

Appendix F

Specialist's Evaluation – Geotechnical

Memo

To:	Paul Ryan – Hamilton City Council		
From:	John Brzeski – Tonkin + Taylor	Date:	13 May 2025
Subject:	Rotokauri Strategic Infrastructure Requirement – Technical Specialist Report for Section 42A Reporting		
Technical Area:	Geotechnical		
Version:	Final		

Purpose

1. This memorandum has been prepared to provide technical assessment under section 42A of the Resource Management Act 1991 (RMA), in respect of geotechnical matters in relation to the Rotokauri Strategic Infrastructure Requirement (the Requirement).

Introduction

2. My full name is John Joseph Brzeski. I hold the qualifications of Bachelor of Science with Honours in Applied Geology from Kingston University, London and Master of Science in Geohazard Assessment from the University of Portsmouth, both in the United Kingdom.
3. I have held the position of Engineering Geologist with Tonkin & Taylor Limited (T+T) for eight years and have twenty years of experience in Engineering Geology and Geotechnical Engineering in New Zealand, and the United Kingdom.
4. I have been involved in the review of in excess of five hundred land use and subdivision consent applications for Hamilton City Council (HCC). In my work as an Engineering Geologist in Hamilton I have also undertaken numerous geotechnical investigations within the City and as a result I am familiar with the geotechnical issues commonly encountered in the geological setting of the subject site. I have also held roles on prominent recent roading projects in New Zealand and, as such I have a good understanding of the design requirements for projects such as the one in question. Some example projects are given below to illustrate my expertise:
 - a. Hamilton City Council liquefaction risk assessment: Geological, geomorphological and quantitative liquefaction assessment for Hamilton City.
 - b. Hamilton City Planning Guidance unit geotechnical reviews.
 - c. Hamilton City Building Development unit geotechnical reviews.
 - d. Waikato Expressway, Huntly Section – Principal’s advisor role.

- e. Puhoi to Warkworth Motorway. Engineering Geologist and Construction Phase Manager.

Code of Conduct

- 5. I have read the Environment Court Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023 and agree to comply with it. I confirm that the opinions expressed in this memorandum are within my area of expertise except where I state that I have relied on the advice of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

Scope

- 6. This memorandum covers the following:
 - a. The relevant environmental effects of allowing the Requirement and whether any adverse effects will be acceptable.
 - b. Relevant matters raised, and relief sought, in submissions.
 - c. Relevant statutory considerations.
 - d. Recommended amendments and/or additions to the Requiring Authority's proposed designation conditions¹.

Executive summary

- 7. No site specific information relating to the ground conditions have been provided for review. The proposed design standards and suggestions for further assessment are reasonable and, if the detailed design is undertaken in accordance with these, it should achieve the outcomes sought.
- 8. The effects on surrounding land, infrastructure and structures will need to be determined and mitigated as part of the detailed design. The detailed design should include details of the monitoring required to confirm that effects are no more than minor.

Documents considered

- 9. I considered the following documents when preparing this assessment:
 - a. Rotokauri Strategic Infrastructure Designation: Notice of Requirement: Final Report 19 September 2024: Prepared by Beca Limited for Hamilton City Council, (the NOR).
 - b. Hamilton City Operative District Plan.
 - c. Waikato Regional Council, Regional Plan.
 - d. The submissions listed in Table 1.

¹ See s10 of the NOR.

Table 1 Submissions that raise geotechnical matters

Number	Submitter
14	Rotokauri Development Limited
15	Pragma Holdings Limited

Site visit

10. I visited the site on the 31 October 2023. This involved a walkover at various accessible locations.

Analysis

11. The geotechnical information provided in support of the NOR is high-level and does not lend itself for detailed analysis, which will occur in the subsequent detailed design phases. The design guides named in the design report are relevant and appropriate for the project and it is assumed that any temporary or permanent effects caused by the construction of the project will be identified during detailed design and that any outstanding risks can be addressed and managed in the Construction Environmental Management Plan.

Environmental Effects

12. The Design Report provides a summary of the “geotechnical concept design” but does not describe the nature of the soil profile or the groundwater expected to be encountered². As a result, it is not possible for me to definitively assess the geotechnical constraints that the proposal will have to overcome or any potential effects the proposed works may have on the surrounding area.
13. Notwithstanding this, the proposed design basis for future earthworks presented in section 6.9 of the Design Report and the suggestions for further assessments are reasonable and is in line with current practice for infrastructure projects. The proposed batters of the embankments are achievable, however, the effects of settlement associated with the construction of cuts, fills and any structures may extend beyond the designation. I understand that the Requiring Authority’s position is that these effects will be addressed as part of future resource consent applications for activities such as ground and surface water takes and diversions, bulk earthworks, and other related activities.
14. From my experience with the ground conditions in this area, there may be significant settlements where embankments are to be constructed on the compressible soils. These settlements have the potential to affect existing structures and infrastructure. Any dewatering required, either temporary or permanent also has the potential to lead to unacceptable static settlement affecting existing structures and infrastructure. Dewatering within this area may also lead to the acidification of potential acid sulfate soils resulting in damages to the receiving environment and existing infrastructure.
15. Whilst the provided information lacks detail about the management of the potential effects, I note that these issues are commonly addressed as part of the detailed design stage for

² Further information on these matters was requested from the Requiring Authority but not provided.

infrastructure projects. I recommend that work undertaken during the detailed design stage includes a full assessment of the site including but not restricted to:

- a. Historical aerial photography analysis.
 - b. Site investigations (e.g. trial pits, hand augers, machine boreholes, Cone Penetrometer Testing).
 - c. Laboratory testing.
 - d. Groundwater monitoring.
 - e. Trial embankments.
 - f. Detailed liquefaction assessment.
 - g. Detailed static settlement analysis including under dewatering, excavation and fill embankment conditions.
 - h. Detailed slope stability analysis.
16. Any effects noted as part of the detailed design should be managed by the proposed condition requiring a Construction Environmental Management Plan, which should be explicit in its requirements in terms of the assessments that need to be undertaken to inform it (see my comments in section 9 below).

Matters raised in submissions

Submission # 14 by Rotokauri Development Ltd and Submission #15 by Pragma Holdings Ltd

17. These submissions mirror each other in content and breadth of concern or questions.
18. They seek specific clarification on whether construction of the designated works will result in draining, partial draining or blockage of natural drainage.
19. The geotechnical information does not provide an assessment of this. It is my opinion that the NOR works has the potential to result in temporary and/or permanent draining, partial draining, or blockage of natural drainage.
20. It is my opinion that the potential effects of these can be managed following the actions proposed in the conclusion (paragraph 26) and proposed amendments to the designated conditions (item 28)

Statutory considerations

RMA

21. The following s6 matter of national importance is relevant to the Requirement:
(h) the management of significant risks from natural hazards.
22. Subject to Detailed Design, the proposed road is not expected to be unduly affected by natural hazards, nor is it expected to exacerbate existing or create new natural hazards.

Waikato Regional Council Regional Plan (“WRP”)

23. Several regional resource consents will be required under the WRP to construct the Project. The WRP modules relevant to geotechnical matters include (but are not limited to):
- a. 3 – Water Module.
 - b. 5 – Land and Soil Module.
24. Regional resource consent applications will be prepared and submitted to WRC prior to works commencing on the Project. These applications will include a Construction Environmental Management Plan and a full assessment of the WRP objectives, policies and rules.

Hamilton Operative District Plan

25. Two objectives are provided below as an example, but this is not an exhaustive list.

Objectives	Policies	My comments
3.3.6 Development responds to land suitability including topography, landscape, natural features, soil type, natural hazards, heritage features, adjoining land uses.	3.3.6a The loss of significant vegetation is minimised. 3.3.6b Large-scale earthworks and modifications to landforms are avoided where possible to ensure development retains features of the landscape identified on structure plans. 3.3.6c Road layouts adjacent to identified natural features recognise and retain their natural form where practicable. 3.3.6d The scale and quantum of development and land use type recognises land characteristics and suitability and adjoining land uses.	The proposed road is mostly expected to follow existing topography with gentle transitions from cut to fill slopes. Earthworks will be kept to a minimum. The effects of earthworks will be minimised through detailed design supported by geotechnical investigation and analysis. Residual risks will be managed via the development and implementation of a Construction Environmental Management Plan.
25.2.2.1 Minimise the adverse effects of earthworks and vegetation removal on people, property, and the environment.	25.2.2.1a Earthworks and vegetation removal shall occur in a way that: i. Minimizes adverse effects on existing landforms, natural features, and significant vegetation. ii. Maintains natural processes and features including natural drainage patterns and streams.	The effects of earthworks will be minimised through detailed design supported by geotechnical investigation and analysis. Residual risks will be managed via the development and implementation of a Construction Environmental Management Plan.

Objectives	Policies	My comments
	iii. Does not create new or exacerbate existing natural hazards. iv. Minimizes adverse effects on land and water, especially effects such as erosion and sedimentation. v. Creates practicable building sites, efficient use of land and infrastructure, ensures effective stormwater flow paths, and a safe living and working environment. vi. Minimizes dust, noise, and runoff. vii. Adopts a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River and those effects that threaten serious or irreversible damage to the Waikato River. viii. Maintains or enhances riparian vegetation on the margins of natural watercourses and wetlands.	

Conclusions

26. In my opinion, the proposed works for which designation is sought:
- a. Subject to further investigation, geotechnical assessment and detailed design, and
 - b. Managed by appropriate designation conditions, including the new conditions that I recommend below, or similar conditions, will:
 - i. Have adverse effects on geotechnical matters that are at worst minor, and
 - ii. Comply with the relevant statutory requirements discussed in paragraphs 21 through 25 above.

Recommendations

Modifications to the Requirement

27. I do not recommend any modifications to the Requirement.

Designation conditions

28. I recommend the following amendments and/or additions to the requiring authority's proposed designation conditions³:

³ See s10 of the NOR.

General

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1.5 The detailed design of the Project must include, and be informed by, a site-specific geotechnical investigation, including assessment of seasonal variation in groundwater levels, to determine the potential effects related to liquefaction, lateral spreading, cyclic softening, settlement (from embankment loads, temporary or permanent dewatering, and excavations), and bearing capacity.

Construction Environmental Management Plan

....

7.3 The CEMP must include, as a minimum:

j. A settlement-monitoring specification, including:

i. The required spacing of settlement monitoring,

ii. Methods for settlement monitoring,

iii. Specific assets requiring settlement monitoring,

iv. Duration of monitoring required.

v. Reporting requirements, including when reports are to be prepared and to whom they are to be sent.

k. A Trigger Action Response Plan (TARP) for management of excessive settlement detected during monitoring, including the timeframes in which response actions are to be taken, and requirements for reporting this to the Territorial Authority.

Reasons for the recommended amendments to the Designation Conditions

29. I recommend the amendments set out in paragraph 28 for the reasons set out in Table 2.

Table 2: Reasons for the recommended amendments to the Designation Conditions proposed in the NOR.

Condition Number in the NOR	Reasons for the amendments
New Condition 1.5	To ensure the listed effects are understood and mitigated through engineering design
New Condition 7.3 j	Large parts of the project are to be constructed in a former wetland which is expected to be underlain by peat soils. These soils can experience excessive settlement in response to loading, dewatering, or excavation. The settlement monitoring specification will provide an effective method of detecting any settlement that could cause adverse effects that are more than minor.

Condition Number in the NOR	Reasons for the amendments
New Condition 7.3 k	To avoid or manage any unforeseen effects, or residual risks, that could result from excessive settlement.

13-May-25

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