ASHBOURNE RESIDENTIAL DEVELOPMENT

Construction Management Plan

PROJECT INFORMATION

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1. Introduction

1.1. Background

Maven Waikato Ltd have been engaged by Matamata Developments Ltd to undertake Construction Management Plan in support of Ashbourne Residential Development at 127 Station Road, Matamata.

1.2. Site Description

The Ashbourne Residential area is a circa 45.2ha block of land within the Matamata-Piako District. The current site access is through 127 Station Road in Matamata. The site adjoins with the new Highgrove Development to the north-west, and Peakedale and Pippins Development to the east, and the remainder of the site is surrounded by agricultural land.

There is an existing stormwater swale that follows the southern and western boundary. The Waitoa River which runs south to north is approximately 1km to the west of the subject site.

The site has an existing farmhouse located at 127 Station Road. Most of the site is low-lying flat farmland, that is interspersed with artificial farm drains.

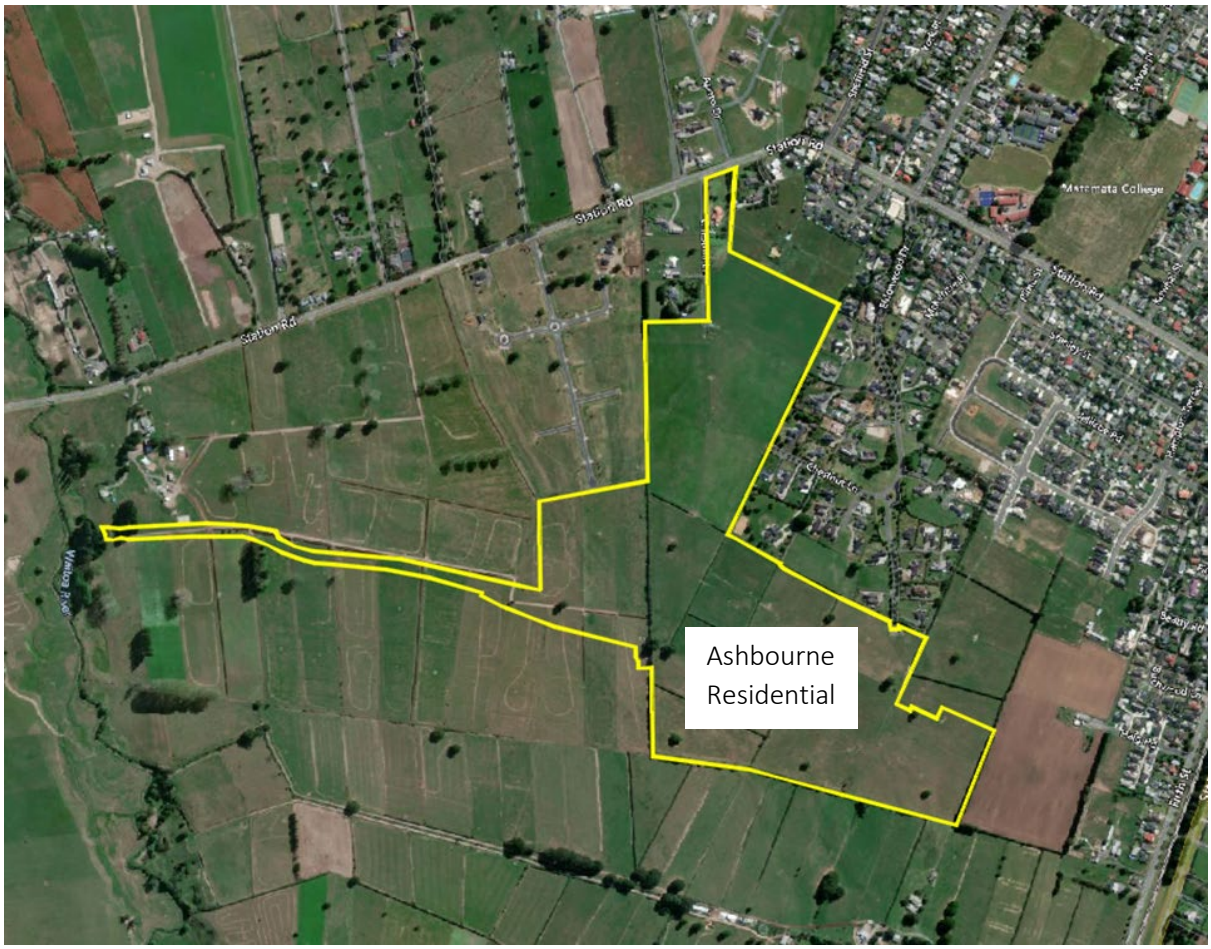

Figure 1: Site Locality

2. Proposed Earthworks

Earthworks will include re-contouring, excavations for drainage reticulation, formation of building platforms, roading and where applicable the construction of retaining walls. The site will contain specific erosion and sediment control measures suitable to control the Earthworks area.

2.1. Geotechnical Investigation

A site-specific Geotechnical investigation has been prepared for the development site by CMW dated 6th May 2025, and Nov 2025 s53 response comments. The report identifies the approximate distribution of prevailing landforms and geologies for the local area. The published geological maps for the area are generally aligned with the geology encountered onsite as comprised of interbedded sand, silt, and gravel from the Hinuera Formation.

From the ground investigations undertaken by CMW, they have summarized the site geology results in Table 1 below.

Unit	Depth to base (m)		Thickness (m)**	
	Min	Max	Min	Max
Topsoil/Fill	0.1	0.5	0.1	0.5
Firm to Stiff Silt/Sandy Silt	0.8	1.2	0.5	0.9
Stiff to Very Stiff Silt (Hinuera Formation)	1.0	1.2	0.5	1.0
Loose to Medium Dense Sand/Silty Sand (Hinuera Formation)	1.4	2.5	0.6	1.7
Dense to Very Dense Sand with interbedded Silt (Hinuera Formation)	5.9	17.3	4.9	16.3
Very Stiff to Hard Silt/Clay (Walton Subgroup)	0.1	18.1	9*	18*
Very Dense Silty Sand (Walton Subgroup)	-	-	**	**
Notes: * Strata not encountered within all test locations. **Thickness only recorded were base of strata has been confirmed.				

Table 1: Summary of Strata Encountered

Upon completion of the proposed earthworks an Earthworks Completion Report will be prepared by the Geotechnical Engineer. This report will certify the adequacy of the earthworks and make recommendations on bearing strengths for foundation design purposes.

For more information, please refer to CMW Geotechnical Investigation Report submitted at this application and Nov 2025 s53 response comments.

2.2. Bulk Earthworks

The total bulk earthworks for whole site is summarized in table 2 below:

Bulk Subgrade Earthworks (topsoil stripping exclusive)	
Total area of ground disturbance	451,969 m^2 (45.20ha)
Total volume of CUT	238,619 m^3
Total volume of FILL	215,675m^3
Total Volume of FILL with Compaction Factor (1.1)	237,243 m^3
Maximum CUT and FILL depth	2.58m FILL / 3.52m CUT
Total Volume (surplus of CUT)	+ 1,376 m^3
Others	
Topsoil stripping (300 mm)	135,591 m^3

Table 2: Summary of Bulk Earthworks

2.3. Site Constraints

2.3.1. Earthworks within Existing Flood Plain

The proposed site comprises multiple interconnected overland flow path and ponding areas dictated by the existing topography of the surface, surrounding rural land uses and primary drainage with hydrology conditions as assumed in the model. Below is a depiction of the overall overview of flooding across the entire 4 sites and surroundings including Waitoa River.

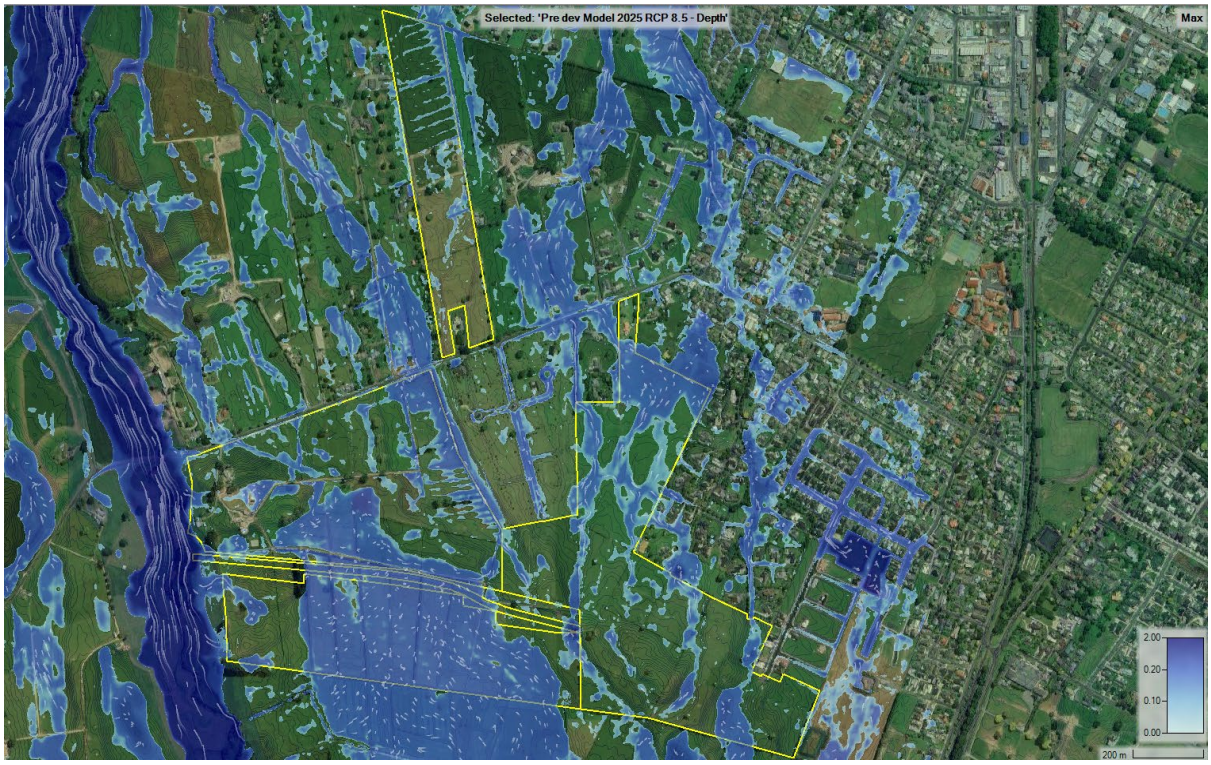

Figure 2: Existing Flood Extent in the 1% AEP Event

Construction within in the proposed site is of paramount importance. Proposed greenway and stormwater basins have been engineered to serve as a flood storage for the subject site, thereby reclaiming a considerable amount of land previously prone to flooding during significant rainfall events, and suitably convey the stormwater flow (100 year – 10 year).

Given the inherent characteristics of the site, there is a risk of floodwaters encroaching upon the designated earthwork area. While this risk is considerable, it can be effectively mitigated through a range of controls, which include but are not restricted to the following:

- Earthworks will only be undertaken during the approved earthwork season unless a Winter Works application is submitted and approved by MPDC.
- In a high-risk location only open a small manageable earthwork area at a time.
- Create low flow diversion channels to divert any existing drains away from earthwork areas.
- Stabilise the earthworks site when a large rainfall event is forecasted.

2.3.2. Earthworks with High Groundwater Level

Similar issue to that mentioned in the section above, a high groundwater level (perched) is expected where an approximate 3.5m of cut is expected. The presence of high groundwater levels can potentially impede the progress of earthwork operations and simultaneously present a substantial health and safety risk to the project.

This risk can be addressed, but not limited to, the following controls:

- Construct the Greenway from the downstream end working back upstream;
- Install subsoil drains as per the Geotechnical Engineer recommendations to lower the groundwater level;
- Undertake the earthwork operations during the earthwork season to avoid high rainfall events; and/or
- Install a dewatering pump to lower the ground water prior-to and during earthwork operations.

Wallbridge Gilbert Aztec Ltd has been prepared the Hydrogeology – Assessment of Effects for the Ashbourne construction. Please consult the Hydrogeological Effects Assessment prepared by WGA Ltd which provides detailed guidance on hydrogeological measures.

2.3.3. Sensitive Receiving Environment

Stormwater runoff from the greenway is proposed to be discharged to Waitoa river (receiving environment).

To safeguard this significant receiving environment, a comprehensive erosion and sediment control strategy must be developed to effectively manage and enhance the water quality of sediment-laden water, ensuring it complies with the aforementioned specification. The mitigation measures may include, but are not limited to, the following:

- All water runoff originating from within the earthworks site must be captured by either a Sediment Retention Pond (SRP) or a Decanting Earth Bund (DEB).
- The use of flocculant treatment is mandatory for all DEBs and SRPs.
- Prior to commencing bulk earthworks within their respective catchments, the treated water from all DEBs and SRPs must undergo testing to verify the effectiveness of these devices in terms of water treatment. Additionally, their water treatment efficiency should be assessed on a monthly basis or following significant rainfall events.
- Where pumping is necessary for treated water discharge, a manhole is required for the DEB or SRP. The pump unit will be situated within the manhole and will exclusively discharge treated water.
- The pumped treated water will be directed towards a grass swale, which will provide additional water quality treatment before discharging into the existing channel or stream.
- Groundwater resulting from dewatering operations should be discharged into a dedicated SRP or DEB to ensure water quality treatment before entering the existing stormwater channel or stream.
- In cases where DEBs and SRPs are not feasible, other sediment control methods, such as silt fences, may be employed at the discretion of the monitoring officer. However, it is important to note that the exposed earthwork area should be limited to less than 1000 square metres and must be completed and stabilised within a single day. Additionally, no earthworks should commence if rain is forecasted.

2.3.4. Ecology

Ecological Solutions has been prepared an Assessment of Ecological Effects in support of the fast-track application. Please consult the Ecological Assessment prepared by Ecological Solutions which provides detailed guidance on ecological measures.

2.3.5. Contamination

SLR Consulting has been commissioned to prepare a Preliminary & Detailed Site Investigation (DSI) for the proposed earthworks extent. It is expected that any contaminated material will be removed and carted to landfill prior-to any large earthwork operation being undertaken. Please refer to the Contaminated Site Management Plan prepared by SLR Consulting for more information.

2.3.6. Iwi Consultation

There is extensive consultation with iwi at the early phases of the project. Furthermore, Te Hira has been tasked to prepare a Cultural Impact Assessment report to address any potential impacts. Please refer to the Cultural Impact Assessment prepared by Te Hira for more information.

2.4. Geotechnical Investigation and Management

Various site-specific geotechnical investigations have been conducted and a geotechnical investigation report has been prepared by CMW on 22nd May 2025, and Nov 2025 s53 response comments, to support the fast-track resources consent application. The recommendations of which have been incorporated into the civil design and construction methodology. Please refer to the Geotechnical Investigation Report for more information.

The Geotechnical reports advise that, based on the available ground investigation, excavations are expected to be able to be carried out using conventional earth working equipment, such as excavators, bulldozers, and scrapers.

Geotechnical Risk Management

Geotechnical recommendations to be adopted in the detailed design will reduce risk during construction, such as.

- To accommodate the liquefaction potential on the site, Hybrid TC2/TC3 foundations are anticipated.
- Controlling surface run-off to reduce infiltration of the water into the ground.
- Improving the ground in soft areas
- Pumping to control ground water level
- Special construction techniques
- Mitigating the risks associated with temporary batter stability through proactive design and site management.
- Stockpiles to be away from the riverbank.
- Anticipating overland flows from storm events by design and installation of measures to mitigate.
- Consideration to be given to batter stability of proposed ponds at design and construction phase.
- The length of excavation open at any one time will be minimised, as far as practicable, with due recognition of and depending on several factors, such as local ground conditions, groundwater, weather, depth of excavations, the presence of geological defects, and the earthworks equipment and methodology used.
- Staging excavation which reduces support to slopes or creates temporary over-steepened slopes, to ensure that large areas are not left unsupported.
- Ensuring that slope angles in temporary batters are suitable and stable.
- Ceasing works during rainfall and assessing the stability of excavations following rainfall events, prior to resuming work.
- Benching or battering back excavated faces.
- Avoid loading the crests of slopes and excavations (including loading with a working plant, or with excavated material).

- Seeking advice from the Geotechnical Engineer where there is doubt as to the stability of a slope and for geological defects in the soil or rock mass, particularly where these are exposed in excavation faces.

Geotechnical Construction Observation

Several elements of the construction work necessitate engineering observation, subject to approval by the Geotechnical Engineer during the construction process. These elements include, but are not limited to:

- Observation and logging of under fill drains and undercut excavations confirm depth extents.
- Foundations and preparation of natural ground prior to fill placement.
- Subsurface drainage installation and extents, including the quality of drainage aggregate.
- Installation of geogrids and geotextiles.
- Fill placement. Regular compaction control testing is required in accordance with the earthwork specification.
- Blending of unsuitable materials, and the observation of placement performance and regular intervals during the works.
- Settlement monitoring at the stream

2.5. Consent Condition and Council Involvement

For an earthwork operation of this scale, several consent conditions are expected to address the potential adverse effects generated during the earthwork and construction phase. Relevant expert reports will be provided to MPDC at the pre-construction meeting and as required.

No earthworks will be undertaken prior to the approval of the monitoring officer, in that all the pre-construction conditions have been satisfied and the sediment and erosion control has been established on site to meet the WRC Erosion & Sediment Control Guidelines for Soil Disturbing Activities TR0902.

2.6. Program of Works

Earthworks will be undertaken in stages and commence when all necessary consents are in place. Once consents are in place, then a start date will be determined in the next earthworks season. It is envisaged that all earthworks will be completed within ten earthworks seasons. Applications for Winter Works will only be lodged if required.

It is proposed that the bulk earthworks operation will comprise of three separated work sections (Stage 1, 2, and 3) that will be undertaken independent of each other as shown on the earthwork plans attached in Appendix A.

Works are intended to be carried out in the following steps for each work section:

- Install silt control measures, as shown on Engineering Drawings
- Strip topsoil to stockpile, or screen and sell to the public
- Cut effected areas and construct retaining walls as required.
- Carry out remaining bulk earthworks
- Stabilise site using topsoil, grassing, metal or other methods as required
- Retain silt control measures until the earthwork area is stabilised

2.7. Earthworks Summary

As mentioned in the above section, the bulk earthworks on site will be divided into three separated work sections. These are from Stage 1 to 3, including stormwater basins, and wastewater pumpstations. Please refer to the earthworks drawings for detail attached in Appendix A.

Stormwater Basin A will be constructed at Stage 1 Earthworks.

Stormwater Basin B and Greenway will be constructed at Stage 2 Earthworks.

Stormwater Basin C will be constructed at Stage 3 Earthworks.

Stormwater Basin D will be constructed at Stage 3 Earthworks.

2.7.1. Stage 1 Earthworks

Subgrade Earthworks (topsoil stripping exclusive)	
Total area of ground disturbance	99,876 m^2 (9.99ha)
Total volume of CUT	76,415 m^3
Total volume of FILL	19,285 m^3
Total Volume of FILL with Compaction Factor (1.1)	21,214 m^3
Maximum CUT and FILL depth	1.70m FILL / 3.52m CUT
Total Volume (surplus of CUT)	- 55,201 m^3
Others	
Topsoil stripping (300 mm)	29,963 m^3

Table 3: Summary of Stage 1 Earthworks

2.7.2. Stage 2 Earthworks

Subgrade Earthworks (topsoil stripping exclusive)	
Total area of ground disturbance	211,782 m^2 (21.18ha)
Total volume of CUT	152,928 m^3
Total volume of FILL	60,619 m^3
Total Volume of FILL with Compaction Factor (1.1)	66,681 m^3
Maximum CUT and FILL depth	1.90m FILL / 3.38m CUT
Total Volume (surplus of CUT)	- 86,247 m^3
Others	
Topsoil stripping (300 mm)	63,535 m^3

Table 4: Summary of Stage 2 Earthworks

2.7.3. Stage 3 Earthworks

Subgrade Earthworks (topsoil stripping exclusive)	
Total area of ground disturbance	142,193 m^2 (14.22ha)
Total volume of CUT	9,018 m^3
Total volume of FILL	138,031 m^3
Total Volume of FILL with Compaction Factor (1.1)	151,834 m^3
Maximum CUT and FILL depth	2.58m FILL / 1.87m CUT
Total Volume (shortfall of FILL)	+ 142,816 m^3
Others	
Topsoil stripping (300 mm)	42,658 m^3

Table 5: Summary of Stage 3 Earthworks

3. Earthworks Operation

3.1. Environmental Aspects

This section details the minimum requirements for environmental management processes and procedures to be implemented on site, to mitigate actual and potential risks associated with the construction of the Ashbourne project. Management plans prepared by the contractor are to be consistent with these aspects.

3.1.1. General Environmental Objectives and Targets

Potential environmental objectives and targets relating to this CMP are described in the table below and will be confirmed with the contractor.

Objective	Target	Proposed KPI
Environmental Compliance Ensure the Project operates in accordance with all Designation and Resource Consent/NOR Conditions and relevant environmental related legislation.	Zero penalty infringement notices or prosecutions for breaches of environmental related legislation. No infringement or abatement letters from authorities.	Number of notices or prosecutions. Number of warning or pre-enforcement letters. Percentage of compliance with conditions of Consent
Earthworks Compliance Ensure the Project operates in accordance with WRC / NZTA Best practice for ESCPs and ESC in accordance with WRC Site Scoring System	Good earthworks performance on site, Reduced potential for enforcement actions, Better environmental outcomes, Enhance opportunity for flexibility in earthworks programme	Number of 1 (fully compliant) scores Percentage of 2-4 scores
Training Train Project personnel in environmental management.	Implement training & awareness programs that promote compliance, improving environmental performance & skill base of staff and workers on the Project and minimise environmental risk.	100% of relevant Project staff receiving environmental training.
Flora, Fauna and Receiving Environments Manage effects of construction activities to minimise impacts on flora, fauna and receiving environments	No unauthorised impact to flora, fauna and receiving environments from construction.	Number of flora, fauna and receiving environments items impacted unlawfully.
Community Manage community and stakeholder relationship to minimise impacts from construction activities	Engage directly with sensitive receivers, key stakeholders, and relevant community groups Respond to complaints within a of days/hours of receipt	Number of complaints and time taken to resolve issues Number of complaints managed effectively within nominated timeframe
Quality Ensure environmental & related audit actions are closed out within the agreed timeframes.	No overdue audit actions.	Number overdue audit actions. Percentage of audit actions completed on time

Table 6: Potential environmental objectives and targets

3.1.2. General Environmental Risks & Opportunities

The table below presents indicators of key environmental performance issues identified in initial desk top risk assessments undertaken for the purpose of developing this plan. Confirmation with the contractor will be undertaken prior to works commencing. The risks identified in initial reviews and site visits will be used to inform and update, where necessary, environmental aspects and impacts which are described in the table below:

Aspect/Risk	Potential Impact
Erosion and Sediment Control	Uncontrolled discharge of sediment to receiving environment Pollution or degradation Loss of reputation Additional costs to remediate Potential delays
Water Quality	Uncontrolled discharge of concrete wash out / slurry Pollutant discharge to receiving environment Uncontrolled discharge of sediment to receiving environment Environmental damage Loss of reputation Additional costs to remediate Potential delays
Noise	Excessive noise generated by the project activities Loss of reputation Additional costs to remediate Potential delays
Archaeology	Items, structures, locations of cultural significance damaged or destroyed by project activities. Loss of reputation Additional costs to remediate Potential delays
Landscape	Landscaping elements do not achieve desired coverage, become weed infested, fail, do not achieve ecological or urban design outcomes. Extended maintenance/re-planting programme Revegetation Restoration objectives not achieved Additional costs to remediate Loss of reputation
Vibration	Excessive vibration caused by project activities Degradation of property outside site Loss of reputation Additional costs to remediate Potential delays
Air Quality (Dust)	Dust created by work activities Pollution or degradation that has impacts on the community and

	/ or environment Loss of reputation Additional costs to remediate Potential delays
Contamination	Uncontrolled cross contamination of site due to ground contamination Health and safety implications Environmental damage Loss of reputation Additional costs to remediate Potential delays
Hazardous Substances / Dangerous Goods	Uncontrolled release of hazardous substances / dangerous goods Health and safety implications Environmental damage Loss of reputation Additional costs to remediate Potential delays
Waste	Waste management activities not in accordance with regulatory and project requirements Environmental damage Loss of reputation Additional costs to remediate Potential delays
Behaviours	Poor uptake of project values and behaviours by staff Negative perception of company / project in wider stakeholder community
Culverts and Stream Diversion	Environmental damage (e.g., sediment impacts on water quality) Fauna lost, through disruption of aquatic fauna plant strike Poor design and/or construction leading to inadequate aquatic habitat Flora dieback/lost Loss of reputation Negative perception of company / project in wider stakeholder community Potential delays

Table 7: Identified Key Risks and Potential Impacts

These aspects/risks identified in the table above and subsequent risk assessment with the contractor will be used to inform the preparation of site-specific method statements.

3.1.3. Environmental Monitoring

Monitoring of environmental performance and regulatory compliance with resource consents and NOR conditions are required during the construction phase of the project. The contractor will identify a program which defines, at a minimum, general site monitoring (scheduled and unscheduled); environmental training; and site inductions along with incident response and reporting.

3.2. Health and Safety

A site-specific Health and Safety Plan will be provided by the Contractor prior to start of any works. This document will encapsulate routine monitoring measures, emergency response protocols, along with the requisite documentation. The Health and Safety Plan will be a dynamic document, updated regularly to address emerging health and safety concerns.

To ensure the safety of all, a protective barrier in the form of safety fencing will be erected around the work extent. Access points to the site will be monitored and controlled by a gate and perimeter fencing. Relevant signage will be affixed to this fencing for clear communication. All construction-related vehicular movement will be streamlined through distinct, predetermined, and well-marked access points.

To maintain a continuous dialogue about health and safety measures, weekly toolbox meetings will be convened on-site. These meetings will be centred around discussions of potential risks associated with the week's scheduled activities and the strategies to mitigate them.

All personal involved in this site construction work, including visitors, are required to complete site induction every year to ensure on-going familiarity with risks present on this construction site. Visitors to the construction site will be obliged to comply with the requirements of the site-specific Health and Safety Plan upon entry and shall be escorted by a nominated contractor personnel throughout their visit.

3.3. Access/Haul Roads

The site will have two main accessways which will be utilised based on specific earthworks operation on site. These entrances will be the primary site entrance and will be utilised during construction. These two main entrances are located at Station Road and Peakedale Drive.

Peakedale Drive will only be used for Stage 1 and 2. Access and use of this public road network will be carefully managed and will be a key requirement and form part of the evaluation of contractors. Positive public consultation and ongoing communication to manage concerns will be a critical deliverable for the project management team. See 3.12 below

Stage 1 and 2 works will only include delivery of pavement, surfacing, and drainage materials. There will be no bulk fill cartage in or out of the site.

Stage 3 and beyond will be accessed via an internal Haul Road from Station Road to minimise construction traffic and disruption to Peakedale and Stage 1 and 2 completed works

It is also possible the Firth St designation and connection will be made that will provide another access point – timing on this out of our control.

It is expected that these site accesses will be fenced off and monitored by the contractor. Queuing or parking on Peakedale Drive will not be acceptable Only authorised personnel and nominated visitors can enter the construction site. This also includes ingress for emergency vehicles as dictated by signage at the site entrance.

The Bulk earthworks operation will require multiple internal haul roads for transporting the cut and fill material. The access track and haul road have the following features.

- The track will be a metal road approximately 3m to 5m wide with drainage swales beside the road formations as required, which will act as a cut-off to divert runoff.
- Upon cessation of site work the track will be removed.

- A stabilised construction entrance with a wheel wash facility will be installed at these access points.

3.4. Working Hours

All construction activities will adhere strictly to the approved consent hours of work generally set at 7.30 a.m. to 6.00 p.m. Monday to Friday, and 8.30 a.m. to 4:30 p.m. Saturday. No work will occur Sundays or public holidays.

3.5. Complaints

Complaints will be addressed first-hand by the site construction manager and proactively followed up on. There will be a complaint register record for detailing the investigation and response. The key contact personnel will be available at site entrances for the public to contact in case of emergency or complaint lodgement.

3.6. Vibration Control

A construction vibration assessment will be done prior to construction commencing from a Vibration Consultant. The effects of vibration during construction are expected to have less than minor effects on any surrounding receiver and will be reasonable in terms s16 of the Resource Management Act.

Some of the mitigation methods for vibration control are:

- Residents will be advised prior to construction activities being undertaken near their buildings.
- The lightest practicable model of vibration inducting plant shall be used within 30m of any dwellings.
- Compaction shall be performed using the lightest practical compaction equipment with the highest practicable vibration frequency to achieve specified compaction.
- Excavator operators shall avoid banging buckets on the ground and workers will be advised on minimising vibration.

Styles Group are undertaking Construction Noise Assessments regarding vibration effects, in the event of issues being raised, vibration monitoring will be undertaken.

3.7. Noise Control

Modern plants and equipment are all fitted with exhaust mufflers and soundproofing that are designed to reduce plant noise and have been manufactured to meet international standards. All items of plant are subject to periodic maintenance checks to ensure they can be operated safely and as intended. If complaints are received, they will be taken seriously, and every effort made to minimise disturbance e.g., continue work in that area at a time that might be more amenable to the complainant(s). Any noise complaints will be followed up with the complainant and will also be discussed at project site meetings. They will also become subject matter at the weekly site toolbox meetings.

If it appears that noise levels are pushing the allowable limits, then an alternative methodology may need to be deployed. The implementation of additional options will be undertaken in consultation with the regulatory authorities, Principal, and Engineer, including, if required and instructed, engaging a noise monitoring specialist to measure and report on-site construction activity to ensure compliance with NZS6803 (NZ Standard for Acoustics – Construction Noise).

Styles Group are undertaking Construction Noise Assessments regarding noise impacts in the event of issues being raised, noise monitoring will be undertaken.

3.8. Weed Management

The protocols outlined in the Waikato Regional Council factsheet will be used to minimise the adverse effects on biosecurity.

3.9. Sediment Control

Throughout the duration of the earthworks, these sediment control measures will be consistently maintained and closely monitored to ensure they function as required. Removal of silt control measures will only be considered once the site is deemed to be stable in terms of silt runoff, to be agreed by Waikato District Council Compliance Officer and the Site Engineer.

The following silt and sediment control protection measures are being proposed:

3.9.1. Stabilized Site Entrances

The contractor shall ensure that all entrances to the site are constructed upon establishment or prior to any intended use. Entrances shall be an area of stabilised and well compacted aggregate constructed and maintained for heavy vehicle use. These entrances shall be constructed in accordance with the agreed, proposed (as per C200 Earthworks drawings), or adopted local Council guidelines, an example of which can be found within the appended standard details.

Tractor sweeps and watercarts will be on hand to maintain a clean and tidy entry and exit point. A wheel wash may also be considered to manage this risk.

3.9.2. Dust Control

For the proposed works, dust generated at the site is likely to have the greatest effect on any existing residential properties bordering the site. To achieve no nuisance dust emissions, the following preventive measures shall be implemented:

- Dampening down of potential dust generation areas with a water truck;
- Mulching and grassing stockpiles and built levels where or when practicable;
- Chemical dust suppressants, used as per manufacturer recommendations as a method of sealing problematic or largely unfinished areas, if the previously mentioned methods fail to mitigate the dust appropriately.
- Ensuring that surfaces are constructed to their final design requirement and are stabilised as quickly as practicable; and
- Controlling reduced vehicle speeds.

Wind conditions should be monitored to assist in daily planning of works to minimise the potential for excessive dust generation and off duty monitoring will be a requirement.

There are various water supply options to be considered by the contractor and project team. Tank storage onsite may also be a contingency measure.

3.9.3. Cut-off Drains/Bunds

Compacted earth bunds will be placed along the top of batter slopes to divert “clean” runoff away from the earthwork area. Compacted earth bunds placed at the bottom of the cut batter slopes to divert generated “dirty” runoff to the nearest local Decant Earth Bund (DEB) / Sediment Retention Pond (SRP). Cut-off drains shall be formed at the bottom of shallow batters where bunding alone will not likely contain expected flows. The purpose of the bund/drain is to prevent any surface water flowing over the newly formed batter faces, into stabilised areas of the site, and to divert flows around the site perimeter to the nearest low point where a DEB / SRP is to be located, if required.

3.9.4. Decanting Earth Bunds/Sediment Retention Ponds

Site run-off will be directed by cut-off drains and bunds to the natural low point within each bund's catchment area prior to discharge onto existing stabilised ground. The locations proposed shall be verified and agreed onsite during a pre-construction meeting and as-builts of decant bund's size/location shall be provided to the Compliance Officer, if required.

Decanting earth bunds (DEB) will serve as the primary treatment for the works. DEBs will be sized by volume to 2-3% of the catchment area as per appended calculations. The details of the DEBs recommended layout can be found online via Waikato Region Council Erosion & Sediment Control Guidelines for Soil Disturbing Activities (TR0902). Where possible, a DEB & SRP will be constructed with a length to width ratio between 3:1 – 5:1, however this may be constrained by site space limitations. Typically, the outlet structure of these DEBs & SRPs will comprise of a floating T-Bar dewatering device (decanting arm with anti-seep collar, as shown in standard details within engineering plans) which discharges to stabilised ground. Where possible, the discharge end of the pipe will be perforated to disperse flows past the working area to stabilised or undisturbed ground.

If chemical treatment is required, the decant bar shall be lifted above the expected storage volume to enable treatment to take place, before being lowered post storm event treatment whereby the storage volume is discharged.

3.9.5. Chemical Treatment

To improve water quality treatment within sediment control devices throughout the construction phase, the use of chemical flocculants is strongly recommended for all DEBs and SRPs.

The method of treatment is variable and dependant on ground conditions and catchment area, this will be confirmed onsite during establishment works and bench testing.

It is proposed that an approved flocculation method will be implemented; the available methods can be found outlined in Table 8:

Flocculation Method	Time Frame	Treatment Area
Floc Blocks for DEBs	Short and Long Term	Up to 5,000 m^2
Batch Dosing for DEB's & SRPs	Short Term	Up to 50,000 m^2
Continuous Dosing of DEBs & SRPs	Long Term	Up to 50,000 m^2

Table 8: Proposed Flocculation Method

Once the DEB & SRP have been flocculated the water quality will be assessed by either measuring the suspended sediment or checking clarity. If the water quality is acceptable the DEB or SRP is emptied by unblocking the outlet, and earthworks within its catchment can continue accordingly.

In cases where a pump is required to empty treated water from the DEB and SRP due to differences in ground level, the installation of a manhole is necessary. The pump is exclusively permitted to extract water from the manhole structure. The discharged water from the pump will then be directed towards a grass swale to further refine the water quality by removing any potential suspended solids captured during the pumping operation.

3.9.6. Silt Fences

Silt fences will be installed as a treatment measure where sheet flows are considered likely. Such as the toe of fill embankments, where it is not practical to divert flows to a DEB. Alternatively, they may

be used in locations where newly generated sheet flows from stabilised areas may concentrate and result in scour of existing natural ground, in this situation a silt fence will impede and aid in mitigating excessive flow velocity.

3.9.7. Wellpoint Dewatering Devices

Prior to and during earthworks in areas with high groundwater levels, wellpoint dewatering devices will be employed. The purpose of these devices is to ensure the stability and safety of excavation faces by lowering the water table. This not only ensures safety but also expedites the construction process. However, it is important to note that the extracted water might contain suspended solids, which could be detrimental to the receiving environment. To mitigate this, the water will first be directed to DEB or SRP for treatment. Once treated, the water will be discharged into the existing stormwater channel.

3.9.8. Topsoil Management

Efficient topsoil management is a core component of this project's environmental strategy. The topsoil will be removed from each earthwork area and stockpiled for later use. Any surplus topsoil, forecasted to exceed project requirements, will undergo screening to make it available for sale to the wider public.

To address sediment and erosion control at the stockpile location, preventative measures will be employed. This includes the use of mulching and grass seeding to facilitate the establishment of grass cover on the topsoil stockpile. These practices help maintain the integrity of the topsoil stockpile, prevent soil erosion, and ensure minimal topsoil loss throughout the project.

Soil rehabilitation will be implemented in landscaping areas as required to reverse compaction effects and to improve near surface soakage prior to placement of topsoil and planting.

3.9.9. Sediment Control Performance Monitoring & Maintenance

All sediment control measures will be checked regularly, to ensure that they are performing as intended by design. The site Construction Manager in conjunction with the Project Engineer will be responsible for actively monitoring installed erosion and sediment control devices. Periodic audits will be undertaken and tabled at regular progress meetings.

A site walk over shall be undertaken weekly to identify any corrective maintenance required. A more thorough inspection will be undertaken at the end of each week, or before and after a forecast major storm event, to identify any preventative and/or corrective maintenance required.

A regular program of sediment, debris and trash removal will be undertaken to ensure sediment control measures do not become blocked and ensure they function as required. Any large floating matter including any organic matter, i.e., fallen tree litter, reaching the pond or discharge structures is to be removed immediately.

Specific monitoring and maintenance of each mitigation method is included below.

Stabilised Vehicle Entrance

- Maintain the Stabilised Vehicle Entrance in a condition to prevent sediment from leaving the construction site. After each rainfall inspect any structure used to trap sediment for the Stabilised Vehicle Entrance and clean out as necessary.

Diversion Drains/Clean Water Cut-Off Bunds

- Inspect after every rainfall event and during periods of prolonged rainfall for scour and areas where they may breach.
- Repair immediately if required to ensure that the design capacity is maintained.

Decant Earth Bunds/Sediment Retention Ponds

- Inspect after every rainfall event to confirm water clarity or organise sediment testing.
- Release stored flows if/when required to ensure that the DEB capacity is maintained prior to any future rain event.
- Muck out and remove collected sediment whenever 1/3 of the dead storage is reached, or bi-monthly, as required.

Chemical Treatment

- Inspect stored chemical volumes after every rainfall event and during periods of prolonged rainfall.
- Refill or repair any systems immediately if required to ensure that the design capacity is maintained.

Silt Fence

- Inspect Silt Fences at least once a week and after each rainfall. Make any necessary repairs when bulges occur, or sediment accumulation reaches 50% of the fabric height.
- Any areas of collapse, decomposition or ineffectiveness need to be immediately replaced.
- Remove sediment deposits as necessary to ensure adequate sediment storage and reduce pressure on the Silt Fence. Remove accumulated sediment from the area to an appropriate secure location.
- Do not remove Silt Fence materials and sediment deposition until the catchment area has been appropriately stabilised.

Sediment control and other environmental issues, health and safety matters, and construction-related Resource Consent condition compliance requirements will be integrated into fortnightly on-site client/engineer/contractor progress meetings as a proactive construction management tool. These meeting discussions are recorded with decisions and agreed courses of action to be followed up on.

3.10. Fill Compaction

Each layer of material shall be compacted by approved compacting machinery throughout the whole area and depth to achieve the specification listed below or as specified by a qualified Geotechnical Engineer.

Not less than the following percentages of maximum dry density obtainable for the material by standard compaction at optimum moisture content determined by NZS 4402, Pt 2P: Test 14:		Clays and Silty Clays	Sands and Gravel
A	Within 500mm of the finished carriageway sub grade levels and within 3m of batter edges	98%	100%
B	Elsewhere	95%	97%
Clays		Air Voids % (as defined NZS 4402: Part 1)	Undrained Shear (measured by in-situ vane)

A	Within 500mm of road subgrade levels and within 3 meters	Average value less than 8% (any 10 tests) Maximum single value 10%	Average value not less than 170 KPa minimum single value 140 KPa
B	General Fill	Average value less than 10% (any 10 tests) Maximum single value 12%	Average value not less than 150 KPa minimum single value 110 KPa
C	Reserve Areas deeper than 600mm below finished formation level	Maximum value 15%	Minimum value 75 KPa

Table 9: Fill Compaction Requirements by Soil Types

3.11. Traffic Management

A comprehensive Traffic Management Plan (TMP) will be developed by the contractor prior to the commencement of works. The TMP will address all construction-related vehicle movements, with particular attention to minimising disruption to surrounding residents and maintaining safe traffic operations.

Key measures include:

- Designated Access Points: Entry and exit to the construction site shall occur only via Station Road and Peakedale Drive.
- Construction Traffic Routes: Heavy vehicle routes shall be pre-approved by Matamata-Piako District Council and appropriately signed. Where narrow roads are encountered specific TMP controls can be used to ensure safety
- Vehicle Control Measures: Construction accessways will be controlled with security gates with entry restricted to authorised vehicles.
- Dust and Debris Management: Receiving road network will need to be monitored for debris being carried into the local roading network. Vehicle wheel wash facilities maybe required at exits to prevent debris onto public roads.
- Traffic Safety: All traffic management measures will comply with Waka Kotahi (NZTA) Code of Practice for Temporary Traffic Management (CoPTTM) requirements.
- Public Notification: Residents along haul routes will be notified in advance of any significant truck movements or temporary road works. A letter drop will be undertaken by the nominated contractor prior to construction works commencing.

Temporary traffic signage, traffic controllers, and restricted construction hours may be employed during peak traffic periods to further minimise disruption.

For more information, please refer to Commutes Integrated Transportation Assessment submitted at this application.

3.12. Community and Stakeholder Engagement

Matamata Developments Ltd acknowledges the importance of proactive communication with the community throughout the construction period.

The following items are suggested to be implemented:

- Pre-Construction letter drop will inform residents and businesses of the construction schedule, accessways, and key project contacts.

- Complaints Register: A designated Site Liaison Officer will be appointed to manage complaints and queries. Contact information will be displayed at all site entrances.
- Response Protocol: Complaints will be acknowledged within 24 hours and notified to the local authority (MPDC) with a follow-up and action plan provided within 72 hours.

Maintaining positive relationships with locals is a priority to ensure the project proceeds with minimal disruption and community support.

4. Construction Methodology and Sequence of Works

As highlighted in the previous section, the earthworks operations at the Ashbourne Residential will be categorized into three (3) sections. These sections have been segregated based on the stages of development.

Noting this is a draft document and the selected Contractor will provide a more detailed methodology and sequence to effectively deliver this project.

To provide comprehensive guidance for the earthwork activities within this domain, an overarching earthwork principle has been formulated. This principle serves as a unifying framework, guiding the execution of earthworks across these sections. Summarized below are the key principles of the earthworks for this area:

i. Establish Temporary Stormwater Diversion:

ii. Sediment and Erosion Control Establishment:

iii. Minimize the Earthworks Area:

iv. Stabilize Earthworks:

Earthwork's methodology is dynamic and adapted to suit the local environment, ensuring that each earthwork area within these sections have specific construction methodology based on the principles mentioned above, which are essential to protect the sensitive receiving environment.

The construction methodology for each respective work section is detailed below.

4.1. Stormwater Basins and Greenway Construction Methodology & Sequence of Works

4.1.1. SW Basin A

The earthwork plan for SW Basin A is comparatively straightforward. It has been devised to occur in Stage 1 (Earthworks Stage). The construction methodology for this area is as follows:

Stage 1 (EW):

- Establish erosion and sediment control
- Carry out earthworks within stage 1 (earthworks stage)
- Construct SW Basin A

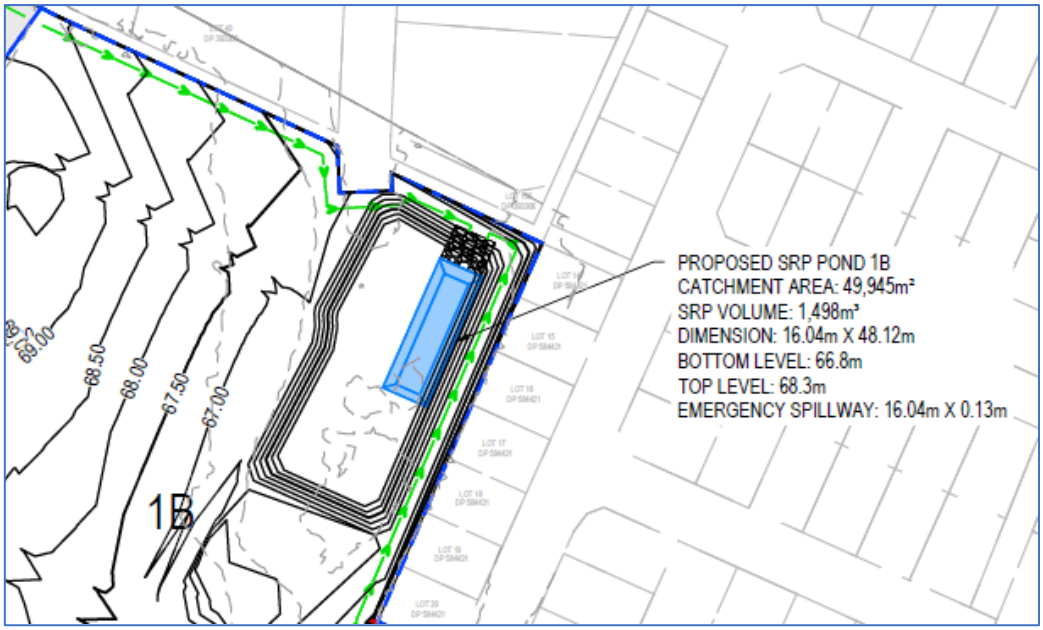

Figure 3: Erosion and Sediment Control for SW Basin A

4.1.2. SW Basin B

The earthwork plan for SW Basin B is comparatively straightforward. It has been devised to occur in Stage 2 (Earthworks Stage). The construction methodology for this area is as follows:

Stage 2 (EW):

- Establish erosion and sediment control
- Carry out earthworks within stage 2 (earthworks stage)
- Construct SW Basin B

4.1.3. SW Greenway

The earthwork for the stormwater greenway is mainly a cut operation. The timing of construction is unknown as it is subject to the surrounding land development. However, It is anticipated to be constructed at the same time of the stormwater basin B, as it conveys stormwater flow from stormwater basin B. The construction methodology for the stormwater greenway will be similar to other stormwater basins, of which a sediment retention pond will be constructed at the downstream end of the earthworks area to contain and treat all the sediment laden runoff prior to discharge. Please refer to Appendix A for relevant engineering drawings.

With the aim of reducing the impact on the existing farm drains, the design of earthwork activities within the stormwater greenway has been formulated to encompass an area of less than 2 hectares. However, as the contractor gains familiarity with the specific site constraints, there is potential flexibility to expand the earthwork extent beyond 2 hectares if the associated risks are assessed to be minimal.

For clarity and logical flow in presenting the work details, the description of earthworks for the stormwater greenway will adhere to the construction sequence. However, it is important to note that this sequence is tentative and might be adjusted to better align with the overall construction schedule.

Stage 3 (EW):

- Establish erosion and sediment control
- Carry out earthworks within stage 2 (earthworks stage)
- Remove the existing farm drains within the earthwork extent
- Construct SW Greenway

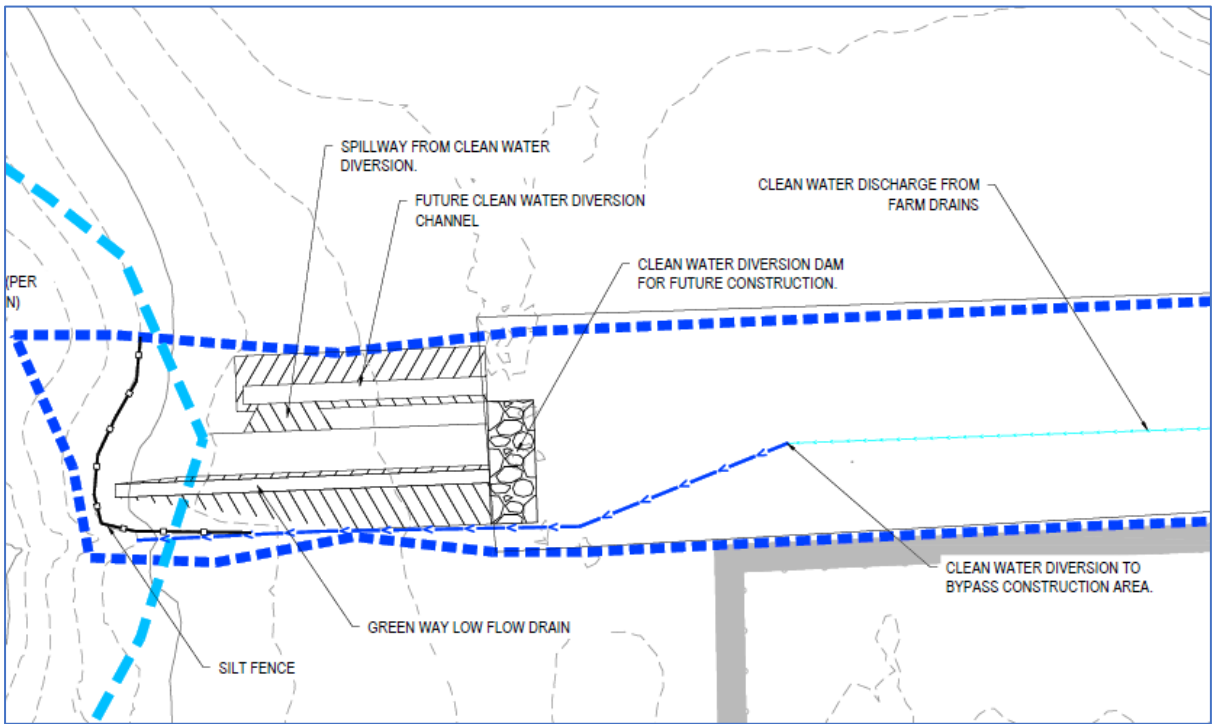

Figure 4: Erosion and Sediment Control for SW Greenway 1

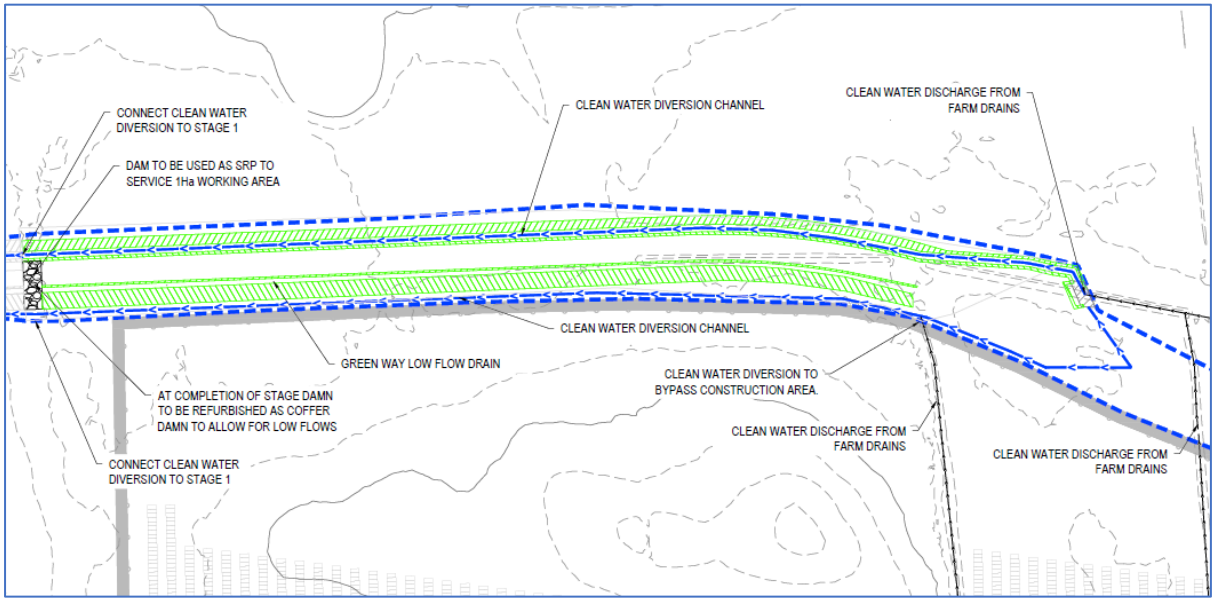

Figure 5: Erosion and Sediment Control for SW Greenway 2

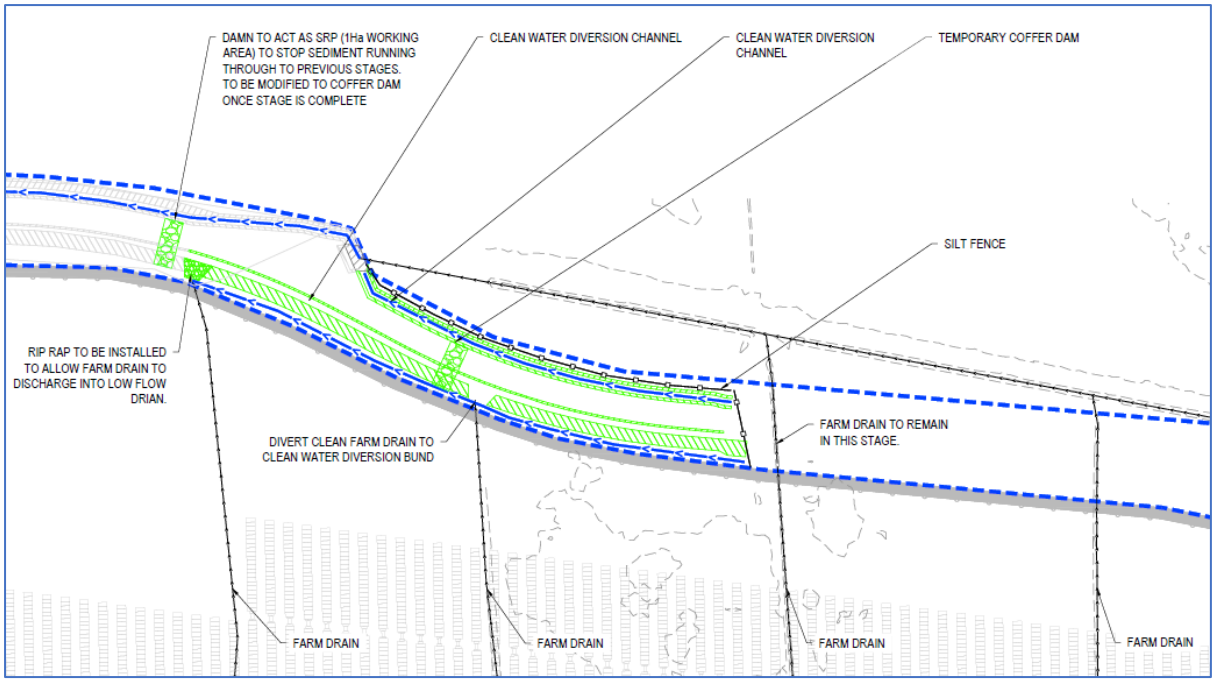

Figure 6: Erosion and Sediment Control for SW Greenway 3A

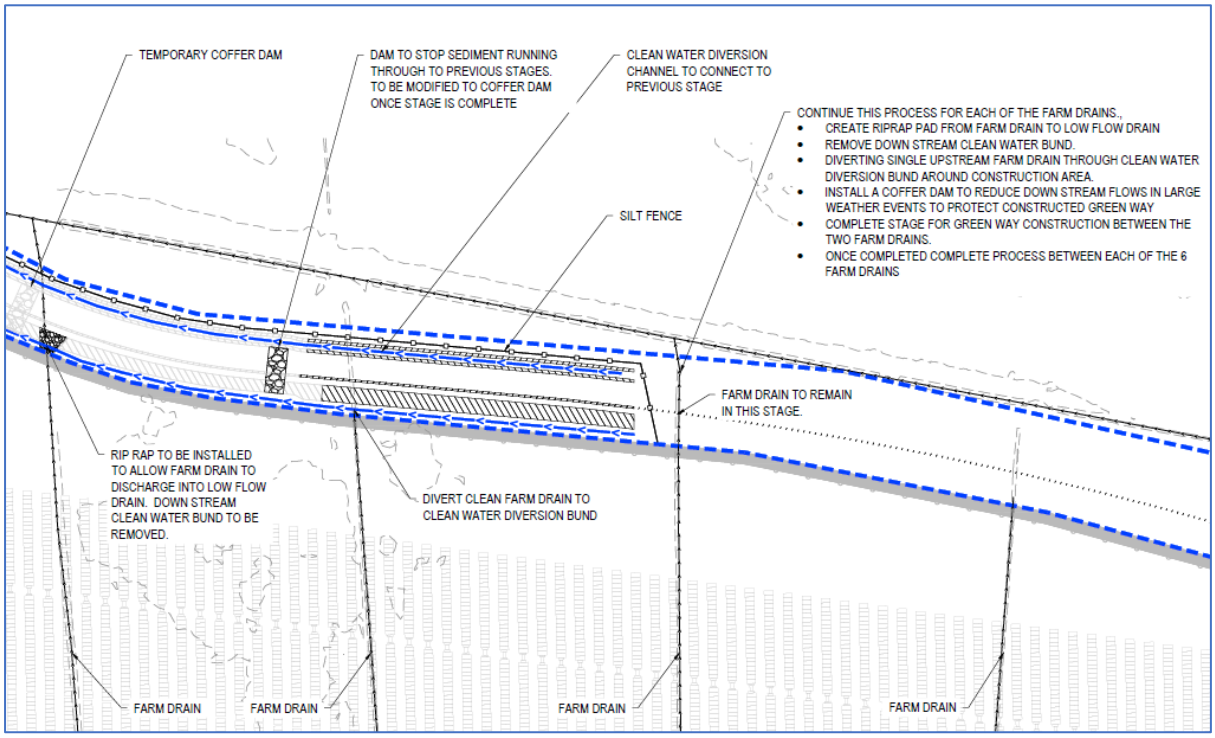

Figure 7: Erosion and Sediment Control for SW Greenway 3B

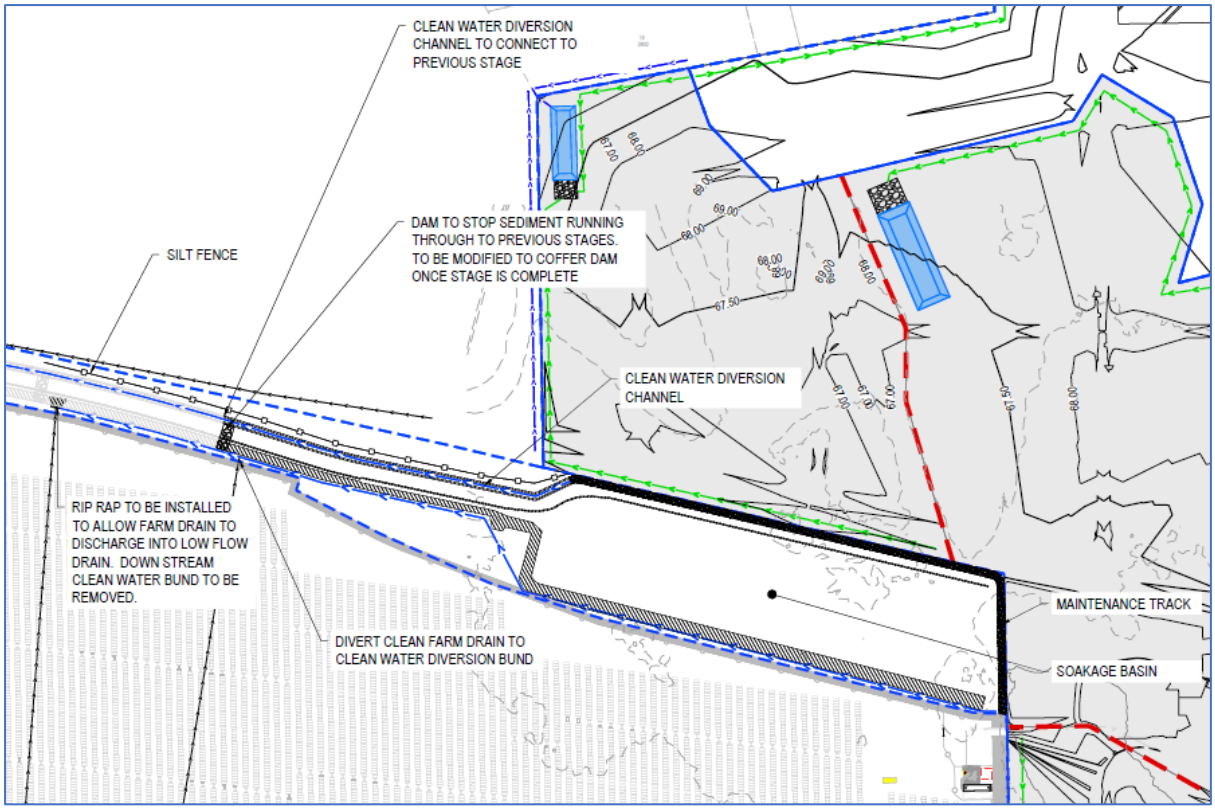

Figure 8: Erosion and Sediment Control for SW Greenway 4

4.1.4. SW Basin C

The earthwork plan for SW Basin C is comparatively straightforward. It has been devised to occur in Stage 3 (Earthworks Stage). The construction methodology for this area is as follows:

Stage 3 (EW):

- Establish erosion and sediment control
- Carry out earthworks within stage 3 (earthworks stage)
- Construct SW Basin C

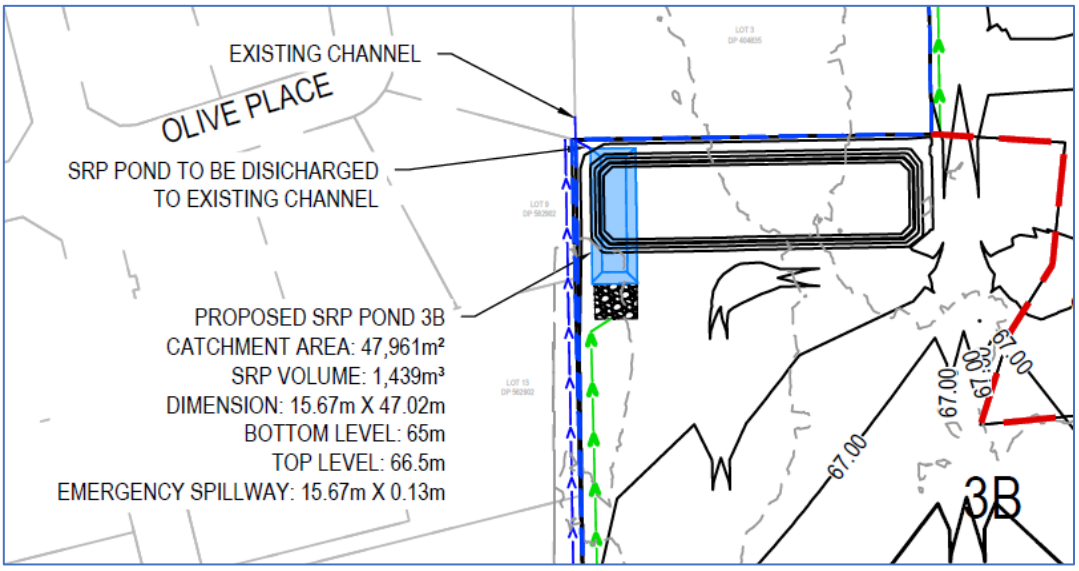

Figure 9: Erosion and Sediment Control for SW Basin C

4.1.5. SW Basin D

The earthwork plan for SW Basin D is comparatively straightforward. It has been devised to occur in Stage 3 (Earthworks Stage). The construction methodology for this area is as follows:

Stage 3 (EW):

- Establish erosion and sediment control.
- Carry out earthworks within stage 3 (earthworks stage)
- Construct SW Basin D

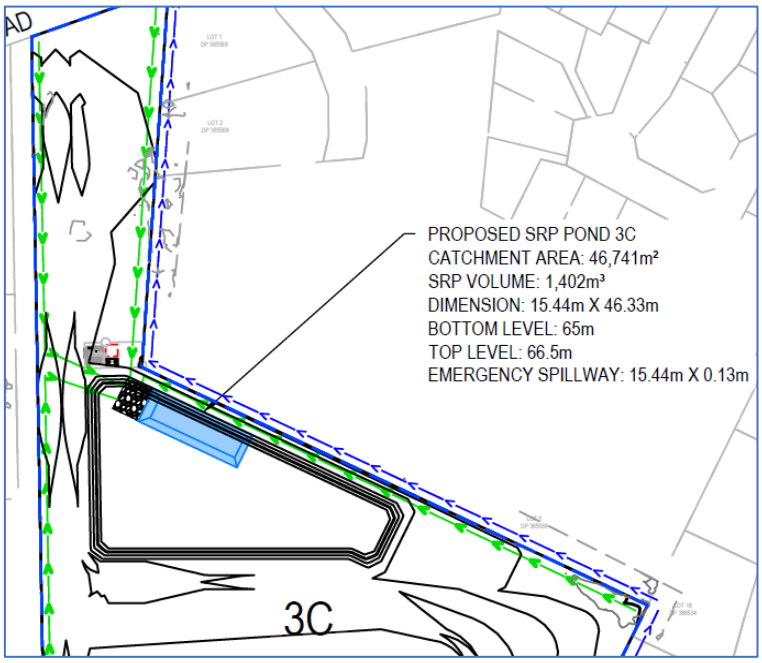

Figure 10: Erosion and Sediment Control for SW Basin D

5. Conclusion

The proposed earthworks outlined in this proposal, has been designed to facilitate the required infrastructure for Ashbourne Residential development, and in accordance with Erosion and Sediment Control Guidelines for Soil Disturbing Activities in the Waikato Region, January 2009.

Careful consideration is given to mitigate possible impacts of the proposed development to the receiving environment through implementation of accepted engineering practices.

5.1. Post Construction Monitoring and Maintenance

Following completion of bulk earthworks and infrastructure works, ongoing monitoring and maintenance will be undertaken to ensure compliance with consent conditions and environmental conditions. This period will coincide with the Defects Liability Period.

Activities include:

- Erosion and Sediment Control Decommissioning: Progressive removal of sediment control devices once full site stabilisation is achieved, subject to approval by WRC at indicated hold points ie waiting for stabilisation 80% grass strike coverage on grassed topsoil.
- Vegetation Establishment: Monitoring of grass and landscape planting success, with remedial planting undertaken as necessary.
- Defect Liability Period Inspections: Periodic site inspections will be undertaken during the defect liability period to address erosion, sedimentation, or settlement issues.
- Final Certification: A completion report, including 'as-built' plans and compliance certificates, will be submitted to MPDC as part of the 224c process.

The above will ensure that long-term environmental and infrastructure outcomes are maintained beyond construction.

Appendix A –Earthworks Drawings

Refer to Maven Engineering Drawings