

Port Hills White Zone – Cliff Collapse, Debris Inundation and Landslips

1. Background

Cliff Collapse / Debris Inundation

- Cliff tops have collapsed; base inundated with debris
- Risk to life at cliff edge and base
- Land weakening back from cliff edges – may become unliveable within 50 years

Refer Box 5 for detail

Landslips

- Similarities with cliff collapse
- Seventeen landslip sites – generally risk is to property rather than life

Refer Box 7 for detail

Category	Number (all numbers indicative)	Value (all figures indicative)
Cliff/debris Group 1	160-185 properties (130 with s124 notices)	\$130-145M gross (\$110-130M net)
Cliff/debris Group 2	80-100 properties (15 with s124 notices)	\$55-75M gross (\$40-65M net)
Landslip	17 sites 650 properties (approx) (40 with s 124 notices)	

2. Possible Groupings

Group 1: Cliff top and base

- Immediate life safety risk
- Infrastructure problematic
- Significant land damage that cannot be cost-effectively remediated
- Small number of landslip properties have these attributes

Group 2: Weakened land

- No immediate life-safety concerns that cannot be remediated
- Land damage is repairable, but rock mass has been weakened
- Infrastructure could be maintained

Landslip

- Geotechnical information less complete

Refer Box 6 for detail



3. Possible Approaches

Group 1

- Ongoing occupation inadvisable

Group 2

- Range of property damage but area remains liveable for now
- Building consents likely to be available
- CCC likely to lift section 124 notices
- Insurance may become an issue
- Decrease in equity relative to pre-earthquake levels

Refer Box 8 for detail

Landslip

- Relatively small number similar to Group 1 for life safety reasons
- Potentially larger number with major to severe land damage that cannot be remediated
- Most remain liveable (similar to Group 2)
- Some of these properties are in the Green zone

4. Conclusions to date

Group 1

- Consider voluntary offer
- Area-wide land remediation possible for one group of 16 properties (\$1.5m) required

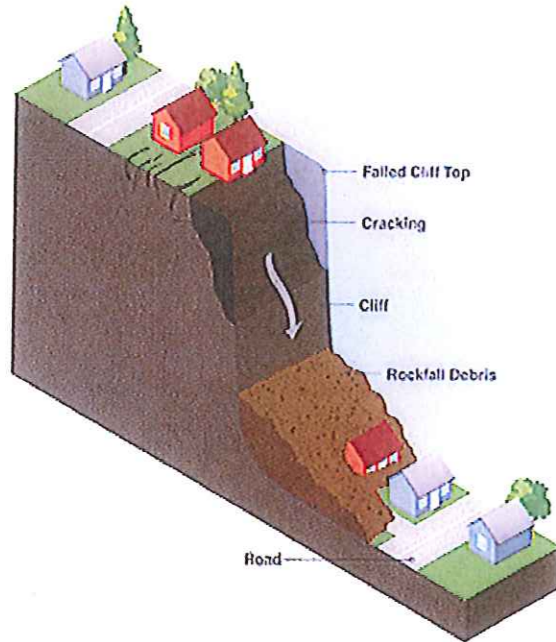
Group 2 and landslip

- Issue arises around whether to include in any assistance package
- Possible reliance on normal insurance procedures
- Offering any assistance would raise significant precedent issues (within and outside Christchurch)
- Cliff collapse typically the responsibility of local government
- Cost share between Crown and Christchurch City Council can be argued in various ways

Refer Box 7 for detail

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5. Cliff Collapse/ Debris Inundation Graphic



6. Geotechnical Information

- Agreed dataset with CERA, CCC and geotechnical advisors.
- GNS modelling of risk contours, and the risk will **not** reduce significantly over time.

Possible Group 1 Criteria for Cliff Collapse

- Properties are at an **immediate life-safety risk that cannot be remediated.**
- Horizontal **infrastructure difficult and costly to maintain** (sewerage, roads, access, water).
- Properties are **subject to significant cliff collapse, debris inundation and/or land cracking that cannot be cost-effectively remediated.**

Possible Group 2 Criteria for Cliff Collapse

- There are **no immediate life-safety concerns** that cannot be remediated on an individual or collective property basis.
- Any land damage is repairable in a cost-effective manner.
- Horizontal **infrastructure could be economically maintained for the present**, subject to detailed investigations.
- Damage very possible in the next 50 years.

7. Geotechnical Information for Landslips

- Geotechnical investigations still underway.
- Initial results are available.

Most landslip properties can be individually remediated, but a small number share similar characteristics with Group 1 Cliff Collapse properties:

- Immediate life risk
- Significant land damage that cannot be remediated *and/or*
- Building may have severe structural damage
- Reactivation of landslip will damage rebuilds

8. Cliff Collapse and Debris Inundation Properties- Breakdown of figures

Category	# Properties (All numbers indicative)	Value (All figures indicative)	Implications	Issues
Group 1	160-185 (130 with s124 notices)	\$130-145M gross (\$110-130M net)	<ul style="list-style-type: none"> • Ongoing occupation inadvisable 	<ul style="list-style-type: none"> • Nature of assistance package to be decided (Red Zone precedent will be strong) • Voluntary offer
Group 2	80-100 (15 with s124 notices)	\$55-75M gross (\$40-65M net)	<ul style="list-style-type: none"> • Investigate, monitor and manage through standard CCC natural hazard processes 	<ul style="list-style-type: none"> • Questions of assistance arise • RMA zoning likely to result in future constraints

9. EQC Damage Categories and Descriptions

9. EQC Damage Categories and Descriptions			Indicative percentage of land damage
LM1	Small scale- Minor	Individual cracks less than 50 mm wide, or less than 100mm cumulative crack widths over a typical 30m section	40%
LM2	Large scale- Major to severe	Individual cracks greater than 50mm wide, or more than 100mm cumulative crack widths over a typical 30m section	54%
LM3	Land inundation	Inundation from failed slopes (unretained and/or retained)	6%



10. Description of Groups		
Issue	Group 1- Retreat	Group 2- Remain in home
Purchase offer	Yes- Voluntary	No?
Zoning	Red Zone equivalent	Green, with limitations?
Life risk	Yes in most cases	No
Building damage	Major repairs/rebuild required in some cases Building consents unlikely to be available for this work	Building damage ranges from minor to major Building consents available to repair damage in most cases
Land damage	Significant damage, which cannot be cost-effectively remediated	Low to moderate damage, which can be remediated in the short to medium term
Subject to s124 notices	Yes in 70-80% of cases, and these cannot be lifted	In 15-30% of cases, but these appear likely to be able to be lifted

11. Considerations for Future	
Issue	Group 2- Remain in home
Subject to District Plan Changes	Yes, property owners may be unable to expand dwellings or subdivide properties Potential restrictions on building/resource consents for significant repair or new building work
Christchurch City Council Monitoring	Yes, Council will need to investigate, and monitor these properties to assess new land damage and life-safety risks. Likely identified as a hazard management area requiring future (medium to long term) land-use decisions
Subject to s72-74 of the Building Act	Yes, unless individual or group remediation is possible, or the hazard is not considered "likely" (i.e. will happen without seismic activity)
Mention of hazard on Land Information Memorandum	Yes
Availability of EQC Coverage	EQC have not considered policies in the Port Hills around future insurance, but they can decline to cover if a hazard notice is in place
Availability of insurance	Uncertain availability
Future home equity	Could decrease further
Impact on critical infrastructure	Some properties may need to be subsequently acquired for critical infrastructure remediation
Ability to sell property	Yes, but at a decreased price relative to pre-earthquake levels
Future stability of property	May be suitable for occupation for several decades

12. Other Cliff Collapse/ Debris Inundation Issues

- Demolitions- CERA will want to manage demolitions for Group 1 sites, given health and safety considerations, and the potential impact on critical infrastructure
- Many Group 1 dwellings may not be badly damaged, with an effect on insurance proceeds
- Some Group 2 properties may subsequently need to be acquired to remediate critical infrastructure lifelines. Specific communications needed to manage this potential issue. (May affect 14 properties in Redcliffs, Peacock's Gallop and Heberden Avenue)
- 2 Green Zone properties in Redcliffs included in Group 1 (1 property) and Group 2 (1 property). Specific communications needed to manage this issue

14. Borderline Cases- Cliff Collapse

Cause	# Properties	Possible Action
Life risk close to dwelling	3	Place in Group 1 or Group 2 (possible subdivision)
Public and Private Road access issues due to life-safety risk	4	Place affected properties in Group 1 or remediate/mitigate
Group remediation required	16	Assess whether remediation feasible and cost effective. Possibly assist property owners with remediation works

13. Viewpoints of Christchurch City Council

Legislative Framework

Section 124 Building Act notices prohibits access to buildings; discretionary under the Building Act

There is a close correlation between properties at heightened life-safety risk according to the Institute of Geological and Nuclear Sciences cliff collapse study, and the section 124 notices associated with cliff collapse.

Christchurch City Council Application of these Provisions

The Council is likely to lift section 124 notices relating to cliff collapse for Group 2 properties (where residents would remain in their homes), but require assurances on status of land for these properties.

The Council is likely to introduce changes to the District Plan to place a hazard line around Group 2 properties. This may mean that building footprints cannot be increased, and that new buildings must be constructed as far away from the source of the risk as possible.