

SC6.11 Planning scheme policy for the landslide hazard and steep land overlay code

SC6.11.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Landslide hazard and steep land overlay code**;
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Landslide hazard and steep land overlay code**; and
- (c) identify guidelines that may be relevant to achieving outcomes in the **Landslide hazard and steep land overlay code**.

Note—nothing in this planning scheme policy limits Council’s discretion to request other relevant information under the Development Assessment Rules made under section 68(1) of the Act.

SC6.11.2 Application

This planning scheme policy applies to development which requires assessment against the **Landslide hazard and steep land overlay code**.

SC6.11.3 Advice for landslide hazard and steep land outcomes

The following is advice for achieving outcomes in the **Landslide hazard and steep land overlay code** relating to landslide hazard and steep land:-

- (a) compliance with Performance Outcomes PO1 and PO2 of **Table 8.2.10.3.1 (Requirements for accepted development and performance outcomes and acceptable outcomes for assessable development)** and PO1 to PO5 of **Table 8.2.10.3.2 (Additional performance outcomes and acceptable outcomes for assessable development)** of the **Landslide hazard and steep land overlay code** may be demonstrated in part or aided by the submission of a geotechnical assessment report prepared by a competent person in accordance with **Section SC6.11.4 (Guidance for the preparation of a geotechnical assessment report)**.

Note—for the purposes of this planning scheme policy, a competent person is a qualified registered professional engineer (RPEQ) with appropriate and proven technical experience in geotechnical engineering or engineering geology.

SC6.11.4 Guidance for the preparation of a geotechnical assessment report

- (1) The extent and detail of investigations required to be incorporated in a geotechnical assessment report will depend upon the particular site characteristics and the nature of the development proposed. Council will require each report to demonstrate a method and scope of work appropriate to the subject site and the proposed development.
- (2) **Table SC6.11A (Indicative scope of work for geotechnical investigations)** provides an indication of the scope of work for geotechnical investigations that may be required to be undertaken for different levels of identified landslide hazard.

Table SC6.11A Indicative scope of work for geotechnical investigations

Level of identified hazard	Scope of geotechnical investigation
Very high/High	<ul style="list-style-type: none"> • Investigation of existing conditions (including groundwater conditions) and soil strength. • Classification testing. • Walk over survey. • Review of aerial photography. • Site survey. • Numerical modelling such as slip circle analysis to determine the probability of global slip failure.
Moderate	<ul style="list-style-type: none"> • Walk over survey. • Subsurface investigation.

Level of identified hazard	Scope of geotechnical investigation
Low/Very low	<ul style="list-style-type: none"> Walk over survey where slopes exceed 15%. Subsurface investigation where slopes exceed 15%.

- (3) The extent of work actually required should be determined by the geotechnical engineer preparing the geotechnical assessment report, provided that the conclusion of the report is that the lot, site, building or other feature under assessment has a Factor of Safety of at least 1.5.
- (4) The following detailed guidance for geotechnical assessment reports may therefore be adjusted (particularly in respect to investigation of existing conditions) having regard to the scope of work determined to be appropriate in the circumstances.
- (5) A geotechnical assessment report is to:-
- describe the subject land and the proposed development;
 - describe the method and scope of investigations;
 - describe the existing conditions of the development site, including an assessment of land suitability and geotechnical constraints to development in accordance with **Section SC6.11.5 (Investigation of existing conditions for geotechnical assessment reports)**;
 - assess the suitability of the site for the proposed development, having regard to the prevailing geological and topographic conditions, including an assessment of the likely effects or impacts of the development upon slope stability and landslip potential;
 - recommend measures to mitigate impacts, including siting, engineering and other measures required to ensure a satisfactory form of development that does not involve high whole of life cycle costs such as deep sub-soil drainage within single residential lots or public land;
 - incorporate conclusions and recommendations in accordance with **Section SC6.11.6 (Conclusions and recommendations for geotechnical assessment reports)**;
 - use contour plans showing 1 metre contours developed from site survey or low level aerial photographs using objective photogrammetric techniques;
 - have regard and refer to the *Landslide Risk Management and Concepts Guidelines (Australian Geomechanics Society) 2007*;
 - utilise the preferred format outlined in **Appendix SC6.11A (Preferred format for a geotechnical assessment report)**; and
 - be illustrated by photographs and sketches as appropriate.
- (6) Where a geotechnical assessment report has already been prepared for the site and provided as supporting documentation to Council as part of a previous development application (i.e. reconfiguring a lot or material change of use of premises), these documents are to be clearly referenced in the geotechnical assessment report prepared as supporting documentation for the subsequent development application (i.e. operational work or building work).

Note—the guidance provided in this planning scheme policy outlines all matters to be addressed in a geotechnical assessment report, on the basis that such supporting documentation (i.e. earlier geotechnical reports) are not available. In the event that geotechnical assessment reports and certifications for the previous development applications are available, items already covered in these earlier reports/certifications may be referenced and covered in less detail.

SC6.11.5 Investigation of existing conditions for geotechnical assessment reports

- (1) A geotechnical assessment report is to include an investigation of existing site conditions comprising an assessment of the existing stability of the subject land and details of geotechnical constraints on building and/or other development works on the site.
- (2) The investigation of existing conditions is to include:-
- a description of existing geology (surface and subsurface materials, soil/rock stratigraphy) and geomorphology (slopes, ground contours, natural features, terrain analysis, landslip features) both locally and regionally, including review of published materials;

- (b) the results of field investigations to assess the following factors:-
 - (i) depth of soil overburden within proposed works areas (including roads, infrastructure, building sites, potential swimming pools, tennis courts, garage, access driveways and the like);
 - (ii) classification of surface and subsurface materials to determine:-
 - (A) erosion potential;
 - (B) foundation conditions that could affect structural performance;
 - (C) suitability for wastewater disposal;
 - (D) any other relevant characteristics;
 - (c) the results of any numerical modelling/slip circle analysis to determine the probability of global slip failure;
 - (d) evidence of previous instability (i.e. irregular contours, hummocky topography, scarp faces in area of tension cracks, curved and/or non-vertical tree trunks, broken kerb and gutters, cracked or uneven roadway surfaces, distressed houses or other buildings);
 - (e) a description of the extent and type of any existing occurrences of erosion;
 - (f) an assessment of sub-surface drainage characteristics (i.e. presence of water table, springs, swampy areas, wet grass types, presence/depth to/ special conditions (artesian) of groundwater, and possible presence of confined aquifer beneath site);
 - (g) a description of existing vegetation cover; and
 - (h) a description of any existing site improvements (i.e. buildings, structures and earth works).
- (3) The results of all field and laboratory tests should be included in the geotechnical assessment report, including the location and level (including datum) of field investigations such as boreholes, trench pits and cone penetrometer results.

SC6.11.6 Conclusions and recommendations for geotechnical assessment reports

- (1) The geotechnical assessment report is to include conclusions about the overall suitability of the land for the proposed development, including clear statements about:-
 - (a) whether all existing/proposed lots are presently stable;
 - (b) whether all lots, and associated completed buildings (i.e. dwelling houses) and infrastructure, will remain stable in the long term – that is, has a factor of safety against failure of at least 1.5; and
 - (c) whether any conditions need to be placed on the development of lot/s to maintain long term stability.
- (2) The geotechnical assessment report is to include recommendations that clearly outline the following:-
 - (a) whether the site has a history of landslip;
 - (b) whether the proposed development (including all lots and buildings where applicable) will alter the present state of stability of the subject land;
 - (c) whether any portion of the subject land should be excluded from the development and included in natural, undisturbed or rehabilitated areas;
 - (d) whether the proposed development (including all lots and buildings where applicable) will adversely affect the current state of stability of adjoining land;
 - (e) whether the proposed development (including all lots and buildings where applicable) should allow cuts and fills and if so, to what depth;
 - (f) whether retaining structures are required and if so, provide necessary foundations design parameters, including drainage requirements;

- (g) whether any special design features are required to stabilise or maintain the stability of the subject land, or portions of the subject land (including each lot where applicable);
 - (h) whether any special surface and/or subsurface drainage measures need to be taken to improve or maintain the stability of the subject land, or portions of the subject land (including each lot where applicable);
 - (i) whether on site disposal of liquids should be allowed; and
 - (j) whether any follow up inspections are required by the geotechnical engineer during construction.
- (3) The recommendations of the geotechnical assessment report should also provide guidance on appropriate measures required to make the site suitable for the proposed development, including:-
- (a) preferred locations for buildings, other structures, driveways, etc.;
 - (b) foundation requirements such as bearing pressures, piling parameters, special techniques for expansive clays;
 - (c) pavement type and design;
 - (d) construction methods to avoid problem areas associated with loose materials and groundwater seepage;
 - (e) preferred excavation/retention/stabilisation techniques and suitability of excavated materials for use in on-site earthworks;
 - (f) surface and subsurface drainage requirements;
 - (g) preferred methods of wastewater disposal (deep soil drainage within single residential lots or public land is not acceptable to Council; and
 - (h) vegetation protection and revegetation requirements.

SC6.11.7 Guidelines for achieving landslide hazard and steep land overlay outcomes

For the purposes of the performance outcomes and acceptable outcomes in the **Landslide hazard and steep land overlay code**, the following are relevant guidelines:-

- (a) *Landslide Risk Concepts and Guidelines* (Journal and News of the Australian Geomechanics Society, 2007).

Appendix SC6.11A Preferred format for a geotechnical assessment report

1. Introduction

- 1.1 Details of development
- 1.2 Site location and description (including survey co-ordinates/co-ordinate system)
- 1.3 Method and scope of investigation
- 1.4 Qualifications of company and competent person(s) to prepare report

2. Description of existing conditions

- 2.1 Geology (local and regional)
- 2.2 Topography
- 2.3 Groundwater
- 2.4 Surface drainage
- 2.5 Vegetation
- 2.6 Buildings, other structures

3. Assessment of land stability

- 3.1 Existing conditions
- 3.2 Geotechnical constraints to development

4. Description of proposed development

- 4.1 Site layout
- 4.2 Proposed development components
- 4.3 Potential geotechnical effects

5. Assessment of development impacts

- 5.1 Site layout
- 5.2 Roadworks, driveways and other pavements
- 5.3 Earthworks (excavation, materials usage)
- 5.4 Foundations
- 5.5 Surface drainage
- 5.6 Wastewater treatment and disposal
- 5.7 Overall effect of development on stability

6. Recommendations and measures to mitigate impacts

7. Summary and conclusions

8. Site plan

APPENDIX – Field and laboratory test results and modelling results