1.0 Purpose of this Memo

The purpose of this memo is to provide a technical assessment of the proposed development based on the information supplied with the application. This memo can be used as supporting information to assist Planning Guidance Unit with the resource consent process and the s42A report on Limited Notified Resource Consent Applications 10.2019. 10392.001 & 11.2019.6939.001. This memo addresses the geotechnical aspects of the development and recommends appropriate conditions pertinent to the geotechnical aspects of the proposed development, should the consents be granted.

2.0 Background

The application is for a concurrent land use and fee-simple subdivision consent for three duplex dwellings. The site is sloping and is bounded by residential properties to the east and the west. A 10m high crib wall is present on the northern boundary. The proposal involves significant re-contouring of the site, this will be achieved mainly with specific engineer designed retaining walls to create level foundations and landscaping areas.

3.0 Review Scope

This compliance review covers Hamilton City Operative District Plan (ODP) considerations with respect to the actual and potential effects of the proposal on geotechnical hazards and the actual and potential effects of geotechnical hazards on the proposal. This review has been guided by the following provisions of the ODP as well as Section 106 of the RMA:

- 25.2.2 Objectives and Policies: Earthworks and Vegetation Removal

This review is based on information relevant to geotechnical matters in the following documents:

- Assessment of Environmental Effects (AEE), Prepared by Blue Wallace Surveyors Ltd
- Development Plans, Prepared by HBC Design Ltd (Appendix A to the AEE).
- Development Plans, Prepared by Blue Wallace Surveyors (Appendix C to the AEE)
- Geotechnical Assessment Prepared by DBCon Consulting Engineers (Appendix D to the AEE)
- Subsequent S92 Response Prepared by DBCon Consulting Engineers and Dated 27 June 2019 (Appendix D to the S92 Response 1)

This review is not to be considered as a design check peer review, as such I have not undertaken a detailed check of any calculations contained within the report.
4.0 Summary
The DBCon Consulting Engineers’ (DBCon) geotechnical report dated 17 January 2019 and subsequent s92 response dated 27 June 2019 have identified slope stability as the main geotechnical hazard at this site given the proposal involves changing the contours. The report has also assumed the soils are moderately expansive. An assessment of the liquefaction hazard was undertaken as part of the geotechnical report, the outcome of which was that liquefaction was unlikely to pose a risk to the site. This is a reasonable conclusion.
DBCon have identified the requirement for specific engineer designed retaining structures to prevent the undermining of the crib wall and have also provided construction methodology recommendations in order to minimise the risk of the works’ effect on neighbouring property. Further slope stability analysis will be undertaken in support of the building consent for the proposed structures. The construction methodology recommendations will need to be taken into account in the design so that the walls are able to be constructed in a safe manner.
As stated in the s92 response, the earthworks will be conducted with appropriate management plans and measures to ensure adverse effects are managed. These management plans, to be submitted at the time of building consent, will be reviewed by the council to confirm that adequate provisions are in place to manage the effects of the earthworks. The management plans should include provisions to monitor effects on the adjacent properties.
It is my opinion that, subject to the recommendations of the DBCon’s report and S92 responses and the suggested conditions below, the effects of natural hazards can be mitigated on this site. Further investigation, assessment and design will be required to support a building consent, should the consents be granted.

5.0 Recommended Consent Conditions and Advisory Notes
1. The consent holder shall undertake and submit additional investigations and assessment for the retaining wall design to the Hamilton City Council Planning Guidance Unit Manager or nominee for certification. The additional investigations and assessments shall include the following matters:
   1.1 numerical analysis to demonstrate adequate factors of safety against sliding, bearing, overturning and structural failure.
   1.2 Confirmation on global stability of the whole slope as adequate including a consideration of the effects of/on the existing crib wall.
   1.3 The analysis should consider static long-term, short term elevated ground water and seismic stability and also consider the temporary stability throughout each stage of construction

2. The duplex dwellings shall be constructed with a suitable foundations and expansive soil class which to be determined following the additional testing undertaken at the subgrade depth at the time of the building consent.

3. All earthworks shall be managed to ensure that they do not lead to any uncontrolled instability, collapse or unacceptable settlement either affecting the site or adversely affecting any neighbouring properties. In the event that such collapse, instability or settlement does occur, it shall immediately be rectified.

4. All earthworks shall be managed to ensure that no debris, soil, silt, sediment or sediment-laden water is discharged beyond the subject site to either land, stormwater drainage systems, watercourses or receiving waters. In the event that a discharge occurs, works shall cease immediately and the discharge shall be mitigated and/or rectified to the satisfaction of the council.
5. Certification from a suitably qualified engineering professional responsible for supervising the works shall be provided to the council confirming that the works have been completed in accordance with the approved design within ten (10) working days following completion.

6. That a minimum 20 working days prior to the commencement of any earthworks or construction activities onsite (excluding site investigations) the Consent Holder shall provide a Construction Management Plan (CMP) for certification by the Hamilton City Council Strategic Development Unit. The objective of the CMP is to outline the approach to be taken for managing construction works to ensure that impacts that may arise from the works have been appropriately identified, managed and minimised.

7. The Construction Management Plan (CMP) shall include the recommendations in the subsequent s92 response dated 27 June 2020 and the following:
   a) Details of the works, intended construction timetable (including staging) and hours of operation;
   b) Methods to control dust, debris on roads and silt laden runoff during construction;
   c) Existing network utilities;
   d) Anticipated truck movements and routes to and from the site during construction;
   e) Site access and parking management;
   f) Approved Traffic Management Plan;
   g) Contact details for the contractor, including a process for complaints and remedying concerns;
   h) Adjacent land owner liaison during the construction stage;
   i) Quality assurance/quality control;
   j) General methods to mitigate and manage construction noise and vibration in order to comply with the applicable noise limits; and
   k) Identification of any special construction activities (including any pile driving and concrete pours) that may require specific mitigation measures in order to comply with the applicable noise limits.

Any changes to the Construction Management Plan shall be confirmed in writing by the Consent Holder following consultation with Strategic Development Unit before implementation.

8. The consent holder shall carry out operations in general accordance with the provisions of the certified Construction Management Plan, and any subsequent changes certified by the Strategic Development Unit.

Advisory notes
1. A building consent will be required for all retaining walls greater than 1.5m in height or for walls that are likely to be subject to a surcharge by traffic, slopes or structures.

Prepared by: John Brzeski
Date: 15 June 2020