional hand augers and two CPT were undertaken on 24/03/2026 on 90 Duncan Road. The Site is underlain with Typic Orthic Allophonic soils, with an area of Typic Orthic Gley soils intruding into the site from the eastern boundary. There are also Typic Orthic Granular soils coming into the site across the western boundary.

2.3.2 Subsoil profile

The subsoil profile encountered at the site is typical of the area surrounding the site and is consistent with the mapped regional geology.

2.3.3 Surficial Soils

The near surface conditions as encountered in the hand augers consist of 100-300mm of topsoil.

Below the topsoil, the general soil profile consisted of a 0.3m to 0.5m thick layer of stiff to very stiff silts overlaying interbedded sands and silts. The sands generally dominated the soil profile and were loose to dense (Hinuera Formation). Due to poor soil recovery, Scala penetrometer testing was continued below the hand auger depths and is shown on the logs.

HA06 was undertaken on the low-lying hill located near the western boundary. The soil profile consisted of clayey silts through to the base of the investigation.

2.3.4 Deeper Soils

The CPTs indicate the deeper soil profile consists of sands, with varying thickness of silt and clay lenses through to the base of the CPTs.

2.4 Acid Sulphate Soil Risk

BCD prepared a preliminary report assessing the risk associated with acid sulfate soils at the Site because the Waikato Regional Council acid sulfate risk screening map showing the Site as in a medium / high risk area.

28 samples were obtained from six sampling locations. All sampling locations presented at least one indicator of acid sulfate soils. Consequently, acid sulfates could not be conclusively ruled out, and a more comprehensive Acid Sulfate Management Plan (ASMP) was recommended.

When the civil earthworks design progresses past concept a more comprehensive ASMP can be developed that contains:

- an integrated management approach to earthworks
- handling and management protocols of acid sulfate soils

Low pH conditions are likely to complicate any chemical treatment approaches adopted as part of this ESCP. Consequently, the ASMP will be integrated into the chemical treatment section of this Plan when it is developed.

2.5 Groundwater and Dewatering

Groundwater was encountered at depths of 0.9m to 2.8m below ground level (bgl) at the time of the investigation in November. The groundwater was shallowest on the northeastern part of the site with groundwater progressively deepening towards the west and south. However, the depth variation is also a function of the changes in the ground surface elevation. When converted to reduced levels the groundwater is between RL 52m to 53.5m which is considered typical of spring levels in the area and is likely to be higher following periods of prolonged or intense rainfall.

BCD have installed piezometers in selected locations across the site and will be periodically monitoring them over the duration of the design works. Over the period from December 2025 to mid-March 2026, we have found groundwater fluctuations between 200mm to 300mm. A groundwater table of 1m bgl has been used in our preliminary assessment of liquefaction for uniformity.

Due to the shallow groundwater depth, it is anticipated that excavations for infrastructure or foundations will extend below the water table in parts of the site. Saturated sands are likely to be encountered in these scenarios which will impact the stability of the excavations.

The stability of temporary excavations below the groundwater can be managed through, slope design, dewatering, trench shields and temporary retaining, depending on location and depth of the excavation.

Dewatering the shallow groundwater table is unlikely to result in ground surface settlement due to the sandy nature of the zone being dewatered. Water from well points or sump pumps can be diverted away from the excavation and spread over the ground to recharge via infiltration, or to a designated recharge well.

During design phases dewatering needs will be assessed for compliance with the Waikato Regional Plan and any necessary consent will be obtained.

2.6 Slope Stability

The existing slopes are generally no steeper than 1V:6H and not considered to have a risk of slope instability (refer Appendix D). A natural slope is located within the western boundary which runs along Pencarrow Road. New slopes should be specifically assessed, although 1V:2.5H can be adopted for preliminary purposes for slopes not intercepting the water table. For ponds or other areas where cuts may be below the water table, shallower slope angles may be required or retaining / slope reinforcement incorporated into the design.

Final slope angles will be verified through geotechnical investigation, particularly where groundwater, weak soils, or construction disturbance may influence stability. This verification will be completed by a Chartered Professional Engineer (CPEng).

2.7 Hydrology (Surface Water)

An unnamed tributary of the Mangaone Stream is located within the centre of the Site. Also connected to the Site via a culvert under the Waikato Expressway (approximately 400m north of the Site) is the Mangaomapu Stream. The Waikato River is approximately 500 m to the south. Within the Site multiple man-made drains and stormwater channels have been excavated to run along the paddock boundaries. The surface topography directs the majority of surface water flows into these drains, before leaving the Site to the northwest via the un-named tributary of the Mangaone Stream. A significantly smaller portion of surface water runoff leaves the site to the North, under the Expressway, and into the Mangaomapu Stream (Refer Figure 1).

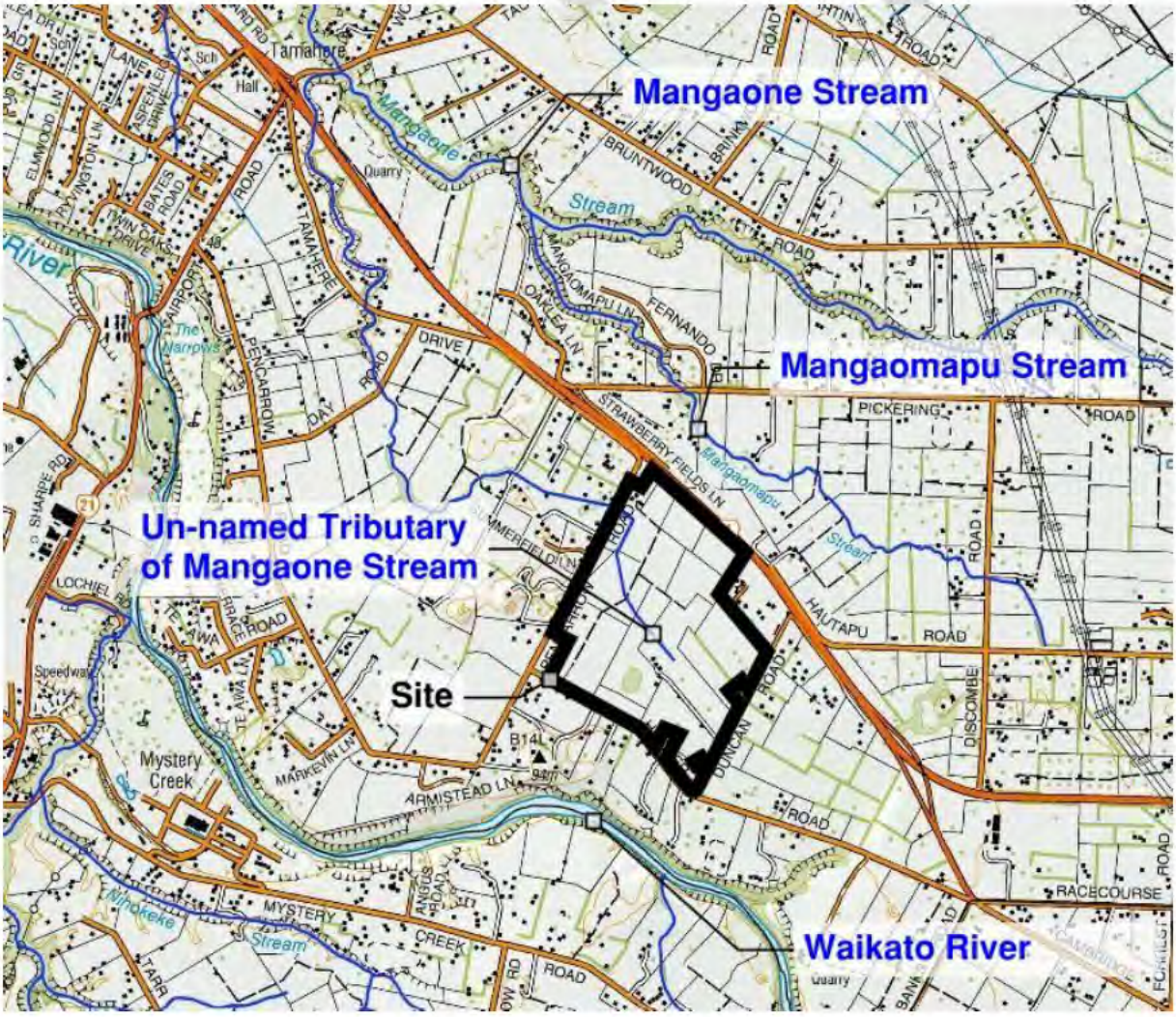


Figure 1: Surface Water Hydrological Connections.

3 ENVIRONMENTAL MANAGEMENT PERSONNEL

An earthworks contractor has not yet been confirmed. When a contractor is appointed, they will assign a "Project Manager" to the project who will be responsible for the implementation of the ESCP for the proposed works at the site. For the purposes of this work, the roles and responsibilities have been set out in Table 3.

Table 3: Erosion & Sediment Control Roles & Responsibilities

Position	Contact Name & Company	Responsibilities
Principal Earthworks Contractor	TBC	• Ensures that the Project Manager (PM) is aware of the importance of following the Erosion & Sediment Control Plan (ESCP) and provide the necessary support and resources to the PM to deliver upon the commitments made in the ESCP. • Ensure that the Project Manager is aware and clear about their responsibilities under this plan.
Project Manager	TBC	• Manage communications regarding the ESCP with the Waikato District Council (WDC) and the Waikato Regional Council (WPRC). • Ensure that the commitments made within the ESCP are delivered upon and achieved. • Ensure the Site Manager/Supervisor are aware and clear about their responsibilities under this plan. • Inspection or maintenance of erosion and sediment controls
Site Manager /Supervisor	*TBC*	• Ensure that all staff who work on the site, including sub-contractors, are made aware of the erosion and sediment control measures on site during their induction onto site. • Complete daily inspections of the erosion and sediment controls to ensure they are functioning correctly and direct any maintenance or corrective actions needed. • Liaise with WDC/WRC staff who attend site to inspect ESC. • Direct and supervise the installation of erosion and sediment controls in accordance with the ESCP.
Health, Safety & Environmental Advisor	TBC	• Inspection or maintenance of erosion and sediment controls.
Environmental Consultant	*BCD Group Limited* *Simon Cathcart* M[redacted] [redacted]	• Support the Site Manager/Supervisor with technical advice when required.

4 EROSION & SEDIMENT CONTROL DESIGN

This section of the ESCP discusses the range of different tools that will be employed by the Contractor to control and manage erosion and sediment control on the Project.

4.1 Design Philosophy

The following statements have been established to assist with understanding the philosophy that BCD Group have applied to the design and development of the ESCP.

- Erosion control will be considered as much as sediment control in the design of treatment options with an overall goal of high-quality discharges of treated water.
- The ambient ground Infiltration capacity will be encouraged wherever possible.
- A "treatment train" approach shall be adopted.
- As a priority clean water will be isolated from dirty water.
- Disturbance of soil within the project boundary will be staged and limited wherever possible to reduce the risk of sediment generation through erosion.
- Areas of disturbed soil will be stabilised either temporarily or permanently as soon as practicable to limit sediment generation through erosion.
- 24 hour, 7 days a week, 365 days a year maintenance access to all devices will be a priority.

4.2 Treatment Train

A "treatment train" comprises a series of best management practices and/or natural features, each planned to treat a different aspect of pollution prevention, or in this instance sediment prevention, that are implemented in a linear fashion to maximise the sediment removal. Erosion and sediment controls will be linked together each performing a specific role in terms of either surface water management, soil protection and stabilisation, and sediment capture. This approach will see a combination of structural and non-structural practices.

4.3 Management and Design Objectives

The management and design objectives of the ESCP are to:

- To operate in full compliance with the resource consent requirements and demonstrate this through reporting procedures and third-party compliance monitoring.
- To operate in full compliance with the Waikato Regional Plan permitted activity rules related to soil disturbance.
- To operate in full compliance with the Resource Management Act 1991.
- To liaise closely with the WRC and WDC and its agents during construction over matters of erosion and sediment control.
- To provide the methods that will be employed to avoid, remedy or mitigate adverse effects of sediment on the environment due to construction activities.
- Not to create any discharges of sediment from the construction site.
- To target a no discharge outcome through enhancement/encouragement of infiltration.

4.4 Erosion and Sediment Control Design Specifications

The nature and design criteria for all erosion and sediment controls used within the administrative boundaries of the Waikato Regional Council (WRC) are prescribed within the "Erosion and Sediment Control Guidelines for Soil Disturbing Activities, Guideline 2009/02" published by the WRC, January 2009.

4.5 Appropriately experienced and qualified ESC designer.

This ESCP has been developed by a suitably qualified and experienced practitioner (SQEP). Simon Cathcart is a certified Environmental Practitioner (CEnvP) with more than 20 years of experience designing, building, and maintaining erosion and sediment controls on a variety of construction projects ranging from small house lots through to large scale $800M Roads of National Significance (RoNS).

5 SEDIMENT CONTROLS

The WRC prescribe within the "Erosion and Sediment Control Guidelines for Soil Disturbing Activities, Guideline 2009/02" many possible sediment treatment devices/techniques available to be used as part of an erosion and sediment control plan. For this Project a limited number of controls will be used. These include:

- Decanting Earth Bund (DEB)
- Sediment Retention Pond (SRP)
- Perimeter bunds
- Super Silt Fence (SSF)
- Stabilised Construction Entranceways

5.1 Decanting Earth Bund (DEB)

A decanting earth bund is a temporary embankment built to capture sediment-laden runoff and release it slowly through a controlled decant system. It reduces flow velocity, promotes sediment settlement, and prevents downstream discharge of untreated runoff during earthworks, especially on construction sites where exposed soils generate high sediment loads (refer **Photo 1**).

WRC Guidelines detail the specifications for DEBs in Section 3.6 (pages 87-88) and refer to WRC Earthworks series – erosion and sediment control factsheet – Decanting earth bund.



Photo 1: Classic Decanting Earth Bund (DEB)

5.2 Sediment Retention Pond (SRP)

A sediment retention pond is an engineered basin constructed by excavation or embankment to capture sediment-laden runoff from disturbed areas (**Photo 2**). It temporarily stores water and releases it slowly through a controlled outlet, allowing suspended sediment to settle before discharge. Its primary function is to reduce sediment leaving a site, protecting downstream waterways from excessive sedimentation, erosion, and water quality degradation.

The WRC Guidelines detail the specifications for SRPs in Section 3.1 (pages 61-73) and refer to WRC Earthworks series – erosion and sediment control factsheet – Sediment Retention Pond.



Photo 2: Classic Sediment Retention Pond (SRP)

5.3 Runoff diversion channels

A dirty water runoff diversion channel is a compacted ridge or embankment constructed around or across a site to intercept and control runoff. It creates a temporary impoundment where water can be diverted, slowed, or ponded, allowing sediment to settle before discharge.

Its primary function is to prevent sediment-laden runoff from leaving the site by directing flows to appropriate treatment measures or retaining them within the site, thereby protecting downstream environments from erosion and sediment contamination.

The WRC Guidelines detail the specifications for dirty water runoff diversion channel in Section 2.1 (pages 19-22) refer **Figure 2**.

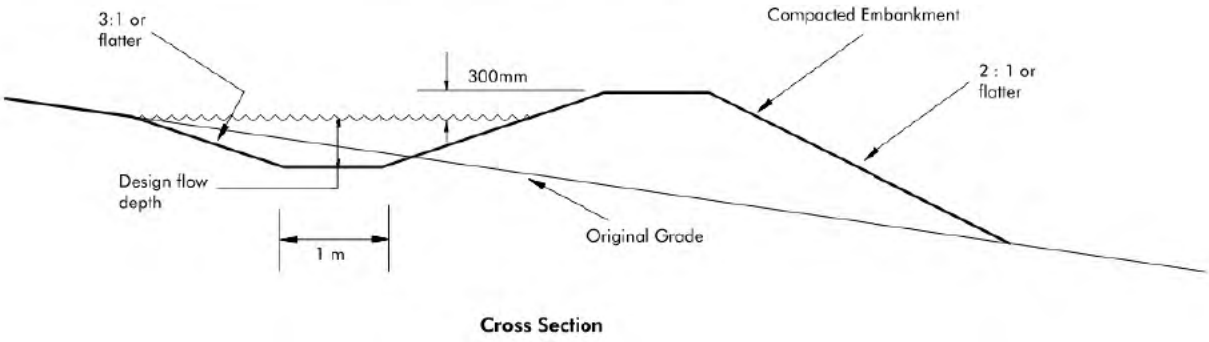


Figure 2: Runoff Diversion Channel Design Details

5.4 Super Silt Fence (SSF)

A super silt fence (SSF) is a reinforced sediment control barrier made of geotextile fabric supported by posts and often backed with mesh. It is installed along contours to intercept and slow overland flow, causing runoff to pond and allowing suspended sediment to settle before water passes through or around the barrier. Its primary function is to retain sediment from disturbed areas and minimise sediment discharge from construction sites, helping protect downstream environments from erosion and water quality degradation.

The WRC Guidelines detail the specifications for a SSF in Section 3.3 (pages 79-81). The general design specifics are illustrated in **Figure 3** below and an example of a SSF is illustrated in **Photo 3**.

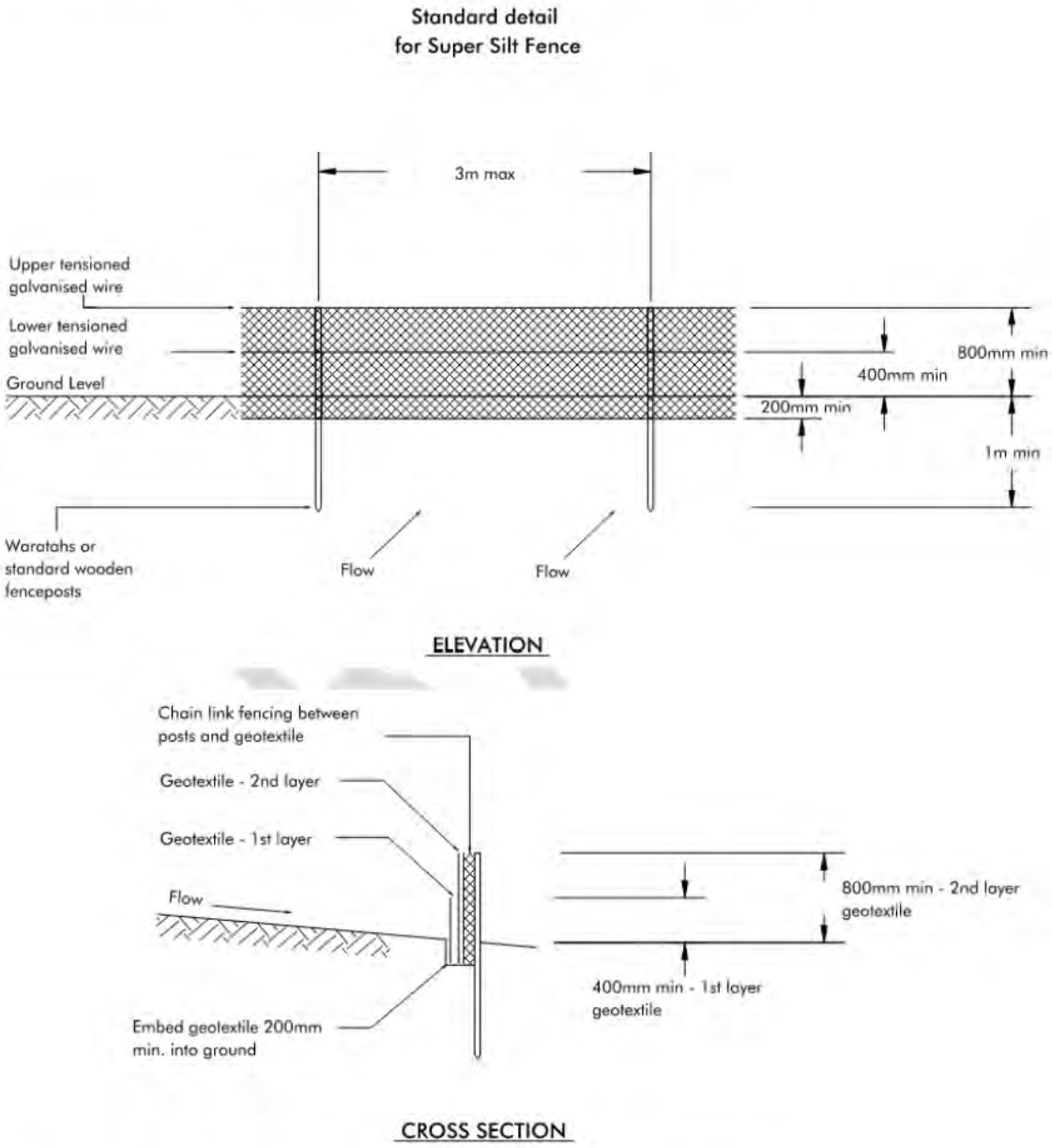


Figure 3: Super Silt Fence (SSF) Design Details (Figure 25 from WRC Guidelines)



Photo 3: Example of a Super Silt Fence (image courtesy of Cirtex Industries Ltd)

5.5 Stabilised Construction Entranceways

A stabilised construction entranceway is a defined access point at a construction site, typically formed using a layer of aggregate over filter fabric. It provides a firm surface for vehicles entering and leaving the site.

Its primary function is to prevent site access points from becoming sources of sediment by minimising tracking of mud and soil onto public roads, as well as reducing dust and disturbance around the site boundary.

The WRC Guidelines detail the specifications for a stabilised construction entrance in Section 2.13 (pages 49-50). The general design specifics are illustrated in **Figure 4** below and an example of a SSF is illustrated in **Photo 4**.

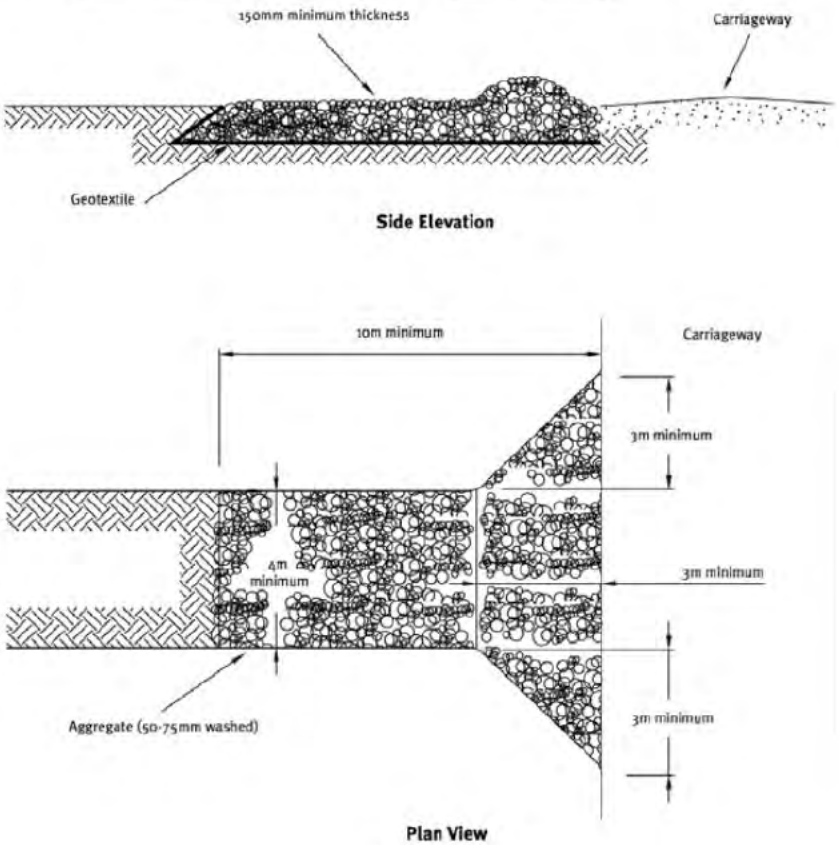


Figure 4: Stabilised Entranceway Design Details (Figure 13 from WRC Guidelines)



Photo 4: Example of a stabilised entranceway

6 LOCATION OF SEDIMENT CONTROLS

As discussed in Section 1.4. this ESCP is not yet developed sufficiently to be used for construction as:

- Civil and structural design has not been finalised sufficiently.
- Subsequently construction methodologies and particularly construction sequencing have not been finalised.
- An earthworks contractor has not been engaged, and they would traditionally, and need to, be engaged with over the sequencing, methodology, location and sizing of controls.

When the Project reaches the stage that an earthworks contractor has been engagement and appointment, but prior to construction commencing, this ESCP will be updated. The updates will detail the site-specific details of the deployment of sediment controls are shown in an Appendix to this plan.

7 CALCULATIONS

As described in section 6 when the Project reaches the stage that an earthworks contractor has been engagement and appointment, but prior to construction commencing, this ESCP will be updated. The updates will include the calculations used to accurately size the dirty water diversion channels, and the essential/specified design elements of the SRP/DEB are shown in an Appendix to this plan.

8 DUST MANAGEMENT

8.1 Potential Project Dust Sources

- Demolition.
- Earthworks, including vegetation removal, stripping of topsoil.
- Vehicle movements on unpaved surfaces.
- Loading and unloading of materials.
- Wind generated dust from dry exposed surfaces such as stockpiles and yard areas
- Rehabilitation of pavements including use of cement and lime.
- Pavement construction

8.2 Factors Influencing Dust Generation

The major factors that influence dust generation are:

- Wind speed across the surface (critical wind speed for "pick up" of dust particles is 5m/s (18km/h).
- Pick up increases rapidly above 10m/s (36km/h).
- Percentage of fine particles in the material on the surface.
- Moisture content of the material on the surface.
- Disturbances such as traffic, excavation, loading and unloading materials.
- The height of the source of dust above the surrounding ground level.

The smaller the particle size of the material on the surface of a road or an exposed surface, the more easily the particles are able to be picked up and entrained in the wind. Moisture binds particles together preventing them from being disturbed by wind or vehicle movements.

The larger the area of exposed material the more potential there will be for dust emissions. Vehicles travelling over exposed surfaces tend to pulverise any surface particles. Particles are lifted and dropped from the rolling wheels and the road surface is exposed to strong air currents due to turbulence between the wheels and the surface. Dust is also sucked into the turbulent wake created behind moving vehicles.

8.3 Prevailing Winds

Wind in the Tamahere area of the Waikato is characterised by a westerly bias as shown in **Figure 5**.

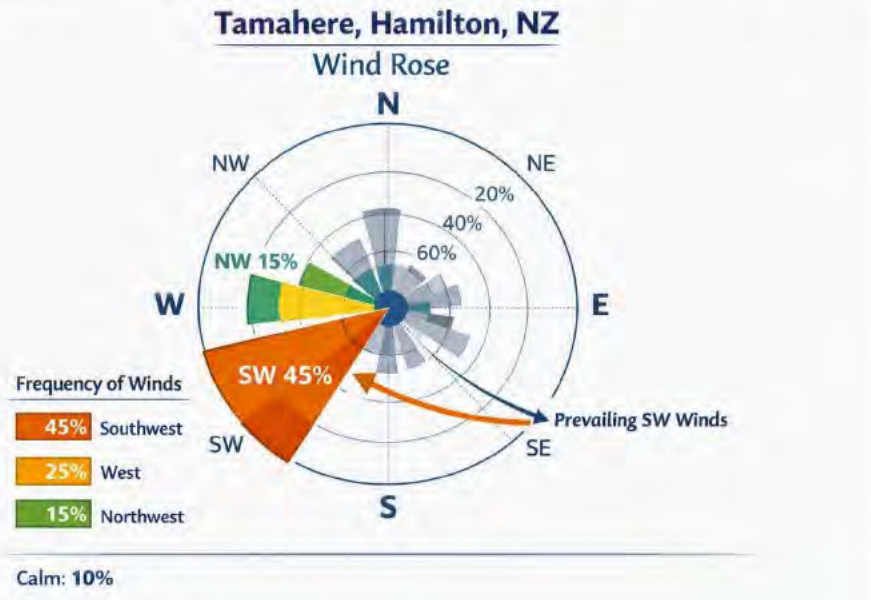


Figure 5: Wind directions in Tamahere

8.4 Dust Monitoring

Due to the site footprint being in close proximity to surrounding neighbouring properties Waikato Thoroughbred Racing Ltd recognises that nuisance dust is a possible risk. As such dust monitoring and mitigation will be a focus for the construction teams. Monitoring will consist of visual checks made by the Project Manager during the day.

8.5 Sensitive Receivers

Numerous neighbouring residential properties, in terms of dust nuisance, have been identified as potential sensitive receivers. This is due to their physical proximity (closer than 200m) to the proposed construction works. These properties are identified in Figure 6 and in **Table 5**.

8.5.1 Risk Profiles for Dust

To guide on-site approaches to dust management each potential sensitive receiver has been profiled. The risk profiles consider proximity to earthworks, location relative to prevailing winds and the site, nature of the property use. Four categories have been used to guide management – Tier 1, Tier 2, Tier 3, and Tier 3. **Table 4** defines the 4 risk categories. The baseline assumption is that the property is within 200m of the Site boundary and has a residential dwelling on it. The ascending order of control is 1 to 4:

- Tier 4 – Highest Control Requirements
- Tier 3 – Elevated Control Requirements
- Tier 2 – Standard Control Requirements
- Tier 1 – Baseline Control Requirement

Table 4: Risk Profiles for Dust

Risk Category	Determination Factors
Tier 1	• Property is surrounded by the site on at least 2-3 boundaries or is a medical facility requiring enhanced management.
Tier 2	• Residential dwelling within 50m of the site requiring heightened management.
Tier 3	• Property contains a residential dwelling, but that dwelling is between100-200m away from the boundary requiring standard management.
Tier 4	• Property is not immediately adjacent the Site and considered to have some for of vegetative screening on either that property or an adjacent property requiring general management.

Table 5: Potential Sensitive Receiver Properties adjacent the Site

Road	Address	Type of Property	Level of Risk (Extreme/High/Medium/Low)
Tamahere Drive	342B	Lifestyle Block	Tier 4
Pencarrow Road	478	Lifestyle Block	Tier 4
	480	Lifestyle Block	Tier 3
	511A	Lifestyle Block	Tier 2
	511C	Lifestyle Block	Tier 2
	516	Lifestyle Block	Tier 1
	525	Lifestyle Block	Tier 4
	531	Lifestyle Block	Tier 2
	533	Lifestyle Block	Tier 3
	535	Lifestyle Block	Tier 2

	557	Lifestyle Block	Tier 3
	563	Lifestyle Block	Tier 2
	587	Lifestyle Block	Tier 2
	599	Lifestyle Block	Tier 2
	605	Lifestyle Block	Tier 2
	607	Lifestyle Block	Tier 4
	613	Lifestyle Block	Tier 2
	635A	Lifestyle Block	Tier 3
	643	Lifestyle Block	Tier 2
	644	Lifestyle Block	Tier 1
Summerfield Lane	4	Lifestyle Block	Tier 2
	5	Lifestyle Block	Tier 2
	12	Lifestyle Block	Tier 4
Hooker Road	14	Lifestyle Block	Tier 3
	18	Lifestyle Block	Tier 3
	20	Lifestyle Block	Tier 2
	34	Lifestyle Block	Tier 2
	48A	Lifestyle Block	Tier 3
	62	Lifestyle Block	Tier 2
	70	Lifestyle Block	Tier 2
	72	Lifestyle Block	Tier 2
	82	Lifestyle Block	Tier 2
	100	Lifestyle Block	Tier 2
	101	Lifestyle Block	Tier 1
	102	Lifestyle Block	Tier 4
	136	Lifestyle Block	Tier 2
	146	Lifestyle Block	Tier 3
	154	Lifestyle Block	Tier 4
Duncan Road	18	Lifestyle Block	Tier 1
	47	Lifestyle Block	Tier 2
	70	Lifestyle Block	Tier 1
	71A	Lifestyle Block	Tier 2
	71B	Lifestyle Block	Tier 3
	77	Lifestyle Block	Tier 2
	93	Lifestyle Block	Tier 3
	104A	Mental Health Operations	Tier 1
	104B	Lifestyle Block	Tier 2
	104C	Lifestyle Block	Tier 2
	104D	Gardens	Tier 4
	107	Lifestyle Block	Tier 2

	109	Lifestyle Block	Tier 2
	110	Lifestyle Block	Tier 2
	112	Lifestyle Block	Tier 2
	114	Lifestyle Block	Tier 4
	117	Lifestyle Block	Tier 4
	124	Lifestyle Block	Tier 4
	151B	Lifestyle Block	Tier 4
	151C	Lifestyle Block	Tier 4
Hautapu Road	570	Dairy Farm	Tier 4
	573	Equine Breeding Farm	Tier 3
Strawberry Fields Lane	56	Equine Breeding Farm	Tier 4
	74	Orchard, Lifestyle Block	Tier 4
	78	Specialist Bovine Breeding	Tier 3

8.6 Dust Impacts on Traffic

Uncontrolled dust has the ability to adversely impact visibility on the roads surround the Site. Of particular concern is the higher speed and higher volume Waikato Expressway to the North of the Site.

DRAFT

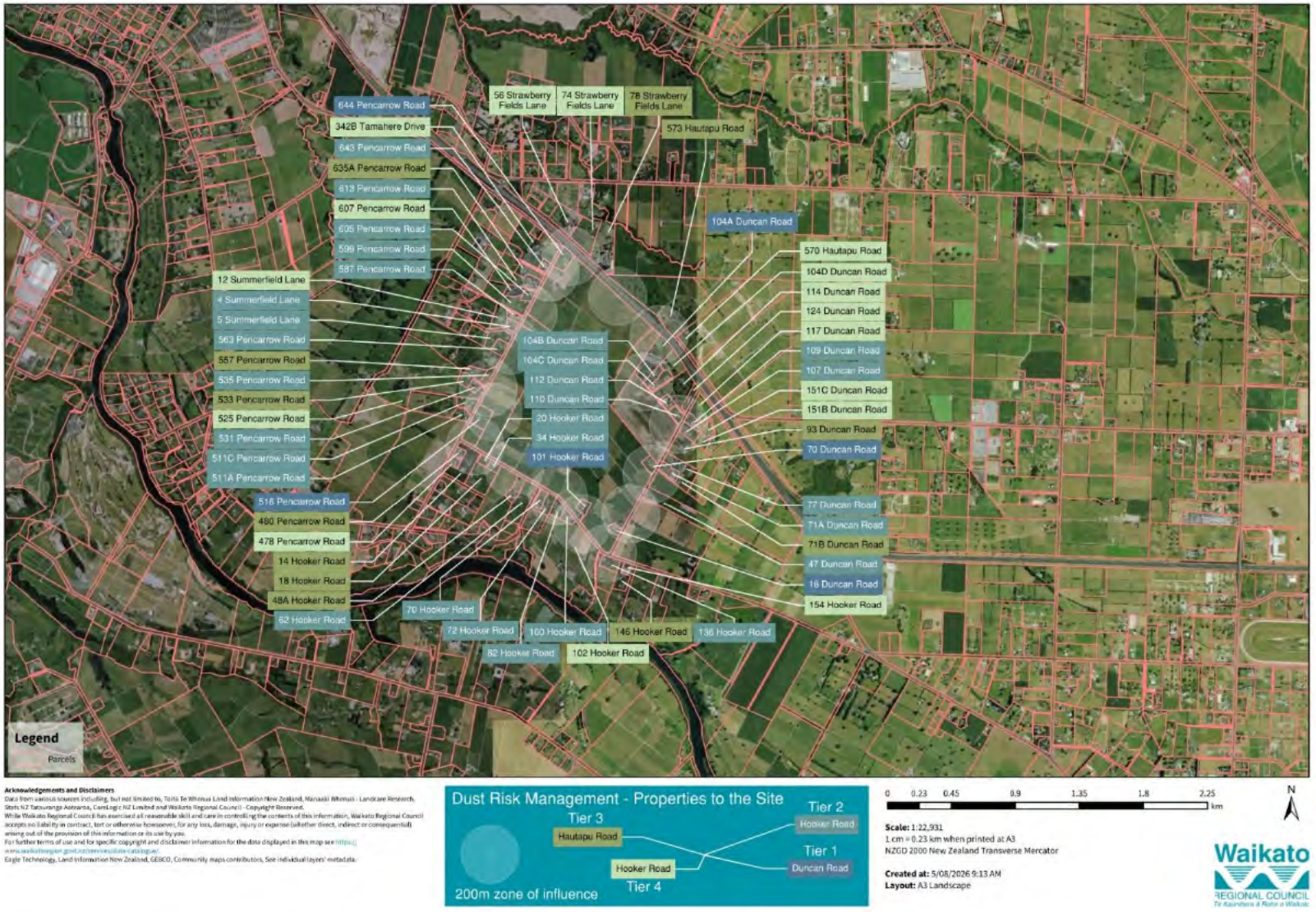


Figure 6: Sensitive receivers (closer than 200m from the proposed construction works)

8.7 Dust Management Toolbox

The following dust management and mitigation measures will be undertaken as required to minimise overall dust emissions and nuisance.

8.7.1 Water Resources

A water resource has yet to be confirmed for the site.

8.7.2 Water Carts/Water Trailers

Water carts and trailers will be the primary dust control mechanism. The advantage of the water cart/trailer for dust suppression on this site is mobility as water is not readily available on site which rules out sprinklers and water cannons. Water carts (and trailers can for example be deployed to retrieve water from neighbouring properties/orchards where water may be available subject to negotiations.



Photo 5: Example of a Water Cart (Courtesy of Condor Civil Ltd)



Photo 6: Example of a Water Trailer (Courtesy of Metro Hire)

8.7.3 Surface applications of polymer stabilisers and hydroseed.

Polymer stabilisers may be used to protect the high-risk areas and be applied to surfaces where dust has been identified as a significant risk. The inert nature of these products makes them ideal as an environmentally friendly application. The decision as to whether a polymer stabiliser will be utilised rests with Project Manager. Polymer stabilisers will only be used to treat dust nuisance issues and not be used to stabilise areas of exposed soil for erosion control purposes as this practice is not recognised by the guidelines. Hydroseeding of earth surfaces will also provide protection against nuisance dust (Refer Photo 7).



Photo 7: Hydroseed and polymer surface applications used to "lock down" and stabilise surfaces.

8.7.4 Hay mulch stabilisation.

Larger areas of exposed soil surfaces around the construction site can be covered with hay to stabilise them and reduce the risk of dust generation. Hay mulch may also be used to stabilise finished areas adjacent sensitive receivers or neighbours to mitigate as much dust nuisance as possible (refer Photo 8)



Photo 8: Surfaces can be covered with hay to stabilise them and reduce the risk of dust generation.

8.7.5 Stockpile management.

The surface of any stockpiles will be stabilised with either hay or geotextile fabric upon their completion and their size. Topsoil stockpiles will also be constructed with a low profile wherever possible to reduce the height of the bund and thus further reduce the stockpiles ability to generate dust as it has a lower profile exposed to wind (Refer Photo 9).



Photo 9: Use of geotextile fabric to stabilise stockpiles.

8.7.6 Entranceways

All entranceways, to and from the site, will consist of stabilised construction entranceways that will minimise the tracking of material out of the construction areas and onto the State Highway where if it dried may become a source of dust. The Project Manager will monitor the condition of the entranceways for debris and have them maintained using road sweeper vehicles and sucker trucks where required.

8.7.7 Restrictions of work.

Where wind conditions are severe enough then construction activities may cease or be restricted to mitigate any potential dust issues. The decision to restrict or cease work all together will be made by the Project Manager. To assist in making the decision the following criteria shall be reviewed:

- Wind Speed and direction currently prevailing.
- The construction activity currently being performed, and the length of time that activity is to continue.
- The distance to the nearest sensitive receiver and the nature of their sensitivity.
- The presence of historical complaints and the outcome of investigations into those complaints.
- The existence of a current complaint.
- The mitigation measures currently being applied and the additional measures that might be utilised.

9 COMPLIANCE MANAGEMENT

Erosion and sediment control will be administered on site by the Site Supervisor. A current copy of the ESCP will always be kept on site.

When issued, resource consent conditions will specify monitoring regimes and discharge standards. The following undertakings are meant to act as indictors and will be amended to reflect resource consent conditions when they are known.

9.1 Routine Internal Inspections

Monitoring will be undertaken to assess the effectiveness of erosion and sediment control measures and to confirm that sediment discharges from the site are being appropriately avoided, remedied, or mitigated in accordance with the conditions of consent conditions (when issued). Monitoring will focus on visual water quality observations and inspection of erosion and sediment control measures during earthworks.

9.2 Monitoring Locations

Water quality monitoring and visual inspections will be undertaken as part of the routine inspections at the following locations:

- SRP/DEB outlet pipes.
- Downstream monitoring location (zone of reasonable mixing).This location represents downstream conditions following the zone of reasonable mixing of site discharges with the receiving environment.
- Dewatering outlet locations.

Wherever possible these locations will remain consistent for the duration of the works unless otherwise approved by the Waikato Regional Council.

9.3 Monitoring Methodology

Monitoring will be undertaken by a Suitably Qualified and Experienced (SQE) Person and will include:

- Visual water quality assessments at both discharge and downstream locations, including observations of water clarity, colour, presence of suspended sediment, and any visible sheen or debris.
- Comparative assessment between upstream and downstream conditions to identify any discernible change attributable to site activities.
- Inspection of erosion and sediment control measures to confirm they are installed, operated, and maintained in accordance with the certified ESCP.

Where dewatering or active discharge is occurring, monitoring will confirm that water quality meets the ESCP requirements prior to discharge from site.

The Suitably Qualified and Experienced (SQE) Person responsible for oversight of erosion and sediment control monitoring and audits will be the Site Manager. The Site Manager will be responsible for day-to-day implementation, inspections, and compliance with the certified ESCP, including coordination of corrective actions where required.

In addition to the routine inspections and rainfall triggered audits specified in possible consent conditions, a formal monthly audit of the site and all erosion and sediment control measures will be undertaken by the Project Manager to verify ongoing compliance, identify any emerging risks, and confirm that controls remain effective and aligned with consent and ESCP requirements.

9.4 Monitoring Frequency and Triggers

Monitoring will be undertaken:

- At least weekly during periods of active earthworks; and
- As soon as practicable and within 24 hours following any rainfall event greater than 7 mm in 1 hour or 20 mm in 24 hours; and
- Following any incident, complaint, or failure of erosion and sediment control measures that may result in sediment discharge.

Response to Adverse Monitoring Results

If monitoring identifies:

- A noticeable deterioration in downstream water quality compared to upstream conditions; or
- Evidence of sediment discharge beyond that anticipated in the ESCP; or
- Failure or malfunction of erosion and sediment control measures,

Then immediate corrective actions will be implemented. These may include cessation of earthworks (except for ESC maintenance), repair or upgrade of control measures, additional stabilisation, or changes to construction sequencing. Where required by the consent conditions, the Manager will be notified and reporting undertaken in accordance with the incident response requirements.

9.5 Records and Reporting

All monitoring inspections will be recorded in writing, including:

- Date and time of monitoring.
- Weather conditions.
- Observations at SRP outlet and the downstream location.
- Condition of erosion and sediment control measures; and
- Any corrective actions undertaken.

Monitoring records will be provided to the Waikato Regional Council upon request and retained on site for the duration of the works

9.6 Maintenance Completed in a Timely Manner

The Site Manager/Supervisor will ensure that ESC work is completed as soon as practicably possible and not deferred only to be completed immediately before an external inspection.

9.7 Construction Management

The construction of the sediment controls will be closely managed as follows:

- The Project Manager will issue an approved ESCP to the Site Manager/Supervisor who will be responsible for the establishment.
- The construction of the controls will be overseen by the Site Manager/Supervisor.
- The Supervisor will liaise closely with the Environmental Consultant.
- Each control will be 'as built' by the Site Manager/Supervisor.

9.7.1 Removal of Sediment Controls

No ESCP amendments, or removal of sediment controls, will take place without first ensuring that either the site is stabilised sufficient that no controls are necessary and/or the amendment complies with the Guidelines. If in doubt the Site Manager/Supervisor can liaise with the Environmental Consultant for advice and direction.

9.8 As Built Documentation

Any "As Built" documentation will be completed by the Site Manager/Supervisor and supplied to WRC upon request. Copies of the "As Built" documentation will also be kept of site. All sediment controls will be labelled clearly with their identification number to aid with quick identification of controls and effective communication both with internal communications and external. "As Built" documentation will include photographs of the controls.

9.9 Management Plan Amendments

Amendments to the ESCP can be submitted to the WRC for review. Until such time as written approval is received from WRC on any proposed amendments the existing plan will remain in effect.

9.10 Winter Works

Only approved earthworks can be undertaken between 1st of May and 30th of September each year. Unless written approval of a winter works application is received from the WRC then all areas where earthworks have been undertaken shall be stabilised prior to 1st of May each year and be maintained in a stabilised state until at least 30th of September each year. The stabilised surface will be maintained in accordance with the ESCP.

Otherwise without written approval to complete earthworks during winter then no earthworks authorised by this consent, other than those necessary for the maintenance of erosion and sediment controls, shall take place during the period of 1st of May to 30th of September inclusive each year.

9.11 Decommissioning of Erosion & Sediment Controls

The Project Manager will not authorise the removal or decommissioning of any erosion or sediment control measure until the contributing catchment for the erosion or sediment control measure is completely stabilised. The Project Manager will submit in writing to WRC notice of the intent to remove controls prior to their removal or decommissioning. Written notice must include evidence of stabilisation and be signed off by SQE Person confirming that the contributing catchment for the erosion or sediment control measure is completely stabilised. Written approval from WRC is required before any controls are removed.

10 CONTINGENCY MEASURES.

10.1 Heavy Rainfall.

In the event of heavy rainfall, or where rainfall is forecast that is likely to generate increased sediment runoff, earthworks will cease (except for works necessary for the maintenance, repair, or modification of erosion and sediment control measures) and no further areas will be opened until conditions are suitable and controls are functioning as intended.

10.1.1 Trigger thresholds and required response time (audits / inspections)

- The site and all erosion and sediment control measures will be audited at least weekly, and as soon as practicable and within 24 hours after a rainfall event greater than 7 mm in 1 hour, or 20 mm in 24 hours.
- Following these rainfall events, any defects, overtopping risk, erosion, bypassing, tracking, or capacity issues identified will be rectified as soon as practicable to ensure controls remain effective and compliant with the certified ESCP.

10.1.2 Pre rainfall preparedness (forecast heavy rain)

Where heavy rainfall is forecast, the following measures will be implemented prior to rainfall to reduce risk of erosion and sediment discharge:

- Confirm clean water diversion controls are operating to isolate uncontaminated runoff from disturbed areas and reduce the dirty water catchment.
- Check perimeter controls (e.g., silt fence / super silt fence) for integrity and ensure no low points or outflanking pathways exist.

- Confirm sediment control devices have sufficient available storage and are functioning (including inlet/outlet protection and any treatment components).
- Ensure exposed areas are progressively stabilised where practicable (or otherwise protected) in accordance with the staging and stabilisation requirements of the ESCP

10.2 Dewatering

Where foundation excavations or other excavated areas accumulate water during rainfall, dewatering will be managed as follows:

- Sediment laden water will not be discharged untreated. Water will be pumped to sediment skips / sediment tanks (or equivalent containment) to allow settlement prior to discharge.
- Discharge will only occur once clarity is achieved. A minimum of 100 mm water clarity will be achieved before any water is pumped offsite/discharged.
- If 100 mm clarity cannot be achieved, water will be retained for further settlement/treatment or removed from site by tanker, as necessary.
- Where water is pumped to a sediment retention device, the outlet will remain closed/capped until clarity has been checked and confirmed to meet the minimum requirement prior to release.

10.3 Incident Response

If heavy rainfall results in a failure or malfunction of any erosion and sediment control measure, or any other unauthorised discharge of contaminants that has discharged either directly or via land to a waterbody or stormwater infrastructure, the following actions will be taken:

- Immediately notify the Manager of the incident.
- Immediately investigate the cause and implement changes required to prevent recurrence.
- Take photographs of the discharge point, and upstream and downstream of the discharge point.
- Re-establish erosion and sediment control measures as soon as practicable in accordance with the certified ESCP.
- Provide a written report within 5 working days including date/time, weather conditions, photographs, investigations undertaken, cause, response actions, and lessons learnt/preventative actions

11 REPORT LIMITATIONS

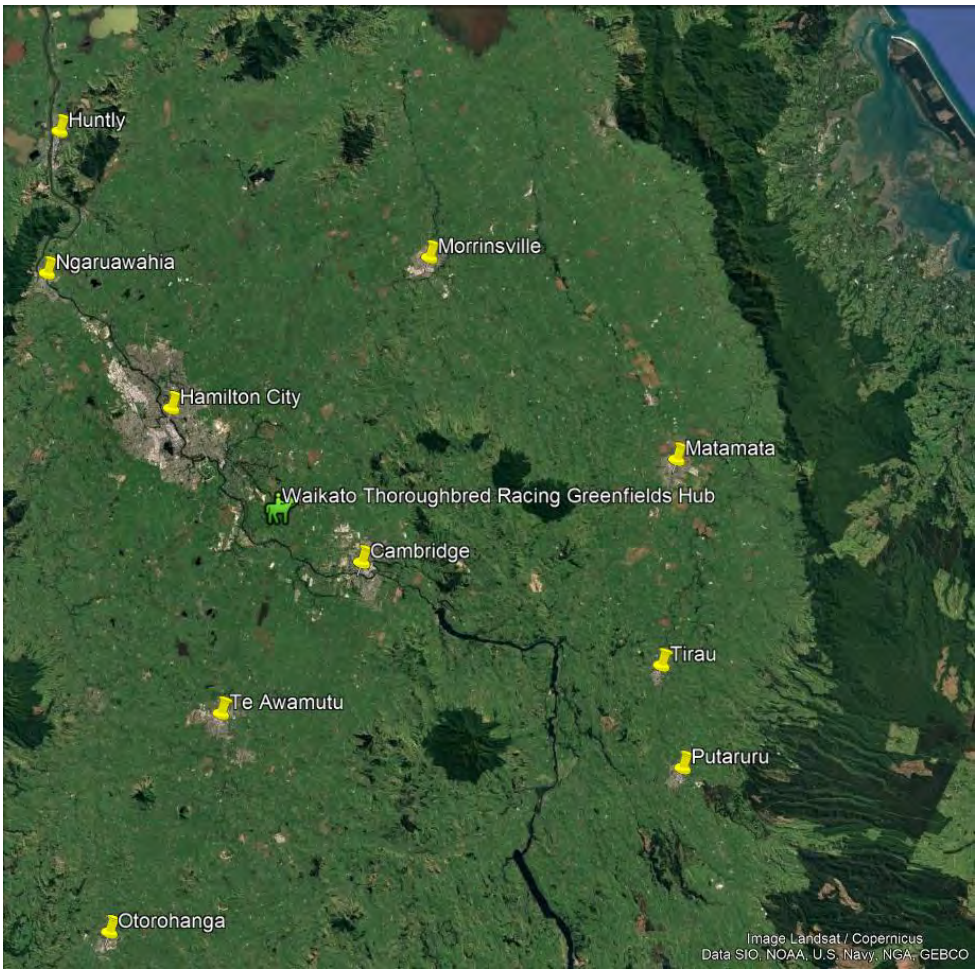
This report has been prepared for our client for their purposes and the regulatory authority in relation to the consent application within the scope of this report. It is based on our understanding of the proposed development. Should any changes to the nature of the development occur, BCD should be asked to provide comment on the ongoing applicability of recommendations made in this report. It is not to be relied upon or used out of context by any other person without reference to BCD Group Ltd. The reliance by other parties on the information or opinions contained in this report shall, without prior review and agreement in writing, be at such parties' sole risk. To avoid misinterpreting this report, we recommend that the assistance of ESC professionals familiar with the project and scope of this report is maintained.

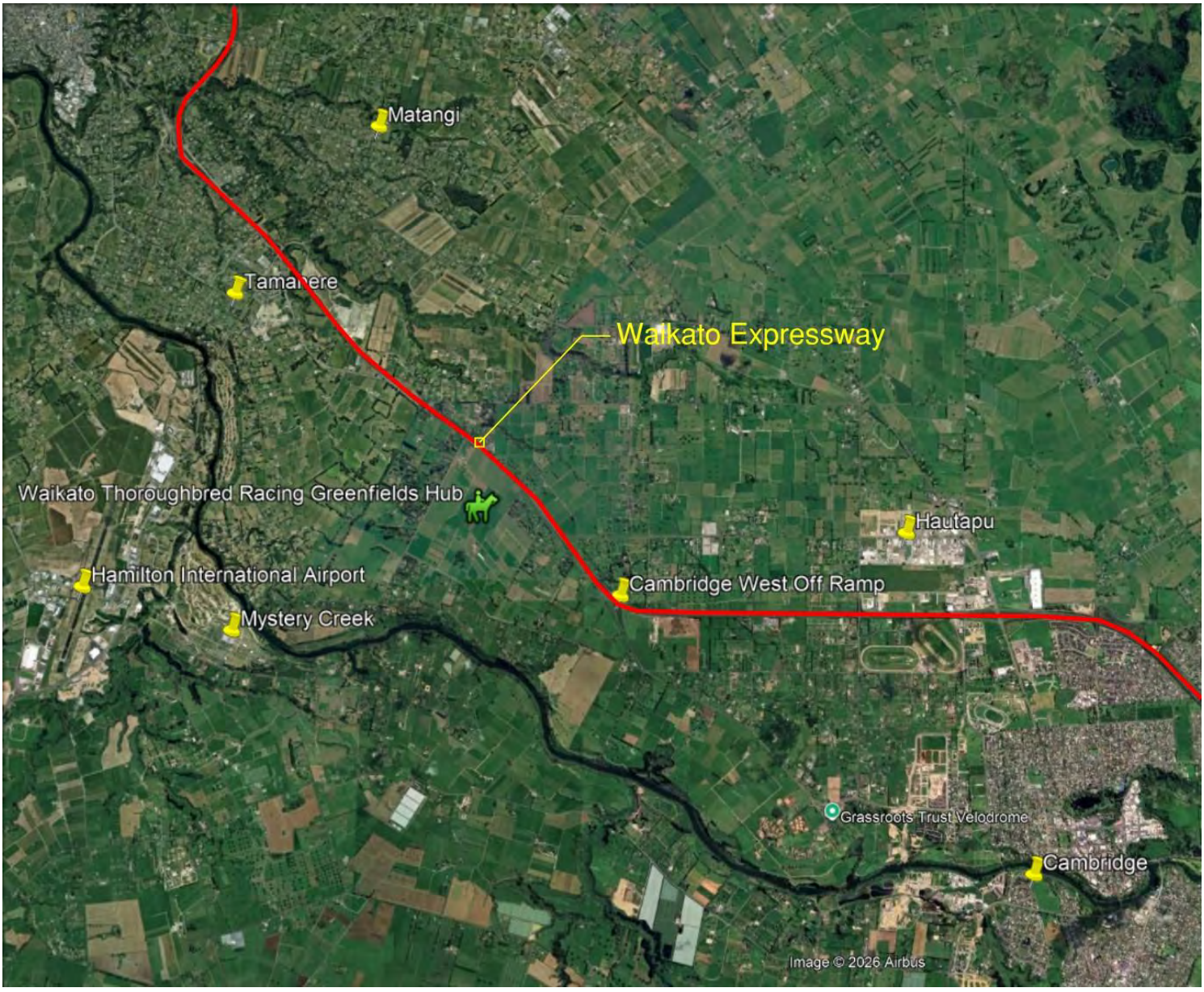
This report covers erosion and sediment control considerations only. We recommend the proposed works be checked against current District and Regional Council plans or checked by a registered planner.

Appendix A

Location of Development Site


Waikato Thoroughbred Racing Greenfields Hub
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO


Huntly
Ngaruawahia
Morrinsville
Hamilton City
Matamata
Waikato Thoroughbred Racing Greenfields Hub
Cambridge
Tirau
Te Awamutu
Putaruru
Otorohanga
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO


Matangi
Tamahere
Waikato Expressway
Waikato Thoroughbred Racing Greenfields Hub
Hautapu
Hamilton International Airport
Cambridge West Off Ramp
Mystery Creek
Grassroots Trust Velodrome
Cambridge
Image © 2026 Airbus

Appendix B

Master plan of Development Site

(Refer Appendix M: Architectural Masterplan and Drawings – Fast-track Substantive Application Planning Assessment – Overall Summary)

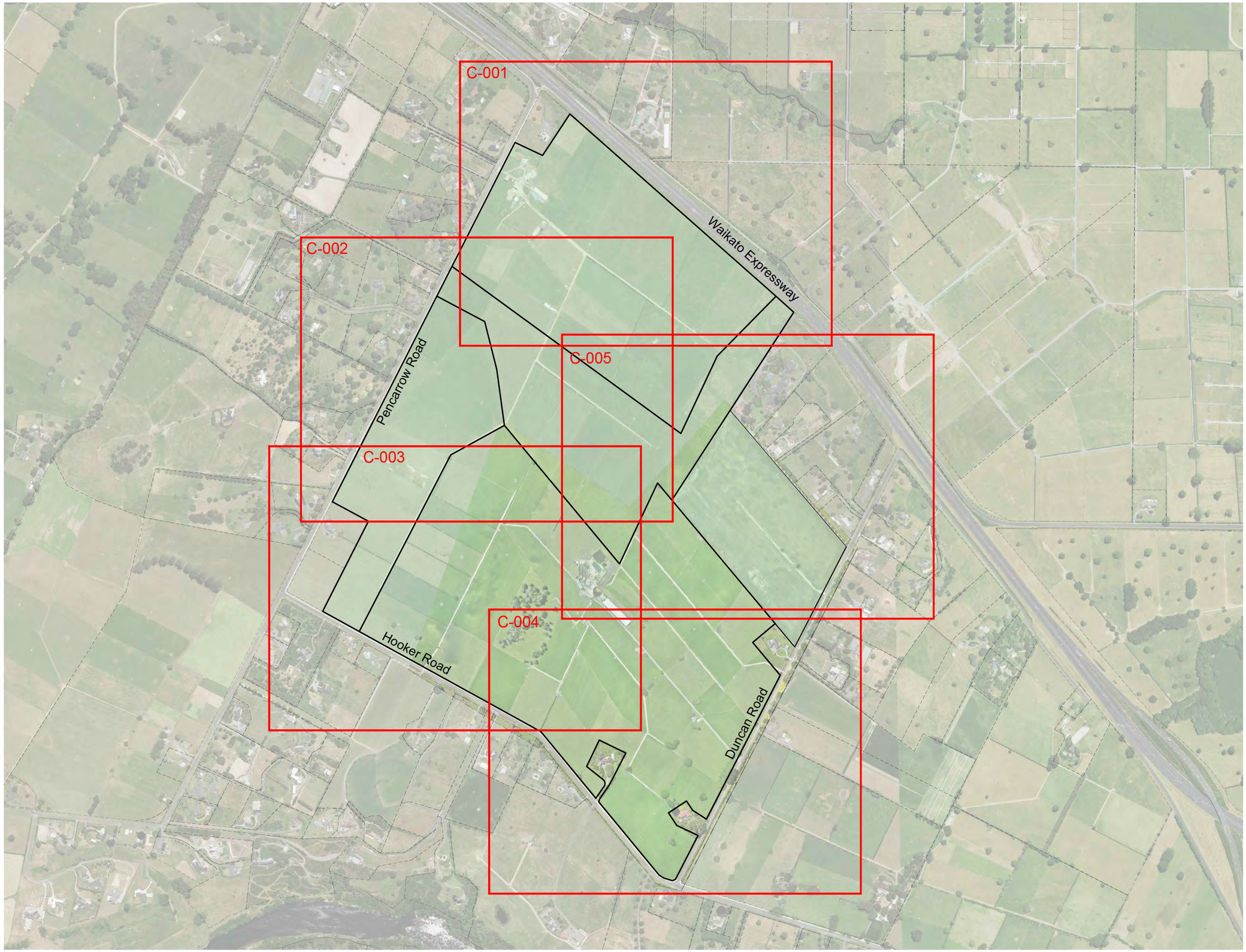
Appendix C

Change of Levels (cut and fill)

(Refer Civil Design Drawing “Change in Levels – Overall C-200 revision 3)

Appendix D

Detailed Topographic survey



NORTH

Notes

1. GENERAL

1.1. Existing subject property boundaries source:
1.1.1. Survey accurate (calculated).

1.2. Areas and measurements are approximate and subject to survey.

1.3. All easements may not be shown.

1.4. Subject Property

1.5. Services have been obtained from Council GIS and may not have been verified.

1.6. Invert Levels where the Culvert was filled with dirt need to be verified as the true invert was unable to be captured.

2. SURVEY

2.1. Datum
2.1.1. Horizontal datum: Mount Eden 2000
2.1.2. Vertical datum: NZVD2016
2.1.2.1. Datum Mark: IB I DPS 90398 (E4K6)
2.1.2.2. RL: 57.05

3. SURFACES

3.1. Existing contour interval
3.1.1. Major = 2.5m
3.1.2. Minor = 0.5m

3.2. Source:
3.2.1. Survey 17/11/2025
3.2.2. LIDAR - NZ LiDAR 1m DEM
3.2.2.1. LIDAR contours may not have been verified on ground.
3.2.3. Surface in built from Survey data in Lot 1 DP 16925, on Duncan Road, All drains. The rest is made up from LIDAR.

SERVICES NOTE

EXISTING SERVICES SHOWN ARE INDICATIVE ONLY. ALL SITE SERVICES MAY NOT BE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE ONSITE WORKS.

KEY:

- FENCE - EXISTING
- TOP OF BANK - EXISTING
- BOTTOM OF BANK - EXISTING
- DRAIN - EXISTING
- EDGE OF SEAL - EXISTING

Client

Contractor

ISSUED

BCD GROUP

Sheet
TOPOGRAPHICAL PLAN

Project Title
WAIKATO THOROUGHBRED RACING
PENCARROW ROAD, TAMAHERE, HAMILTON

Rev	Date	By	Reason
4	17/06/2026	JC	FOR INFORMATION
3	27/03/2026	DL	FOR INFORMATION
2	26/11/2025	LR	FOR INFORMATION
1	18/11/2025	LR	FOR INFORMATION

Drawn: LR | Scale: 1:5000 | at A1
Engineer: -
Job No: 23-1883 | Sheet No: C-000 | Revision: 3

all dimensions to be verified on site before making any shop drawings or commencing any work.

the copyright of this drawing remains with BCD Group



Notes

1. GENERAL

1.1. Existing subject property boundaries source:
1.1.1. Survey accurate (calculated).

1.2. Areas and measurements are approximate and subject to survey.

1.3. All easements may not be shown.

1.4. Subject Property

1.5. Services have been obtained from Council GIS and may not have been verified.

1.6. Invert Levels where the Culvert was filled with dirt need to be verified as the true invert was unable to be captured.

2. SURVEY

2.1. Datum
2.1.1. Horizontal datum: Mount Eden 2000
2.1.2. Vertical datum: NZVD2016
2.1.2.1. Datum Mark: IB I DPS 90398 (E4K6)
2.1.2.2. RL: 57.05

3. SURFACES

3.1. Existing contour interval
3.1.1. Major = 2.5m
3.1.2. Minor = 0.5m

3.2. Source:
3.2.1. Survey 17/11/2025
3.2.2. LIDAR - NZ LiDAR 1m DEM
3.2.2.1. LIDAR contours may not have been verified on ground.
3.2.3. Surface in built from Survey data in Lot 1 DP 16925, on Duncan Road, All drains. The rest is made up from LIDAR.

SERVICES NOTE

EXISTING SERVICES SHOWN ARE INDICATIVE ONLY. ALL SITE SERVICES MAY NOT BE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE ONSITE WORKS.

KEY:

- FENCE - EXISTING
- TOP OF BANK - EXISTING
- BOTTOM OF BANK - EXISTING
- DRAIN - EXISTING
- EDGE OF SEAL - EXISTING

Client

Contractor

ISSUED

BCD GROUP

Sheet
TOPOGRAPHICAL PLAN

Project Title
WAIKATO THOROUGHBRED RACING
PENCARROW ROAD, TAMAHERE, HAMILTON

Rev	Date	By	Reason
4	17/06/2026	JC	FOR INFORMATION
3	27/03/2026	DL	FOR INFORMATION
2	26/11/2025	LR	FOR INFORMATION
1	18/11/2025	LR	FOR INFORMATION

Drawn: LR | Scale: 1:1500 | at A1
Engineer: -
Job No: 23-1883 | Sheet No: C-001 | Revision: 3

all dimensions to be verified on site before making any shop drawings or commencing any work.

the copyright of this drawing remains with BCD Group



Notes

1. GENERAL

1.1. Existing subject property boundaries source:
1.1.1. Survey accurate (calculated).

1.2. Areas and measurements are approximate and subject to survey.

1.3. All easements may not be shown.

1.4. Subject Property

1.5. Services have been obtained from Council GIS and may not have been verified.

1.6. Invert Levels where the Culvert was filled with dirt need to be verified as the true invert was unable to be captured.

2. SURVEY

2.1. Datum
2.1.1. Horizontal datum: Mount Eden 2000
2.1.2. Vertical datum: NZVD2016
2.1.2.1. Datum Mark: IB I DPS 90398 (E4K6)
2.1.2.2. RL: 57.05

3. SURFACES

3.1. Existing contour interval
3.1.1. Major = 2.5m
3.1.2. Minor = 0.5m

3.2. Source:
3.2.1. Survey 17/11/2025
3.2.2. LIDAR - NZ LIDAR 1m DEM
3.2.2.1. LIDAR contours may not have been verified on ground.
3.2.3. Surface in built from Survey data in Lot 1 DP 16925, on Duncan Road, All drains. The rest is made up from LIDAR.

SERVICES NOTE

EXISTING SERVICES SHOWN ARE INDICATIVE ONLY. ALL SITE SERVICES MAY NOT BE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE ONSITE WORKS.

KEY:

- FENCE - EXISTING
- TOP OF BANK - EXISTING
- BOTTOM OF BANK - EXISTING
- DRAIN - EXISTING
- EDGE OF SEAL - EXISTING

Client

Contractor

ISSUED

BCD GROUP

Sheet
TOPOGRAPHICAL PLAN

Project Title
WAIKATO THOROUGHBRED RACING
PENCARROW ROAD, TAMAHERE, HAMILTON

Rev	Date	By	Reason
4	17/06/2026	JC	FOR INFORMATION
3	27/03/2026	DL	FOR INFORMATION
2	26/11/2025	LR	FOR INFORMATION
1	18/11/2025	LR	FOR INFORMATION

Drawn: LR | Scale: 1:1500 | at A1
Engineer: -
Job No: 23-1883 | Sheet No: C-002 | Revision: 3

all dimensions to be verified on site before making any shop drawings or commencing any work.

the copyright of this drawing remains with BCD Group



Notes

1. GENERAL

1.1. Existing subject property boundaries source:
1.1.1. Survey accurate (calculated).

1.2. Areas and measurements are approximate and subject to survey.

1.3. All easements may not be shown.

1.4. Subject Property

1.5. Services have been obtained from Council GIS and may not have been verified.

1.6. Invert Levels where the Culvert was filled with dirt need to be verified as the true invert was unable to be captured.

2. SURVEY

2.1. Datum
2.1.1. Horizontal datum: Mount Eden 2000
2.1.2. Vertical datum: NZVD2016
2.1.2.1. Datum Mark: IB I DPS 90398 (E4K6)
2.1.2.2. RL: 57.05

3. SURFACES

3.1. Existing contour interval
3.1.1. Major = 2.5m
3.1.2. Minor = 0.5m

3.2. Source:
3.2.1. Survey 17/11/2025
3.2.2. LIDAR - NZ LIDAR 1m DEM
3.2.2.1. LIDAR contours may not have been verified on ground.
3.2.3. Surface in built from Survey data in Lot 1 DP 16925, on Duncan Road, All drains. The rest is made up from LIDAR.

SERVICES NOTE

EXISTING SERVICES SHOWN ARE INDICATIVE ONLY. ALL SITE SERVICES MAY NOT BE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE ONSITE WORKS.

KEY:

- FENCE - EXISTING
- TOP OF BANK - EXISTING
- BOTTOM OF BANK - EXISTING
- DRAIN - EXISTING
- EDGE OF SEAL - EXISTING

Client

Contractor

ISSUED

BCD GROUP

Sheet: **TOPOGRAPHICAL PLAN**

Project Title: **WAIKATO THOROUGHBRED RACING**

PENCARROW ROAD, TAMAHERE, HAMILTON

Rev	Date	By	Reason
5	17/06/2026	JC	FOR INFORMATION
4	27/03/2026	DL	FOR INFORMATION
3	10/12/2025	LR	FOR INFORMATION
2	26/11/2025	LR	FOR INFORMATION
1	18/11/2025	LR	FOR INFORMATION

Drawn: LR | Scale: 1:1500 | at A1

Engineer: -

Job No: 23-1883 | Sheet No: C-003 | Revision: 4

all dimensions to be verified on site before making any shop drawings or commencing any work.

the copyright of this drawing remains with BCD Group



Notes

1. GENERAL

1.1. Existing subject property boundaries source:
1.1.1. Survey accurate (calculated).

1.2. Areas and measurements are approximate and subject to survey.

1.3. All easements may not be shown.

1.4. Subject Property

1.5. Services have been obtained from Council GIS and may not have been verified.

1.6. Invert Levels where the Culvert was filled with dirt need to be verified as the true invert was unable to be captured.

2. SURVEY

2.1. Datum
2.1.1. Horizontal datum: Mount Eden 2000
2.1.2. Vertical datum: NZVD2016
2.1.2.1. Datum Mark: IB I DPS 90398 (E4K6)
2.1.2.2. RL: 57.05

3. SURFACES

3.1. Existing contour interval
3.1.1. Major = 2.5m
3.1.2. Minor = 0.5m

3.2. Source:
3.2.1. Survey 17/11/2025
3.2.2. LIDAR - NZ LiDAR 1m DEM
3.2.2.1. LIDAR contours may not have been verified on ground
3.2.3. Surface in built from Survey data in Lot 1 DP 16925, on Duncan Road, All drains. The rest is made up from LIDAR.

SERVICES NOTE

EXISTING SERVICES SHOWN ARE INDICATIVE ONLY, ALL SITE SERVICES MAY NOT BE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE ONSITE WORKS.

KEY:

- FENCE - EXISTING
- TOP OF BANK - EXISTING
- BOTTOM OF BANK - EXISTING
- DRAIN - EXISTING
- EDGE OF SEAL - EXISTING

Client

Contractor

ISSUED

BCD GROUP

Sheet
TOPOGRAPHICAL PLAN

Project Title
WAIKATO THOROUGHBRED RACING
PENCARROW ROAD, TAMAHERE, HAMILTON

Rev	Date	By	Reason
5	17/06/2026	JC	FOR INFORMATION
4	27/03/2026	DL	FOR INFORMATION
2	26/11/2025	LR	FOR INFORMATION
1	18/11/2025	LR	FOR INFORMATION

Drawn: LR | Scale: 1:1500 | at A1
Engineer: -
Job No: 23-1883 | Sheet No: C-004 | Revision: 3

all dimensions to be verified on site before making any shop drawings or commencing any work.

the copyright of this drawing remains with BCD Group



NORTH

Notes

1. GENERAL

1.1. Existing subject property boundaries source:
  1.1.1. Survey accurate (calculated).

1.2. Areas and measurements are approximate and subject to survey.

1.3. All easements may not be shown.

1.4. Subject Property

1.5. Services have been obtained from Council GIS and may not have been verified.

1.6. Invert Levels where the Culvert was filled with dirt need to be verified as the true invert was unable to be captured.

2. SURVEY

2.1. Datum
  2.1.1. Horizontal datum: Mount Eden 2000
  2.1.2. Vertical datum: NZVD2016
    2.1.2.1. Datum Mark: IB I DPS 90398 (E4K6)
    2.1.2.2. RL: 57.05

3. SURFACES

3.1. Existing contour interval
  3.1.1. Major = 2.5m
  3.1.2. Minor = 0.5m

3.2. Source:
  3.2.1. Survey 17/11/2025
  3.2.2. LIDAR - NZ LiDAR 1m DEM
    3.2.2.1. LIDAR contours may not have been verified on ground.
  3.2.3. Surface in built from Survey data in Lot 1 DP 16925, on Duncan Road, All drains. The rest is made up from LIDAR.

SERVICES NOTE

EXISTING SERVICES SHOWN ARE INDICATIVE ONLY. ALL SITE SERVICES MAY NOT BE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE ONSITE WORKS.

KEY:

- FENCE - EXISTING
- TOP OF BANK - EXISTING
- BOTTOM OF BANK - EXISTING
- DRAIN - EXISTING
- EDGE OF SEAL - EXISTING

Client

Contractor

ISSUED

BCD GROUP

Sheet
TOPOGRAPHICAL PLAN

Project Title
WAIKATO THOROUGHBRED RACING

PENCARROW ROAD, TAMAHERE, HAMILTON

Rev	Date	By	Reason
5	17/06/2026	JC	FOR INFORMATION
4	27/03/2026	DL	FOR INFORMATION
3	10/12/2025	LR	FOR INFORMATION
2	26/11/2025	LR	FOR INFORMATION
1	18/11/2025	LR	FOR INFORMATION

Drawn: LR | Scale: 1:1500 at A1

Engineer: -

Job No:	Sheet No:	Revision
23-1883	C-005	4

all dimensions to be verified on site before making any shop drawings or commencing any work.

the copyright of this drawing remains with BCD Group

Appendix E

Location of Sediment Controls (future update)

Appendix F

Supporting Calculations (future update)