

# GUIDE TO SETTLEMENT OF PORT HILLS LAND CLAIMS



May 2013

# Introduction

This guide focuses on repair methods for some of the types of land damage that occurred in the Port Hills as a result of the Canterbury earthquakes.

EQC costs land repair for the purposes of calculating the land settlement. For these costings, EQC will often use the potential land repair methods that are described generally in this guide. EQC will not in most cases be carrying out, or arranging to carry out, the land repair.

Land damage claims will mainly be settled by EQC with a cash settlement to the homeowner or mortgagee. This will enable you to undertake or arrange the work yourself.

The repair methods in this guide are general in nature. The actual repair methods used on your insured land need to be considered on a case-by-case basis, appropriate for your specific site and the nature of the land damage.

In some cases there will be other methods not covered in this guide that may be more appropriate or practical for your land. This guide should not be read as implying that any particular repair method must be undertaken or that a particular repair method is suitable in every case. You will need to take appropriate advice before starting repairs on your insured land.

This guide does not provide engineering or design documentation for repair purposes. Any such documentation (if required) will need to be drawn up for your specific situation.

Detailed provisions on EQC land cover can be found in the Earthquake Commission Act 1993 at [www.legislation.govt.nz](http://www.legislation.govt.nz). The provisions of that Act will be applied by EQC at all times. This guide is a summary only.



# Types of land damage

There will be land damage where the land has been materially physically changed as a direct result of an earthquake, and that change has materially affected the physical use of the land.

The following types of land damage have been identified on the Port Hills:

- Inundation: Land is considered damaged as a result of debris material being deposited on the insured land, where this materially affects the physical use of the land.

- Evacuation: Land is considered damaged as a result of land moving vertically and/or horizontally downslope where the land no longer occupies the space it did before the earthquakes, where this materially affects the physical use of the land. This can take the form of land cracking/ bulging/ undulations and loss of land (such as cliff collapse).

Land damage mechanism	Land damage type description
Rock fall and cliff collapse	<p>Rocks that detach and roll from a bedrock outcrop during the ground shaking that have inundated houses, land and other structures.</p> <p>Cliff rock outcrops that have loosened by the ground shaking, resulting in loss of land (evacuation) at the top of the cliff face and debris inundation (burial) of land/houses/structures on the properties below.</p> <p>Land damage as a result of impacts (evacuation) and impact marks (undulations) from rockfall and cliff collapse.</p>
Large scale land movement	<p>Land cracking/ bulging near the base of the slope caused by downslope displacement/ deformation of land (evacuation) during strong earthquake shaking.</p> <p>Co-seismic deformation of land resulting in land cracking and deformation of land (undulations), and may result in some down slope/lateral movement (evacuation).</p>
Small scale land movement and retaining wall failures	<p>Evacuation of land and resulting inundation as a result of failures of unretained cut or fill slopes.</p> <p>Evacuation of land and resulting inundation as a result of failures of retaining walls supporting cut or fill slopes.</p>

In addition to the above land damage types there are some areas within the hills where a new groundwater spring has emerged and is now flowing over the ground where this was not happening before the earthquake. Further information and the potential repair method for this type of damage can be found in the "Guide to Settlement of Canterbury Flat Land Claims". This can be downloaded

from: [www.eqc.govt.nz/land](http://www.eqc.govt.nz/land), or you can request a copy be sent to you by calling 0800 32 62 43.

Further information can be found in the Earthquake Commission: Canterbury Earthquakes 2010 and 2011 - Land Report as at 29 February 2012 (July 2012). This Report can be found at [www.eqc.govt.nz/canterbury-earthquakes/land-claims/land-reports/stage-3-land-report](http://www.eqc.govt.nz/canterbury-earthquakes/land-claims/land-reports/stage-3-land-report).

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# Potential repair methods

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## About the repair methods

This guide sets out some potential repair methods for the types of land damage.

The repair methods for reinstating land:

- for one type of land damage may repair other land damage types at the same time. For example, the repair of cracked land may fully or partially repair land undulations
- generally comprise earthworks and/or retaining wall repair
- focus on the repair of individual sites only - not area wide solutions.

## Consents and other statutory approvals

You may need a Christchurch City Council resource or building consent before undertaking land repairs.

We recommend that you contact the Council to confirm:

- the site specific requirements of your property, and
- whether a resource or building consent is required to authorise the repair.

In some instances, engineering or drainage advice may be required to assist in the repair. Christchurch City Council and Environment Canterbury have worked together to streamline the consent process.

Visit the Council's land repair page at [www.ccc.govt.nz/landrepair](http://www.ccc.govt.nz/landrepair) to find out more about the process and to understand what may, or may not be, required as you continue with your land repair.

Before you contact the Council, you'll need to talk to your private insurer, mortgagee and also, where necessary, the contractor or engineer you will engage to undertake the repairs. When you contact the Council, please have the information about the type of land damage and the way it is proposed to repair it.



# Rock fall and cliff collapse

The insured land is considered damaged if individual rocks or cliff collapse debris have inundated the ground surface which affects the physical use of the land. Impact marks (undulations) resulting from the debris inundation is also considered land damage that requires repair.

### Potential Repair Methods

Inundation by rock fall and cliff collapse debris where rocks have been deposited to the ground surface



**METHOD: Earthworks to remove rocks, boulders and cliff collapse material offsite**

Remove the debris material (by hand or using machinery) and dispose of it offsite. An engineering structure may be required to protect the land from inundation such as catch fences or debris walls.

Undulation from rock fall and cliff collapse debris where rocks have impacted the ground surface



**METHOD: Earthworks to re-level ground**

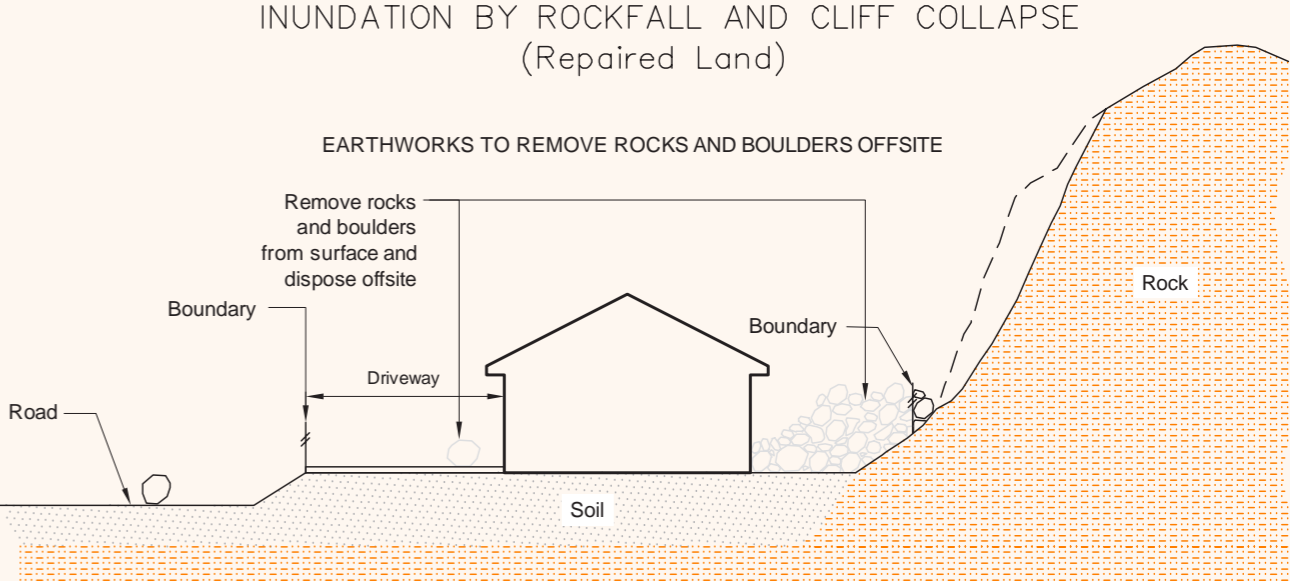
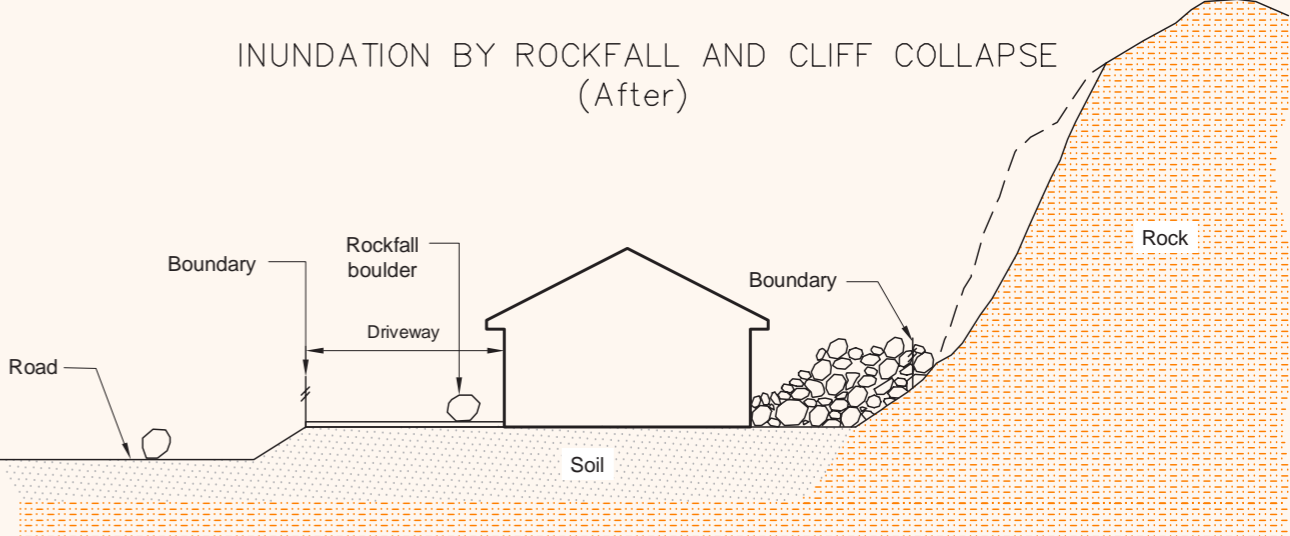
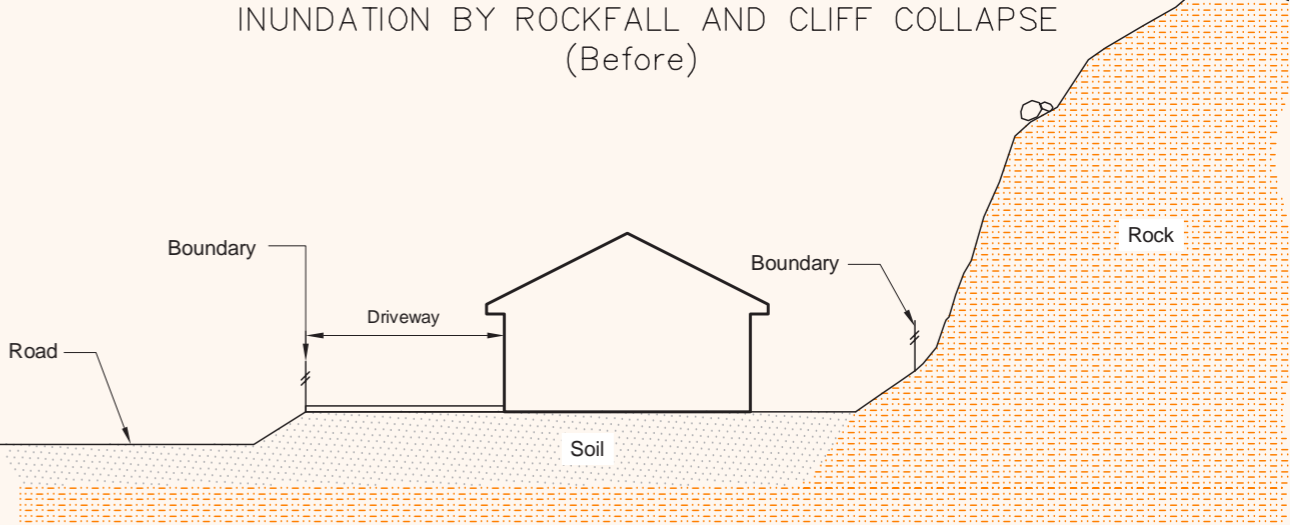
**Earthworks for unpaved areas:**  
Remove topsoil and raise the land to the same level as the surrounding ground with compacted soil and grass.  
**Earthworks for paved areas:**  
Remove paved surface. Place compacted sand to re-level ground. The pavement (including base course) if damaged by the earthquake may be covered by your private insurer. We recommend that you contact your private insurer to check.

Land loss (evacuation) from cliff collapse



**METHOD: Engineering design**

An engineering structure may be required to retain the land from evacuation such as retaining walls or ground anchors. However, in the case of total loss of land resulting from cliff collapse, a land repair may not be practicable. Engineering advice will be required to assist in the repair or cash settlement for value of insured land when repair is not practical or more expensive.



# Large scale land movement

Large scale land movement results in physical damage to the land in the form of cracking and undulations such as depressions and bulges, land loss (evacuation) and inundation of debris material in response to strong earthquake shaking.

The insured land has cracking and deformation resulting in lateral and/or vertical displacement caused by tension

in the ground surface from land movement and ground oscillations (backwards and forwards ground movement) as a direct result of the earthquake.

Undulations are caused by the uneven consolidation of the ground surface as a result of land movement, and the uneven settlement of soils below ground.

## Potential Repair Methods

Crack open 80mm wide or less



### METHOD: Earthworks to fill crack

Fill with sand up to 300mm of surface then fill with a sand/bentonite/cement slurry.

Crack open greater than 81mm wide



### METHOD: Earthworks to fill crack

#### Outside any structure:

Fill with sand up to 300mm within the surface then evacuate a 300mm depth (300mm wide) trench and place and re-compact a sand/bentonite/cement mixture.

#### Under any structure:

##### For house with timber floors:

Fill with sand slurry. If house is removed for other reasons then fill with sand up to 300mm within the surface then evacuate a 300mm depth (300mm wide) trench and re-compact a sand/bentonite/cement mixture.

##### For house with concrete floors:

No repair required if the concrete slab is not being removed. If the slab is being removed for other reasons, fill with sand up to 300mm within the surface then evacuate a 300mm depth (300mm wide) trench and re-compact a sand/bentonite/cement mixture.



# Large scale land movement continued

## Potential Repair Methods

Undulation greater than 50mm high (if on lawn)

Undulation greater than 25mm high (if under path/patio)



Land loss (evacuation)



### METHOD: Earthworks to re-level ground

#### Earthworks for unpaved areas:

Remove topsoil and raise the land to the same level as the surrounding ground with compacted sand, topsoil and grass.

#### Earthworks for paved areas:

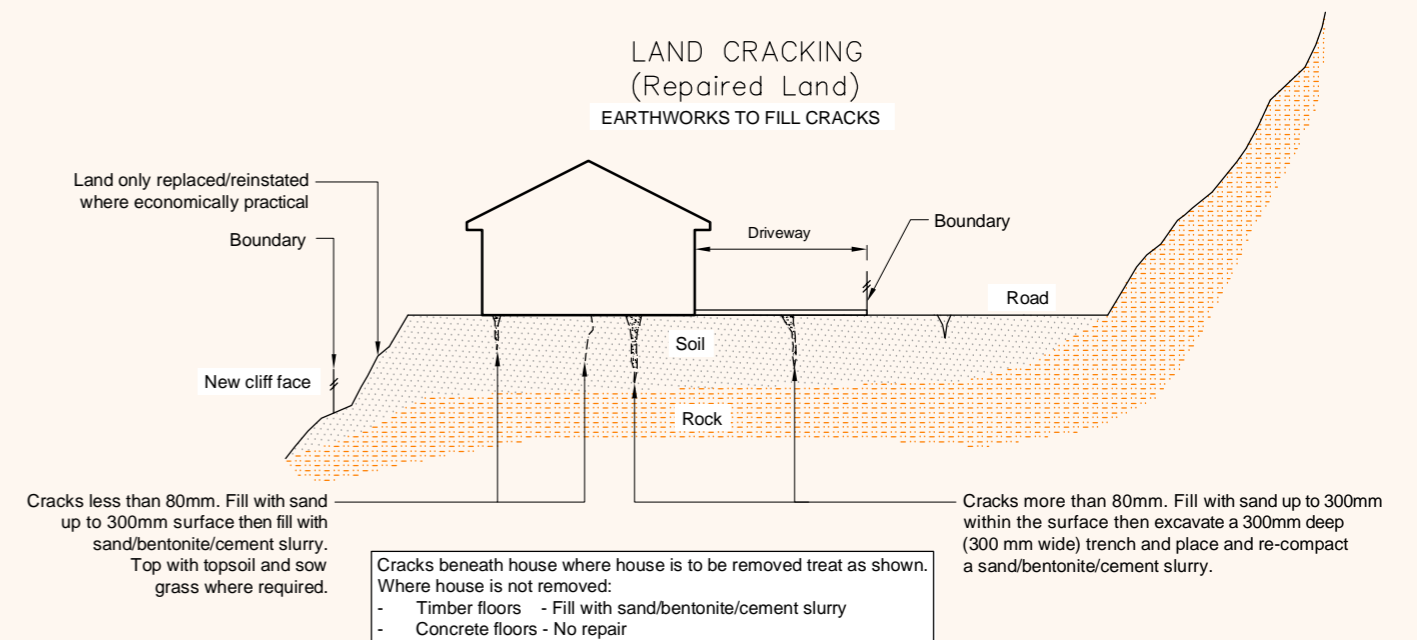
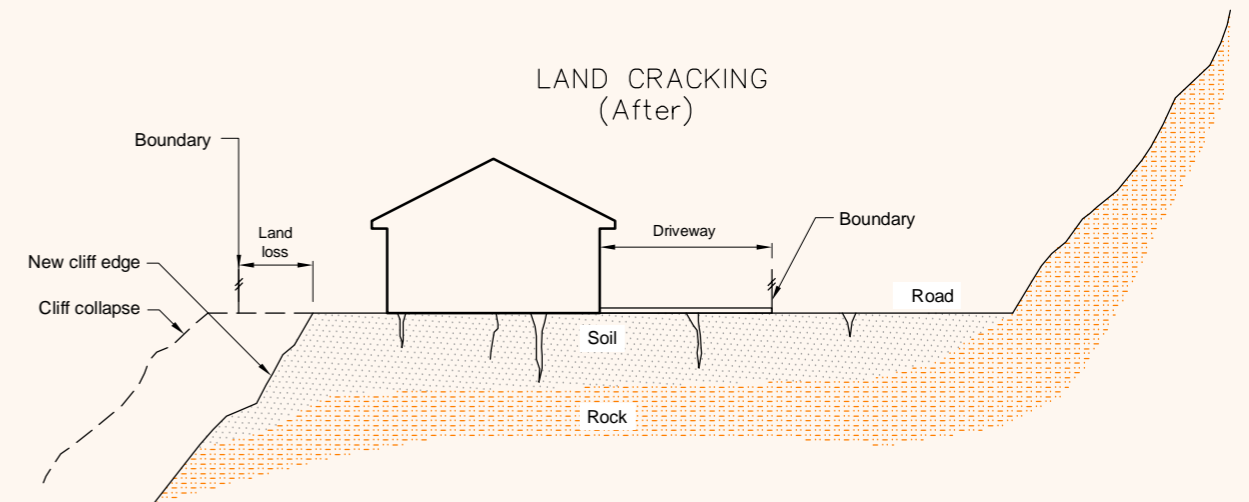
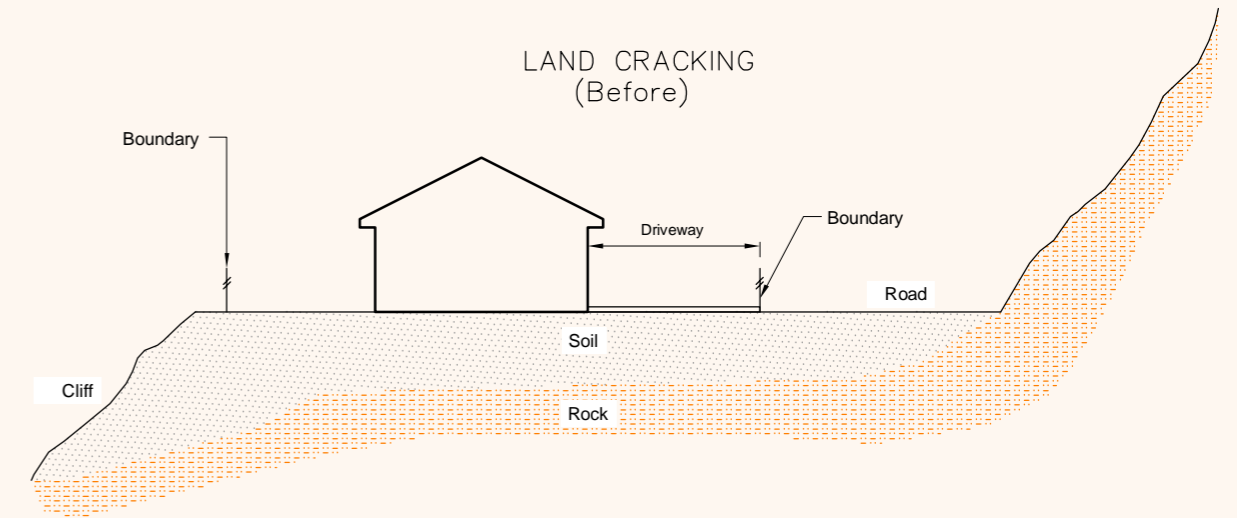
Remove paved surface. Place compacted sand to re-level ground.

The pavement (including basecourse) if damaged by the earthquake may be covered by your private insurer. We recommend that you contact your private insurer to check.

### METHOD: Engineering design and earthworks to retain land

An engineering structure may be required to retain the land such as retaining walls or ground anchors.

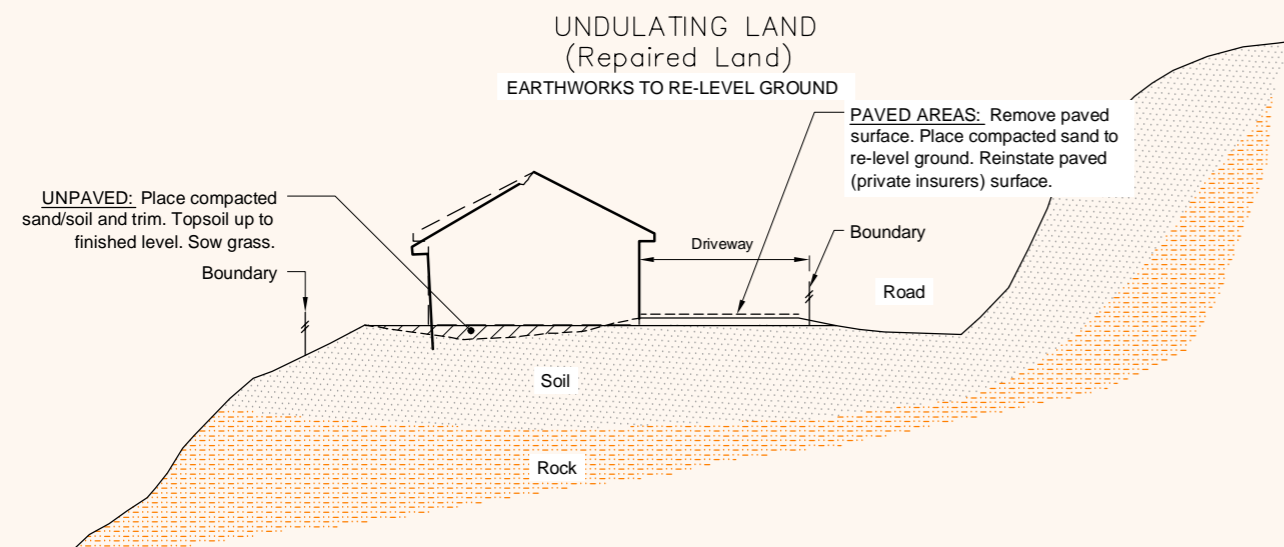
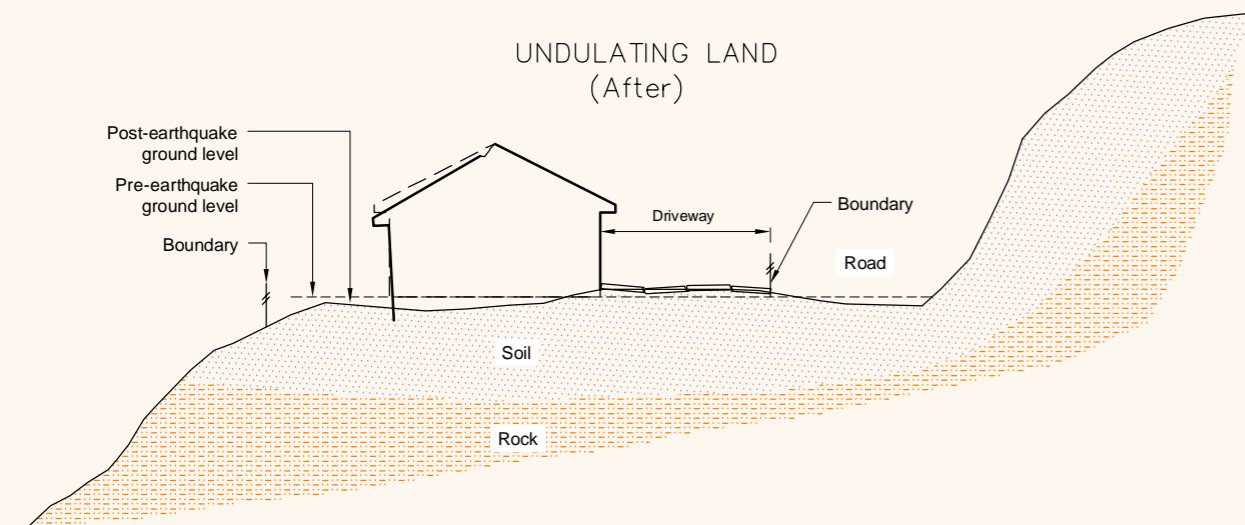
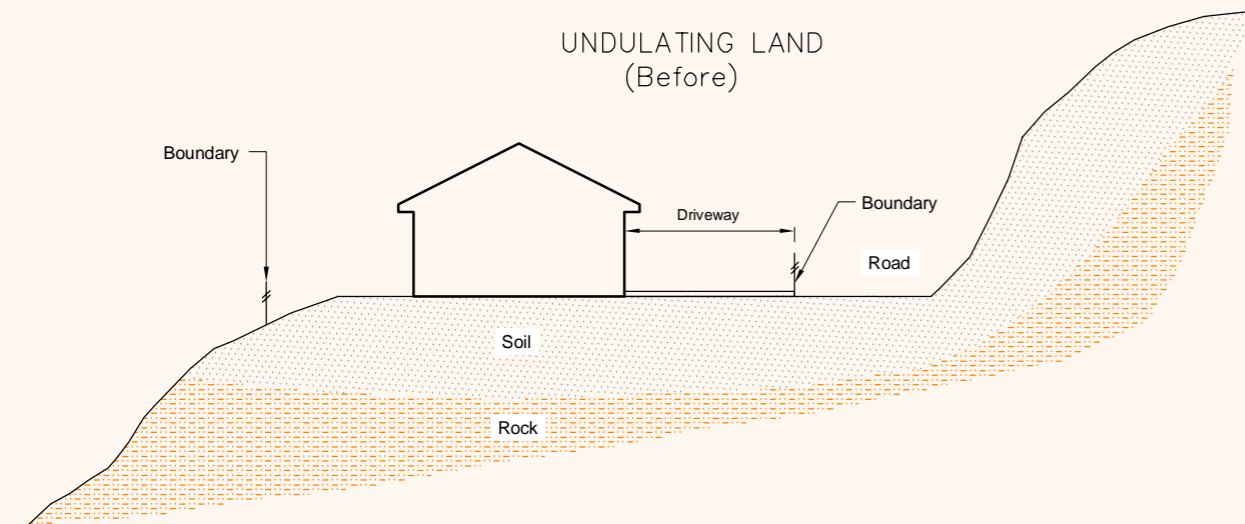
Engineering advice will be required to assist in the repair or cash settlement for value of insured land when repair is not practical or more expensive.



# Small scale land movement and retaining wall failures

Small scale land movement results in physical damage to the land in the form of cracking and undulations such as depressions and bulges, land loss (evacuation) and inundation in response to earthquake shaking.

Small scale movements are typically associated with deformation of unretained slopes or existing retaining walls, fill slopes or cut faces. Undulations are caused by the uneven consolidation of the ground surface behind (upslope of) walls shaken or damaged by the earthquakes.



## Potential Repair Methods

### Unretained slope failure

#### METHOD: Engineering design and earthworks to reshape the slope or construct retaining wall

An engineering structure may be required to retain the land such as retaining walls or ground anchors.

Engineering advice will be required to assist in the repair or cash settlement for value of insured land when repair is not practical or more expensive.

### Retaining wall failure

#### METHOD: Engineering design and earthworks to reinstate the retaining wall

Engineering advice will be required to assist in the repair or cash settlement for value of insured land when repair is not practical or more expensive.

Note: In many cases the 'retaining wall' that has been damaged or collapsed was not designed to support the slope, but was instead a facing to protect against erosion or weathering.



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## **For further information about your settlement**

If you have further queries about your settlement, please email [info@eqc.govt.nz](mailto:info@eqc.govt.nz) or call 0800 DAMAGE (0800 32 62 43). The international number is +64 4 978 6400.

## **For further information about land repair**

Christchurch City Council and Environment Canterbury have worked together to streamline the consent process.

Visit the Council's land repair page at [www.ccc.govt.nz/landrepair](http://www.ccc.govt.nz/landrepair) to find out more about the consent process and to understand what may, or may not be, required as you continue with your land repair.

## **The Earthquake Commission**

Level 20  
Majestic Centre  
100 Willis Street  
Wellington

**Email** [info@eqc.govt.nz](mailto:info@eqc.govt.nz)

**Web** [www.eqc.govt.nz](http://www.eqc.govt.nz)

**0800 DAMAGE (0800 32 62 43)**



**EARTHQUAKE COMMISSION**

Kōmihana Rūwhenua