MEMO – AUCKLAND TRANSPORT

To:	Vineway Ltd
From:	James Kitchen
Cc:	James Kitchen
Date:	27/06/2025

Subject: Technical Response – Auckland Transport ("**AT**") Memo

1. BACKGROUND

As part of the Supporting Growth Programme's strategic planning for Auckland's urban expansion, a future arterial road corridor was identified and a Notice of Requirement to designate the land for that use was lodged with Auckland Council ("**NOR 6**"). The NOR 6 designation sits over land zoned Future Urban. The initial, conceptual alignment of the NOR 6 road was not informed by a comprehensive masterplan to assess its integration with anticipated land use patterns and development outcomes within the area

2. AT POINT 11 – NOR 6 – CONNECTION BETWEEN MILLDALE AND GRAND DRIVE ŌREWA COSTINGS

The following response is provided to point 11 in the AT Memo. It is split into three to address each aspect of the comment provided.

a) The cost savings contended by the Applicant for the proposed arterial road alignment option are significantly inflated. The difference in length has been overstated by a factor of 10 (i.e. 30m as opposed to 300m).

Response – It is acknowledged that there was typographical error in the calculations provided to AT ahead of it providing its comments to the Panel. An additional '0' was added to the distance. The NOR 6 Memorandum (**Attachment A**) has been updated with the correct figures.

b) Design refinement and optimisation of the bridge over a single stream (rather than two stream as proposed by the Applicant in the revised alignment) for the SGA NoR alignment has not been undertaken, so it's not appropriate to use this as the basis for comparison.

Response – Both alignment options are at the same preliminary design stage and therefore must be evaluated on an equal footing. It's not clear why design refinement at this point would be considered exclusively for one option; early-stage design is precisely when maximum flexibility exists to explore and optimise different alignments. These comparative studies should be undertaken

now—while the design is still conceptual—so that any potential benefits or drawbacks of each route can be properly assessed. Moreover, neither at the Notice of Requirement hearing nor during the fast-track application meeting did AT raise any objection to considering this alternative alignment. Indeed, during the hearing AT's evidence was that the concept plan in the Notice of Requirement was indicative only and that the more refined alignment presented by Vineway Ltd was acceptable. This is addressed in the legal memorandum provided with the Applicant's response to comments.

c) *The Applicants proposed alignment will require crossing two streams at a convergence point, which increases environmental risks and reduces opportunities to refine the design further.*

Response –. The convergence point design has been expressly considered pre-lodgement by the applicant whilst modelling the alternative design. As a result of this investigation, the following is noted. The applicant's route does cross two converging streams, but its lower, shorter spans allow for a mid-span pier—unlike the AT alignment, whose greater height and geometry preclude such support. That pier can be sited well outside riparian margins, simplifying foundations and access. Overall, the two-stream crossing proposed by the applicant yields a lighter, more cost-effective structure with reduced embankment works, lower visual impact and shorter span lengths—offering clear advantages in constructability, maintenance and environmental mitigation, as outlined in the NOR 6 Memorandum (**Attachment A**). The proposed crossing significantly decreases the amount of covenanted bush requiring removal, so in that regard it is considered to be a superior alignment.

d) *The vertical grade has also been increased beyond what is desirable, so a comparison of this with the SGA bridge is not fair or appropriate comparison.*

Response – The vertical grades are within the allowable limits of Austroads Chapter 3, and thus, comply with the limits in AT's own TDM manual. It is therefore not clear why AT considers the grades are not desirable, when they meet their own design expectations.

3. STORMWATER

Point 37. AT's interest in the Projects stormwater management is twofold, firstly as future asset owner of any stormwater devices that take runoff (solely) from the road reserve. AT need to consider whole of life cycle costings for any devices proposed to be vested to AT, as ultimately ratepayers will bear the ongoing costs of these assets. Secondly, stormwater management must consider pedestrian and vehicle safety in storm events.

37. **Response** – Noted. There are no stormwater treatment assets that are proposed to be vested directly with Auckland transport, as the stormwater network services both lots and the road network. It is proposed to vest these assets to Auckland Council.

Point 38. The Applicant has not provided a complete Over Land Flow Path (OLFP) assessment and has not demonstrated that flood hazards associated with the OLFP within the road corridor

are safely managed.

38. Response –Overland Flow Path's ("**OLFP**") were identified and assessed in order to inform the application as lodged. In our view this provided the information that generally accompanies are consent application. The relevant documents are Appendix 12, Appendix 12-6, and Appendix 29 of the application as lodged. However, considering AT's comments we have prepared a supplementary OLFP Memorandum. Key elements are summarized below; the full calculations and mapping are included in the OLFP Memorandum. The conclusion of this memorandum is consistent with that made within the lodged Flood Assessment Report (Appendix 29 of the application as lodged) – that "that the proposed development has been designed to manage stormwater runoff effectively. The assessment confirms that the minimum floor levels for the proposed lots are above the 1% AEP flood levels (unblocked scenario) and overland flow paths are contained within existing streams and channels."

1. **OLFP Mapping & Plans**
    - **Stage 1:** Sheets 32751-1-4600 to 4607
    - **Stage 2:** Sheets 3725-2AB-4600 to 4650 and 3725-2CDE-4600 to 4605

These plans show all modelled flowpaths, critical control points, and discharge locations.

2. **Modelling Methodology**
    - **Design Storm:** 1% AEP event including 3.8 degree climate change, in accordance with Auckland Council GD05.
    - **Software:** 12d Rational analysis.
    - **Parameters:** Manning's n = 0.015 , on a combined design/topographic survey .
3. **Containment within Road Reserve**
    - All OLFPs remain within the legal road corridor under the 1% AEP + 3.8 degree Climate Change design storm.
    - All pram crossing locations do not exceed 0.4 m/s^2, consistent with "Obvious Danger" criteria in Table 3 of AT's Road Drainage Guide (TDM).
    - Some isolated areas, the D×V is below 0.6 m^2/s^2, however these are in areas categorised as "No Obvious Danger." So are compliant with the TDM.
4. **Discharge to Streams & Erosion Protection**
    - At the points where OLFPs exit the road reserve into receiving streams, we will install geotextile-lined rip-rap aprons sized per TR2013/013 guidelines to prevent scour and erosion. These may be protected with easements, where necessary. These locations are shown on the OLFP plans.

- Finished floor levels of adjacent lots on the subject site will exceed the 1% AEP flood level by at least 300 mm freeboard.
- Encumbrance covenants will ensure minimum floor levels are maintained for future development.

Next Steps

At Engineering Plan Approval stage we will refine cross-sectional surveys, verify invert levels, and confirm rip-rap sizing. This is consistent with the standard process for when detailed design of these aspects occurs.

The comprehensive OLFP assessment demonstrates that flood hazards are safely managed within the road reserve, in line with Auckland Council and Auckland Transport standards.

Point 39. An assessment for the proposed culverts has not been provided and has not demonstrated that the culverts are appropriately sized or enable non-hazardous conveyance of stormwater.

This is also highlighted in NZTAs comments to Auckland Council. If the culverts are identified to be insufficiently sized and require upsizing, this could affect lot boundaries near the culvert and channels.

39. Response

We have completed a full culvert sizing and performance assessment for all road and stream crossings. Key points are outlined below:

Compliance Table & Standards

A detailed culvert compliance table is provided in Section 10 and calculations are located in Appendix B of the Stormwater Infrastructure Report (Appendix 12 as lodged with the substantive application), which demonstrates conformance with:

- Auckland Council Stormwater Code of Practice (CoP v4)
- NES Freshwater Standards (Regulation 70 – fish passage, invert depth, velocity, geomorphic continuity)
- AT Code of Practice & Technical Design Manual

Culvert Modelling

HY-8 Culvert Design

Flows entering the culverts, have been calculated with TP108 including climate change, and the culverts were modelled in HY-8 software to determine the appropriate size. The culverts and catchments were then modelled using Hec Ras 2D/ 1D model to determine how they integrate with the overall stormwater system.

NES Freshwater Criteria (Regulation 70)

Fish Passage: Culvert barrels are embedded ≥ 25% into bed, to provide substrate continuity.

Velocity & Width: Mean velocities within culverts do not exceed adjacent stream reaches, and barrel width ≥ 1.3× natural channel width where w ≤ 3 m (and ≥ 1.2×w+0.6 m where w > 3 m).

Three culverts however do not meet the NES FW standards, being culverts 7, 9 and 10. This is because of the local typography of the adjacent stream bed, making the 1.3 x W dimension not possible.

Therefore, the proposed culverts comply with the above permitted activity standards under NES-F Regulation 70.

Roading Requirements (NZTA / AT)

Marking & Safety: Inlets in potential shallow flooding zones are marked with green retro-reflective pavement markers per AT TDM; headwalls will include guard-barriers where required.

Maintenance Access: Inlet and outlet locations have 3 m-wide access tracks for inspection, debris removal, and scour protection maintenance.

Scour & Erosion Protection

All outlets have geotextile-lined rip-rap aprons located at the inlet and outlets. Detailed outlet cross-sections are on Drawings 4800–4813 (Appendix A).

Appropriately Sized

Given the above, each culvert:

- Passes the HY-8 capacity checks for both 1% AEP events.
- Meets NES velocity, width, and substrate criteria, except for culverts7, 9 & 10 as outlined above.
- Provides safe freeboard and headwater depths per SW CoP.

We therefore confirm that all culverts are appropriately sized for non-hazardous conveyance of stormwater.

40. The Applicant's Flood Assessment Report does not provide a suitable assessment of flooding within the development. The hydraulic modelling has not been demonstrated as appropriate

for use and validation method has only been compared to the Healthy Waters Rapid Flood Hazard Assessment (RFHA) in a single location.

40. Response -

We do not agree with this. The flood assessment undertaken is consistent with best practice and reflects the work typically undertaken for consent applications for residential development.

Our assessment shows that the flood plain does not affect the lots and roads within the development. The flood plain is contained within the streams areas. The roads are not affected by the flood plain, this is covered in the lodged flooding report (Flood Assessment Report as Appendix 29). The report The assessment confirms that the minimum floor levels for the proposed lots are above the 1% AEP flood levels (unblocked scenario) and overland flow paths are contained within existing streams and channels.

Further work on OLFPs has been undertaken given the comments made and these are covered above in our RFI 38 response. This work confirms that these can safely be conveyed through the development.

41. AT concur with the major concern raised by NZTA in relation to existing stormwater infrastructure being inadequate to accommodate impacts of the proposed development. A full assessment of the impact has not been provided. Therefore, it is not possible to determine flood hazards impacts, whether stormwater infrastructure is appropriate for the development, or the potential flood depth increases. There are serious flood risks that require further investigation to be undertaken to confirm the degree of safety risk to the public.

41. Response

The original flood assessment concluded that a 210mm increase in flood level to downstream properties and 550mm increase in flood level to upstream properties would have a less than minor effect. Since the original assessment, the flood model has been updated . The increase in flood level to downstream properties is now 140mm and is 210mm at upstream properties. As such, the original conclusion made in the Flood Assessment Report lodged with the substantive application (Appendix 29), that flood effects on these properties is less than minor, is considered to remain applicable.

NOTICE OF REQUIREMENT 6 REALIGNMENT ASSESSMENT

To: Vineway Limited

From: Pedro Ortiz
Cc: James Kitchen
Date: 27/06/2025

Subject: Technical Response – Comparison of NOR 6 Original Alignment vs. Proposed Realignment through Delmore Development (Stages 1 & 2), Russell Road, Orewa

1. BACKGROUND

As part of the Supporting Growth Programme's strategic planning for Auckland's urban expansion, a future arterial road corridor was identified and a Notice of Requirement to designate the land for that use was given to Auckland Council (NOR 6). The NOR 6 designation sits over land zoned Future Urban. The initial, conceptual alignment of the NOR 6 road was not informed by a comprehensive masterplan to assess its integration with anticipated land use patterns and development outcomes within the area it traverses.

Mckenzie & Co has subsequently developed an alternative alignment, guided by a development master plan for Vineway Ltd's Delmore Development (Stages 1 and 2). This revised alignment aims to optimize the road's function in supporting urban development while maintaining compliance with the technical, planning, and policy requirements of NOR 6, and staying within the NOR 6 designation envelope.

The alternative alignment was submitted to the NOR 6 Hearing Panel and was accepted by Auckland Transport in principle in its evidence.

Following this, an application for the approvals needed for Delmore, and for the NOR 6 road, was lodged based on the realigned design.

Auckland Transport has now requested a comparative assessment of the proposed alignment versus the original NOR 6 design to confirm that the proposed realignment is optimal.

2. PURPOSE OF TECHNICAL RESPONSE

This technical memo responds to Auckland Transport's request by providing a comparative evaluation of the original and proposed NOR 6 alignments. The assessment addresses engineering feasibility, cost-efficiency, functional performance, and integration with surrounding infrastructure and land use. Particular attention is given to:

1. Earthworks volume and bridge design efficiency
2. Footpath gradient compliance
3. Interface with AT-designed roundabout infrastructure
4. Engineering rationale for the proposed shift
5. Impacts on consent notice areas and related planning risks
6. Design Specifications Comparison

3. DESIGN SPECIFICATIONS COMPARISON

Parameter	Original Design	Proposed Design
1. **Alignment length**	1.163km	1.133km **(Length reduced by 30m overall, from Grand drive to Upper Orewa Rd. Reduced construction and maintenance costs)**
2. **Fill Volume (Earthworks)**	108,400 m^3	101,900 m^3 **(reduced by 6,500 m^3)**
3. **Bridge Length**	106.0 m	95.0 m **(Reduced by 11m)**
4. **Bridge Configuration**	Single span	Optional mid span pier **(63.0 m + 32.0 m spans – Lower cost)**
5. **Abutment Heights (N/S)**	North Abutment - 5.8 m South Abutment - 14.4 m	North Abutment - 7.6 m **(Higher)** South Abutment 12.0 m **(Lower)** **Small net decrease in total abutment height, but reduced cost from reducing the tallest abutment (South).**
6. **Covenant Impact**	3,136m2	1,619m2 **(1,517m2 Lower area of impact)**

7.	**Stormwater Device**	Standalone SW device	Communal SW device **(reduced requirements for communal vs standalone through efficiencies on batter slopes, access, pipework etc)**

4. FEASIBILITY AND FUNCTIONAL JUSTIFICATION

1.1 Earthworks and Bridge Design

- The proposed alignment results in a 6,500 m^3 reduction in fill volume, due to more favourable alignment to the existing contours and a lower approach level.
- Lower abutment heights will be lower cost to construct the abutments.
- Shorter bridge span reduces structural load, foundation design requirements, and total construction cost. The option of a mid-span pier, could reduce bridge cost due to much shorter spans. The pier avoids stream alignments, being located minimum 15m from the centreline of each stream adjacent to the pier. No vegetation removal would be required for its installation. Refer to Figure 1 for indicative location of mid-span pier option.
- Intermittent pier option improves constructability and cost efficiency.

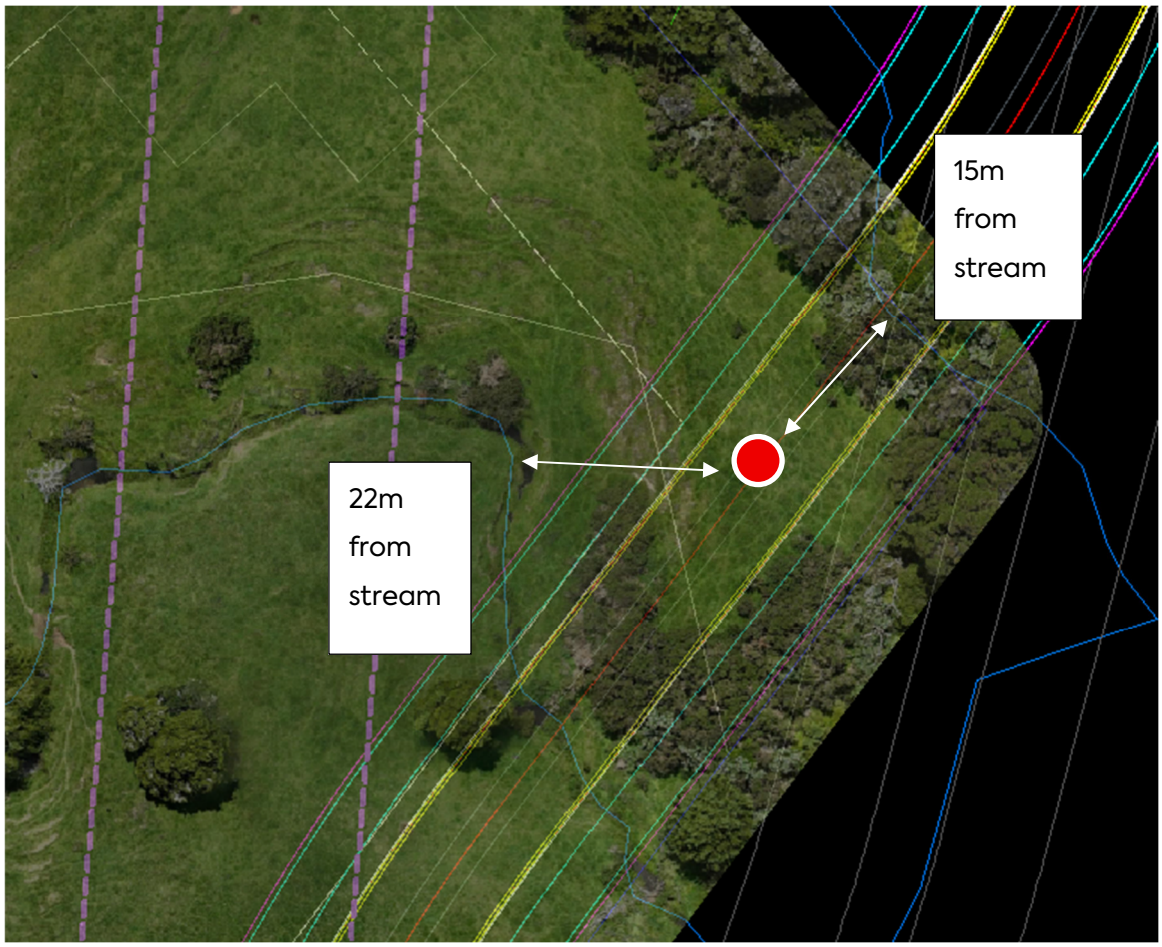

Figure 1 - Indicative location of mid-span pier. Refer Long-section for bridge configuration.

1.2 Stormwater and Infrastructure Coordination

- The revised route accounts for relocated stormwater treatment infrastructure.
- Stormwater device integrated with the land development requirements, reducing cost that would otherwise be required for stand-alone infrastructure.
- Updated design eliminates conflicts between SW ponds and future development and improves integration with internal development network.
- Through integrating the stormwater system with the residential development, efficiency gains can be had. These are made through combining both systems into a communal system. There is a cost efficiency in combining these systems. The levels of the revised alignment still work to discharge stormwater into this new system.

1.3 Topographic and Terrain Considerations

- Better conformity to natural terrain reduces cut-and-fill requirements and improves long-term stability and efficiencies gained through reduce cut fill quantities.

1.4 Shorter Route

Through efficiencies gained through the realignment of the road, a saving in approximately 300m of road construction can be gained. This will flow through to a saving in ongoing maintenance of the road.

1.5 Futureproofing and Access Integration

- Proposed alignment improves connections to internal Delmore roads.
- Enables enhanced multimodal access (pedestrians, cyclists, PT).

1.6 Consent Notice Area Considerations

- The revised alignment is more efficient in terms of reduction of the loss of covenanted bush area, due to the reduced footprint of earthworks due to the combining of the stormwater device shown on the original design which services the NOR 6 road, with the stormwater device requirements for the roads associated with the Delmore development.
- Figures 2 & 3 show the affected area of covenant for each option.

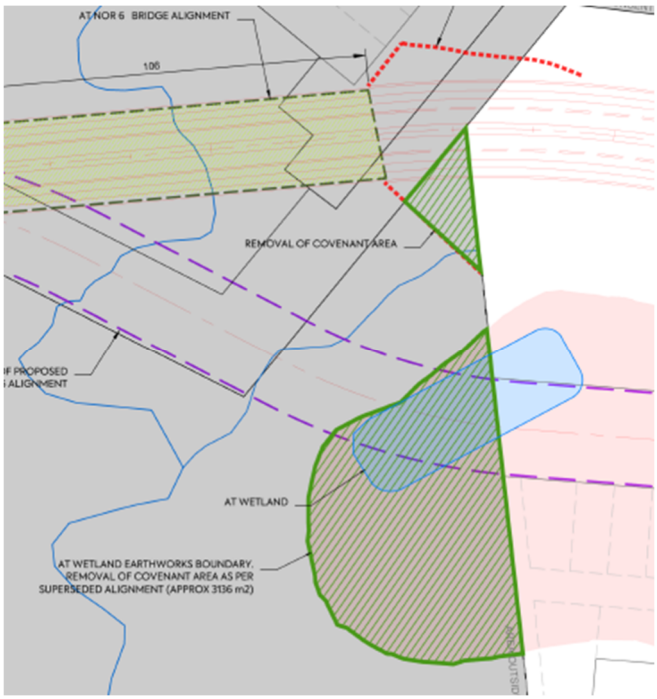

Figure 2 - Covenant areas to be removed with original alignment

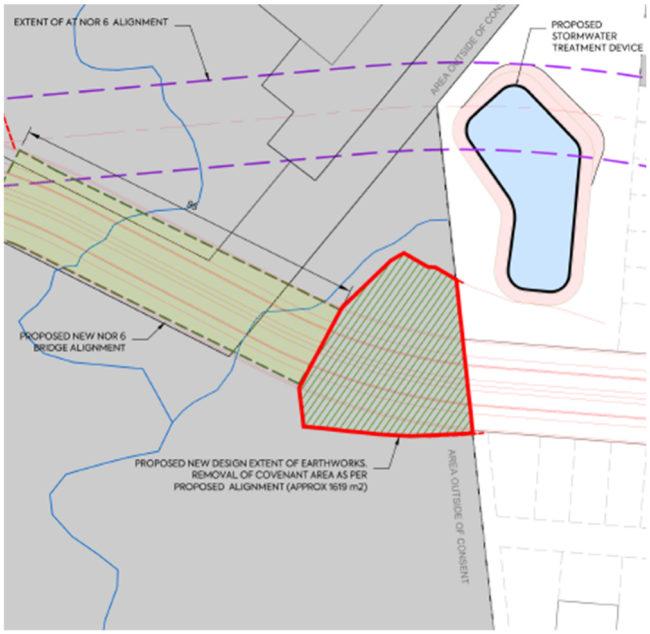

Figure 3 - Covenant areas to be removed with proposed alignment

5. COST COMPARISON SUMMARY

Cost Category	Quantity	Assumed Rate	Total	Notes
1. **Alignment Length Reduction**	30m	$10k/m	-$300K	Historical cost of Arterial Road in Auckland

2.	**Earthworks Reduction**	6500m^3	\$100/ m^3	-\$650K	Imported fill and placement
3.	**Reduced Bridge Length**	11m x 28m wide	\$5,000	-\$1.54M	Waka Kotahi NZ Transport Agency (NZTA) provides planning and cost guidance that suggests \$3,500–\$6,000+ per m^2 is a common range for typical road bridge construction in New Zealand.
4.	**Bridge Configuration**	1	Simpler construction		Not quantified
5.	**Bridge abutment heights**	1	\$70K	-\$70K	Calculated using volume of concrete work.
6.	**consent notice impact avoided for southern area**	-1,517m2	\$60m2	-\$90K	Vegetation clearance @\$15/m2, consenting, replanting offset planting \$40/m2.
	Total estimated cost saving			**-\$2,650M**	**Total estimate cost saving of proposed route.**

6. CONCLUSION AND RECOMMENDATION

The proposed realignment offers clear engineering and cost advantages while maintaining compliance with all relevant ATCOP and TDM design requirements. In summary:

- It reduces construction cost and complexity.
- It minimizes planning and environmental risk.
- It is functionally superior due to better terrain alignment and infrastructure integration.