



Memorandum

To	§ 6(c) - Maintenance of Law	§ 7(2)(f)(ii)
Copy	§ 7(2)(f)(ii)	
From	§ 7(2)(a) - Privacy	
Office	Tauranga	
Date	11 November 2024	
File/Ref	2-9B441.03	
Subject	Response to ENGEO review of WSP methodology	

WSP have been engaged by Tauranga City Council ('TCC') to review the Mount Maunganui and Papamoa areas of the Tauranga City Landslide Study. ENGEO have been engaged by TCC to provide peer review services to support the Tauranga City Landslide study.

Below are WSP responses to the peer review comments provided by ENGEO (Ref: 025120.000.001, 3 October 2024). The majority of queries will be addressed within the final mapping and technical report. The memo provided for the peer reviewer will not be updated.

Hopukioire Mt Drury

Item	ENGEO Comment / Question	WSP Response
1	<p>Triggering mechanisms – We consider that a clearer explanation of WSP's interpretation of the slope failure mechanisms should be provided to give better context to the conclusions reached.</p> <p>This is likely to be a combination of rockfall (which is discussed later in the memo) and likely translational or sliding failure of overburden material under rainfall trigger. There are a number of outcrops that show the soil rock interface and in general ground conditions comprise shallow rock with limited opportunity for significant regression of soil slopes.</p>	<p>Noted. This will be provided in the technical report.</p> <p>However, we are cognisant that this is a Tauranga City Landslide Study and detailed analysis of Hopukioire is outside of the scope i.e. this is not a site-specific study.</p>
2	<p>Table 1 – Table 1 should clarify that unit parameters used for modelling represent a drained case.</p>	<p>Noted. This will be taken into consideration for the mapping and technical report.</p>
3	<p>Table 1 – The table describes the overburden as 'topsoil' which is somewhat misleading. The overburden soils are likely</p>	<p>Noted. This will be taken into consideration for the mapping and technical report.</p>

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	to comprise a combination of materials including weathered rock / boulder colluvium and ash. Topsoil would only make up a small proportion of the soil profile.	
4	Table 1 – It is unclear why soil parameters are presented if these were not used in any quantitative analyses	The analyses were undertaken using a range of parameters for sensitivity checking and were not shown in memo for brevity.
5	<p>Slope Runout – The methodology is unclear in describing how a 1V:2.5H run-out zone was derived. Was it purely qualitative based on professional judgement, review of landform, or was this supported by any empirical model? It is important to make this clear. It remains unclear as to what reliance, if any, was given to quantitative analyses vs geomorphological mapping.</p> <p>We recommend that it is made clear as to what WSP mainly relied upon to reach their conclusions on runout and regression angles.</p>	<p>Slope runout was determined by desktop geomorphological mapping, professional judgement, and reviewing the empirical models for ash slope runout for the remainder of Tauranga.</p> <p>Will make clear in final report.</p>
6	<p>Slope Runout – Whilst we understand and agree with the need to show the current modelled runout line (1V:4H) as a comparison, we are unsure of the need to present the 1V:2.75H run out. It introduces confusion, particularly as there is no clear discussion as to why both 1V:2.75H and 1V:2.5H lines were modelled. Consider removing.</p>	Was just for comparison to show differing runout following discussions with TCC. Will be removed for final report.
7	<p>Slope Regression – Section 3.3.1 is unclear, and we suggest this section is revisited to clearly explain the reasoning for the conclusions reached.</p> <p>We agree that in the absence of site-specific information quantitative analyses alone is not determinative. The opportunity exists to undertake back analyses utilising geomorphological mapping to derive appropriate ground models and soil parameters for forward analyses. By combining and converging qualitative and quantitative models you will be able to present a more compelling and robust argument as to the conclusions reached.</p>	Outside of the scope for a city-wide study. Suggest could be site-specific study outside of the Tauranga city wide landslide study.
8	<p>Sensitivity checking – If some back analyses was undertaken there may be additional opportunity for sensitivity checks considering variability in thickness of</p>	As above

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	overburden unit and its contribution to regression and run-out.	
	Northern perimeter of Hopukiore – The northern edge of the Hopukiore is excluded from the analyses. We are unsure as to why this has been omitted. WSP to confirm whether this is deliberate exclusion of this slope, or whether it fell outside the height and slope gradient bounds adopted for the city-wide assessment. If this exclusion relates to modifications to the slope, then ENGEO would suggest that reasoning alone is not sufficient, particularly as slope hazard assessments have consider other modified landforms around the city as part of the wider study.	Slope angle too shallow to meet the criterial for 2:1, so no runout or regression mapped. Terraces too low height to warrant consideration as slope itself.

Mt Maunganui / Papamoa Dune Sands (Te Tumu)

Item	ENGEO Comment / Question	WSP Response
1	Table 1 – Parameters selected for analyses appear generally appropriate for sand, however WSP should consider whether the second unit [Medium Dense to Dense Sands] is necessary and whether it introduces unintended consequences. Whilst it appears this modelled unit has little bearing on the slope analyses, it may bias other sites that are modelled. In the absence of site-specific data, ENGEO suggest that a uniform model is adopted with a single unit and parameter.	Noted. This will be taken into consideration for the mapping and technical report.
2	Slope Runout – As per comment for Mt Drury, is there any need to present the 1V:2.75H run out if not ultimately used for anything. Consider removing.	Noted. This will be taken into consideration for the mapping and technical report.
3	Figure 2 clarification - Shows the extent of the 1V:2H failure zone to sit behind the FoS 1.5 envelope. But when we compare this to the slope model, the critical 1.5 failure surface sits behind the 1V:2H zone, not the other way around. Please can WSP review and rectify where necessary?	Noted. This will be taken into consideration for the mapping and technical report.
4	Modelled Sections – for clarity it may be appropriate just to show the failure surface contours to FoS = 1.2 only.	Noted. This will be taken into consideration for the mapping and technical report.
5	Modelled Sections – for clarity it may be more appropriate to also show the 1V:2.5H line of regression line to make it easier to	Noted. This will be taken into consideration for the mapping and technical report.

Item	ENGE Comment / Question	WSP Response
	compare where the proposed regression line site relative to the quantitative modelling results.	

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Principal Engineering Geologist

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