



APPENDIX D

Example Schedule to the EMO

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C--

SCHEDULE TO THE EROSION MANAGEMENT OVERLAY

Shown on the planning scheme map as **EMO**.

1.0 *Land Susceptible to Landslide*

The City of Moreland contains areas of land which are susceptible to landslide. This land is generally associated with the Moonee Ponds and Merri Creek Valleys. Geotechnical studies have been undertaken to identify those areas within the City of Moreland that may be susceptible to landslide. On the basis of these studies, the City of Moreland has adopted a city wide slope hazard classification system and guidelines for the development of land potentially affected by landslide.

All land included within the Erosion Management Overlay has been identified as having a sufficiently high risk of potential instability to warrant specific review of these risks prior to issuing a planning permit. The control of environmental factors and development such as vegetation cover, drainage and earthworks are important in managing the risk of landslide.

2.0 *Definitions*

AGS 2007

Australian Geomechanics Society (Australian Geomechanics Society Landslide Taskforce, Landslide Practice Note Working Group) 'Practice Note Guidelines for Landslide Risk Management 2007' Journal and News of the Australian Geomechanics Society Volume 42 No 1, March 2007 and any subsequent revision of the procedure therein.

Geotechnical Declaration and Verification

A declaration form completed by the geotechnical engineer that authored the geotechnical report submitted with the application verifying that it has been prepared in accordance with *AGS 2007c* and that the maximum landslide risk has been calculated at 10^{-5} ('Tolerable Risk') or less, taking into account the proposed development and site conditions.

Landslide

The movement of a mass of rock, debris or earth down a slope.

Landslide Hazard

A Landslide hazard is a site condition with the potential for causing an undesirable consequence (the landslide) – (AGS Journal No 42 Vol 1, March 2007)

Geotechnical Practitioner

Is defined as:

- Degree qualified Geotechnical Engineer or Engineering Geologist; and

- has achieved chartered professional status being a Chartered Professional Engineer (CPEng), A Chartered Professional Geologist (CPGeo) or a Registered Professional Geologist (RPGeo); and
- has experience in the identification and management of slope stability problems and landslide as a core competence.

Tolerable Risk

For new development or changes to existing development a risk to life and/or property which:

- For loss of life for the person(s) most at risk is taken as having a probability of no greater than 10^{-5} (1:100,000) per annum calculated in accordance with AGS Guidelines 2007;
- For property loss is 'Low' or 'Very Low' assessed qualitatively using AGS Guidelines 2007 and specifically Appendix C to that document.

3.0

Objectives

- To manage the risk of landslide.
- To ensure that development can be carried out in a manner which will not adversely increase the landslide risk to life or property affecting the subject land or adjoining or nearby land.
- To ensure that on land where a Landslide Risk Assessment is required development is not carried out unless the risk associated with landslide is a Tolerable Risk.
- To ensure that applications for development are supported by adequate site investigation and documentation of geotechnical and related structural matters.
- To ensure that development is only carried out if identified geotechnical and related structural engineering risks to life and property are effectively addressed.
- To ensure that development is appropriate to be carried out either conditionally or unconditionally, having regard to the results of the geotechnical and related structural investigations.
- To ensure that approved development is thereafter appropriately maintained.

4.0

No permit required

A permit is not required to construct or carry out any of the following buildings or works:

- A fence provided that:
 - No trench is required for the construction of the fence.
 - No post holes exceed 0.5 metre in depth.
 - The fence is not constructed on, or within one metre of, land with a slope exceeding 50 percent.
- A retaining wall that either:
 - Replaces an existing retaining wall with identical construction specifications and dimensions.
 - Does not exceed one metre in height and does not provide landslip protection for any adjoining land.

- Repairs and routine maintenance to an existing building or works.
- Internal alterations to an existing building provided that, if the land is unsewered, no additional bathrooms, toilets or kitchens are constructed.
- Extensions to the floor area of an existing building, including decks or verandahs, provided that:
 - There is no increase in the ground surface area covered by roofed buildings.
 - No earthworks in the form of cuts or fills are required.
 - No additional bathrooms, toilets or kitchens are constructed.
- Minor structures ancillary to a dwelling provided that:
 - No earthworks (cuts or fills) are required.
 - The ground surface area occupied by structure(s) does not exceed a total maximum of 4 square metres.
- Landscaping and gardening provided that:
 - Any retaining walls comply with the relevant exemptions.
 - No change is made to constructed drainage or fixed irrigation systems.
 - It does not result in the removal of trees or significant vegetation.
- Signs provided that:
 - No trench or post holes or other excavations required for the construction and display of the sign exceed 0.5 metre in depth.
 - The sign is not constructed on, or within one metre of, land with a slope exceeding 50 percent.
- Street furniture.
- A temporary shed or temporary structure required for construction purposes.
- Demolition provided that:
 - No earthworks in the form of cuts or fills are required; and
 - No change is made to constructed drainage or fixed irrigation systems.
- Emergency works undertaken by, or on behalf of, a municipality or public authority or utility service provider in the exercise of any power conferred on them by any Act.

5.0

Application requirements

An application must be accompanied by:

- Development plans showing existing and proposed development.
- A written geotechnical assessment of the proposed development in relation to existing conditions to verify whether it can be carried out in a manner which will not adversely increase the landslide risk to life or property affecting the subject lot or adjoining or nearby land or a landslide risk assessment is required.
- A written Landslide Risk Assessment of the proposed development in relation to existing conditions, if the Geotechnical Assessment or other landform data indicates natural slopes underlying or immediately adjacent to the subject lot which:

- are steeper than 30% (16.7°) and underlain by Tertiary Older Volcanics (T_{ov}) or Quaternary Age alluvium and colluvium (Qrt, Qrc and Qra);
- are steeper than 35% (19.3°) and underlain by Tertiary Brighton Group (T_b);
- are steeper than 50% (26.5°) in all other areas;
- or where in the opinion of the Responsible Authority, the Geotechnical Assessment is not sufficient to determine that the development can be carried out in a manner which will not adversely increase the risk to life or property affecting the subject lot or adjoining or nearby land.

Development Plans

Development plans, must be drawn to scale and dimensioned, showing:

- The proposed development, including a site plan and building elevations, and any proposed cut and fill or retaining wall.
- Any existing development, including buildings and water tanks on both the subject lot and adjacent land, cut and fill, stormwater drainage, subsurface drainage, water supply pipelines, sewerage pipelines and any otherwise identified geotechnical hazard.
- Details and location of existing vegetation, including any vegetation to be removed.

Geotechnical Assessment

A Geotechnical Assessment must be prepared or technically verified by a Geotechnical Practitioner and must include, to the satisfaction of the Responsible Authority:

- Details of the Geotechnical Practitioner and his or her qualifications and experience including without limitation experience in the management of slope stability problems and landslide risk management.
- A statement that the assessment is based on field survey measurements which have been undertaken not more than six months prior to the relevant application for development.
- A detailed site description.
- Site assessment plans and cross sections of the subject lot and related land for survey and field measurements with contours and ground slopes as measured shown and drawn to scale and dimensioned.
- A detailed assessment of the subsurface conditions, including the underlying geology.
- A statement indicating whether there are natural slopes on or immediately adjacent to the lot which:
 - Are steeper than 30% (16.7°) and underlain by Tertiary Older Volcanics (T_{ov}) or Quaternary Age alluvium and colluvium (Qrt, Qrc and Qra);
 - are steeper than 35% (19.3°) and underlain by Tertiary Brighton Group (T_b);
 - are steeper than 50% (26.5°) in all other areas;
 - where evidence for past slope instability has been observed.
- A detailed description of any evidence of slope instability.
- Details of all site investigations and any other information used in the preparation of the geotechnical report.
- Whether the site investigation requires subsurface investigation that may involve boreholes and/or test pits or other methods necessary to adequately assess the geotechnical/geological model for the subject lot and details of all such investigations, boreholes test pits or other methods.
- A conclusion which:
 - Is supported by the data and all stated assumptions contained in the assessment and is capable of being verified by peer review.

- States whether or not a Landslide Risk Assessment is required.
- Where it is considered that a Landslide Risk Assessment is not required, states that, in the opinion of the Geotechnical Practitioner, the development can be carried out in a manner which will not adversely increase the landslide risk to life or property affecting the subject lot or adjoining nearby land.
- Provides justification, including any necessary calculations, for the conclusion.
- States whether or not the development should only be approved subject to conditions, and if so state recommendations of what conditions should be required, including, but without limitation condition relating to:
 - The determination of appropriate footing levels and foundation materials and in any structural works, including all footings and retaining walls;
 - the location/s of and depth/s of earth and rock cut and fill;
 - the construction of any excavations and fill and the method of retention of such works;
 - any details of surface and subsurface drainage;
 - the selection and design of a building structure system to minimise the effects of all identified geotechnical hazards;
 - retention, replanting and new planting of vegetation;
 - any drainage and effluent discharge;
 - any necessary ongoing mitigation and maintenance measures and any recommended periodic inspections, including performance measures;
 - the time within which works must be completed after commencement and the location/s and period in which materials associated with the development can be stockpiled;
 - any requirements for geotechnical inspections and approvals that may need to be incorporated into a construction work plan for building approval purposes.

Landslide Risk Assessment

The Landslide Risk Assessment must, to the satisfaction of the Responsible Authority:

- Be prepared by a suitably qualified and experienced geotechnical practitioner (as defined in Section 20 of this Schedule) and incorporating an *AGS 2007c Risk Assessment and Checklist* and CV of the author.
- Contain a *Geotechnical Declaration and Verification* by the author verifying their expertise, the contents and report conclusion. Copies of the *Geotechnical Declaration and Verification* form can be obtained by contacting the planning section of the Moreland City Council.
- Contain a copy of or include the Geotechnical Assessment prepared for the subject land and proposal and, if not prepared by the Geotechnical Practitioner preparing the Landslide Risk Assessment, contain a response by the Geotechnical Practitioner preparing the Landslide Risk Assessment that the findings and conclusions of the Geotechnical Assessment are agreed with.
- If the Geotechnical Practitioner preparing the Landslide Risk Assessment does not agree with the findings and conclusions of the Geotechnical Assessment for the subject land and proposal, another Geotechnical Assessment must be prepared by that Geotechnical Practitioner.
- Be based on field survey and measurements which have been undertaken not more than six months prior to lodgement of the application.
- Include a full assessment of the risk posed by all reasonably identified geotechnical hazards which have potential to either individually or cumulatively impact upon people or property on the subject lot or related land. This assessment must be in accordance with AGS 2007c Guidelines.
- Contain a conclusion as to whether the subject lot is suitable for the proposed development. This must be in the form of a specific statement that the subject lot is suitable, or can be made suitable, for the proposed development and that the subject lot

and/or the proposed development can meet the tolerable risk criteria, as defined in this schedule. The report must specify all conditions required to achieve the outcome.

At all times, any decision regarding the degree of investigations and assessment required must be dictated by the consideration of risk to life and property and the recognition by the geotechnical practitioner that the responsible authority will rely on the Geotechnical Assessment and/or Landslide Risk Assessment as the basis for ensuring that the geotechnical risk management aspects of the subject lot and the proposal have been adequately addressed.

6.0 Independent Review

The Responsible Authority may require a Geotechnical Assessment and/or a Landslide Risk assessment that has been submitted with an application, to be reviewed by an independent geotechnical practitioner at the applicant's cost.

7.0 Decision Guidelines

In deciding on an application, the responsible authority must consider:

- Whether, in the case of land for which natural slopes on or immediately adjacent to the subject lot:
 - are not steeper than 30% (16.7°) and underlain by Tertiary Older Volcanics (T_{ov}) or Quaternary Age alluvium and colluvium (Qrt, Qrc and Qra);
 - are not steeper than 35% (19.3°) and underlain by Tertiary Brighton Group (T_b);
 - are not steeper than 50% (26.5°) in all other areas;
 - do not exhibit evidence for active slope instability.
- The development can be carried out so that the risk associated with the development is a Tolerable Risk.
- The recommendations of the Geotechnical Assessment, any Landslide Risk Assessment and any other information accompanying the application.
- The advice of any Geotechnical Practitioner who has reviewed the application.
- The risks associated with the development require ongoing monitoring and maintenance of mitigation measures.
- The risks associated non compliance with any conditions placed on the approval of a development.

8.0 Conditions and requirements of Permits

Any planning permit issued for development within the EMO must include a condition requiring that:

- Where ongoing maintenance is recommended by the submitted geotechnical report, those obligations are to be included in any planning permit.

9.0 Reference Documents

Risk of Landslide Survey & Recommended Action For the City of Moreland, USL Group Pty Ltd, March 2009.

City of Moreland, Landslide Hazard Assessment, Golder Associates Pty. Ltd. September 2009.

Journal of the Australian Geomechanics Society, Vol. 42 No 1, March 2007.

EXAMPLE