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Ryde City Council
Civic Centre
Devlin Street
RYDE NSW 2112

Attention: Ms S Wotton

Dear Madam

re: **Ryde Council Instability Risk Zones**
City of Ryde
Geotechnical Advice- Areas of Extensive Man-made Fill

This letter report presents the results of geotechnical mapping of known areas of *extensive man-made fill* within the City of Ryde, as identified on the Coffey Geosciences Pty Ltd Slope Instability Risk Zones Map. This advice is given to determine whether or not development on properties, identified as lying within areas of *extensive man-made fill*, is restricted because the properties are at risk of the likelihood of landslip.

As stated above, this assessment is limited to areas previously identified by Coffey Geosciences Pty Ltd and does not cover all areas of *extensive man-made fill* within the City of Ryde. Additional areas of fill exist in areas such as along railway embankments, within parks and playing fields, subdivisions and embankments along the M2 motorway and are not covered by this assessment

Most non-waterfront areas of *extensive man-made fill* identified within the City of Ryde are characterised by near level platforms flanked by steep (30% to 60%) filled batters. In many of these cases, the fill appears to be uncompacted or poorly compacted. As a result, these batters display many localised slip, slump, flow and erosional failures.

In addition to the abovementioned stability issues, fill materials placed in areas of *extensive man-made fill*, particularly within waterfront areas, may constitute domestic, industrial and demolition wastes and are subject to continual decomposition, subsidence and consolidation.

The *Landslide Risk Management Concepts and Guidelines* (2000), prepared by the Australian Geomechanics Sub-committee on Landslide Risk Management of the Australian Geomechanics Society (Reference 1) defines landslide in Appendix B, as follows:

*The term **landslide** denotes "the movement of a mass of rock, debris or earth downslope". The phenomena described as landslides are not limited to either "land" or "sliding" and usage of the word has implied a much more extensive meaning than its' component parts suggest.*

Reference 1 describes a classification system that has two terms. The first term describes the material type and the second term describes the type of movement.

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The material types are **Rock, Earth and Debris**. The terms used should describe the displaced material in the landslide, before it was displaced.

The types of movement describe how the landslide movement is distributed through the displaced mass. The five kinematically distinct types of movement are described in the sequence, **fall, topple, slide, spread and flow**.

Areas of *extensive man-made fill*, where batters exceed 25%, are at risk of Earth, Rock and/or Debris slide, spread and flow failures.

In addition to these risks, potential damage to property within areas of *extensive man-made fill* may result from movement of footings founded on uncontrolled fill materials or where footings are founded partially on deep fill and partially on natural materials.

Therefore, damage to property in areas of extensive man-made fill may result from any one or a combination of the following:

- Landslip
- Subsidence/consolidation
- Any other reason not investigated at this stage

Based on the foregoing, it is considered that development on properties identified as lying within or directly downslope of areas of *extensive man-made fill*, where fill batters exceed 25%, should be restricted, as the properties are at risk from landslide. It should be noted that properties below these fill slopes are generally parks, roads and creeks.

In addition to these restrictions, it is considered that all development within areas of *extensive man-made fill*, where the fill materials are uncontrolled, should be restricted.

As such, all development within areas of extensive man-made fill should be restricted. Restriction on these properties may simply entail the provision of a site-specific geotechnical report, identifying potential risks for the proposed development and providing recommendations for remedial works to ensure the stability of the proposed development and surrounding properties.

General measures to reduce the potential risk of damage to property, as a result of instability or consolidation of fill materials, may include but are not limited to:

- Minimising batter slopes to less than 25%
- Construction of retaining walls where batter slopes of less than 25% are unable to be attained
- Construction of all footings below any uncontrolled fill materials


Should you have any questions relating to this letter report, please do not hesitate to contact the undersigned.

Yours faithfully
GEOTECHNIQUE PTY LTD



MATTHEW CUPITT
Engineering Geologist

Reviewed by:



EMGED RIZKALLA
Principal Geotechnical Engineer

Reference 1: Australian Geomechanics Sub-committee on Landslide Risk Management (2000) --
Landslide Risk Management Concepts and Guidelines, Vol 37, No 2, pp 1-44.