

Delmore Fast-Track

04/05/2026 – Auckland Council Response

Annexure 6:

Geotechnical

Delmore Fast Track Application

To: Auckland Council – Geotechnical

From: James Beaumont – Riley

Date: 15 April 2026

Re: Geotechnical Response Memorandum

1.0 Technical Specialist Memo – Geotechnical Review

From: Frank Zhou, Senior Geotechnical Specialist

Qualifications
& Relevant
Experience:

I hold the qualification(s) of: **Bachelor of Civil Engineering** and have 8 years of geotechnical experience in both private and public sectors for land development, hazard remediation and infrastructure projects across the Auckland region. I am a full member of **Engineering New Zealand** and **New Zealand Geotechnical Society**. I have prepared expert evidence and technical assessments for resource consent applications, plan changes, notices of requirement for designation and fast-track applications.

Preparation in
Accordance
with the Code
of Conduct:

I confirm that I have read the Environment Court Practice Note 2023 – Code of Conduct for Expert Witnesses ([Code](#)), and have complied with it in the preparation of this memorandum. I also agree to follow the Code when participating in any subsequent processes, such as expert conferencing, directed by the Panel. I confirm that the opinions I have expressed are within my area of expertise and are my own, except where I have stated that I am relying on the work or evidence of others, which I have specified.

Please note that this review is specific to the Operative AUP requirements and excludes assessment against PC120.

Signature: Frank Zhou

Date: 23/04/2026

2.0 Original Specialist Review Memo

Our geotechnical assessment has been detailed in the previous memo. Below is a brief summary of key missing information of the previously provided geotechnical information. For more details, please refer to the previous memo.

- The potential risk that the geotechnical assessment and reporting has been prepared by outdated plans.
- Minor errors in the slope stability output pages, which limit our regulatory review and could potentially lead to underestimating slope instability and the adequacy of proposed remedial measures.
- Remediation plan indicated the use of reinforced earth batter to retain a cut slope however was presented where filling is proposed.

3.0 Updated Response to Applicant's Memo

I have reviewed the following information provided by the applicant in response to the queries outlined in our previous memo:

- Geotechnical Attachments.pdf
- 240065-SK143 Rev E.pdf
- Appendix 44_Proposed Conditions_post lodgement updates
- Applicant's response to queries and conditions (attached at the end of this memo)

In addition to the above, an online meeting was held on 20 April 2026 with Council specialists including Healthy Waters (HW) and the applicant's engineers from Riley and Morpium. The meeting primarily focused on outstanding queries raised by HW regarding the geomorphology assessment and the uncertainty associated with future stream migration. HW also raised concerns that potential stream migration could significantly affect the stability of the reinforced earth (RE) slopes on either side of the stream, which may in turn pose instability risks to the building platforms located above.

There also appears to be some obstructions in the slope stability models for Section AC (seismic and worst credible GW) which limit the reader to view the modelled slopes. The existing slope stability models presented in Appendix F of the Geotechnical Reporting has been relied upon in these cases noting that the same factor of safety values are presented in the models.

Based on the information provided, I confirm that all geotechnical queries raised in our previous memo have been satisfactorily addressed.

In relation to HW's concerns, I agree that stream migration has the potential to impact the RE slope design and should be appropriately accounted for. I note that the submitted geotechnical analyses have incorporated allowances for potential downcutting and channel widening, consistent with recommendations from Morpium. The analyses indicate that adequate factors of safety and therefore slope stability can be achieved with these geomorphic considerations included.

On this basis and the available information, from a geotechnical perspective, the proposal is generally acceptable. Should there be any changes to the geomorphology assessment, including the extent or location of anticipated downcutting and channel widening, the geotechnical assessment will need to be updated accordingly to reflect those changes.

4.0 Conclusion

Based on the information provided I can advise that the reporting, conclusions and recommendations of the provided geotechnical report are generally reasonable for the scale and magnitude of the works and indicate the site could be safely developed from a geotechnical/stability perspective, subject to the conditions mentioned below. If appropriately managed, no other properties are likely to be affected from soil instability issues arising from the earthworks.

I understand there are outstanding queries related to geomorphology assessment. Should there be any changes to the assessment, including the extent or location of anticipated downcutting and channel widening, the geotechnical assessment will need to be updated accordingly to reflect those changes.

Delmore Fast Track Application

1.1 Introduction

This memorandum responds to the Technical Specialist Memo prepared by Auckland Council (Geotechnical) in relation to the above fast-track application (as lodged). This response addresses:

- Further information requests / technical queries; and
- Recommended amendments to consent conditions.

1.2 Response to Further Information Requests / Technical Comments

Information Request from Council on the lodged material	Applicant Response	Council Specialist Response
Earthworks contours Appendix I (Riley Sketches) indicates that the earthworks cut and fill profiles were based on drawings prepared by McKenzie & Co dated 10 December 2025, whereas the latest earthworks plan package is dated 12 December 2025. Suggest confirmation whether the most recent plans have been adopted in the assessment be provided.	Review of the 12 December 2025 drawings prepared by McKenzie and Co indicates that the updates from the 10 December drawings are inconsequential to the proposed cuts/fills, and finished contours. Therefore, the stability analyses are considered to be appropriate and no updates are required.	Accepted and closed.
Slope stability output The stability analysis output pages do not include the soil parameters and support parameters adopted in the modelling (e.g. Sections H, O, AA, AB, AF, AG, AH, etc.).	Stability analysis outputs for these cross-sections showing the soil and support parameters are attached. No notable change to the output results. Recommendations in the GIR remain appropriate.	Accepted and closed.

Suggest that these details be provided to support the analysis and verify model outputs.		
Slope stability output For Section I (remedial option case), the search limits appear to be focused on the toe slope. Suggest that the model extend the search limits to include the upper development area.	Stability analysis outputs for this cross-section with the search limits extended are attached to this memo. No notable change to the output results. Recommendations in the GIR remain appropriate.	Accepted and closed.
Slope stability output For Section Z, no surcharge load appears to have been considered in the analysis. Suggest that this decision be clarified or the model revised.	Stability analysis outputs for this cross-section with the surcharge added are attached to this memo. No notable change to the output results. Recommendations in the GIR remain appropriate.	Accepted and closed.
Slope stability output The output page for Section AC is not legible for regulatory review. Suggest that a clearer output be provided.	Stability analysis outputs for this cross-section have been re-outputted to be clear and are attached to this memo. No change to the calculated FoS. Recommendations in the GIR remain appropriate.	Accepted and closed.
Remediation Plan It is noted that the remediation plan indicates the use of a reinforced earth batter (REB) to retain a cut slope. It appears that the REB may have been erroneously extended from Section AD where filling is proposed. A more practicable option in this instance may be appropriate. Suggest that confirmation that the notation on the remediation plan is correct or a revision provided to reflect intended works.	The remediation plan has been updated and is attached to this memo. The subject portion where cuts are proposed to be formed has been changed to soil nails (consistent with the nearby Section AC). The extent of each type of stability enhancement measure will need to be confirmed during detailed the design. See updated Riley sketch SK143 attached.	Accepted and closed.

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1.3 Response to Recommended / Amended Conditions

Condition Request from Council on the lodged condition document (Appendix 44 to the AEE)	Applicant Response	Council Specialist Response
26. At least 10 working days prior to the commencement of works for any stage or sub-stage of the development, the consent holder must provide a detailed construction methodology endorsed by a chartered geo-professional who must provide written confirmation of the review. The methodology must include earthworks, boundary works and installation of slope protection measures in accordance with the recommendations provided within the Geotechnical Report, referenced in Condition 1 and submitted to Auckland Council. <u>No works onsite are permitted prior to written confirmation that the detailed construction methodology has been reviewed and accepted by the Council.</u> Advice note: The earthworks detailed construction methodology is required to ensure stability is maintained throughout the civil works stage of the development.	This condition is accepted and has been updated within the condition set (refer Section 2.1.10 of the conditions).	Accepted and closed on the premise of the applicant's response however we note that the updated conditions varies from what has agreed in the applicant response which is specific to bulk earthworks. We suggest that this be revised. <i>At least 10 working days prior to the commencement of works for any stage or sub-stage of the development, the consent holder must provide a detailed construction methodology endorsed by a chartered geo-professional who must provide written confirmation of the review. The methodology must include earthworks, boundary works and installation of slope protection measures in accordance with the recommendations provided within the Geotechnical Report, referenced in Condition 1 and submitted to Auckland Council. No bulk earth works onsite are permitted prior to written confirmation that the detailed construction methodology has been reviewed and accepted by the Council.</i>
44. At least 20 working days prior to the commencement of bulk earthworks for any stage or sub-stage of the development, a Settlement	This condition is accepted and has been updated within the condition set (refer Section 2.1.17 of the conditions).	Accepted and closed.

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Monitoring Plan (SeMP) prepared by a SOEP <u>chartered geo-professional</u> , must be submitted to Council for certification. Any later proposed amendment of the SeMP must also be submitted to Council for certification.		
45. The purpose of the SeMP is to set out the practices and procedures to be adopted to ensure compliance with the consent conditions regarding earthworks fill settlement monitoring and shall <u>must</u> include, at a minimum, the following information: a) A monitoring location plan, showing the location and type and construction detail of all settlement monitoring points; b) Details of the monitoring frequency; c) All monitoring data, the identification of services susceptible to damage and all building/service condition surveys undertaken to date; and d) Details of criteria to confirm that fill induced settlements have sufficiently attenuated. Settlement monitoring results must be presented in the Geotechnical Completion Report (refer Condition 46 and Condition 47).	This condition is accepted and has been updated within the condition set (refer Section 2.1.17 of the conditions).	Accepted and closed.
46. The placement and compaction of fill material, construction of geogrid reinforced slopes, <u>shear piles</u> , retaining and <u>palisade</u> walls, <u>soil nails</u> , <u>shear keys</u> , <u>counterfort drains</u> and subsoil drainage	This condition is accepted and has been updated within the condition set (refer Section 2.1.17 of the conditions).	Accepted and closed.

works must be supervised by a SQEP <u>geo-professional</u> . In supervising the works, the SQEP geo-professional must ensure that they are constructed and otherwise completed in accordance with the recommendations contained within the Geotechnical Report approved under Condition 1, relevant engineering code of practice, and the detailed plans forming part of the application and approved under Condition 1.		
47. Within 20 working days from the completion of earthworks, subsoil drainage and slope protection structures, a Geotechnical Completion Report (GCR) signed by the chartered geo-professional must be provided to the Council. The GCR must include (but not to be limited to): a) Earthworks operations (e.g. fill compaction, testing, inspections etc.); <u>b) Site inspections, observations, recommendations and photo evidence</u> c) Results of settlement monitoring; d) Statement of professional opinion (as per schedule 2A of NZS4404:2010); and e) Certified as-built plans for the implemented earthworks <u>including but not being limited to earthworks cut and fill, shear keys, reinforced earth batter slopes, soil nails, retaining and palisade walls, counterfort drains</u> and subsoil drainage.	This condition is accepted and has been updated within the condition set (refer Section 2.1.17 of the conditions).	Accepted and closed.

48. The GCR must also provide justification on soil expansivity, subsoil site class, foundation requirements, <u>geotechnical input of erosion protection measures for dispersal devices on each lot and</u> confirming that the works have been completed in accordance with the approved construction methodology as required by Condition 26 and evidence of settlement monitoring as required by Condition 475 have been met. The GCR must include results of settlement monitoring and demonstration that sufficient settlement attenuation has occurred and be provided to the satisfaction of the Council.	This condition is accepted and has been updated within the condition set (refer Section 2.1.17 of the conditions).	Please note that the condition relating to construction methodology is numbered 29 in the updated set, rather than 26. Further the Settlement Monitoring is no longer condition 45 but Condition 47. The finalised condition set should be amended to reference the correct condition number.
49. All earthworks must be managed to ensure that they do not lead to any uncontrolled instability or collapse either affecting the site or adversely affecting any neighboring properties. In the event that such collapse or instability does occur, the <u>the consent holder</u> must immediately be rectified <u>the damage</u>.	This condition is accepted and has been updated within the condition set, subject to a minor amendment to fix the grammar (refer Section 2.1.17 of the conditions).	Accepted and closed.
104. The consent holder must construct the earthworks, <u>geogrid reinforced earth batters, slopes, shear piles, retaining and palisade walls, soil nails, shear keys, counterfort drains</u> and subsoil drainage in accordance with the recommendations of the Riley Consultants Ltd Geotechnical Investigation Report approved under Condition 1 to ensure the site is stable and suitable for development.	This condition is accepted and has been updated within the condition set (refer Section 3.1.7 of the conditions).	Accepted and closed.

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105. A Geotechnical Completion Report (GCR) from a suitably qualified and experienced chartered geo-professional must be prepared and submitted to Council to confirm that all residential <u>and commercial</u> lots are stable and suitable for development when applying for a certificate under section 224(c) for a subdivision stage (or sub-stage). The GCR must include a Building Restriction Zone plan that identifies specific design zones and no-build zones. Development must be undertaken in accordance with the recommendations of the GCR. The preceding paragraph must be registered as a consent notice on the records of title for all residential <u>and commercial</u> lots to ensure that it is complied with on a continuing basis. The specific name and date of the GCR provided must be referenced in the consent notice. Advice note: <u>The specific name and date of the GCR provided must be referenced in the consent notice.</u> Refer to Auckland Council Code of Practice 2023 (Chapter 2) which details expectations of a geotechnical completion report.	This condition is accepted and has been updated within the condition set (refer Section 3.1.7 of the conditions).	Accepted and closed.
106. <u>Certified</u> as-built details of installed counterfort drains shall <u>must</u> be included within the Geotechnical Completion Report, together with records of counterfort drain commissioning observations and flushing.	This condition is accepted and has been updated within the condition set (refer Section 3.1.7 of the conditions).	Accepted and closed. Please note that there appears to be an error in the Advice note which should be rectified: <i>The drain commissioning information will provide</i>

Advice Note: The drain commissioning information will provide baseline data for the counterfort drain operation and maintenance plan. The as-built drawings shall <u>should</u> also include locations of the flushing ports and outlet structures.		<i>baseline data for the counterfort drain operation and maintenance plan. The as-built drawings should also include locations of the flushing ports and outlet structures.</i>
107. Where counterfort drains are installed within a stage of the development, a counterfort drain operation and maintenance plan (CDOMP) must <u>shall</u> be provided as an attachment to the Geotechnical Completion Report <u>to the Council for certification</u>, incorporating a staged maintenance approach. This shall <u>must</u> include the observations to be made, their frequency and any associated actions <u>to ensure their serviceability. Any subsequent revision of the CDOMP must also be submitted to the Council for certification. The consent holder must meet the costs of the production, certification, monitoring and review of the CDOMP.</u> <u>Advice Note:</u> <u>The council acknowledges that the CDOMP is intended to provide flexibility both for the consent holder and the council for the management of the counterfort drainage and slope stability. Accordingly, the CDOMP may need to be reviewed over time. Any reviews should be in accordance with the stated objectives of the management plan and limited to the scope of this consent.</u>	This condition is accepted and has been updated within the condition set (refer Section 3.1.7 of the conditions).	Accepted and closed.

- Certification of the CDOMP by the council relates only to those aspects of the management plan that are relevant under the Resource Management Act 1991. The certification does not amount to an approval or acceptance of suitability by the council of any elements of the management plan that relate to other legislation, for example, but not limited to, the Building Act 2004, the Heritage New Zealand Pouhere Taonga Act 2014, or the Health and Safety in Employment Act 1992.