Memorandum

Vineway Ltd
Attn: [redacted]
email: [redacted]

Woods
[redacted] – Technical Director

W-REF: P25-534
19 December 2025

1. Introduction

1.1 Purpose

The purpose of this peer review is to:

- Evaluate the technical validity of the proposed stormwater management approach.
- Assess compliance with relevant Council guidelines and statutory frameworks.
- Identify risks and dependencies (if any) requiring resolution.

1.2 Project Summary

Table 1 – Site summary

Item	Description
Project	Delmore Residential Development, Ōrewa
Client	Vineway Ltd
Site Area	~109 hectares
Lots Proposed	~1,250
Location	53A, 53B & 55 Russell Road; 88, 130 & 132 Upper Ōrewa Road
Existing Land Use	Pasture, pine plantation, covenanted bush
Zoning	Future Urban

The proposed development necessitates a site-specific stormwater discharge consent. The infrastructure layout has been developed with the intent of future integration into the Auckland Council Regionwide NDC upon rezoning.

2. Stormwater Management Framework

2.1 Water Quality & Hydrology Mitigation

The proposed strategy aims to meet GD01 requirements and achieve ≥75% TSS removal for all impervious surfaces.

Although the site is not within a SMAF overlay, hydrological mitigation (retention / detention) has been implemented as part of the development stormwater management strategy. The proposed measures target GD01 performance standards:

- **Retention:** Minimum 5 mm from all impervious areas.
- **Detention:** 95th percentile 24-hour rainfall event (38 mm), with 24-hour drawdown.

A source-specific Best Practicable Option (BPO) framework has been applied.

Table 2 - Summary of Proposed Treatment Measures

Source Area	BPO Treatment Measures
Residential Lots	Water quality treatment to be provided for all impervious areas; with exception to roof runoff where the BPO is as follows: **Roof Areas** Low-contaminant roofing materials; re-use tanks to provide retention / detention.
Public Roads & JOALs	Water quality treatment to be provided for all impervious areas; the management approach is summarised as follows: • Catchpits with sumps. • Gross Pollutant Trap (GPT) for pre-treatment prior to discharge to communal raingardens. • Hydrology mitigation provided within communal devices.

The distributed nature of the treatment train is appropriate for a large greenfield catchment with varied terrain, minimising concentrated discharges and improving system resilience.

3. Flood Management Assessment

3.1 Network Design Parameters

The proposed stormwater network is designed in full accordance with the currently operative Stormwater Code of Practice (SWCoP V4). The design standards applied to both the primary and secondary systems are summarized below:

- **Primary System (Pipe Network)**
    - The underground pipe network is designed to convey minor storm events.
        - **Capacity:** 10% Annual Exceedance Probability (AEP) event.
        - **Climate Change Allowance:** Includes a 2.1°C temperature allowance.
- **Secondary System (Overland Flow Paths)**
    - The secondary system manages major storm events and ensures safe conveyance of floodwaters.
        - **Conveyance:** 1% Annual Exceedance Probability (AEP) event.
        - **Method:** Utilizes designated Overland Flow Paths (OLFPs) primarily located within the road corridors.
        - **Climate Change Allowance:** Incorporates a more conservative 3.8°C temperature allowance.

3.2 Floodplain Performance and Downstream Effects

The Ōrewa West ICMP identifies no current downstream flood constraints in the receiving environment. Based on this, peak flow attenuation is not proposed part the design.

This approach is further supported by the McKenzie & Co. Flood Assessment and the project hydraulic model, which indicates:

- No adverse flooding effects on upstream or downstream properties.
- All habitable floor levels and allotments located above the modelled 1% AEP floodplain under MPD and climate change conditions.

3.2.1 NZTA Culvert

Consultation with the New Zealand Transport Agency (NZTA) regarding the culvert at the project site has been undertaken by way of email and calls, a copy of the correspondence can be found in **Appendix A – NZTA Correspondence.**

The consultation focused on NZTA's primary concern relating to the potential risk of culvert blockage and the resilience of the motorway embankment. Specifically, NZTA sought assurance that any changes in runoff frequency, velocity, and volume directed towards the embankment would not increase the risk of scour, erosion, or structural vulnerability at the culvert inlet and transition zone, where hydraulic effects are expected to be greatest.

The proposed development has been assessed against various flood scenarios. A plot illustrating the modelled flood levels is provided in **Appendix B – NZTA Culvert Flood Levels.**

With regards to the culvert the following is noted:

- The culvert inlet level is 7.25mRL.
- The existing motorway elevation is approximately 27mRL.

The modelling results, summarized in **Table 3**, demonstrate that flood level increases are considered negligible to less than minor in the context of the motorway's elevation and do not increase the risk to the embankment.

- **100-Year Event:** The post-development flood level (16.80mRL) is lower than the pre-development level (17.10mRL). This is because the proposed culverts provide attenuation in the post-development scenario, reducing downstream flood elevations. These culverts are designed to pass smaller events/flows forward.
- **Full Blockage Scenario:** Even under a hypothetical full blockage scenario (100-year event), the modelled flood level is 21.50mRL, which leaves approximately 5.5m of freeboard to the motorway.

Table 3 - Summary of Proposed Treatment Measures

Event	Pre-Development (mRL)	Post-Development (mRL)	Difference (mm)	Freeboard to Motorway (m)
2yr (3.8oc)	11.4	11.5	100	15.5
10yr (3.8oc)	13.86	14.06	200	12.94
100yr (3.8oc)	16.73	17.02	-290	9.98
100yr – Blocked		21.39		5.61

Management of Blockage Risk

Based on the flood modelling undertaken by McKenzie and the substantial reduction in blockage risk associated with the change in land use, it is proposed that a secondary inlet is not required.

All parties have acknowledged that this risk of blockage will be significantly reduced as the site transitions from forestry operations to residential development.

NZTA have also confirmed that based on the model results presented the proposed changes in water depths associated with the development are unlikely to materially alter the existing risk profile of the highway system.

Therefore instead of a secondary inlet, it is proposed managing the temporary blockage risk through active maintenance and monitoring of the culvert via the following approach:

- **Consent Condition:** A consent condition will be required to mandate a comprehensive Management Plan to address potential blockage from any residual slash or debris, particularly during the construction phase.
    - The monitoring regime to include a condition that, should accelerated scour or erosion be observed through mutual monitoring prior to full site stabilisation, a requirement could be triggered to install a relief inlet riser in accordance with NZTA

P46 standard design and/or implement additional embankment interface resilience measures.

- **Duration:** This plan would remain in place until the development is fully built out and the site is stabilized. Once the site is developed, the blockage risk is expected to be substantially lower.

Based on the consultation undertaken and NZTA's feedback, NZTA is satisfied with the proposed approach to managing culvert blockage risk, monitoring potential scour and erosion, and the assessment of flood effects. NZTA agrees that the proposed development does not materially alter the existing risk profile or resilience of the highway embankment and that any residual risk can be appropriately managed through the agreed consent condition and monitoring & management measures.

3.2.2 Pumpstation

A concern was raised regarding the potential effects of the proposed development on the existing Watercare Pump Station.

The hydraulic modelling work undertaken by McKenzie confirmed the following key findings:

- **10-Year Event (3.8oc):** The pump station is situated outside of the modelled floodplain for the 10-year design event.
- **100-Year Event (3.8oc):** There will be no increase in flooding at the pump station location in the 100-year design event. In fact, the model shows a slight decrease in flood level compared to the existing/pre-development scenario, confirming no adverse effects.

These results indicate that the development will not negatively impact the existing Watercare infrastructure in relation to flooding.

3.2.3 Blockage & Development Resilience

To ensure the resilience of the development to potential flooding events, an assessment of the downstream NZTA culvert's impact was undertaken.

The assessment determined the potential impact of the development on the surrounding area and confirmed that:

- **No Development Impact:** Even under the most severe scenario, including 100% blockage of the downstream culvert, no areas of the proposed development will be impacted by flooding.
- **Outside Floodplain:** All proposed development areas are confirmed to be outside of the floodplain, even when accounting for the maximum modelled flood level under the 100% blockage condition.

This analysis confirms that the development is highly resilient to flooding and appropriately sited outside of the designated floodplain.

4 Overall Conclusion

The peer review conducted on the Stormwater Management Strategy (SMS) and associated flood assessments confirms that the proposed Delmore residential development is fully compliant with the Auckland Unitary Plan, GD01, and the currently operative Stormwater Code of Practice (SWCoP V4).

The stormwater management proposal meets all requirements of the Network Discharge Consent (NDC) and effectively addresses water quality, hydrology mitigation, and flood management. The key findings are summarised as follows:

- **Water Quality Treatment & Hydrology Mitigation:** The strategy adopts a source-specific and communal approach, ensuring both water quality treatment and hydrology mitigation are provided for all impervious surfaces. The communal treatment of roads and Jointly-Owned Access Lots (JOALs) results in a highly efficient design, minimizing the total number of required devices while achieving compliance.
- **Preventing Adverse Downstream Effects:** Hydraulic modelling confirms no adverse flooding effects on upstream or downstream properties. This includes the existing Watercare Pump Station, which is confirmed to be safely situated outside of both the 10-year and 100-year floodplains.
- **Protecting Development Resilience:** All proposed residential lots and habitable floor levels are demonstrably resilient to extreme events and lie outside the 1% AEP floodplain. This resilience holds true even under the most conservative scenario of 100% blockage of the downstream NZTA culvert.
- **Addressing Stakeholder Concerns (NZTA):** The primary concern raised by NZTA regarding temporary culvert blockage risk is fully mitigated. The proposal to substitute a secondary inlet with a robust Management Plan, enforced by a consent condition until the site is stabilised, is an effective and appropriate solution.

In summary, there are no outstanding stormwater impediments or technical matters that cannot be effectively addressed through the current design, the proposed consent conditions, and the progression to detailed design.

Appendix A

FLOWSTATE CONSULTING [redacted]

RE: Delamore - NZTA

Peter Mitchell [redacted] 19 December 2025 at 09:40
To: [redacted]
Cc: [redacted]

Thank you [redacted] – Perfect.

From: [redacted]
Sent: Friday, 19 December 2025 9:38 am
To: [redacted]
Subject: Re: Delamore - NZTA

Hi [redacted]

Thank you for your response. I appreciate you taking the time to provide feedback, especially given how busy you have been.

I am happy to accept the additional condition you suggested regarding monitoring for scour or erosion, including the potential trigger for a relief inlet riser or embankment reinforcement. I can confirm we will include this from our end.

Have a great Christmas break, and thanks again.

Kind Regards

[redacted] - Director
BE Civil, CPEng, IntPE(NZ), CMEngNZ
[redacted]
www.fsconsulting.co.nz

On Fri, 19 Dec 2025 at 00:33, [redacted] wrote:

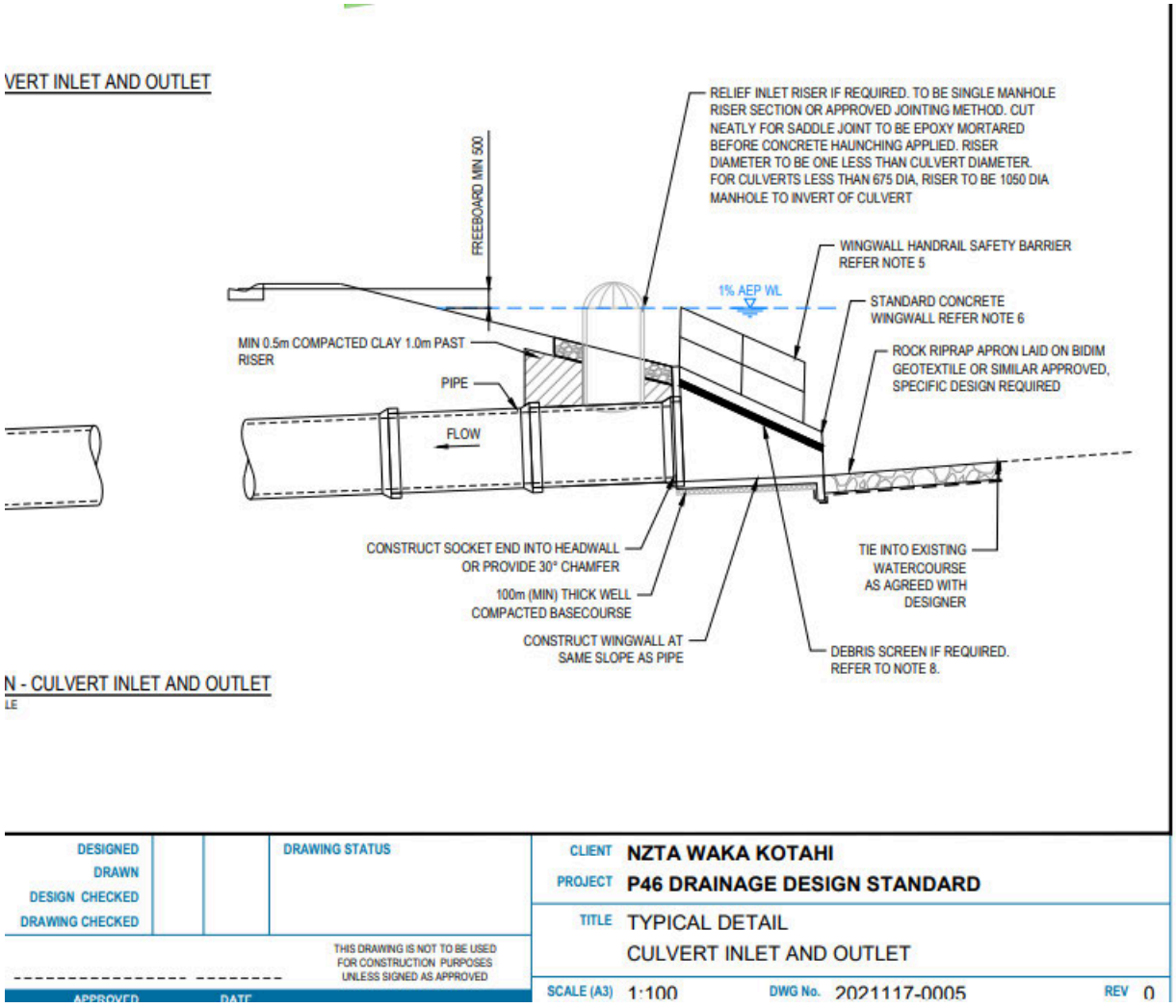
> Hi [redacted]

Thank you for following up. Your assessment and summary look good. Nice.

I can confirm that, in general, I am comfortable with what is being proposed for the monitoring and proactive management of the risk of culvert blockage from excessive “slash” and debris, which we have previously experienced where forestry-type land has been cleared for development.

The risk of highway overtopping has never been raised as a concern. Rather, my concern relates to the resilience of the highway embankment due to the increased frequency, velocity, and volume of runoff directed towards the embankment—particularly at the transition from the natural stream to the culvert inlet, and at the ground interface beyond the culvert headwall. Specifically, this relates to the potential risk of scour and erosion at the transition and inlet where velocities and risk to our system resilience here will be highest.

That said, I am comfortable that the proposed change in water depths is unlikely to materially alter the existing risk profile at our highway system. It may be appropriate, however, for the monitoring regime to include a condition that, should accelerated scour or erosion be observed by mutual monitoring (up to the time that the development is fully built out, and the site is stabilised), that a requirement could be triggered to install a relief inlet riser consistent with NZTA P46 standard design and/or additional embankment interface reinforcement/resilience measures could be proposed by the project. https://nzta.govt.nz/assets/resources/stormwater-specification/P46-Stormwater-management-and-minor-stream-diversion-design-specification-guidance-document.pdf



Happy to discuss further.

Regards,

[redacted]
NZTA Capital Projects Liaison Manager and Stormwater Assets Manager, Asset and Network Performance
Auckland System Management

Email: [redacted]
Mobile: [redacted]

NZ Transport Agency Waka Kotahi

Facebook | Twitter | LinkedIn

From: [redacted]
Sent: Wednesday, 17 December 2025 11:18 am
To: [redacted]
Cc: [redacted]
Subject: RE: Delamore - NZTA

Hi [redacted]

Hope you're having a good week.

Just wanted to quickly follow up on the email below. Are you able to confirm if you are satisfied with our proposal, or do you have any further questions? Let me know if you'd like to catch up and /or have a quick call to clarify anything.

Also, as a heads-up, I'm moving on from Woods soon, so I won't have this email anymore. Going forward, please send any emails for me to my new address: [redacted]

[redacted]

General Manager - Water
Infrastructure and Planning

BE Civil, CPEng, IntPE(NZ), CMEngNZ

[redacted]

[redacted]

woods.co.nz

From: [redacted]
Sent: Monday, 8 December 2025 8:24 pm
To: [redacted]
Cc: [redacted]
Subject: Delamore - NZTA

Hi [redacted]

Thank you again for your time last week to discuss the Delamore project and matters relating to the downstream culvert.

I have summarised our discussion below and highlighted NZTA's key concern:

- NZTA's primary concern is the potential risk of blockage at the downstream culvert. It was acknowledged by all parties that this risk will be significantly reduced as the site transitions from forestry operations to residential development.
- As requested, I have included a plot illustrating the modelled flood levels for the various scenarios. These results are summarised in **Table 1** below.
- It is important to note that the culvert inlet level is 7.25mRL, while the existing motorway is at approximately 27mRL.
- The table shows that even under a full blockage scenario, there remains approximately 5.5m of freeboard to the motorway.
- For the 100-year event, the pre-development flood level is higher than the post-development level. This is due to the proposed culverts providing attenuation in the post-development scenario, reducing downstream flood elevations. These culverts will, however, pass smaller events/ flows forward.
- Overall, the results demonstrate that while there are increases in flood levels are considered negligible to less than minor in the context of the culvert and its relationship to the motorway elevation and increased risk to embankment.

Table 1 – Culvert Flood Level summary

	Pre-Development	Post-Development	Difference	Freeboard to Motorway
2yr (3.8°c)	11.40mRL	11.70mRL	300mm	15.3m
5yr (3.8°c)	12.60mRL	13.20mRL	600mm	13.8m

10yr (3.8°c)	13.90mRL	14.20mRL	300mm	12.8m
100yr (3.8°c)	17.10mRL	16.80mRL	-300mm	10.2m
100yr – Blocked (3.8°c)	-	21.50mRL		5.5m

Secondary Inlet

- Based on the McKenzie modelling and the significant reduction in blockage risk associated with the change in land use from forestry to residential, our view is that a secondary inlet is not required.
- Rather than providing a secondary inlet, we propose managing this risk through active maintenance and monitoring of the culvert.

The proposed management approach includes:

- A consent condition requiring a management plan to address potential blockage from any residual slash / debris.
- This plan would remain in place until the development is fully built out, and the site is stabilised. Once developed, the blockage risk is expected to be substantially lower; however, we acknowledge some level of temporary risk during construction which will be managed through the management plan.

Could you please confirm whether NZTA would be satisfied with a consent condition requiring a management and monitoring plan - prepared to NZTA's approval - to manage blockage risk until full build-out and site stabilisation?

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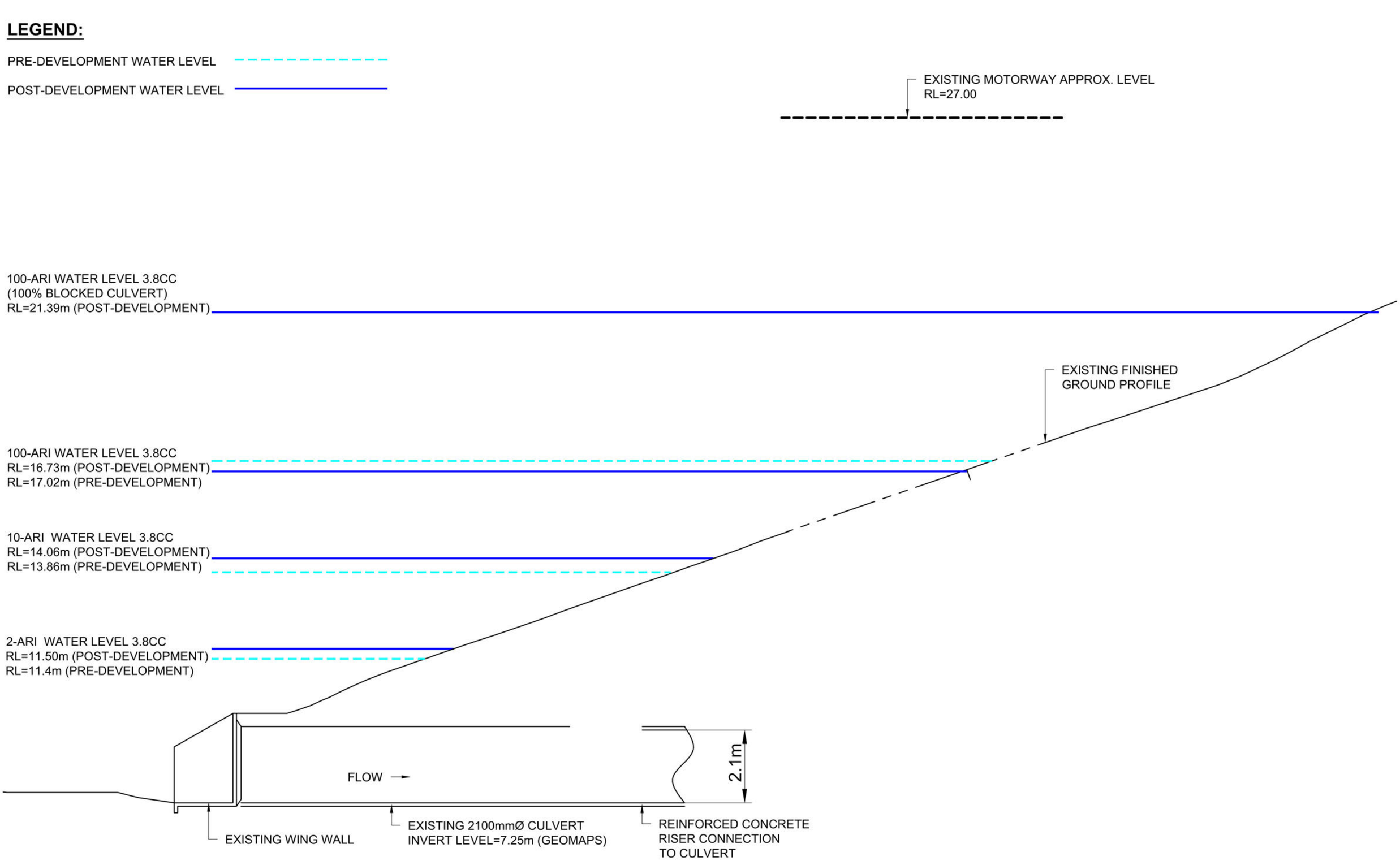
Appendix B

LEGEND:

PRE-DEVELOPMENT WATER LEVEL

POST-DEVELOPMENT WATER LEVEL



REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
E	UPDATED FLOOD LEVELS	JDK			19/12/25
D	REMOVED RISER	JDK			05/12/25
C	FOR DISSCUSSION	ZW	JDK	JDK	02/12/25
B	FOR DISSCUSSION	ZW	JDK	JDK	01/12/25
A	FIRST ISSUE	ZW			20/11/25

MCKENZIE & CO.

CLIENT: VINEWAY LTD

PROJECT: DELMORE
53A, 53B & 55 RUSSELL ROAD
OREWA
STAGE 1

TITLE: STORMWATER
EXISTING NZTA CULVERT
UPGRADE PLAN

PURPOSE OF ISSUE: RESOURCE CONSENT

SCALE: 1:100m@A3
DO NOT SCALE

DRAWING NO: 3725-1-4815

REV: E

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