INFRASTRUCTURE REPORT

Sunfield – Fast-Track Approvals Application

Ardmore, Auckland

CIVIL ENGINEERING ▾ SURVEYING ▾ LAND DEVELOPMENT

PROJECT INFORMATION

CLIENT	Winton Land Limited
PROJECT	215010

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1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY OVERVIEW

Sunfield Developments Limited (SDL) is proposing to consent a contiguous 244.5-hectare (ha) site to allow the development of a master planned community to be known as “Sunfield”, (the Site).

This Infrastructure Report along with the Three Waters report prepared by Maven outlines the strategy for the provision of infrastructure for the Site and has been prepared to support the Fast-track Approvals Act Application (FTA) and subsequent development of the Site.

The scope of these reports includes the identification of key design strategies, developing design solutions for infrastructure servicing to the site.

Acceptable engineering solutions have been determined and details of which are contained within the main body of the reports. The proposed consent conditions for this application require the detailed design of these solutions to be subject to review through an Engineering Plan Approval (EPA) process by the local authority.

The engineering solutions for the Site outlined within these reports have been prepared based on the standards and requirement of each of Auckland Council, Watercare and Healthy Waters, and are in line with best practice options.

1.2 SITE DESCRIPTION

The Site is located over several land tiles and is indicatively shown on the aerial photo below. The Site is bounded by Old Wairoa Road to the south, Cosgrave Road to the west and Airfield Road to the north.

Figure 1: Aerial Photo (indicative extent of Sunfield Master plan shown in red outline)

The current land zoning for the Site comprises approximately 57ha of land identified as Future Urban Zone (**FUZ**) and 187ha as Mixed Rural Zone (**MRZ**) under the Auckland Unitary Plan (**AUP(OP)**).

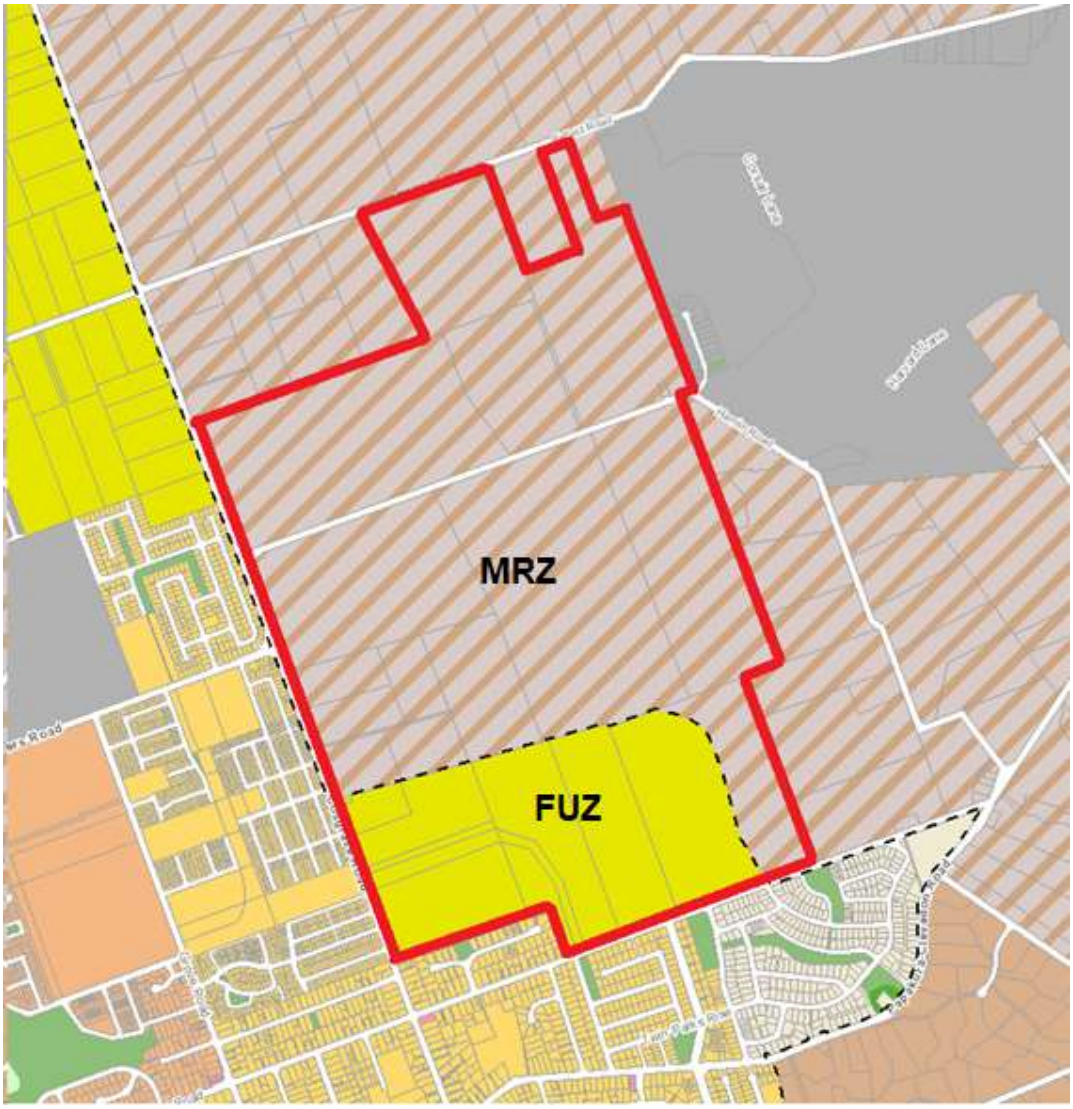

Figure 2: Current Zoning Plan (extent of FUZ land shown in yellow)

Auckland Council's Framework Plan for the adjacent Awakeri Wetland Development provides a possible density for the existing FUZ land, and when a similar density is interpolated through the FUZ land, approximately 1,550 lots can be realised. The interpolated density is the maximum probable development (**MPD**) of the land.

The MPD of 1,550 lots sets the development baseline for the FUZ land, from which stormwater and wastewater discharges are calculated and analysed within this report.

Further interpolating the density guidance for the adjacent MRZ land results in a total MPD for the Site of 4,000 residential lots.

1.3 LEGAL DESCRIPTION

The legal description and underlying zoning of the existing land parcels within the Site are shown below.

Address	Legal Description	Record of Title	Area (ha)	Underlying Zoning
55 Cosgrave Road, Papakura	Section 3-4 Survey Office Plan 495342	828127	9.2433	Future Urban
Old Wairoa Road, Papakura	Section 5-6 Survey Office Plan 495342	828128	11.8128	Future Urban
Old Wairoa Road, Papakura	Lot 1 Deposited Plan 55480	NA6C/1128	5.8014	Future Urban
Old Wairoa Road, Papakura	Lot 4 Deposited Plan 55480	NA6C/1131	10.3587	Future Urban
508 Old Wairoa Road, Ardmore	Deposited Plan 10383	NA258/245	23.6336	Future Urban & Rural
85 Hamlin Road, Ardmore	Lot 8 Deeds Plan Whau 38	NA778/296	22.5233	Rural
80 Hamlin Road, Ardmore	Part Lot 2 Deposited Plan 22141	NA1B/856	18.9937	Rural
80 Hamlin Road, Ardmore	Lot 2 Deposited Plan 21397	NA477/291	10.1171	Rural
80 Hamlin Road, Ardmore	Lot 1 Deposited Plan 21397	NA477/75	30.7192	Rural
80 Hamlin Road, Ardmore	Lot 5 Deposited Plan 12961	NA631/77	35.9057	Rural
80 Hamlin Road, Ardmore	Part Lot 4 Deposited Plan 12961	NA636/171	21.8505	Rural
279 Airfields Road, Ardmore	Lot 2 Deposited Plan 199521	NA128A/553	14.4224	Rural
92 Hamlin Road, Ardmore	Lot 1 Deposited Plan 46615	NA1666/17	0.0911	Rural

143 Cosgrave Road, Papakura	Lot 1 Deposited Plan 103787	NA57A/1149	3.0400	Rural
131 Cosgrave Road, Papakura	Lot 2 Deposited Plan 103787	NA57A/1150	3.0370	Rural
121A Cosgrave Road, Papakura	Lot 3 Deposited Plan 103787 and 1/3 Share in Lot 7 Deposited Plan 103787	NA57A/1151	3.0400	Rural
123 Cosgrave Road, Papakura	Lot 4 Deposited Plan 103787 and 1/3 Share in Lot 7 Deposited Plan 103787	NA57A/1152	8.6325	Rural
119A Cosgrave Road, Papakura	Lot 5 Deposited Plan 103787 and 1/3 Share in Lot 7 Deposited Plan 103787	NA61A/530	3.0370	Rural
119A, 121A and 123 Cosgrave Road, Papakura	Lot 7 Deposited Plan 103787		0.2417	Rural
119 Cosgrave Road, Papakura	Lot 6 Deposited Plan 103787	NA57A/1154	3.0360	Rural
101 Cosgrave Road, Papakura	Part Lot 1 Deposited Plan 45156	NA24C/216	1.9425	Future Urban
103 Cosgrave Road, Papakura	Lot 1 Deposited Plan 62629	NA18B/646	0.0809	Future Urban
55A Cosgrave Road, Papakura	Section 1-2 Survey Office Plan 495342	828126	2.9343	Future Urban
Total			244.4947	

Table 1- Legal Description & Existing Zoning Summary

1.4 PROPOSAL

The proposed development of Sunfield is a large-scale master-planned community, consisting of approximately 4,000 residential lots, and approximately 56.5ha of industrial/employment land. In addition to residential and industrial use, other uses to support a new community of this size are proposed, such as, a town centre, health care, aged care, local hubs, a school, parks/open space, stormwater reserves and green connections/shared pathways. The Sunfield development concept plan is shown in Figure 3 below.

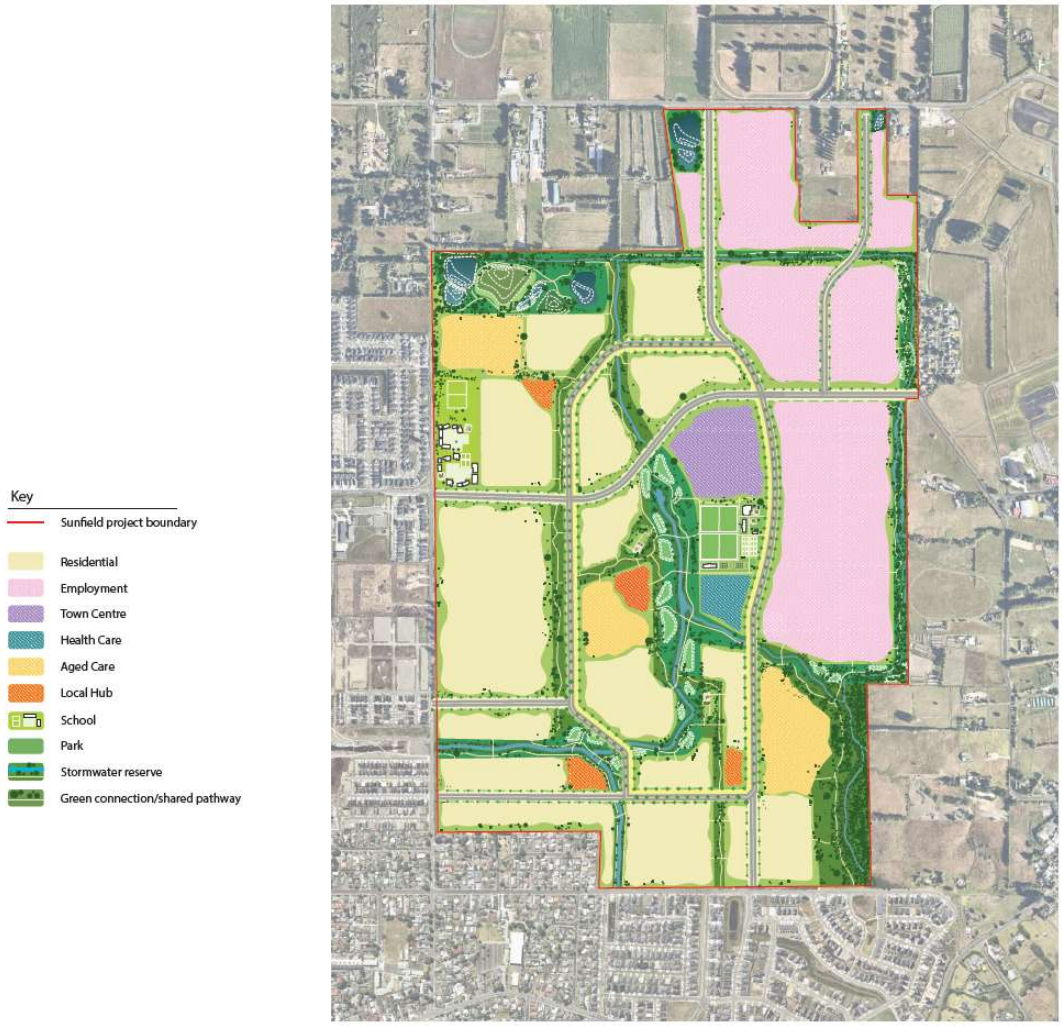

Figure 3: Sunfield Concept Masterplan

2.0 ROADING

Public Roads

A new network of public roads has been proposed to service the Site.

There are various hierarchies of roads throughout the site with road reserves ranging from 16m for local roads to 32m for the major roads servicing industrial traffic, cycle and private busway.

Maven engineering plans M-C310 and M-C350 to M-C356 identity the various types of roads and their cross-sections.

All roads have been designed to Auckland Transport Design Manual (TDM), Austroads and NZS4404 with both vertical and horizontal geometry designs meeting with acceptable parameters. On-site intersection tracking has been modelled and kerb radii checked to confirm that design meets the relevant standards.

The treatment of intersections within the site includes give way, traffic signals and roundabout, these have been identified on Maven Plan C340.

Intersection upgrades will be required where new roads tie into existing roads. These include upgrades along Airfield Road, Cosgrave Road and Old Wairoa Road.

External intersection upgrades will also be required, these include:

- Existing roundabout upgraded to larger roundabout where Mill Road intersects Airfield Road & Cosgrave Road.
- Existing give way upgraded to traffic signals where Cosgrave Road intersects with Clevedon Road and Okawa Avenue & Dominion Road intersects with Clevedon Road.

All new roads and external intersection upgrades will be reviewed by a lighting engineer and a design produced to ensure all areas are lit to the appropriate lighting standards.

Public Lighting on the roading network to be vested shall be provided with designated Road Classification and Sub-Categories identified by Auckland Transport Street Lighting in the provision of a Lighting Design Brief specific to the project for the roads identified below. Additionally any existing roads impacted or that interface directly with the Sunfield Development, the lighting design shall ensure that an integrated Public Lighting system is provided for both vehicular and pedestrian traffic to maintain road safety considerations.

Refer to Sunfield Masterplanned Community Fast-Track Integrated Transportation Assessment Report prepared by Commute for detailed traffic assessment.

Private Roads

There is proposed an extensive network of private roads for the Sunfield development in the form of commonly owned laneways.

These commonly owned access lots (COAL) will be a minimum of 6m in width and are designed to relevant engineering standards, they will demonstrate appropriate service vehicle tracking and lighting requirements.

The laneways will have lighting appropriate to pedestrian access and vehicle access serving dwellings and shall be based upon the current versions of the Auckland Unitary Plan (AUP) E27 Transport and E24 Lighting, designed and certified in a statement by a suitably qualified and experienced lighting professional.

3.0 EARTHWORKS

3.1 PROPOSED EARTHWORKS:

Earthworks are required to enable the Site and to allow for the construction of the required infrastructure to support the development. Earthworks are proposed over an area of 244ha and entail cut and fill operations associated with the formation of finished ground levels across the Site.

Below is a summary of earthworks quantities based on the earthwork modelling completed by Maven Associates:

Total area of ground disturbance	= 244Ha
Maximum cut and fill depth	= 18m cut & 6m fill
Fill required (excludes preload)	= 1,490,000 m^3
Cut volume	= 1,700,000 m^3
Bulk earthworks cut to fill (Including compaction factor of 0.8)	= 1,360,000 m^3
Cut to fill of surplus material from services & drainage	= 100,000 m^3
Total cut/fill volume (Sum of total cut + total fill)	= 3,290,000m^3
Net cut/fill balance (Fill Import)	= 30,000 m^3
Preload (import) (Based on preloading one superlot at a time)	= 100,000 m^3

The site wide earthworks will be refined through detailed engineering design to achieve a closer cut/fill balance of the earthworks volume.

The Engineering Drawings (**Appendix B**) detail the extent of works and sediment control measures attached with the Fast Track Act application.

Building platform areas will need to be preloaded with approximately 0.5m – 2.25m of material (depending on the underlying soil profile / land use) to consolidate the upper peat layers prior to the commencement of building construction. Full details of preload requirements are provided within the Geotechnical Report Prepared by LDE.

During construction earthworks supervision will be undertaken by a suitably qualified engineer to confirm the geotechnically suitable for the development proposals. A Geotechnical Completion Report (GCR) will be provided at the completion of any stage of earthworks. The GCR will set out the earthworks specification that was achieved and have a record of the management and monitoring of the works as they progressed.

A suitably qualified engineer will issue a statement confirming the standard of any fill placed and any constraints associated with areas of natural ground or slope stability with respect to building foundation design.

The conditions of consent will require that erosion and sediment control measures to be implemented and maintained in accordance with these guidelines and the approved Earthworks Plans. (**Appendix B**).

3.2 GEOTECHNICAL ASESSMENT

A geotechnical assessment has been undertaken by Land Development and Engineering (LDE) in support of this consent application. The geotechnical assessment investigates the suitability of the development and details the site geology and subsurface conditions. Findings from the assessment are outlined in the Geotechnical Assessment Report prepared by Land Development & Engineering (LDE).

The LDE report concluded:

Overall, the landholding is considered suitable for urban intensification as has been done on other topographically large land holdings to the west in similar geologies, and we therefore support the development proposal.

Further site investigation, and/ or design analyses will be required as part of the EPA application process in due course, commensurate with earthworks plans.

Upon completion of the proposed earthworks an Geotechnical 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 future foundation design purposes.

3.3 PROGRAMME OF WORKS

Earthworks will commence when all necessary consents are in place. It is proposed to begin the proposed earthworks at the start of the earthworks season being October 1st of the relevant year.

Due to the size of the project, it is envisaged that earthworks will be completed in a staged fashion over various earthworks seasons to maximise the efficiency and minimise the risk of environmental issues related to weather events. Applications for out of season (winter works) will be lodged as and when required.

Earthworks will be undertaken to enable an efficient use of plant and materials with borrow area and fill area volumes managed to achieve an on-site volume balance.

Earthworks stages will generally be larger and not directly related to subdivision civil stages.

Works are intended to be carried out in the following steps:

- Installations of all erosion and sediment control devices as shown on the approved engineering plans.
- Carry out bulk earthworks.
- Progressively stabilise bulk earthwork areas as finished levels are achieved, to minimise the potential for erosion.
- Retain erosion and sediment control devices until completion, and approval is granted from Council to remove controls.

3.4 CHANNEL/SWALE CONSTRUCTION METHODLOGY:

The construction of channels and swales will be undertaken generally in accordance with the following methodology. A more detailed methodology by the contractor will be provided to council prior to commence of works.

1.Fish relocation to be undertaken prior to commencement of works. A fish relocation plan will be provided to Council prior to commencement of works.

2. The diversion channel or swale (is to be excavated and the proposed culvert is to be installed. Small portion of earth (plug) is to remain at each end of the diversion channel to ensure the watercourse does not breach into the diversion. The new channel or swale will have sufficient capacity to service the 1% AEP storm event.

Once the channel is excavated into its final shape, it is to be stabilised.

Following stabilisation, the channel downstream plug is to be opened to allow water from the existing channel to flow in. The upstream plug is then to be opened to allow water to flow into the new channel.

3. A non-erodible dam should be placed immediately in the upstream end of the existing channel. Where a dam is constructed from compacted earth bund, it must be stabilised with an appropriate geotextile pinned over the upper face and the adjacent to the lower face for scour protection. Coffer dam constructed from sandbags can also be used to construct the dam.

4. A non-erodible dam on the downstream end of the existing stream should then be installed to prevent backflow into the construction area. any water remaining within the existing watercourse is to be drained by pumping to a sediment retention pond.

The existing drain is then to be back filled and stabilised and any existing culverts to be removed.

5. The downstream dam should be removed first, allowing water to flood back into the original channel. The upstream dam is then removed, and both ends of the diversion channel are filled with non-erodible material. Any sediment-laden water should be pumped to a sediment retention pond.

3.5 SEDIMENT AND EROSION CONTROL

All earthworks within the Site are supported by measures for erosion and sediment control to ensure all adverse effects from stormwater runoff during earthworks are mitigated. The site is mostly very flat topography which will result in significant areas of impoundment during rainfall events. It is envisaged that pumping of stormwater will be required to manage the run-off from rainfall events and the high groundwater levels present at the Site.

Proposed measures for erosion and sediment control have been designed in accordance with Auckland Councils design manual *'GD05 Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region'*.

Silt control measures will need to be installed onsite prior to the earthworks commencing. All silt control measures will be checked and confirmed acceptable by the Engineer before works commence.

During earthworks, the sediment control measures will be maintained such that they function as proposed. Refer to section 3.9.2 of this report for further details in this regard.

Silt control measures will only be removed once the site is considered stable in terms of silt run-off by Auckland Council and the Site Engineer.

3.6 PROPOSED CONTROLS

The following system of erosion and sediment control protection measures are proposed:

Erosion Controls

The site is relatively flat and due to the site contained peat soils, erosion control is limited to diversion bunds to stop rainwater entering/ leaving the site. The bunds allow for the localized ponding (impoundment) of rainwater on the site which can then be managed by pumping or directing to treatment devices as required. The impounded rainfall will also recharge the peat soils to maintain consistent groundwater levels.

Clean Water Diversion Channels and Bunds: These measures are used primarily to intercept and convey runoff to stable outlets. Clean water diversions intercept clean water away from the works area. Erosion damage potential is minimised by reducing the volume of water flowing over the site. This also then reduces the potential for sediment generation and the size of sediment-control devices needed.

Dirty Water Diversion Channels and Bunds: Dirty water diversions convey sediment-laden water within the disturbed area and direct it to a sediment-retention device to enable it to be treated or allow localized ponding of rainwater.

Sediment Controls

Stabilised Entrance: A stabilised vehicle entrance will be formed stabilised to minimise potential for sediment to leave the site with construction traffic.

Progressive Stabilisation: The site will be progressively stabilised as areas of earthworks are completed. This will be undertaken by hay mulching or grass establishment.

Sediment Retention Ponds (SRPs): Where clay is present on-site, SRPs are proposed as a temporary storage and attenuation device. These devices will chemically treat the sediment laden water and will prevent the site from discharging suspended sediments into the receiving environment. Treated water will be discharged from the SRPs into existing drains and watercourses within the Site.

Dirty water diversion bunds will direct runoff towards the proposed SRPs.

Decanting Earth Bunds (DEBS): DEBs are a smaller version of an SRP and can be installed quickly and efficiently. They have the same rainfall activated treatment systems as SRPs but the catchment area they can treat is limited in size.

Silt Fences: Silt fences can be used as a barrier to contain runoff flows and trap sediment laden water, these are particularly useful on flat land where runoff is slow.

3.7 POTENTIAL ENVORONMENTAL EFFECTS

Other effects to the surrounding environment include vibration impacts and noise generation from earthmoving equipment, these can be mitigated by adhering to the vibration and noise guidelines mandated in the draft consent conditions.

Dust generation will be controlled by earthworks management practices such as trimming haul roads and cycling plant through alternative haul routes. Watering construction areas and haul roads with watercarts and or K-line irrigators will also be implemented when required.

Mitigating measures will be proposed in a Construction Management Plan (CMP) by the Contractor to minimise any adverse effects. A CMP will be required by condition of consent and will be provided to the Local Authority monitoring office prior to construction works commencing.

3.8 EARTHWORKS WITHIN 100-YR FLOOD PLAIN & OVERLAND FLOW PATH

3.8.1 EXISTING/PRE-EARTHWORKS FLOODING AND OVERLAND PATH

Auckland Council's GeoMaps indicate several existing major overland flow paths (OLFPs) which traverse through the Site and generally flow from south-east to north-west direction There is doubt as to the scale and location of the OLFPs due to the very flat nature of the topography of the Site. The OLFPs originate from within the Site and from upstream of the Site.

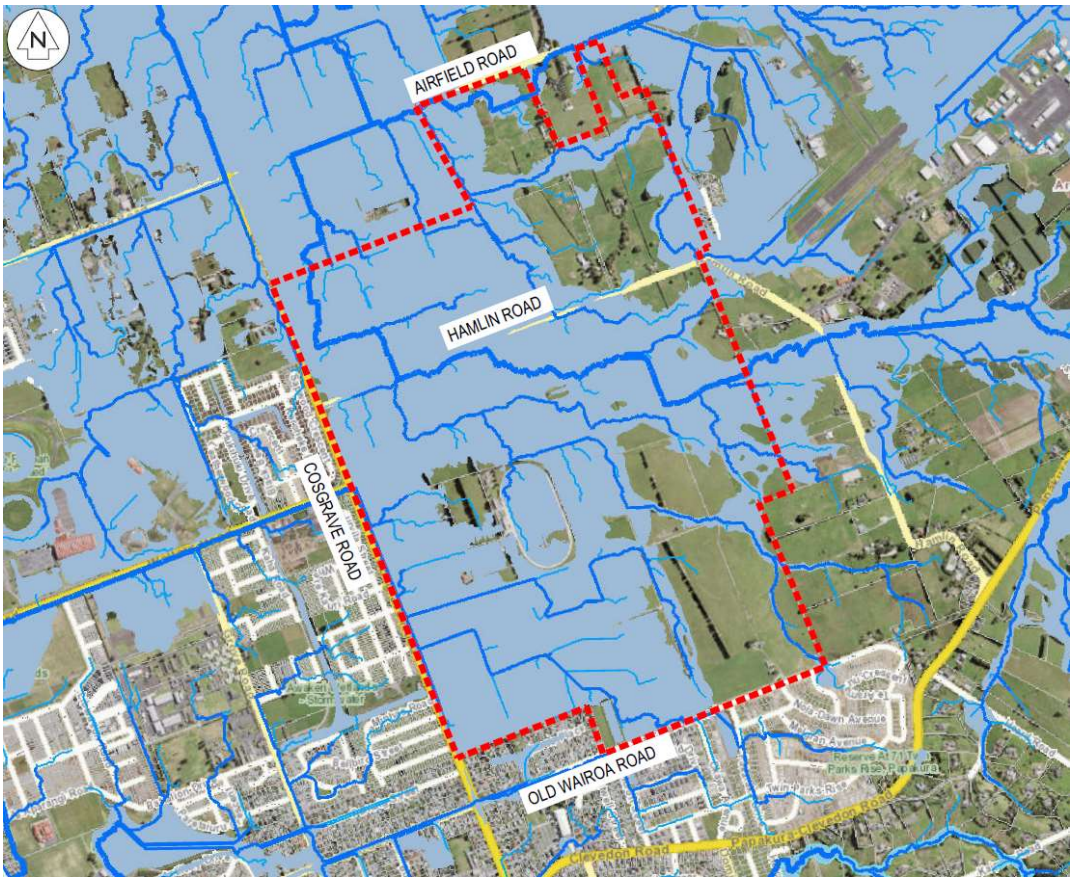

Figure 4: Existing OLFPs and Floodplain as plotted on Auckland Council's GeoMaps

3.8.2 PROPOSED EARTHWORKS WITHIN FLOOD PLAIN & OVERLAND FLOW PATH

Earthworks are proposed within flood prone areas, flood plain areas and major overland flowpaths. These flood hazards will be managed during earthworks, upstream flows will be diverted around the area of works and all earthworks disturbed areas will have appropriately sized control devices to manage flows from rainfall events.

As detailed in the Three Waters Report prepared by Maven, Flood management devices including stormwater ponds and swales across the site will be constructed first, ahead of any building development. These devices will contain or divert the flood hazards, effectively removing the floodplain area from the development Site.

3.9 ADDITIONAL INFORMATION

3.9.1 FILL COMPACTION

Refer to Geotech report for testing and compaction requirements.

3.9.2 MONITORING

All sediment control measures will be checked regularly, to ensure that they are performing as intended by design.

A site walk over shall be undertaken daily 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 proposed. Any large floating matter including any organic matter, ie fallen tree litter, reaching the ponds or discharge structures is to be removed immediately.

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

Diversion Drains/ Clean Water cut-off bunds

- Inspect weekly and after every rainfall and during periods of prolonged rainfall for scour and areas where diversions may breach. Repair immediately, if required, to ensure that the design capacity is maintained.
- Remove any accumulated sediment deposited in the diversion channel where there is a risk of overtopping due to a lack of freeboard.
- Check invert and outlets to ensure that these remain free from scour and erosion. These points may require geotextile lining to avoid scour.
- Look for low spots, areas of water ponding, formation of tunnel gullies, sediment deposition and debris blockage.
- Check for stabilisation cover and where required, ensure full stabilisation cover remains.
- Perimeter diversions need particular care to protect against damage from earthmoving operations and should be reinstated if damaged.

Silt Fence

- Inspect silt fences at least once a week and after each rainfall
- Check for damage including rips, tears, bulges in the fabric, broken support wires, loose waratahs, overtopping, outflanking, undercutting, and leaking joins in fabric
- Make any necessary repairs as soon as identified
- As the geotextile material becomes clogged with sediments, this will result in increased duration of ponding. Therefore, careful cleaning of the silt fence geotextile with a light broom or brush may be appropriate

- Remove sediment when bulges occur or when sediment accumulation reaches 20% of the fabric height
- Remove sediment deposits as necessary (prior to 20% of fabric height) to continue to allow for adequate sediment storage and reduce pressure on the silt fence
- Dispose of sediment to a secure area to ensure that it does not discharge to the receiving environment.

Stabilised Vehicle Entrance

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

Sediment Retention Ponds

- Inspect SRPs daily and before and after each rainfall event.
- Clean out SRPs before accumulated sediment volume of reaches 20% of the total SRP volume. To assist in gauging sediment loads, clearly mark the 20% volume height on the decant riser.
- Clean out SRPs with high-capacity sludge pumps, or with excavators (long-reach excavators if needed) loading onto sealed tip trucks or to a secure bunded area where the sediment can dry
- Maintain access to the forebay at all times to allow removal of accumulated sediment. Clean out the forebay after each runoff event if there is any evidence of sediment deposition
- The ESC Plan should identify disposal locations for the sediment removed from the SRP. Deposit the sediment in a location that avoids direct discharge to receiving environments. Stabilise all disposal sites as required and approved in the site's ESC Plan. Provide all weather access for the desilting and secure bunded areas if the SRP is to operate throughout winter
- Immediately repair any damage to SRPs caused by erosion or construction equipment.

Dust Controls

- Monitor dust emissions at least daily. In windy dry conditions, review dust emissions continuously. If you see dust discharges, evaluate whether the methods you are using are effective or need to be improved or adapted to give effective control.
- Reapply water as required to effectively manage levels of dust generation, especially when soil moisture conditions become low during hot and windy conditions.

4.0 THREE WATERS – STORMWATER, WASTEWATER & WATER SUPPLY

4.1 THREE WATERS REPORT

The Three Waters Report and Stormwater Water Management Plan has been prepared by Maven to outline the strategy for the provision of stormwater, wastewater and water supply (the Three Waters Strategy) for the Site.

The scope of this report includes the identification of key design strategies, developing design solutions for stormwater and wastewater disposal and water supply, and articulating the designs in accordance with the Three Waters Strategy.

5.0 Utilities

The existing utility services surrounding the site are:

Power – which is managed by Vector.

Telecommunication – which is managed by Chorus, and

Gas – which is managed by Vector and First Gas.

Initial liaison with the respective service providers has been undertaken, as is detailed below:

5.1 TELECOMMUNICATIONS

Both Chorus and Tuatahi First Fibre have confirmed that there is existing telecom infrastructure in the surrounding area of the Site and that they are able to extend their existing network to provide connection to the proposed development. Refer to **Appendix A**.

5.2 POWER

SDL have engaged Vector for the proposed development of the Site. Vector have confirmed they will continue to work with SDL to understand the electrical load requirements and timing of delivery of the Sunfield development.

5.3 GAS

An existing gas line owned by First Gas transects the Site. Easements registered on the respective titles protect the gas line, set the required setback distances for housing and specify the approval process with First Gas that is required to be undertaken in the event that works are to be undertaken near the gas line. Winton has had initial engagement with First Gas around the Plan Change and intended future development.

5.4 SUMMARY

Detailed design of utility services for the proposed development of the Site will be completed as part of the Engineering Plan Approval applications in liaison with the respective service providers.

Services will be connected to the development as per respective service agreements that will be entered into between Winton and the service providers.

Any works near to or within the First Gas easements will be conveyed and discussed with and approved by First Gas before any works commence.

4.0 INFRASTRUCTURE REQUIREMENTS

	SUNFIELD INFRASTRUCTURE REQUIREMENTS BY STAGE					
STAGE	**LOTS**	**STORMWATER**	**SEWER**	**ROADING**	**WATER SUPPLY**	**UTILITIES**
1	353 including a Local Hub	Awakeri Wetlands Stage 2 and 3. Secondary swales conveying SW to Awakeri Wetlands. Internal: Stormwater network and provision for future stages.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superhot via Walters Road and Cosgrave Road. Internal: LPS network and provisions for future stages	External: Intersection of proposed Road 2 and Cosgrave Road. External: Upgrade of Road frontage (Stage 1 frontage only). Internal: New Road Network. Includes Type 7 and Type 10 (refer to M-C310 and M-C351 to M-C356 identity the various types of roads and their cross-sections)	External: Extension of water supply from existing 250mm line on western side of Cosgrave Road. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
2	209	Awakeri Wetlands Stage 2 and 3. Secondary swales conveying SW to Awakeri Wetlands. Internal: Stormwater network and provision for future stages	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superhot via Walters Road and Cosgrave Road. Internal: LPS network and provisions for future stages	External: Intersection of proposed Road 4 and Cosgrave Road. External: Upgrade of Cosgrave Road frontage of Stage 2. External: Signalised intersection of Cosgrave Road and Clevedon Road should Stage 2 follow Stage 1. External: Pedestrian and Cycle links on Cosgrave Road between Walters Road and Clevedon Road Internal: New Road Network. Includes Type 6, & 10.	External: Extension of water supply from existing 250mm line on western side of Cosgrave Road. Internal: Water supply network extension from and provisions for future stages.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

3	330	Awakeri Wetlands Stage 2, 3 & 4 (Swale section only). Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network and provision for future stages.	Internal: Extension of LPS network from Stage 2 and provisions for future stages	Internal: Private network accessed via vehicle crossing from superlot 4.	Internal: Extension of Water supply network from Stage 2 and provisions for future stages.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
4	312 including a Local Hub	Awakeri Wetlands Stage 2, 3 & 4 (including SW Pond 4). Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	Internal: Extension of LPS network from superlot 3.	External: Signalised Intersection on Old Wairoa Road. Internal: Road network from superlot 2. Includes type 2 & 10.	External: Extension of Water supply network from BSP on Airfield Road down Mill Road and Cosgrave Road to Road 4. Internal: Extension of Water supply network from Stage 3.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

5	165	Awakeri Wetlands Stage 2, 3 & 4 (Swale section only). Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	Internal: Extension of LPS network from Stage 2.	Internal: Extension of road network from Stage 2. Includes Type 10. Provisions for future stages	External: Extension of water supply from existing 250mm line on southern side of Cosgrave Road. Internal: Extension of Water supply network from Stage 2 and provisions for future stages.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
6	215	Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	Internal: Extension of LPS network from Stage 3.	External: Intersection of Road 1 and Old Wairoa Road. Internal: Road network from Stage 3. Includes type 6 & 10.	Internal: Extension of Water supply network from Stage 3. External: Connection to the existing 125dia PE in Old Wairoa Road	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
7	11 Lots - Employment Zone	Internal Stormwater Network for Stage 7	Internal: Extension of LPS network from Stage 4.	Internal: Extension of road network from Stage 4. Includes Type 10. Provisions for future stages	Internal: Extension of Water supply network from Stage 4.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
8	202	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Hamlin Road realignment. Internal: LPS network.	Hamlin Road realignment & Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Internal: Road network. Includes Type 10	External: Extension of Water supply network from BSP on Airfield Road to site. Extension of water supply network from Stage 7 or Stage 21 and Hamlin Road realignment. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

9	219	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the Stage via Stage 8 or Stage 21. Internal: LPS network.	Extension of road network through Stage 8 or Stages 19 & 21. Internal: Road network. Includes Type 10.	External: Extension of Water supply network from BSP on Airfield Road to site. Water connection from water network in Stages 8 or 21. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
10	150	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the Stage via Walters Road. - LPS network through Hamlin Road realignment. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Internal: Road network. Includes type 2 & 10.	External: Extension of Water supply network from BSP on Airfield Road to site. Extension of water supply network from Stage 8 and Hamlin Road realignment. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
11	346 Lots including Local Hub	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the Stage via Walters Road. Extension of LPS network through Hamlin Road realignment and Stage 10. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road and Stage 10. Internal: Road network. Includes type 10.	External: Extension of Water supply network from BSP on Airfield Road to site. Extension of water supply network from Hamlin Road realignment or Stage 10. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

12	139 Lots - Lilyburn Village	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the Stage via Walters Road. Extension of LPS network through Hamlin Road realignment and Stages 10 & 11. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road and Stages 10 & 11. Internal: Private network accessed via vehicle crossing from superlot 12.	External: Extension of Water supply network from BSP on Airfield Road to site. Internal: Water connection from network in Stage 11.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
13	School	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Access via vehicle crossing on Hamlin Road realignment.	External: Extension of Water supply network from BSP on Airfield Road to site.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
14	109	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the Stage via Walters Road. - LPS network through Hamlin Road realignment. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Internal: Road network. Includes type 10.	External: Extension of Water supply network from BSP on Airfield Road to site. Extension of water supply network from Hamlin Road realignment. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

15	85	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the Stage via Walters Road. - LPS network through Hamlin Road realignment. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Internal: Road network. Includes type 10.	External: Extension of Water supply network from BSP on Airfield Road to site. -Extension of water supply network from Hamlin Road realignment. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
16	2 Lots - Employment Zone	Perimeter Diversion Swale. Awakeri Wetlands Stage 2, 3 & 4 (Including SW pond 4). Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	LPS network through Hamlin Road realignment & Superlot 7. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Internal: Road network. Includes Type 4.	External: Extension of Water supply network from BSP on Airfield Road to site. -Extension of Water supply network from Superlot 20 Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
17	3 Lots - Employment Zone	Perimeter Diversion Swale. Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road. - LPS network through Hamlin Road realignment & Stage 16. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Access via Stage 16 or Hamlin Road	External: Extension of Water supply network from BSP on Airfield Road to site. Water connection from water network in Stage 16.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

18	1 Lot - Employment Zone	Perimeter Diversion Swale SW Pond 3 Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road. - LPS network through Hamlin Road realignment -LPS network through Stage 20 Internal: LPS network and provisions for future stages	External: Intersection on Airfield Road. Internal: Road network. Includes type 4.	External: Extension of Water supply network from BSP on Airfield Road to site. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
19	6 Lots - Employment Zone	Perimeter Diversion Swale. SW Pond 2. Swales conveying SW to SW Pond 2. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road. - LPS network through Hamlin Road realignment -LPS network through Stage 21. Internal: LPS network.	External: Intersection on Airfield Road and Airfield Road Frontage upgrade. Internal: Road network. Includes type 4 & 9.	External: Extension of Water supply network from BSP on Airfield Road to site. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
20	4 Lot - Employment Zone	Perimeter Diversion Swale. SW Pond 1. Swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road. - LPS network through Hamlin Road realignment. Internal: LPS network.	Hamlin Road realignment. Internal: Road network. Includes type 4 & 9.	External: Extension of Water supply network from Stage 18. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

21	4 Lots - Employment Zone	Perimeter Diversion Swale. SW Pond 1. Secondary swales conveying SW to SW Pond 1. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road. LPS network through Hamlin Road realignment. Internal: LPS network.	Hamlin Road realignment & intersection at Intersection of Hamlin Road realignment, Mill Road & Cosgrave Road. Internal: Road network. Includes Type 9.	External: Extension of Water supply network from BSP on Airfield Road to site. -Extension of Water supply network from either Stage 19 or 20. Internal: Water supply network and provisions for future stages	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
22	221 Lots - Homehill Village	Awakeri Wetlands Stage 2, 3 & 4 (Including SW pond 4). Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road. Internal: Extension of LPS network from either Stage 3 or 4	Internal: Private network accessed via vehicle crossing from Stage 4.	External: Extension of Water supply network from BSP on Airfield Road to site. Internal: Water connection from network in either Stage 3 or 4.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised
23	TBC	Awakeri Wetlands Stage 2, 3 & 4 (Including SW pond 4). Swales conveying SW to Awakeri Wetlands. Internal: Stormwater network.	External: Low pressure sewer (LPS) network from existing 525Ø wastewater transmission line on Walters Road to the superlot via Walters Road. Internal: Extension of LPS network from either Stage 3 or 4	Internal: Private network accessed via vehicle crossing from Stage 4. External: Cosgrave Road frontage upgrade	External: Extension of Water supply network from BSP on Airfield Road to site. Internal: Water connection from network in either Stage 3 or 4.	Network extensions of power and communications media to provide for and future stages. External network upgrades to be advised

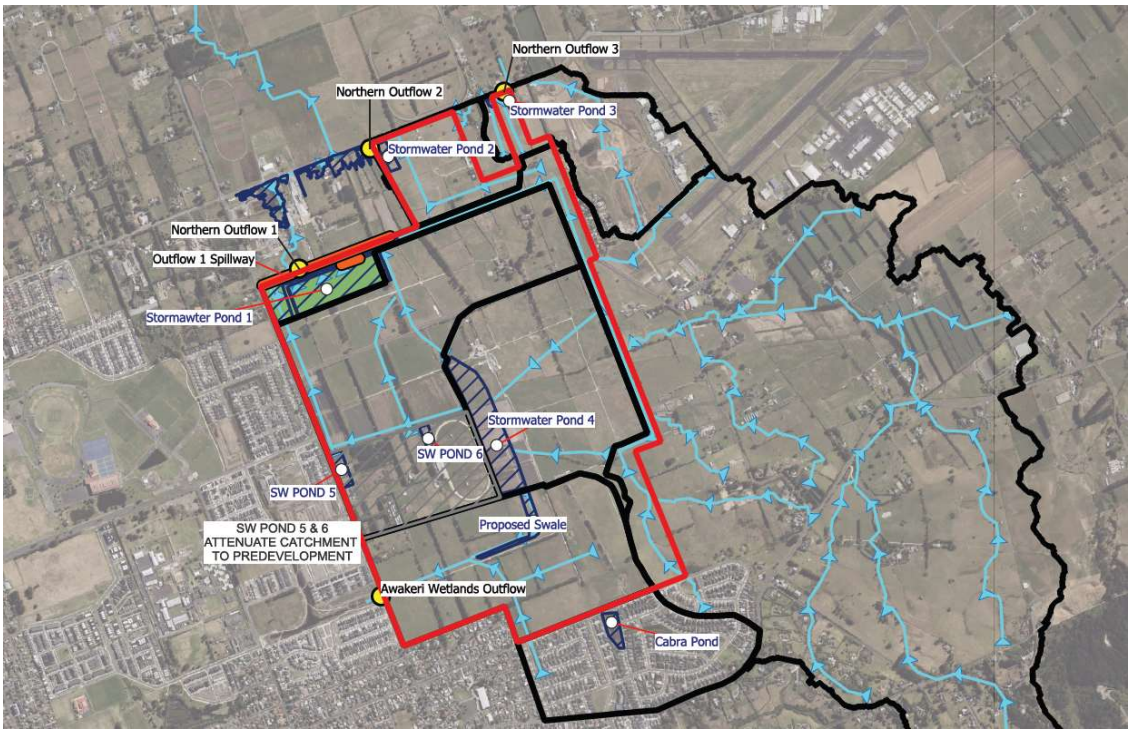

Figure: Stormwater Management Devices

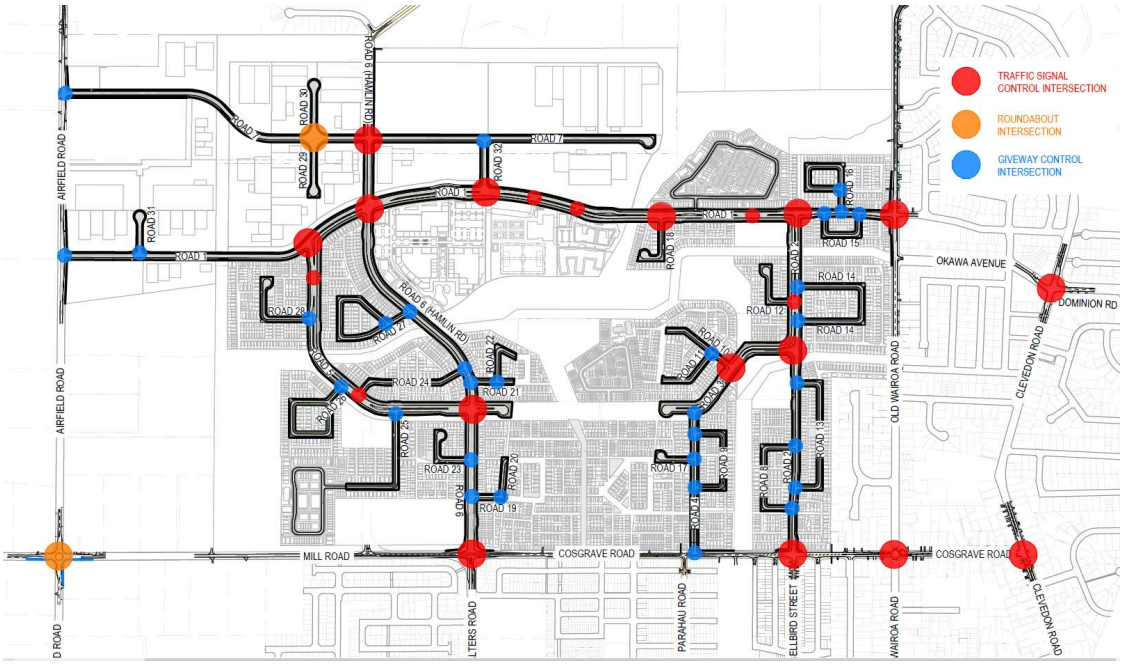

Figure: Proposed Intersection Upgrades

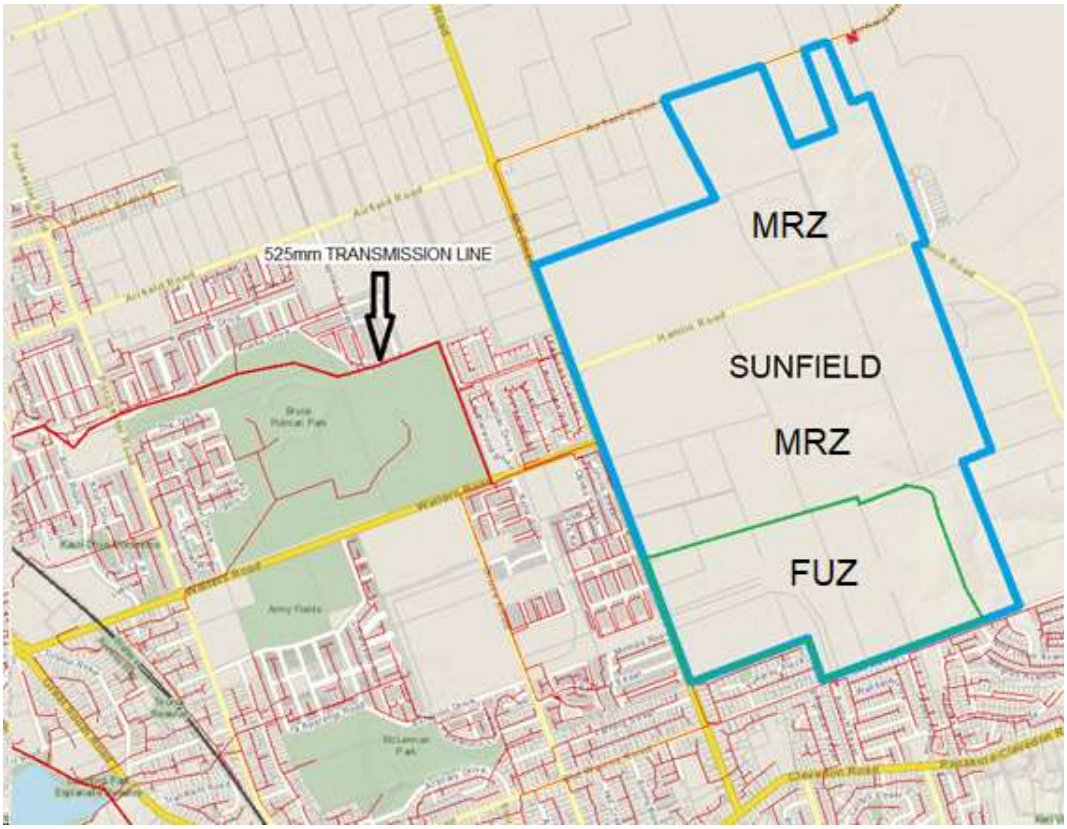

Figure: Existing Wastewater assets

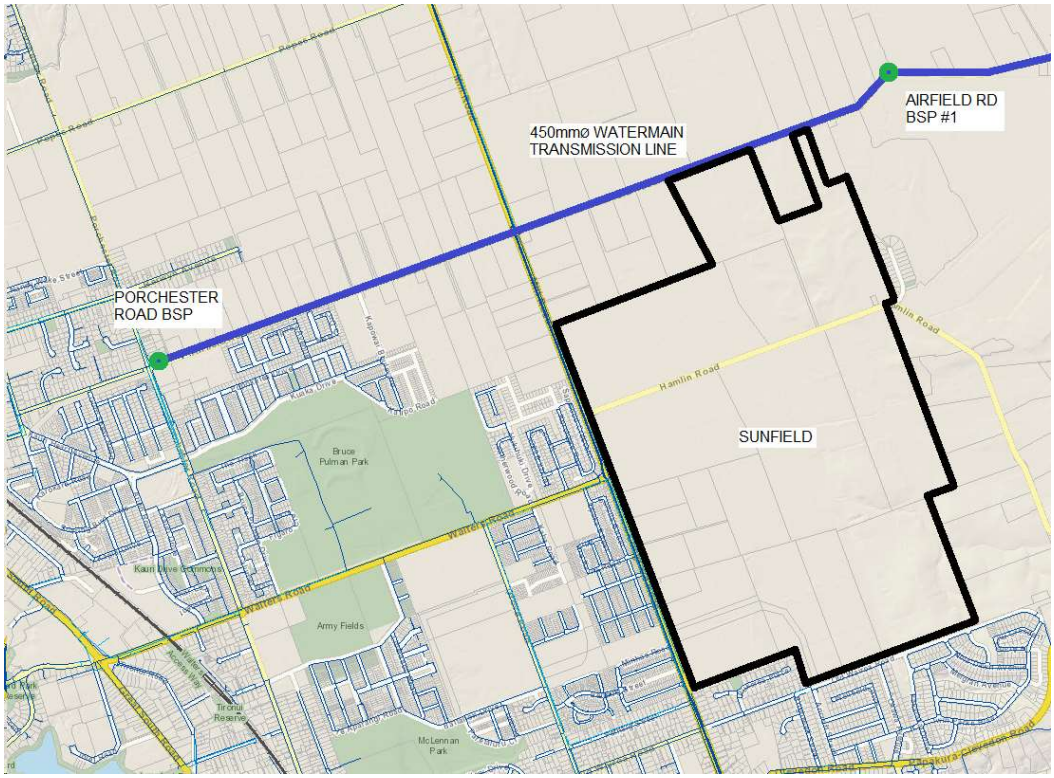

Figure 19: Water supply Transmission lines

5.0 CONCLUSIONS

As identified in this Infrastructure Report and the Three Waters Strategy Report prepared by Maven, from an engineering perspective, proposed infrastructure servicing can be achieved via methods consistent with current relevant AUP(OP) requirements and relevant Engineering Standards.

Subject to detailed design and approval from the local authorities, we believe there are no infrastructure issues that would preclude the Site being developed for the proposed land use.

We recommend final solutions are developed after consultation with third party stakeholders including Veolia, Watercare, Auckland Council, Auckland Transport and Healthy Waters.

APPENDIX A – CONSULTATION EVIDENCE

Chorus NZ Ltd
4 Graham Street
Auckland CBD
Auckland

David Osborne
Head of Land Development
Winton
Auckland

22nd November 2024

Hi David,

Thank you for providing an indication of your development plans in this area. I can confirm that we have UFB fibre infrastructure in the area that you are proposing to develop. Chorus will be able to extend our network to provide connection availability to **"Sunfield Development - Papakura-Clevedon Road, Cosgrave Road, Mill Road & Airfield Road Papakura, Auckland".**

However, please note that this undertaking would of course be subject to Chorus understanding the final total property connections that we would be providing, roll-out of property releases/dates and what investment may or may not be required from yourselves and Chorus to deliver the infrastructure to and throughout the site in as seamless and practical way as possible.

The costs involved can only be finalised at the time that you are ready to proceed.

Chorus is happy to work with you on this project as the network infrastructure provider of choice. What this ultimately means is that the end customers (business and home owners) will have their choice of any retail service providers to take their end use services from once we work with you to provide the physical infrastructure.

Please reapply with a detailed site plan when you are ready to proceed.

Thanks

Kind Regards,

Danny Masterson
Business Development Manager
021849233
Chorus NZ Ltd

5 December 2024

Vector Limited
101 Carlton Gore Rd
PO BOX 99882
Auckland 1149
New Zealand
+64 9 978 7788 / vector.co.nz

Sunfield Developments Limited
PO Box 105526
Auckland 1143

Attention: David Osborne

Sunfield Developments Limited – Takanini – Electrical Network Provisioning

I can confirm that Sunfield Developments Limited (SDL) has been engaging with Vector regarding providing an extension of the existing electrical network into the proposed master planned development (Sunfield) in Takanini.

We understand SDL plans to make an application under the Fast Track Legislation in the first quarter of 2025.

SDL has confirmed the make-up of the master-planned development is as follows:

Land Use	Area	No. - GFA or Building Coverage
Residential	85ha	3,400 Units – 105m2 to 175m2
Lifestyle Villages	9.5ha	600 Units – 130m2 Average
Employment	46ha	28.4ha – 26.3ha warehouse and 2.15ha office
Town Centre - Retail	7.5ha	48 Tenancies
Education - School	4ha	
Local Hub - Retail	6ha	5 hubs – total 7,500m2 GFA

Vector will continue to work with SDL to understand the electrical load requirements and timing of delivery of the Sunfield development.

Yours sincerely

Daniel Mason
Strategic Projects Relationship Manager

APPENDIX B – ENGINEERING PLANS

NOTES

1. ALL WORKS TO BE IN ACCORDANCE WITH AUCKLAND COUNCIL STANDARDS.
2. COORDINATES IN TERMS OF NZ GEODETIC DATUM MT EDEN 2000
3. LEVELS IN TERMS OF THE NEW ZEALAND VERTICAL DATUM 2016.
4. ORIGIN OF LEVELS = SM 5812 SO 58209 (BUU5) PUBLISHED RL=30.588, SOURCED FROM THE LINZ DIGITAL GEODETIC DATABASE.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL SERVICES THAT MAY BE AFFECTED BY THEIR OPERATIONS.
6. THE CONTRACTOR SHALL COMPLY WITH ALL RELEVANT HEALTH AND SAFETY REQUIREMENTS.
7. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVAL FROM UTILITY OPERATORS BEFORE COMMENCING WORK UNDER OR NEAR THEIR SERVICES.
8. SEDIMENT CONTROL SHALL BE INSTALLED AND OPERATIONAL BEFORE EARTHWORKS START ONSITE IN ACCORDANCE WITH COUNCIL STANDARDS.
9. CONTRACTOR SHALL PROVIDE AS-BUILT OF WORKING SEDIMENT CONTROL DEVICES AND CONFIRMATION OF POND/DECENT VOLUMES TO ENGINEER.
10. SEDIMENT CONTROL TO COMPLY WITH GD05 STANDARDS.

LEGEND

- EX BDY
- PR BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PR EXTENT WORK
- PR SUPERLOT BDY

Rev	Description	By	Date
A	RESOURCE CONSENT	CE	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	CE	02/2025
Drawn	CE	02/2025
Checked	JP	02/2025

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5 Owens Road, Epsom
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Project

SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED OVERVIEW EARTHWORKS PLAN

Project no.	215010
Scale	1:10000 @ A3
Cad file	215010-M-C200.DWG
Drawing no.	M-C200 Rev A

RESOURCE CONSENT

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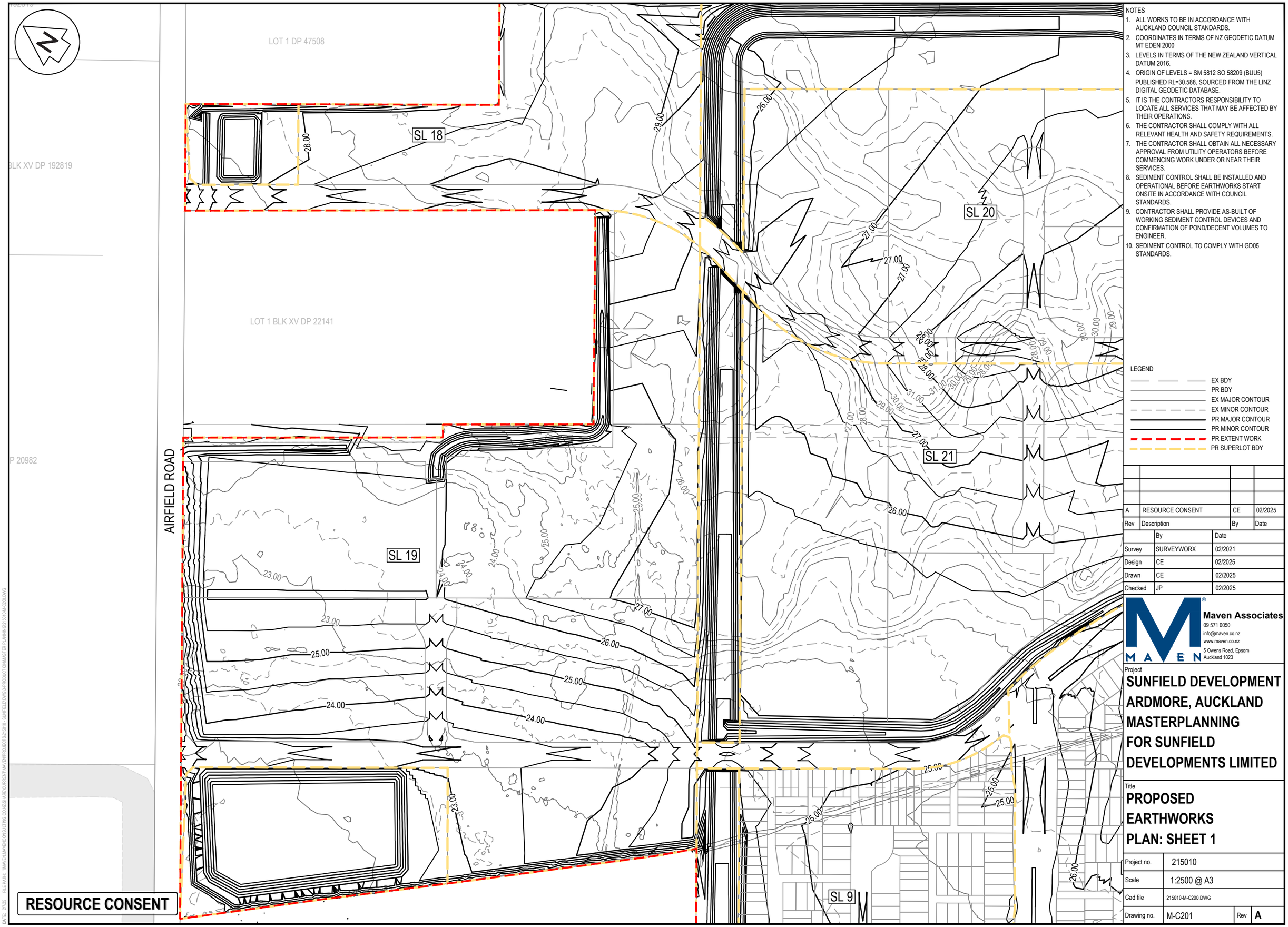

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Title

PROPOSED EARTHWORKS PLAN: SHEET 1

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DATE: 27/05 FILEPATH: MAVEN MAVEN CONSULTING CO NZ\SHARED\CURRENT\WORKING\ECS\SHEQ - SUNFIELD\DWGS PRODUCTION\ARTEP PLANNING\215010-M-C200.DWG

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Title

PROPOSED EARTHWORKS PLAN: SHEET 2

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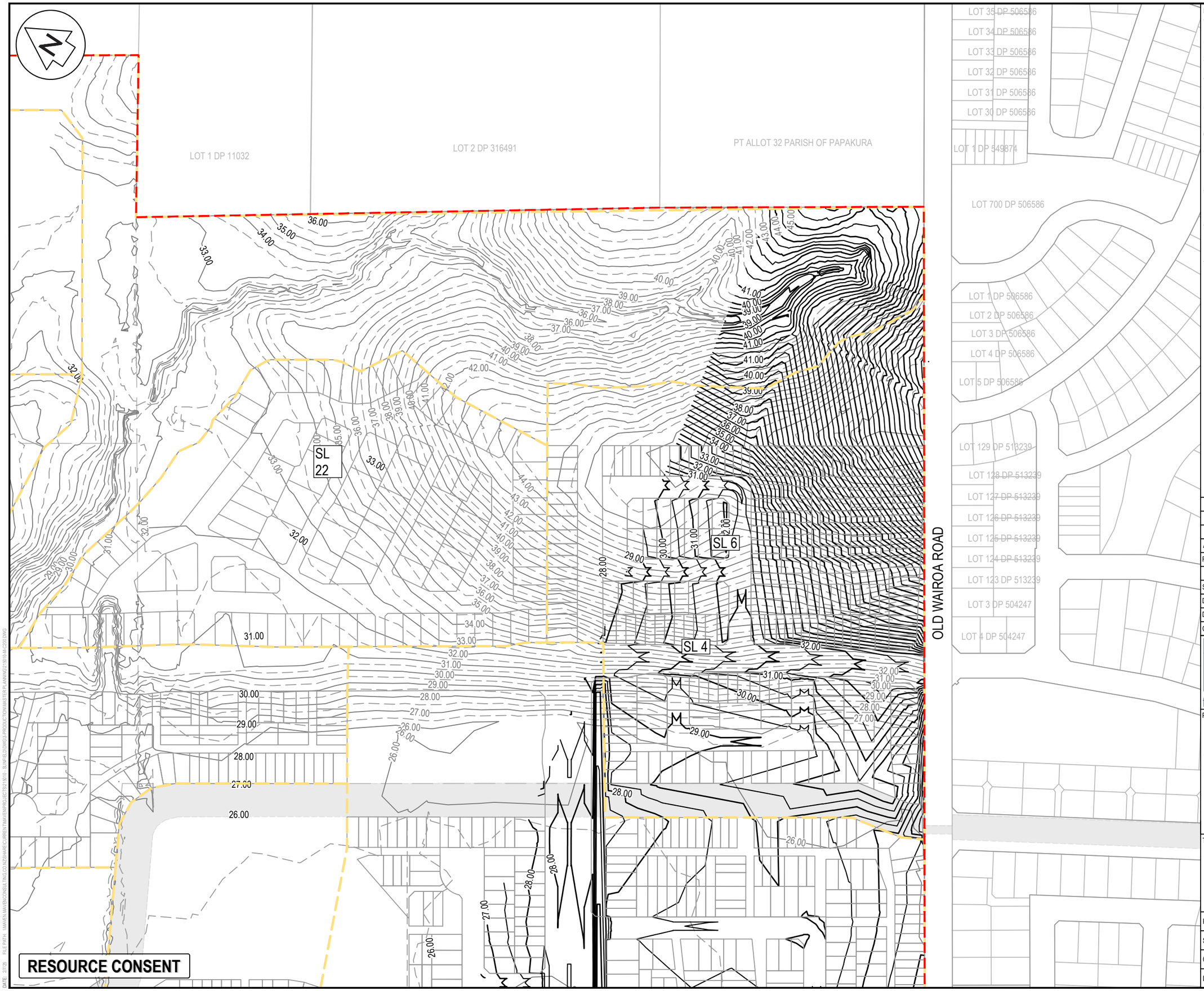

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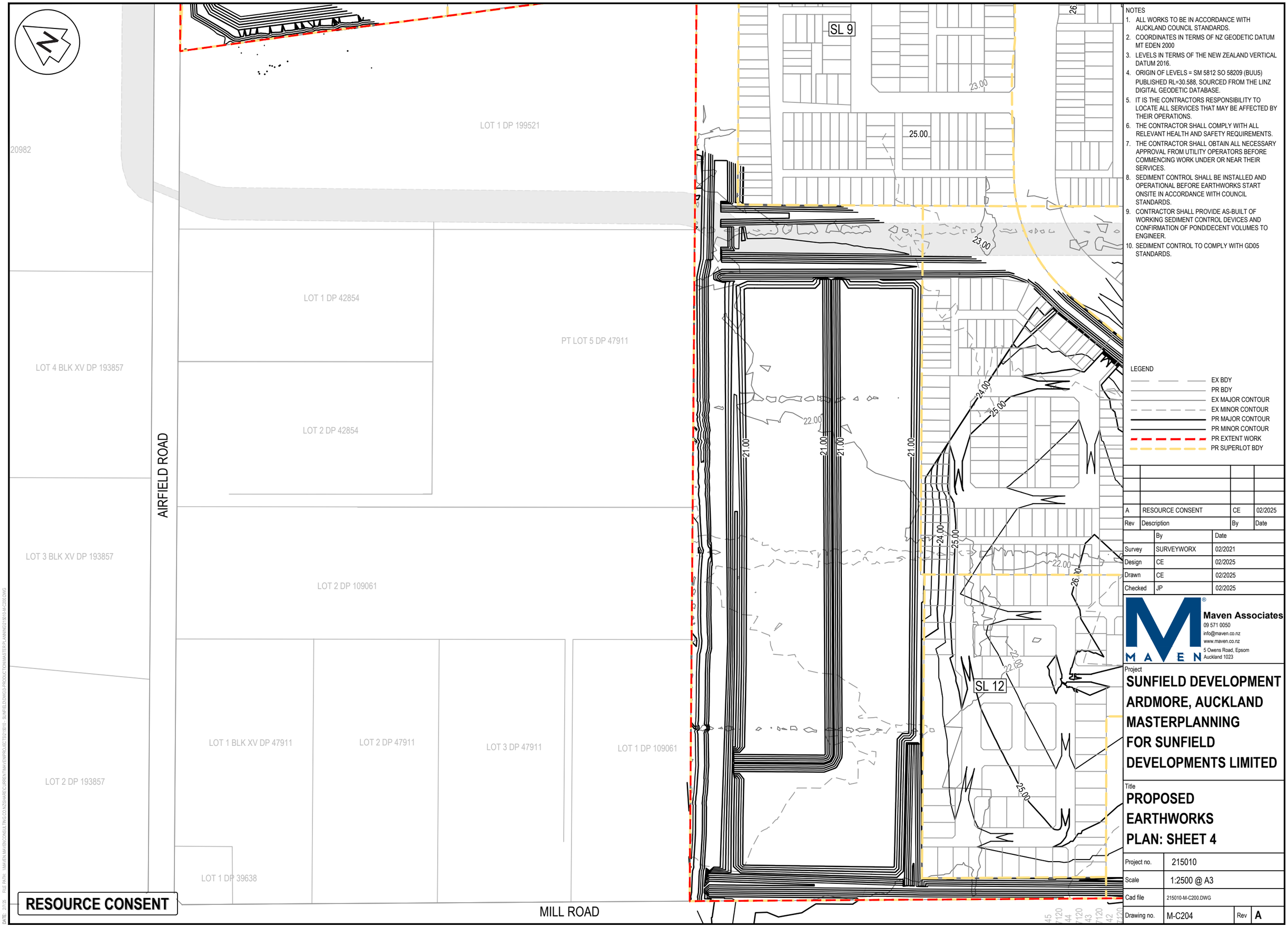

RESOURCE CONSENT

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PROPOSED EARTHWORKS PLAN: SHEET 4

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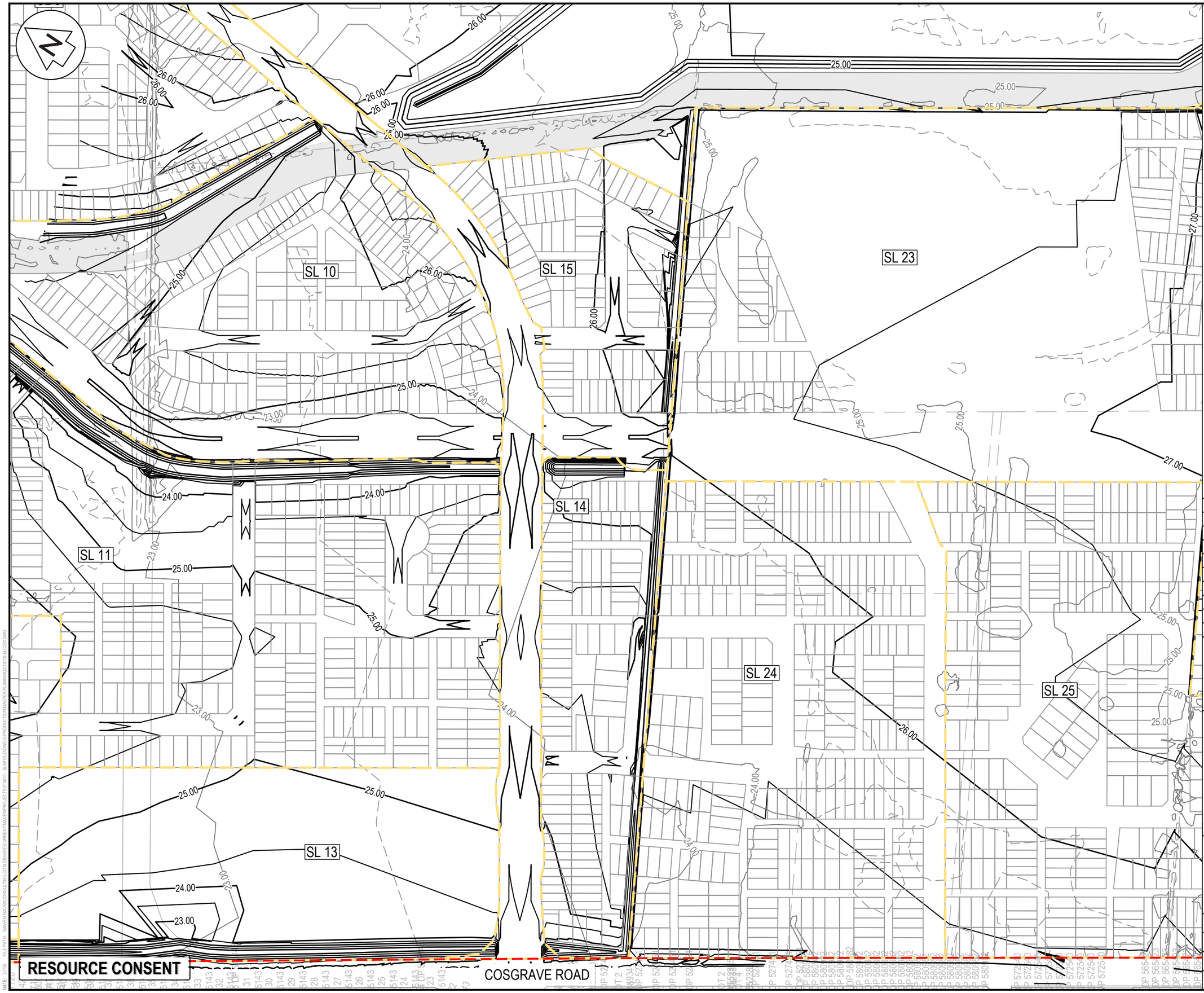

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4. ORIGIN OF LEVELS = SM 5812 SO 58209 (BUU5) PUBLISHED RL=30.588, SOURCED FROM THE LINZ DIGITAL GEODETIC DATABASE.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL SERVICES THAT MAY BE AFFECTED BY THEIR OPERATIONS.
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9. CONTRACTOR SHALL PROVIDE AS-BUILT OF WORKING SEDIMENT CONTROL DEVICES AND CONFIRMATION OF POND/DECENT VOLUMES TO ENGINEER.
10. SEDIMENT CONTROL TO COMPLY WITH GD05 STANDARDS.

LEGEND

- EX BDY
- PR BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PR EXTENT WORK
- PR SUPERLOT BDY

Rev	Description	By	Date
A	RESOURCE CONSENT	CE	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	CE	02/2025
Drawn	CE	02/2025
Checked	JP	02/2025

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Project

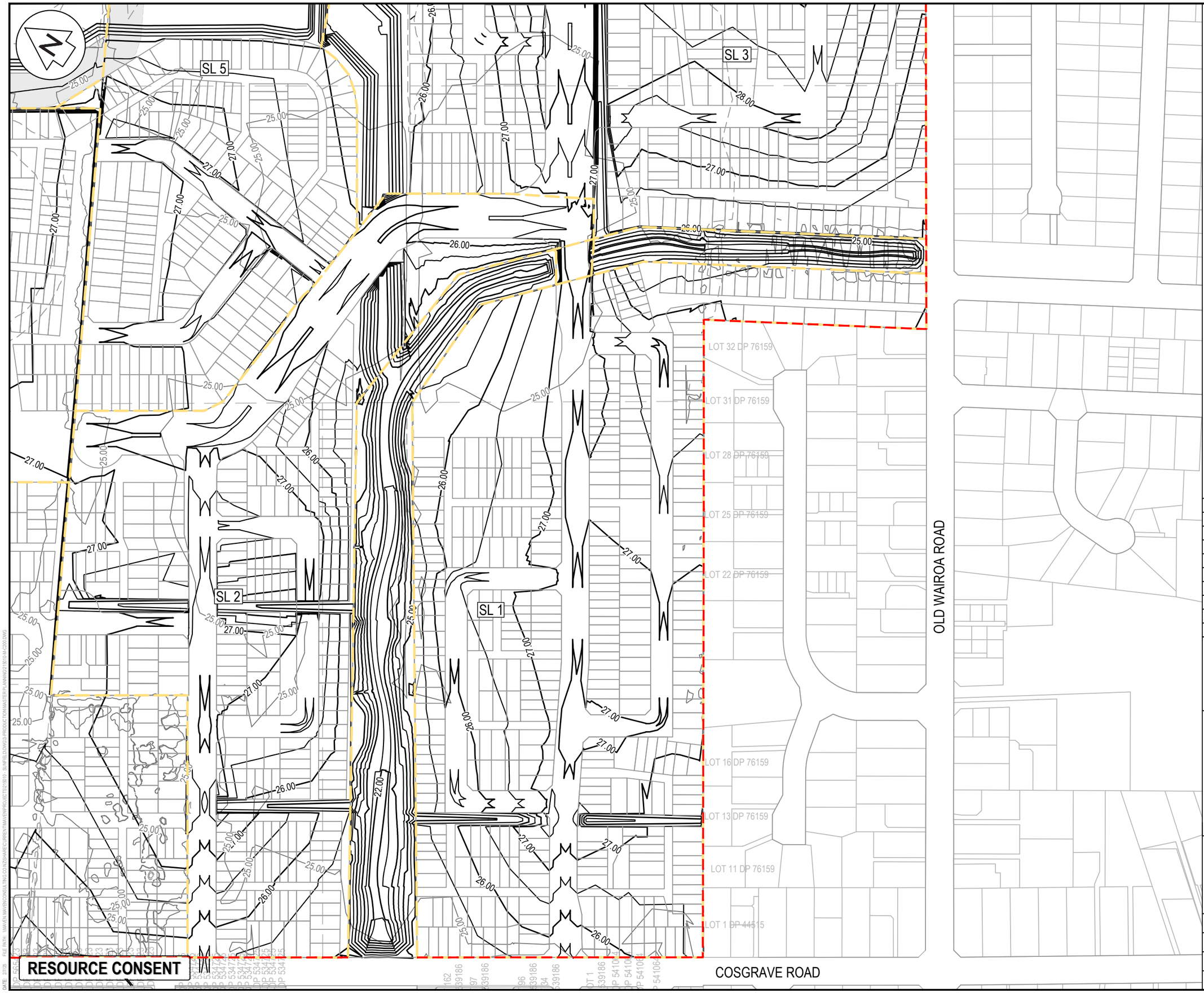
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED EARTHWORKS PLAN: SHEET 5

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C200.DWG
Drawing no.	M-C205
Rev	A

DATE: 27/02/2025 FILE PATH: MAVEN MASTER\CONSULTING\CO NZ\SHARED\CLIENTS\MAVEN\PROJECTS\2015 SUNFIELD\DWGS\PRODUCTION\MASTER PLAN\M\2015 M-C200.DWG



NOTES

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- EX BDY
- PR BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PR EXTENT WORK
- PR SUPERLOT BDY

Rev	Description	By	Date
A	RESOURCE CONSENT	CE	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	CE	02/2025
Drawn	CE	02/2025
Checked	JP	02/2025

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Project

SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED EARTHWORKS PLAN: SHEET 6

Project no.	215010		
Scale	1:2500 @ A3		
Cad file	215010-M-C200.DWG		
Drawing no.	M-C206	Rev	A

EARTH WORKS (SURFACE BULK EARTHWORKS WITH ROAD SUBGRADE COMPARISON WITH SURFACE EGL)

EARTHWORKS AREA	2,440,000m² / 244 Ha
FILL REQUIRED (EXCLUDES PRELOAD)	1,490,000 m³
CUT VOLUME	1,700,000 m³
BULK EARTHWORKS CUT TO FILL (INCLUDING COMPACTION FACTOR OF 0.8)	1,360,000 m³
CUT TO FILL OF SURPLUS MATERIAL FROM SERVICES & DRAINAGE	100,000 m³
NET CUT/FILL BALANCE (FILL IMPORT)	30,000 m³
PRELOAD (IMPORT) (BASED ON PRELOADING ONE SUPERLOT AT A TIME)	100,000 m³

NOTES
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LEGEND
- EX BDY
- PROP BDY
- PROP EXTENT WORK
- SUPER LOT BDY

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	-18.84	-1.00	
2	-1.00	-0.50	
3	-0.50	0.00	
4	0.00	0.50	
5	0.50	1.00	
6	1.00	1.50	
7	1.50	2.00	
8	2.00	5.67	

REFER M-C221 | REFER M-C222 | REFER M-C223
REFER M-C224 | REFER M-C225 | REFER M-C226

HAMLIN RD
AIRFIELD RD
OLD WAIROA RD
MILL RD
COSGRAVE RD
WALTERS RD

PROPOSED STORMWATER CHANNEL TO BE EXCAVATED FIRST ONSITE

PROPOSED STORMWATER CHANNEL. CUT/FILL SUBMITTED UNDER A DIFFERENT RESOURCE CONSENT. WILL UNDERGO FIRST CONSTRUCTION ONSITE.

RESOURCE CONSENT

Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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Project
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title
PROPOSED OVERVIEW CUT/FILL PLAN

Project no.	215010		
Scale	1:10000 @ A3		
Cad file	215010-M-C210.DWG		
Drawing no.	M-C210	Rev	A

NOTES

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- EX BDY
- PROP BDY
- PROP EXTENT WORK
- SUPER LOT BDY

Elevations Table

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7	1.50	2.00	
8	2.00	5.67	

Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

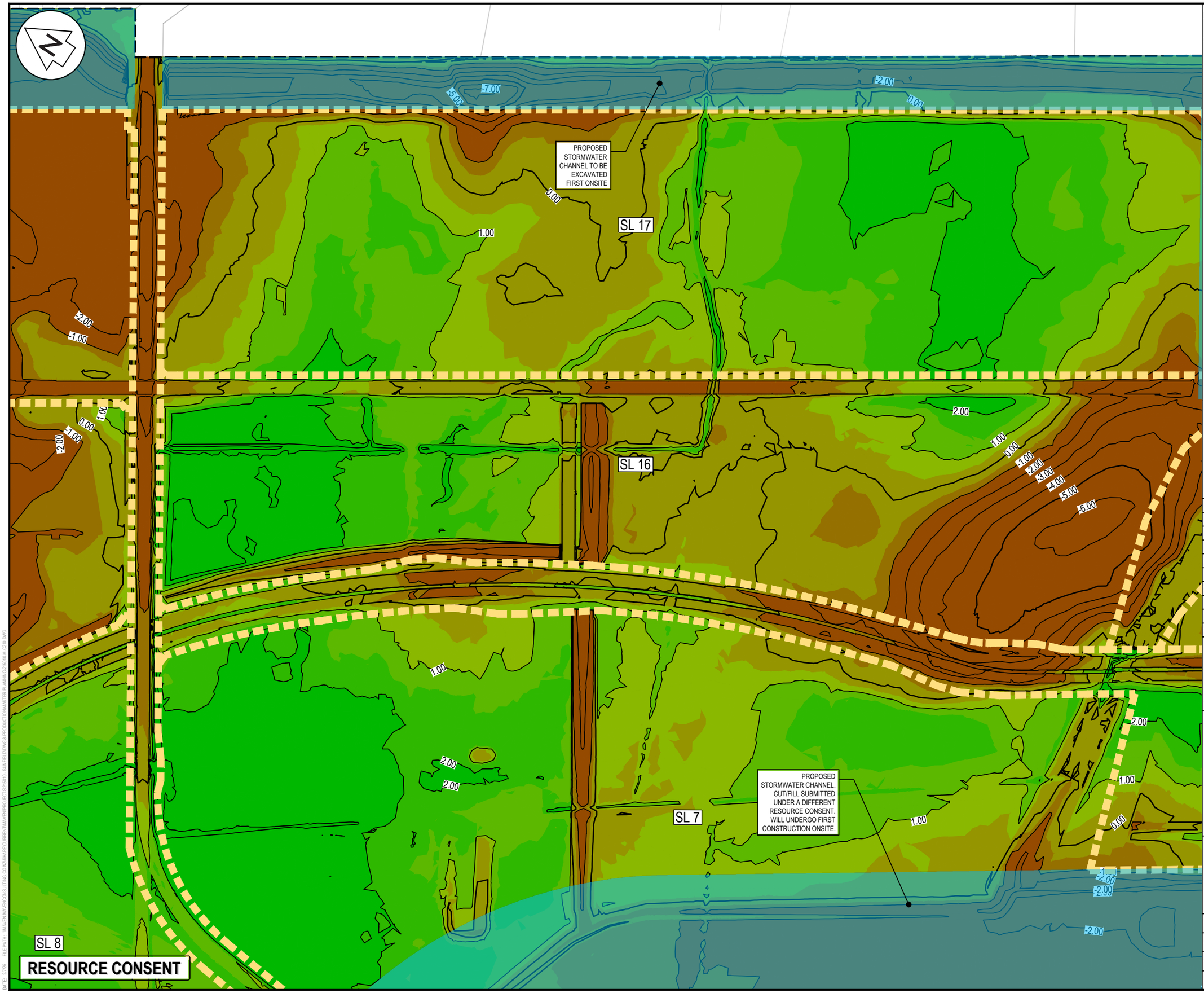
Title

PROPOSED CUT/FILL PLAN: SHEET 1

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C210.DWG
Drawing no.	M-C211 Rev A

RESOURCE CONSENT

DATE: 2/7/25 FILE PATH: I:\MAVEN\WORKING\LTNG.CO.NZ\SHARED\CURRENT\MAVEN\PROJECTS\215010 - SUNFIELD\DWGS\PRODUCT\MASTER PLANNING\215010-M-C210.DWG



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LEGEND

- EX BDY
- PROP BDY
- PROP EXTENT WORK
- SUPER LOT BDY

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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED CUT/FILL PLAN: SHEET 2

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C210.DWG
Drawing no.	M-C212 Rev A

PROPOSED STORMWATER CHANNEL TO BE EXCAVATED FIRST ONSITE

SL 22

SL 6

SL 4

SL 3

OLD WAIROA ROAD

PROPOSED STORMWATER CHANNEL. CUT/FILL SUBMITTED UNDER A DIFFERENT RESOURCE CONSENT. WILL UNDERGO FIRST CONSTRUCTION ONSITE.

RESOURCE CONSENT

NOTES

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LEGEND

- EX BDY
- PROP BDY
- PROP EXTENT WORK
- SUPER LOT BDY

Elevations Table

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4	0.00	0.50	
5	0.50	1.00	
6	1.00	1.50	
7	1.50	2.00	
8	2.00	5.67	

Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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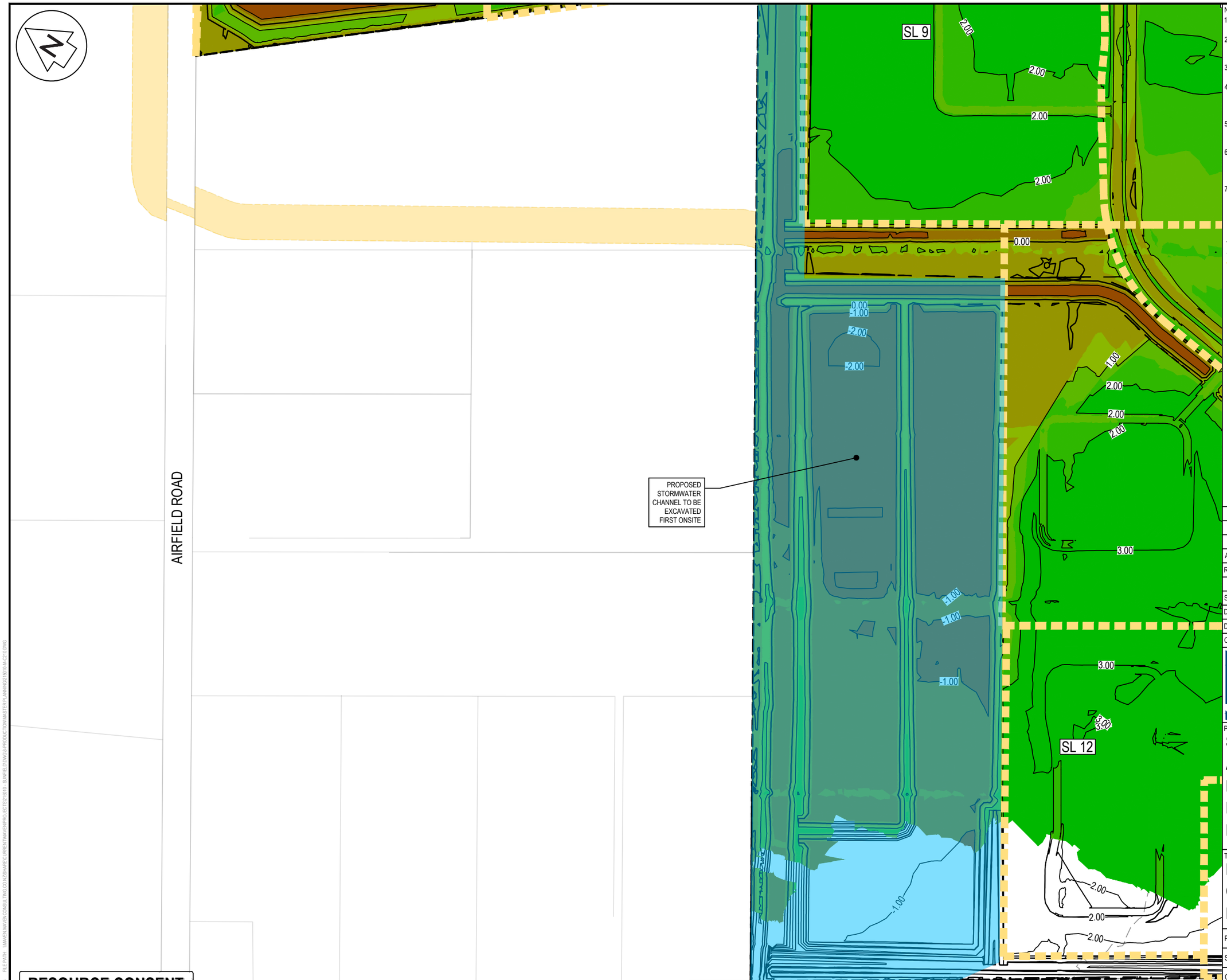
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED CUT/FILL PLAN: SHEET 2

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C210.DWG
Drawing no.	M-C213 Rev A



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LEGEND

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Elevations Table

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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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Project

SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED CUT/FILL PLAN: SHEET 4

Project no.	215010		
Scale	1:2500 @ A3		
Cad file	215010-M-C210.DWG		
Drawing no.	M-C214	Rev	A

RESOURCE CONSENT

DATE: 2/7/25 FILE PATH: M:\AVEN\MAVEN CONSULTING CO\N DRIVE\CURRENT\MAVEN PROJECTS\215010 SUNFIELD\DWGS\PRODUCTION\MASTERPLANNING\215010-M-C210.DWG

NOTES

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Elevations Table

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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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Project
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title
PROPOSED CUT/FILL PLAN: SHEET 5

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C210.DWG
Drawing no.	M-C215 Rev A

RESOURCE CONSENT

RESOURCE CONSENT

NOTES

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LEGEND

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- PROP EXTENT WORK
- SUPER LOT BDY

Elevations Table

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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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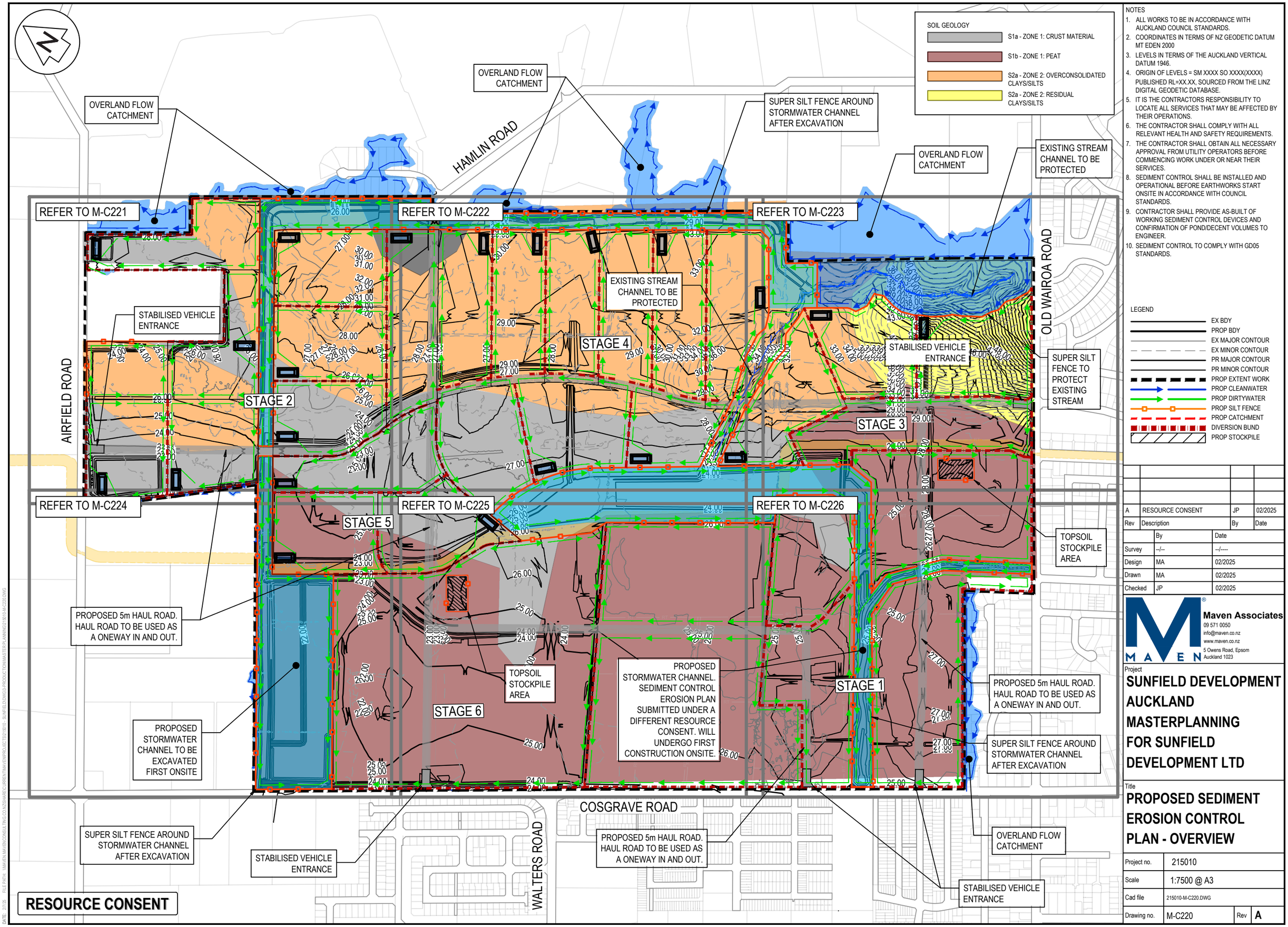
Project

SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED CUT/FILL PLAN: SHEET 6

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C210.DWG
Drawing no.	M-C216
Rev	A



NOTES

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3. LEVELS IN TERMS OF THE AUCKLAND VERTICAL DATUM 1946.
4. ORIGIN OF LEVELS = SM XXXX SO XXXX(XXXX) PUBLISHED RL=XX.XX, SOURCED FROM THE LINZ DIGITAL GEODETIC DATABASE.
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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	--/--	--/----
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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Project

SUNFIELD DEVELOPMENT AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENT LTD

Title

PROPOSED SEDIMENT EROSION CONTROL PLAN - OVERVIEW

Project no.	215010
Scale	1:7500 @ A3
Cad file	215010-M-C220.DWG
Drawing no.	M-C220 Rev A

RESOURCE CONSENT

DATE: 2/7/25 FILEPATH: \MAVEN\MAVEN\CONSULTING\CONTRACTS\DIRECTWAY\ENPROJECTS\215010 - SUNFIELD DWGS\PRODUCTION\MASTERPLANNING\215010-M-C220.DWG

OVERLAND FLOW CATCHMENT

SEDIMENT EROSION POND 4
CATCHMENT AREA = 45914m²
BASE AREA 12.1m x 36m
DEPTH 1.50m
TOP = 18m x 44m
FOREBAY = 5m x 18m
TOTAL AREA = 880m²

CLEAN WATER/DIRTY WATER PERIMETER BUND AROUND AWAKERI WETLANDS SITE BOUNDARY. BUND TO BE CONSTRUCTED 0.5m ABOVE EXISTING GROUND LEVEL

SEDIMENT EROSION POND 3
CATCHMENT AREA = 41902m²
BASE AREA 11.4m x 34m
DEPTH 1.50m
TOP = 17m x 42m
FOREBAY = 5m x 17m
TOTAL AREA = 811m²

PROPOSED STORMWATER CHANNEL TO BE EXCAVATED FIRST ONSITE

SEDIMENT EROSION POND 7
CATCHMENT AREA = 46666m²
BASE AREA 12.2m x 37m
DEPTH 1.50m
TOP = 18m x 44m
FOREBAY = 5m x 18m
TOTAL AREA = 893m²

SEDIMENT EROSION POND 6
CATCHMENT AREA = 45309m²
BASE AREA 12.0m x 36m
DEPTH 1.50m
TOP = 18m x 43m
FOREBAY = 5m x 18m
TOTAL AREA = 870m²

SEDIMENT EROSION POND 5
CATCHMENT AREA = 42369m²
BASE AREA 11.0m x 34m
DEPTH 1.50m
TOP = 17m x 42m
FOREBAY = 5m x 17m
TOTAL AREA = 819m²

SEDIMENT EROSION POND 20
CATCHMENT AREA = 47693m²
BASE AREA 12.3m x 37m
DEPTH 1.50m
TOP = 18m x 44m
FOREBAY = 5m x 18m
TOTAL AREA = 911m²

SEDIMENT EROSION POND 2
CATCHMENT AREA = 43707m²
BASE AREA 11.7m x 35m
DEPTH 1.50m
TOP = 18m x 43m
FOREBAY = 5m x 18m
TOTAL AREA = 842m²

PROPOSED 5m HAUL ROAD. HAUL ROAD TO BE USED AS A ONEWAY IN AND OUT.

STABILISED VEHICLE ENTRANCE

SEDIMENT EROSION POND 1
CATCHMENT AREA = 44643m²
BASE AREA 11.9m x 21m
DEPTH 1.50m
TOP = 18m x 28m
FOREBAY = 5m x 18m
TOTAL AREA = 596m²

P1 P2 P3 P4 P5 P6 P7 P20

AIRFIELD ROAD

RESOURCE CONSENT

NOTES
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3. LEVELS IN TERMS OF THE AUCKLAND VERTICAL DATUM 1946.
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10. SEDIMENT CONTROL TO COMPLY WITH GD05 STANDARDS.

LEGEND
- EX BDY
- PROP BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PROP EXTENT WORK
- PROP CLEANWATER
- PROP DIRTYWATER
- PROP SILT FENCE
- PROP CATCHMENT
- DIVERSION BUND
- PROP STOCKPILE

Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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Auckland 1023

Project
SUNFIELD DEVELOPMENT
ARDMORE, AUCKLAND
MASTERPLANNING
FOR SUNFIELD
DEVELOPMENTS LIMITED

Title
PROPOSED SEDIMENT EROSION CONTROL PLAN: SHEET 1

Project no.	215010		
Scale	1:2500 @ A3		
Cad file	215010-M-C220.DWG		
Drawing no.	M-C221	Rev	A

DATE: 27/5 FILE PATH: \\MAVEN-MA\BIC\00_JOBS_TNG\215010_SUNFIELD\02_DESIGN\DWG\PROJECT\215010_SUNFIELD.DWG\3 PRODUCTION\MASTER PLAN\M221 215010-M-C220.DWG

OVERLAND FLOW CATCHMENT

P19

P18

P17

P16

P15

P14

P12

P11

P10

SEDIMENT EROSION POND 19
CATCHMENT AREA = 50226m²
BASE AREA 12.7m x 38m
DEPTH 1.50m
TOP = 19m x 46m
FOREBAY = 5m x 19m
TOTAL AREA = 955m²

SEDIMENT EROSION POND 18
CATCHMENT AREA = 47236m²
BASE AREA 12.3m x 37m
DEPTH 1.50m
TOP = 18m x 44m
FOREBAY = 5m x 18m
TOTAL AREA = 903m²

SEDIMENT EROSION POND 17
CATCHMENT AREA = 44155m²
BASE AREA 11.8m x 35m
DEPTH 1.50m
TOP = 18m x 43m
FOREBAY = 5m x 18m
TOTAL AREA = 850m²

SEDIMENT EROSION POND 16
CATCHMENT AREA 1= 46265m²
CATCHMENT AREA 2= 44299m²
BASE AREA 12.1m x 36m
DEPTH 1.50m
TOP = 18m x 44m
FOREBAY = 5m x 18m
TOTAL AREA = 886m²

SEDIMENT EROSION POND 15
CATCHMENT AREA = 50055m²
BASE AREA 12.7m x 38m
DEPTH 1.50m
TOP = 19m x 46m
FOREBAY = 5m x 19m
TOTAL AREA = 952m²

PROPOSED STORMWATER CHANNEL TO BE EXCAVATED FIRST ONSITE

CLEAN WATER/DIRTY WATER PERIMETER BUND AROUND AWAKERI WETLANDS SITE BOUNDARY. BUND TO BE CONSTRUCTED 0.5m ABOVE EXISTING GROUND LEVEL

PROPOSED 5m HAUL ROAD. HAUL ROAD TO BE USED AS A ONEWAY IN AND OUT.

SEDIMENT EROSION POND 12
CATCHMENT AREA = 49519m²
BASE AREA 12.6m x 38m
DEPTH 1.50m
TOP = 19m x 45m
FOREBAY = 5m x 19m
TOTAL AREA = 943m²

SEDIMENT EROSION POND 11
CATCHMENT AREA = 30255m²
BASE AREA 9.3m x 28m
DEPTH 1.50m
TOP = 15m x 36m
FOREBAY = 4m x 15m
TOTAL AREA = 606m²

PROPOSED STORMWATER CHANNEL TO BE EXCAVATED FIRST ONSITE

SEDIMENT EROSION POND 10
CATCHMENT AREA = 50244m²
BASE AREA 12.7m x 38m
DEPTH 1.50m
TOP = 19m x 46m
FOREBAY = 5m x 19m
TOTAL AREA = 955m²

RESOURCE CONSENT

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10. SEDIMENT CONTROL TO COMPLY WITH GD05 STANDARDS.

LEGEND
- EX BDY
- PROP BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PROP EXTENT WORK
- PROP CLEANWATER
- PROP DIRTYWATER
- PROP SILT FENCE
- PROP CATCHMENT
- DIVERSION BUND
- PROP STOCKPILE

Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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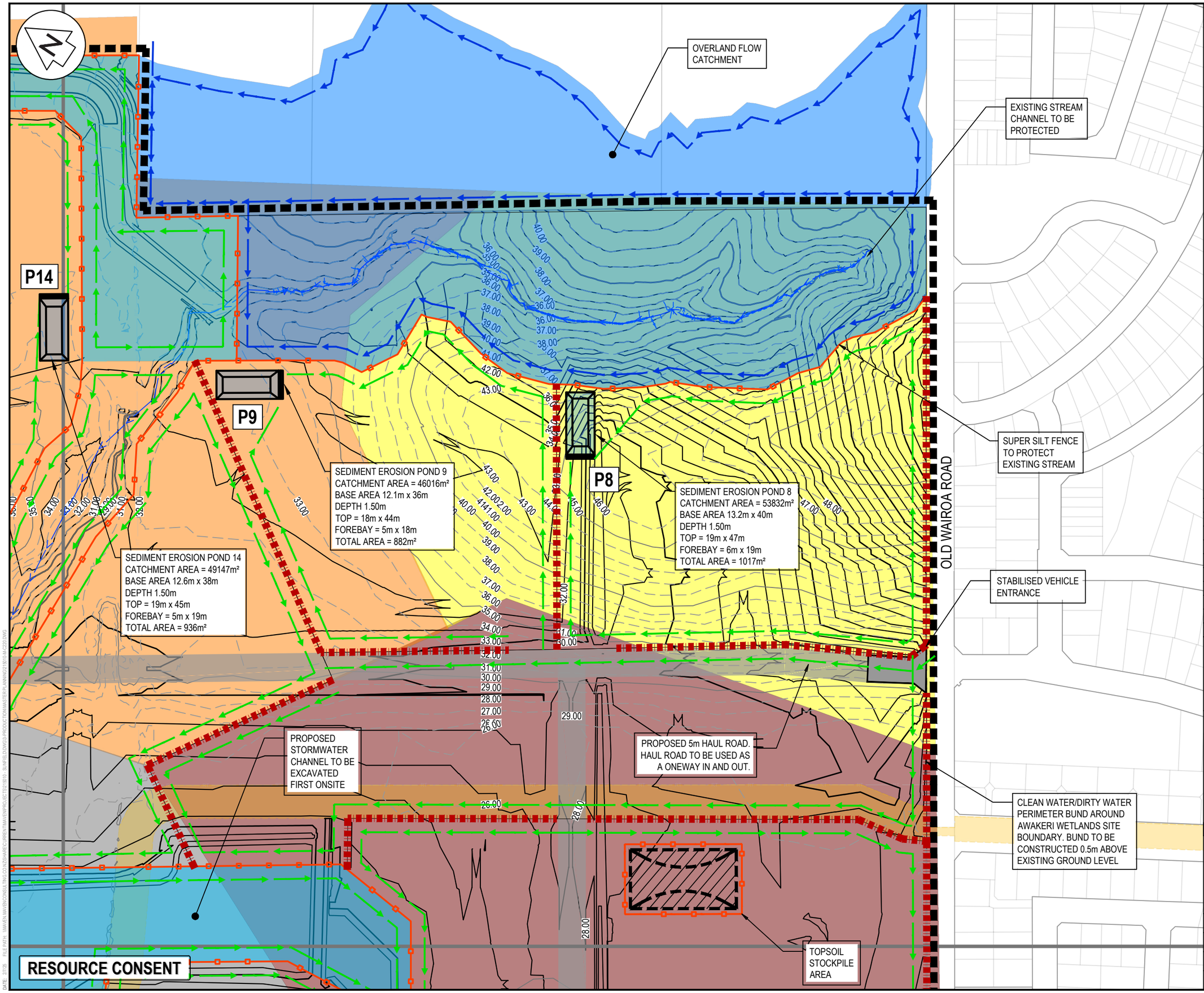
Project
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title
PROPOSED SEDIMENT EROSION CONTROL PLAN: SHEET 2

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C220.DWG
Drawing no.	M-C222 Rev A



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A	RESOURCE CONSENT	JP	02/2025

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Survey	SURVEYWORX	02/2021
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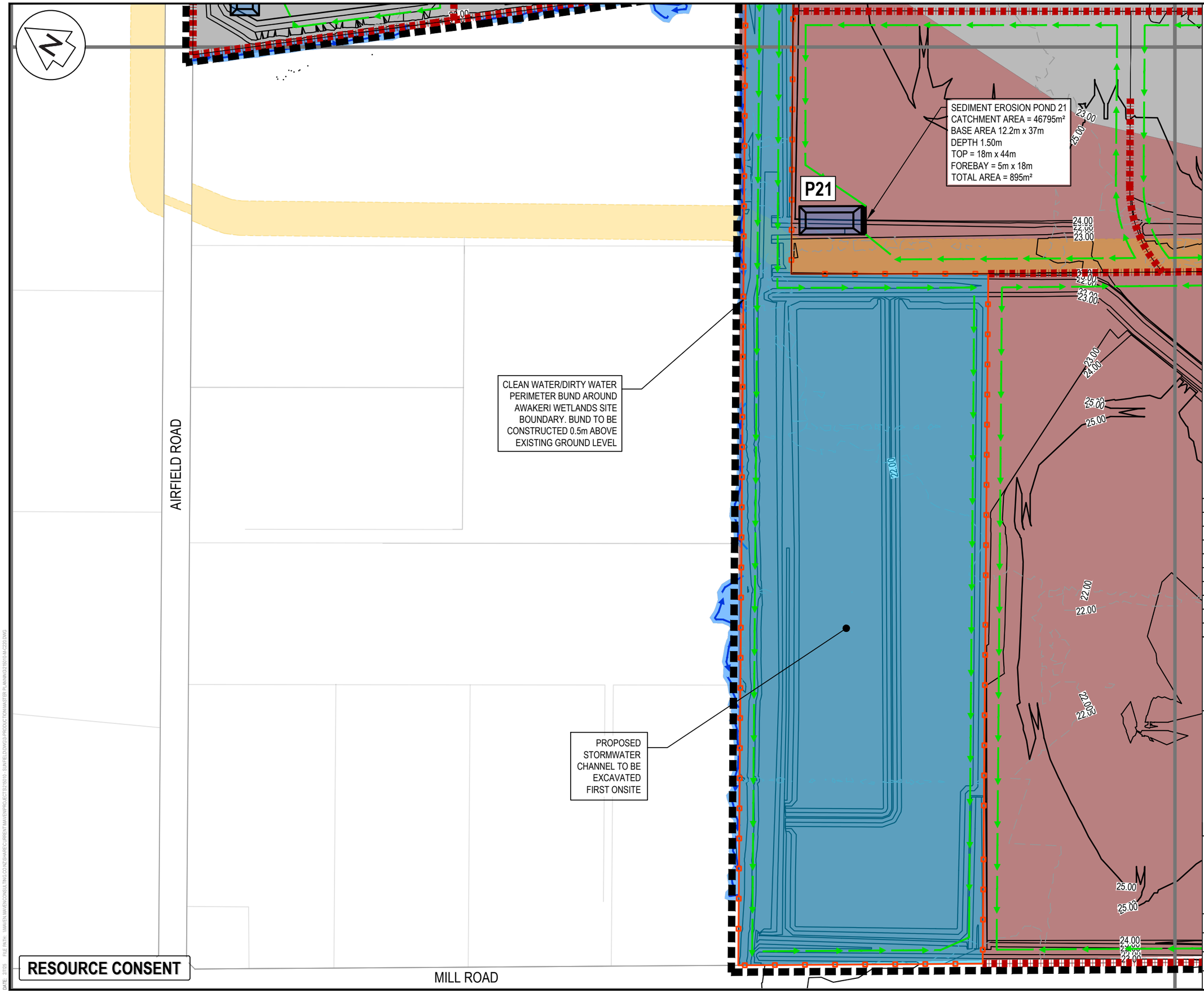
Project

SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED SEDIMENT EROSION CONTROL PLAN: SHEET 2

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C220.DWG
Drawing no.	M-C223 Rev A



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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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Project

SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title

PROPOSED SEDIMENT EROSION CONTROL PLAN: SHEET 4

Project no.	215010		
Scale	1:2500 @ A3		
Cad file	215010-M-C220.DWG		
Drawing no.	M-C224	Rev	A

P13

SEDIMENT EROSION POND 13
CATCHMENT AREA 1 = 49815m²
CATCHMENT AREA 2 = 47130m²
BASE AREA 12.7m x 38m
DEPTH 1.50m
TOP = 19m x 45m
FOREBAY = 5m x 19m
TOTAL AREA = 948m²

PROPOSED STORMWATER CHANNEL TO BE EXCAVATED FIRST ONSITE

CLEAN WATER/DIRTY WATER PERIMETER BUND AROUND AWAKERI WETLANDS SITE BOUNDARY. BUND TO BE CONSTRUCTED 0.5m ABOVE EXISTING GROUND LEVEL

PROPOSED 5m HAUL ROAD. HAUL ROAD TO BE USED AS A ONEWAY IN AND OUT.

STABILISED VEHICLE ENTRANCE

RESOURCE CONSENT

COSGRAVE ROAD

NOTES
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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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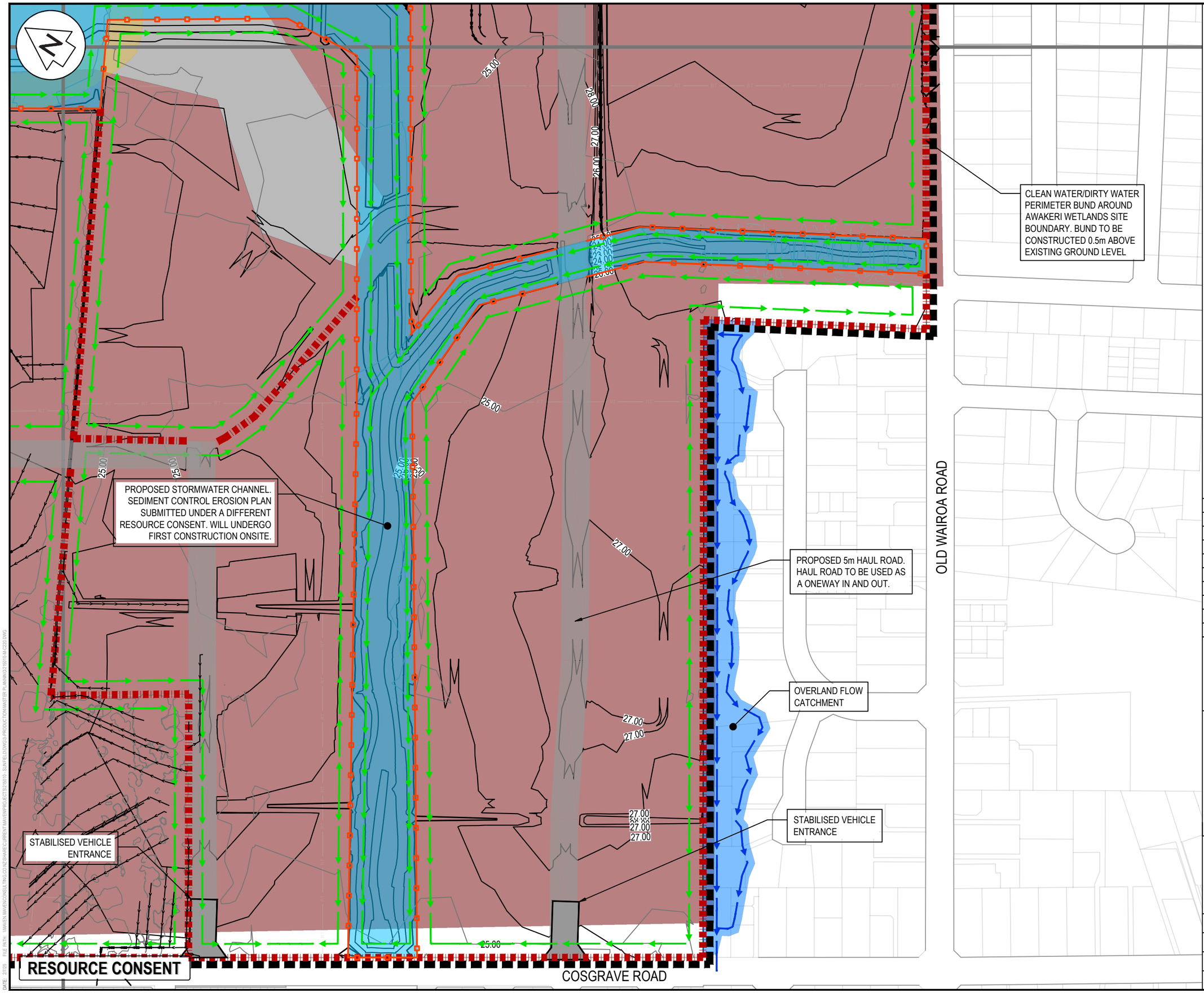
Project
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title
PROPOSED SEDIMENT EROSION CONTROL PLAN: SHEET 5

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C220.DWG
Drawing no.	M-C225 Rev A



NOTES

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LEGEND

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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	SURVEYWORX	02/2021
Design	MA	02/2025
Drawn	MA	02/2025
Checked	JP	02/2025

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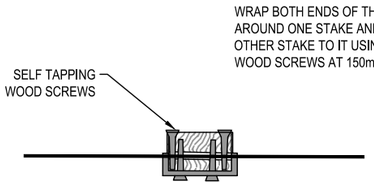
Project

SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

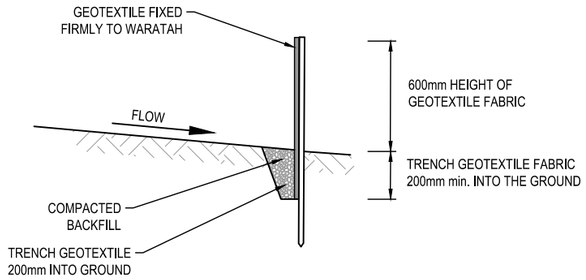
Title

PROPOSED SEDIMENT EROSION CONTROL PLAN: SHEET 6

Project no.	215010
Scale	1:2500 @ A3
Cad file	215010-M-C220.DWG
Drawing no.	M-C226 Rev A

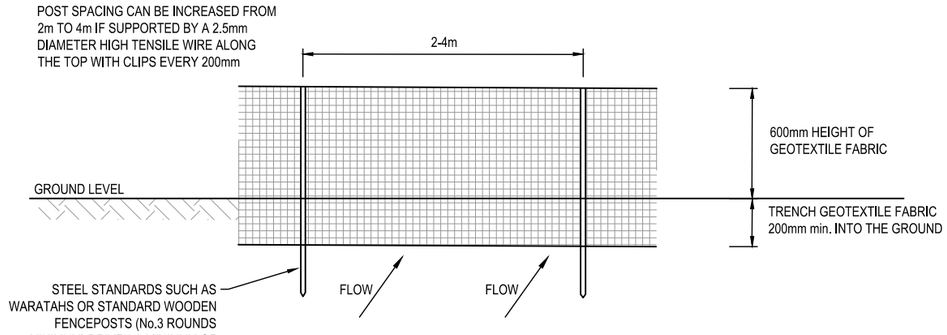


STANDARD DETAIL FOR FABRIC JOIN

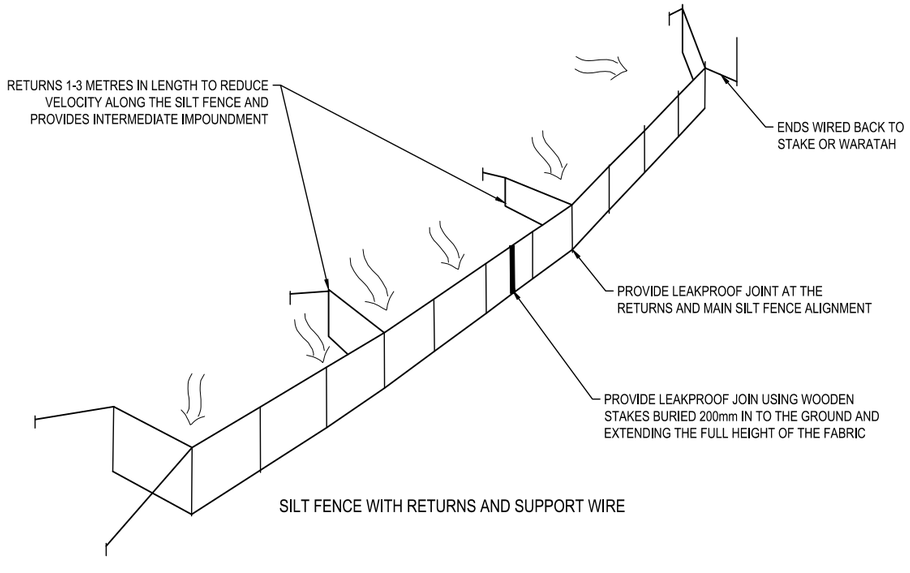


CROSS SECTION

STANDARD DETAIL FOR SILT FENCE

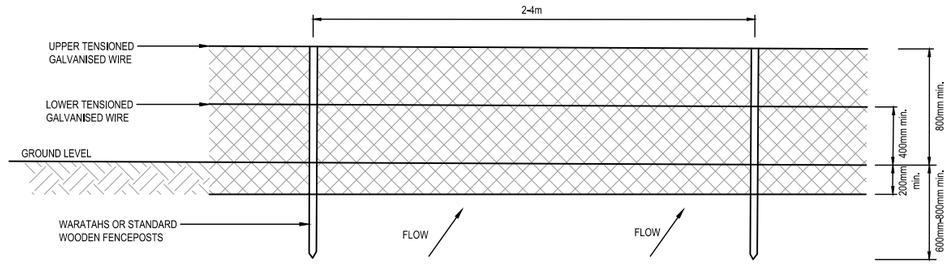


ELEVATION

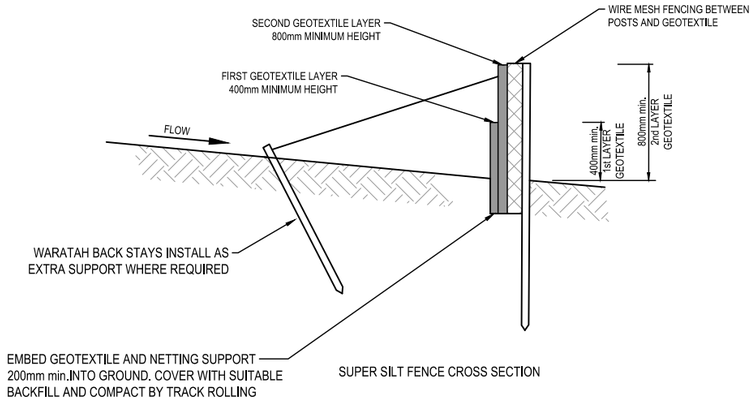


SILT FENCE WITH RETURNS AND SUPPORT WIRE

SUPER SILT FENCE DETAIL



ELEVATION



SUPER SILT FENCE CROSS SECTION

RESOURCE CONSENT

NOTES

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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	--	--/----
Design	--	-
Drawn	MA	02/2025
Checked	JP/LC	02/2025

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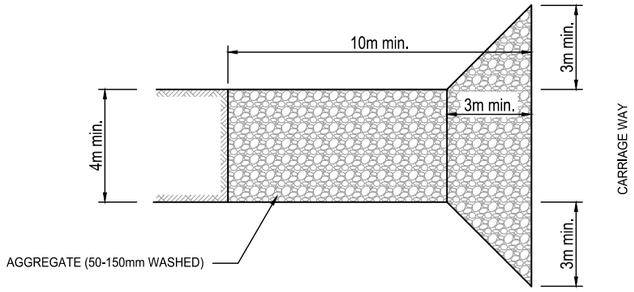
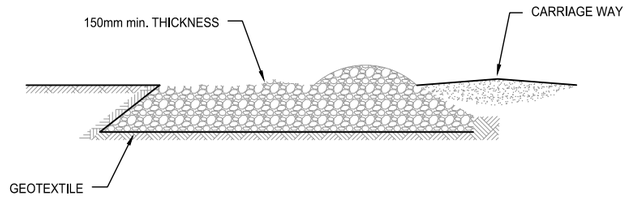
Project
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title
PROPOSED SEDIMENT EROSION CONTROL DETAILS: SHEET 1

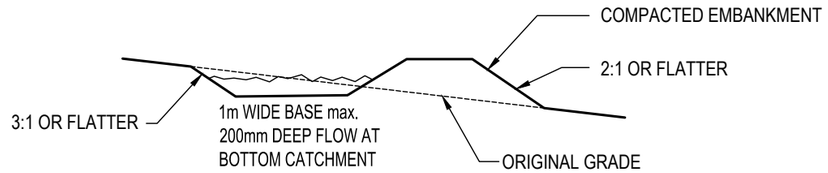
Project no.	215010		
Scale	N.T.S		
Cad file	215010-M-C230.DWG		
Drawing no.	M-C230	Rev	A



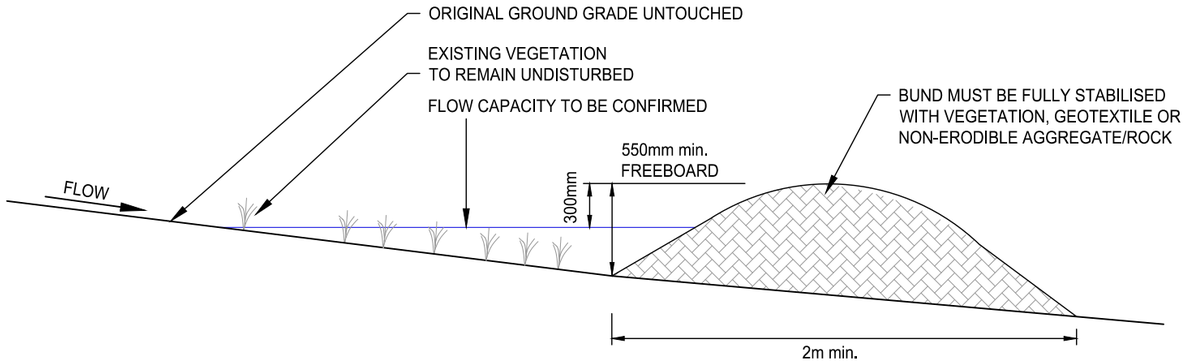
STABALISED VEHICLE ENTRANCE
PLAN VIEW



STABALISED VEHICLE ENTRANCE DETAIL
SIDE ELEVATION



TYPICAL CROSS SECTION OF A RUNOFF DIVERSION
TYPICAL DIMENSIONS UNLESS OTHERWISE NOTED



CLEAN WATER DIVERSION BUND DETAIL

RESOURCE CONSENT

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Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

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Survey	--	--/----
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Project
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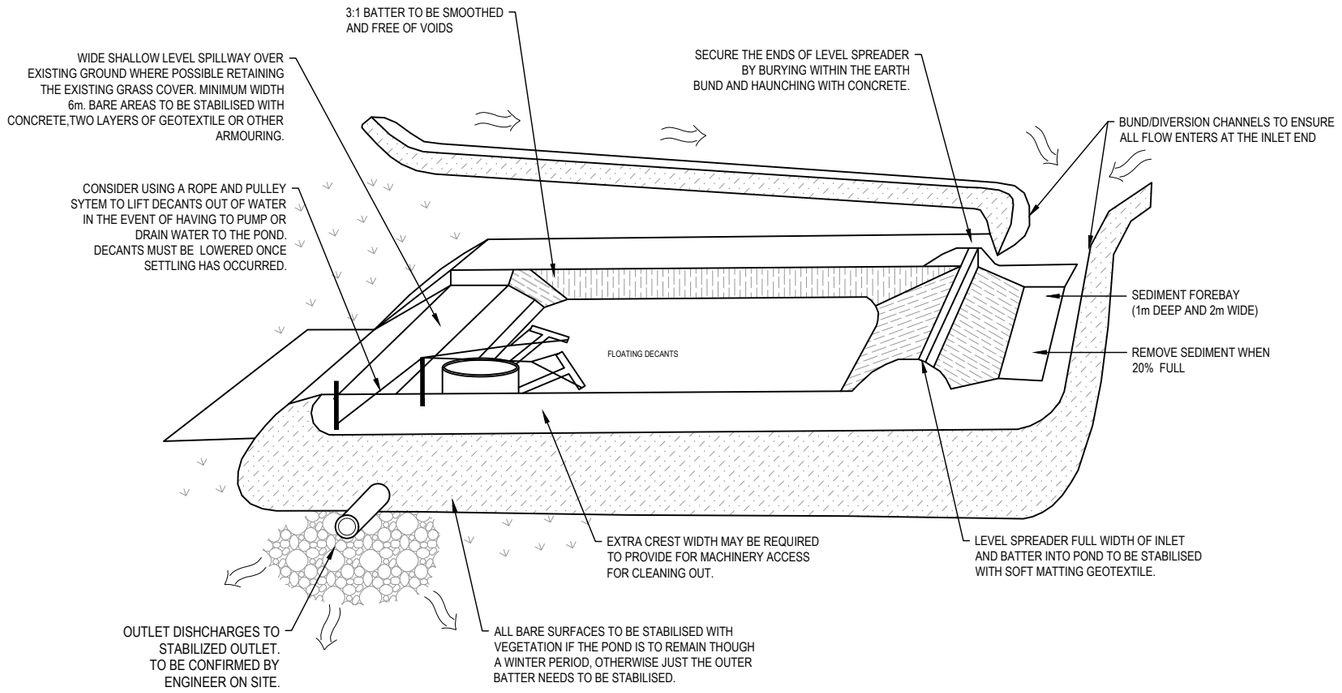
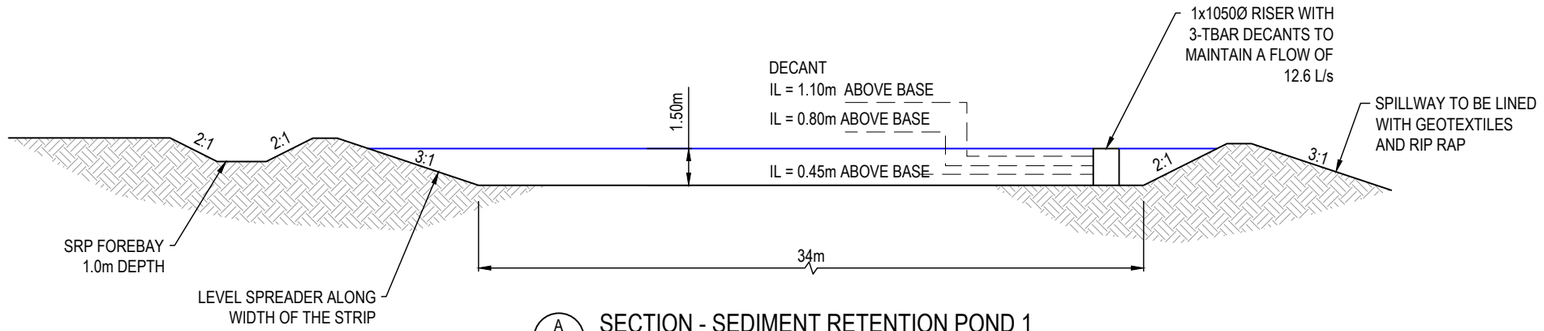
Title
PROPOSED SEDIMENT EROSION CONTROL DETAILS: SHEET 2

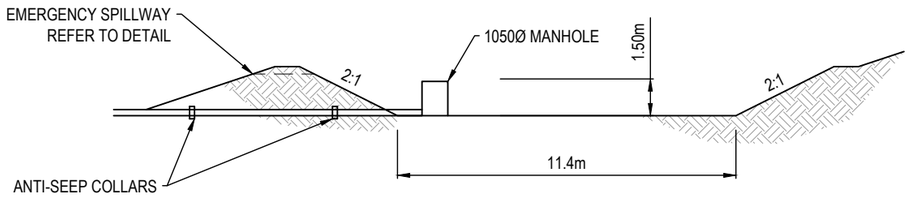
Project no.	215010		
Scale	N.T.S		
Cad file	215010-M-C230.DWG		
Drawing no.	M-C231	Rev	A



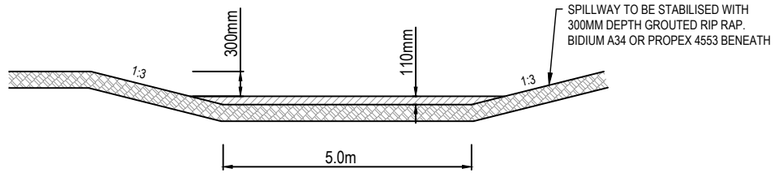
SEDIMENT POND DETAILS
(NTS)



A — SECTION - SEDIMENT RETENTION POND 1
SCALE: N.T.S



B — SECTION - SEDIMENT RETENTION POND 1
SCALE: N.T.S



DETAIL I
EMERGENCY SPILLWAY

RESOURCE CONSENT

NOTES
1. ALL WORKS TO BE IN ACCORDANCE WITH AUCKLAND COUNCIL STANDARDS.
2. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL SERVICES THAT MAY BE AFFECTED BY THEIR OPERATIONS.
3. THE CONTRACTOR SHALL COMPLY WITH ALL RELEVANT HEALTH AND SAFETY REQUIREMENTS.
4. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVAL FROM UTILITY OPERATORS BEFORE COMMENCING WORK UNDER OR NEAR THEIR SERVICES.
5. SEDIMENT CONTROL SHALL BE INSTALLED AND OPERATIONAL BEFORE EARTHWORKS START ONSITE IN ACCORDANCE WITH COUNCIL STANDARDS.
6. CONTRACTOR SHALL PROVIDE ASBUILT OF WORKING SEDIMENT CONTROL DEVICES AND CONFIRMATION OF POND/DECENT VOLUMES TO ENGINEER.
7. SEDIMENT CONTROL TO COMPLY WITH GD05 STANDARDS.

Rev	Description	By	Date
A	RESOURCE CONSENT	JP	02/2025

	By	Date
Survey	--	--/----
Design	--	-
Drawn	MA	02/2025
Checked	JP/LC	02/2025

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Project
SUNFIELD DEVELOPMENT ARDMORE, AUCKLAND MASTERPLANNING FOR SUNFIELD DEVELOPMENTS LIMITED

Title
PROPOSED SEDIMENT EROSION CONTROL DETAILS: SHEET 3

Project no.	215010		
Scale	N.T.S		
Cad file	215010-M-C230.DWG		
Drawing no.	M-C232	Rev	A