

Landslide Hazard & Climate Change

Review

Analysis

Ref	Source
Regional Soil Plan (RSP)	Chapters 3, 4, and 5
RSP	RPS001 Section 5.2
RSP	RPS002 Section 5.2
RSP	RPS003 Section 5.3
RSP	RPS004 Section 5.3
Wellington City District Plan (WCDP)	Chapter 29, plus proposed District Plan Change 70 - Earthworks Publicly notified July 2009 Decision notified 1 June 2010 (effective immediately)
WCDP	Subdivision Design Guid
WCC Code of Practice for Land Development (Draft)	Part B - Earthworks Design and Construction

Issues	Objective	Policy
Regionally significant issues for Natural Hazards: 1. Effects of Natural Hazards - natural hazard events ... have an adverse impact on people and communities, businesses, property and infrastructure. 2. Human actions can increase risk and consequences from natural hazards. 3. Climate Change will increase both the magnitude and frequency of natural hazard events.	Objective 18 - Risks and Consequences ... from natural hazards and climate change effects are reduced. Objective 19 - Hazard mitigation measures ... do not increase the risk and consequences of natural hazard events. Objective 20 - Communities are more resilient to natural hazard events.	Policy 28 - Avoiding subdivision and development in areas at high risk from natural hazards - district plans. Policy 50 - Minimising the risks and consequences of natural hazards - consideration. Policy 51 - Minimising adverse effects of hazard mitigation measures - consideration.
Soil Disturbance effects on slope stability - Slopes > 23 degrees in Area 1, or > 28 degrees in Area 2.	Soil disturbance - Roading and Tracking Activities - of continuous length of more than 200m	Roading or tracking activities located in Area 1 or 2 under specified conditions given in Rule 2 paras (1) and (2), excluding activities undertaken in accordance with conditions on a subdivision consent is a Restricted Discretionary Activity
Soil disturbance effects on slope stability - Slopes > 23 degrees in Area 1, or > 28 degrees in Area 2.	Soil disturbance on erosion prone land - involving equal or greater than 1000m ³ soil within 10,000m ² area, etc	Any soil disturbance on erosion prone land under certain specific condition given in Rule 2 paras (1) and (2), excluding activities (a) associated with roading and tracking or (b) undertaken in accordance with conditions on a subdivision consent is a Restricted Discretionary Activity
Vegetation disturbance effects on slope stability - Slopes > 23 degrees in Area 1, or > 28 degrees in Area 2.	Vegetation disturbance on erosion prone land of greater than 1 hectare	Vegetation disturbance on erosion prone land - provided for by Rule 3 Activity is a Permitted activity
Vegetation disturbance effects on slope stability - Slopes > 23 degrees in Area 1, or > 28 degrees in Area 2.	Vegetation disturbance on erosion prone land of greater than 1 hectare	Vegetation disturbance on erosion prone land - provided for by Rule 3 but does not comply with any of the conditions in Rule 3 is a Restricted Discretionary Activity
Earthworks stability - landslips more likely due to increasing frequency extreme weather events associated with climate change; public concern following high profile landslips; engineering design may not be to a standard that provides sufficient safety during earthquakes and extreme weather lack of detailed mapping of riskier sites	Obj 29.2.1 provide for use, development and protection of land and physical resources while avoiding, remedying or mitigating any adverse effects of earthworks and associated structures on the environment	29.2.1.1 ensure design and assessment of earthworks and associated structures is co-ordinated with future land development and subdivision. 29.2.1.2 provide for minor earthworks to allow the use and development of land where the risk of instability is minimal 29.2.1.3 ensure that earthworks are designed to minimise the risk of instability 29.2.1.4 require earthworks to be designed and managed to minimise erosion and the movement of dust and sediment beyond the area of the work, particularly to streams, wetlands and coastal waters. 29.2.1.5 ensure earthworks do not exacerbate flood events in Flood Hazard Areas. 29.2.1.6 protect and enhance character and amenity. 29.2.1.7 earthworks designed and landscaped to reflect natural landforms and reduce/soften visual impact on character and visual amenity of area 29.2.1.10 ensure the design of structures used to retain or stabilise landslips, reflect the character and visual amenity of the local area.
Loss of landform and landscape features during subdivision.	Retain existing landform and landscape features during subdivision (summarised).	Specified requirements and guidelines.
Loss of vegetation during subdivision.	Retain and utilise existing trees and plant new vegetation.	Specified requirements and guidelines.
Changes due to land development	To ensure: > stability or land > geotechnical soundness of any development > control of sediment generated by the works > control of amount of sediment entering receiving environments > control of surface water flows during and after construction > no undue nuisance from silt, dust, noise or vegetation disposal > preservation of natural landform and its features.	No specific policies.

Method	Rule	Tools
> Collect and maintain information about natural hazards and climate change. > Consider when resource consents, notices of requirement and when changing, varying or replacing plans. > District Plan implementation. > Allocation of responsibilities.	N/A	Plans and actions must "give effect" to RPS.
An application for a resource consent for an activity in accordance with Section 5.4 of the Plan, excluding when in accordance with conditions of a subdivision	Rule 1: Soil disturbance on erosion prone land, matter to which Council has discretion include - para (10) any steps to be taken to avoid, remedy or mitigate the effects of the activity on slope stability	> WCC has slope stability hazard maps, but not referenced > Monitoring the Effectiveness of the Plan (Section 9.2), including "Any risk to human life, property, or other aspects of the environment from natural hazards (particularly flooding and erosion)"
An application for a resource consent for an activity in accordance with Section 5.4 of the Plan, excluding when associated with roading and tracking activities or when in accordance with conditions of a subdivision	Rule 2: Soil disturbance on erosion prone land, matter to which Council has discretion include - para (10) any steps to be taken to avoid, remedy or mitigate the effects of the activity on slope stability	> WCC has slope stability hazard maps, but not referenced > Monitoring the Effectiveness of the Plan (Section 9.2), including "Any risk to human life, property, or other aspects of the environment from natural hazards (particularly flooding and erosion)"
An application for a resource consent for an activity in accordance with Section 5.4 of the Plan.	Rule 3: Vegetation clearance of more than 1 hectare is a Permitted Activity provided certain conditions apply, excluding	> WCC has slope stability hazard maps, but not referenced > Monitoring the Effectiveness of the Plan (Section 9.2), including "Any risk to human life, property, or other aspects of the environment from natural hazards (particularly flooding and erosion)" > Best practice methods, e.g. NZ Forest Code of Practice 1993.
An application for a resource consent for an activity in accordance with Section 5.4 of the Plan.	Rule 4: Vegetation disturbance on erosion prone land, matters to which Council has discretion include - para (11) any steps to be taken to avoid, remedy or mitigate the effects of activity on slope stability.	> WCC has slope stability hazard maps, but not referenced > Monitoring the Effectiveness of the Plan (Section 9.2), including "Any risk to human life, property, or other aspects of the environment from natural hazards (particularly flooding and erosion)"
Rules, Design Guides, Section 91 RMA, Structure Plans		Range of Design Guides. Some structure plans.
Rules, Advocacy	Rules 30.1.1-30.1.4 - Earthworks of specified dimensions, generally with cuts and/or fills less than 1.5m, on slopes less than 34 degrees, and areas less than 250m ² , more than a specified distance from a wetland, stream, river, coastal marine area, identified ridgeline, or flood hazard zone, are permitted. Rule 30.2 - Earthworks which exceed permitted activity standards are restricted discretionary activities. Discretion is retained to: > earthworks stability > erosion, dust and sediment control > visual amenity > flood hazard > effect on streams and coastal marine area > transport effects > heritage values.	Apply range of guidelines and standards.
Rules, Design Guides, Technical Guide (GW E&S CRI Guide), WCC Code of Practice for Land Dev	Rule 30.3.1 Earthworks in specified flood hazard areas are fully discretionary activities. Rule 30.3.2 Earthworks on specified ridgelines are fully discretionary activities.	Apply range of guidelines and standards.
Rules, Code of Practice for Land Dev		Flood hazard areas mapped in plan.
Design Guides, Code of Practice for Land Dev, Advocacy - disseminating info by GW publications		N/A
Rules, Design Guides		N/A
Rules, Design Guide		N/A
Design Guidance	Applied for all subdivision where a concept is needed.	Matter of control as part of subdivision consent.
Design Guidance	Applied for all subdivision where a concept is needed.	Matter of control as part of subdivision consent. Otherwise no requirement or guidance.
A mix of guidance and specific standards.	A range of standards to be met - e.g. maximum steepness of batters, bending dimensions; compaction densities; testing requirements for fill.	Same as rules. Refers to wide range of standards and guidelines.

Dependencies	Outstanding Issues	Potential Improvements	Priority of Action	Cost	Statutory Requirements and Reference Documents
Requires collection and dissemination of information and advice, and regular updating of plans.	High-level policy requirement. Needs ongoing monitoring for effectiveness against Anticipated Environmental Results (AER).	Need for GW to monitor effectively and range of enforcement/encouragement actions. AERs can be clarified. No mention of monitoring of climate change effects - just effectiveness of policies	Moderate	?	N/A
> Policy exclusions rely on adequate treatment of slope stability under (WCC) subdivision consent > Resource consent conditions under Section 5.4, including assessment of actual and potential effects on the environment	> Are Soil maps available, not referenced? > Policy Restricted to relatively large scale disturbances > No linkage to climate change > Primarily a soil health & erosion focus, does not specifically address land slip hazard / risk > Need to take account of site history and risk to life and property not just hazard	> Characterise relationship between soil stability and land slip hazard, with greater clarity in rules on the management of land-slip hazard > Clarify roles and responsibilities between WRC and WCC, and cross-reference related policies, methods and tools > Give consideration of a wider range of factors governing soil/land stability, including extreme rainfall events and hence climate change > Use of a more risk-based approach to mapping land-slip prone areas - Riskscape	Moderate	?	Relevant NZ Standards
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Description and assessments of effects, information required in Chapter 3, and further information as the council may require.	No information identifying areas of vulnerability or circumstances of enhanced risk. No information relating to climate changes.	> Use of mapping and overlays to clarify most vulnerable areas. > Clarify information requirements (the guidelines in the Plan for Churton Park Concept Village provide a comprehensive list of information required with an application).	Moderate	?	Relevant NZ Standards
Description and assessments of effects, information required in Chapter 3, and further information as the council may require.	No real issues. Requires adequate information when consents sought.	Not needed	Moderate	?	Relevant NZ Standards
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Description and assessments of effects, information required in Chapter 3, and further information as the council may require.	No real issues. Requires adequate information when consents sought.	Not needed	N/A	?	Relevant NZ Standards
Flood hazard areas identified	Continue to monitor.	Clarify monitoring	N/A	?	Relevant NZ Standards
These (and subsequent policies) focus on visual and amenity aspects.	N/A	N/A - assuming above policies have same or greater weight.	N/A	?	Relevant NZ Standards
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N/A	Could be extended to include stability/safety.	Could be extended to include stability/safety.	Low	?	N/A
N/A	N/A	Could ensure new vegetation is suited to future climates.	Low	?	
N/A - universal application.	Not known.	Monitoring of effectiveness can lead to review of parts of Code.	N/A	?	Wide range of reference documents listed.

RMA	Section 106 Provisions
RMA	
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Plan controls adequate	"Backstop" protection of land/or structures	Over-riding power to limit development and subdivision of at-risk land.

(1) A Consent authority may refuse subdivision consent in certain circumstances: (a) the land in respect of which a consent is sought or any structure on the land, is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage or inundation from any source; or	See method	New or unidentified risk if identified.
(b) any subsequent use that is likely to be made of the land is likely to accelerate, worsen or result in material damage to the land, other land or structure by erosion falling debris, subsidence, slippage or inundation from any source; or		
(c) sufficient provision has not been made for legal and physical access to each allotment to be created by the subdivision		

Last resort protection.	Power remains in RMA, but regarded as a last resort, and used less and less. Expectation is that district and/or regional plans will identify and limit development of such land.	Continue efforts to identify and protect hazard - prone lands from development. Improving Climate Change information should feed into this ongoing requirement.	Moderate	?
				?
				?

N/A

* Note: Costs should be estimated. In many cases, these are largely research plus administrative costs for a plan change. Once costs are estimated, the actions can be prohibited and included in the annual and or LTCCP.
 ** Particularly relevant are NZS4404:2010 Land Development and Subdivision Infrastructure and NZS4431: Code of Practice for Residential Earthworks.

Very High
High
Moderate
Low
Very Low
None
Not Applicable