

# Earthworks (Earth)

## Overview

Whangarei District has varied geology, soil type and ground water levels. This combined with variable climatic conditions creates a risk of natural hazards of land instability. Generally, where there are steep slopes, little vegetation and high rainfall, land is likely to be subject to erosion and movement. Some land formations, including caves and sinkholes, are inherently unstable and constitute a major hazard.

Land suitability issues can be created or exacerbated by inappropriate earthworks. Earthworks are a necessary part of subdivision and development, but need to be managed to ensure that the risk of natural hazards and instability are avoided, remedied or mitigated.

The Earthworks Chapter manages earthworks associated with subdivision to ensure that sites are suitable for development and hazards are managed. In addition to the District Plan, consent may also be required for earthworks under the Regional Plan.

## Objectives

EARTH-O1 – Land Instability	Minimise the risk of land instability and manage compaction.
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## Policies

EARTH-P1 – Adverse Effects	To avoid where practicable, or otherwise remedy or mitigate, adverse effects associated with land instability and compaction by managing subdivision design and layout.
EARTH-P2 – Risk	To design subdivision to minimise potential risks to people, property and the environment.

## Rules

EARTH-R1	Subdivision	
<b>All Zones</b>	Activity Status: RD  Where:  1. Earthworks do not:  a. Change the natural range of water levels or the natural eco-system of flora and fauna in any indigenous wetland.	Activity Status when compliance not achieved: D

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- b. Occur within a Site of Significance to Maori or within 10m of any archaeological site.
- 2. A 100m<sup>2</sup> building area for a residential unit is identified within each allotment.
- 3. Access to the identified building area is identified within each allotment.

Discretion is restricted to:

- 1. The potential increased risk of instability based on the location, layout and design of the subdivision.
- 2. The potential effects and management of vegetation clearance, excavation or fill and disposal of stormwater or wastewater.
- 3. The likelihood of a hazard arising from an unstable land event and the likely extent of any damage.
- 4. Any exacerbation of an existing land instability hazard or creation of a new land instability hazard and possible effects on public health and safety and other property.
- 5. The proposed use of, necessity for and design of hard engineering solutions for land instability hazards.
- 6. The ability to design, construct and maintain future buildings, structures and access so that they are resilient to land instability hazards.
- 7. The adequacy of the site suitability report and any recommendations.

*Note:*

- 1. *Acceptable means of compliance for the scale and design of earthworks is contained within the Whangarei District Council Environmental Engineering Standards.*

## Rule Requirements

EARTH-REQ1	Information Requirement
All Zones	1. Any application under EARTH-R1 shall:

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- a. Provide a site suitability report prepared by a suitably qualified and experienced professional (e.g. Chartered Professional Engineer) to certify that:
    - i. A 100m<sup>2</sup> building area within each allotment is suitable to construct a residential unit, either:
      - a) In accordance with NZS 3604/2011; or
      - b) With specific engineering design of foundations.
    - ii. Access to the certified building area within each allotment is suitable to construct.
  - b. Identify on the scheme plan the building area certified in EARTH-REQ1.1(a)(i).
2. A site suitability report certifying EARTH-REQ1.1(a)(i)(a) shall include the following:
- a. Details of a walk-over inspection of the site and surrounding land.
  - b. Assessment of aerial photographs taken at various times to provide insight into the local geomorphology and evidence of any previous instability.
  - c. Review of geological data (e.g. maps, bulletins, etc.).
  - d. Assessment of local information about stability/instability of the ground.
  - e. Assessment of existing data about the soil and rock profile. Where no data exists, subsurface investigations are required.
  - f. Examination of the soil profile to confirm that the soil is in-situ and not colluvium (slide debris).
  - g. Examination of the existing survey records for evidence of movement (slippage or erosion).
  - h. An opinion stated by a suitably qualified and experienced professional as to the suitability of the land for development (including an assessment of the effects of development such as excavation, filling, removal of vegetation, stormwater or effluent wastewater into or over the area).
  - i. Definite conclusions and recommendations on any development restrictions.
3. A site suitability report certifying EARTH-REQ1.1(a)(i)(b) shall include the following:
- a. Topographic survey or slope profiles.
  - b. A description of the geology and geomorphology of the area, including comment on the areas surrounding the proposed subdivision.
  - c. Definition of the nature and continuity of the strata over the whole area of land which is proposed to be developed (buildings, access and services) and to a depth below which slipping is most unlikely, by means of test pit and/or drilling and/or augering (unless existing exposures are adequate).
  - d. Assessment of the relative strength and the sensitivity of the soil in each stratum in which, or interface on which, sliding is practicable.

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- e. Assessment of likely groundwater levels and piezometric pressures in the strata during extreme infiltration conditions.
  - f. An opinion stated by a suitably qualified and experienced professional as to the stability and suitability of the land for development, including the stability of the whole slope (upon which the site may only form a part of) and the effects of the development (such as excavation, filling, removal of vegetation, disposal of stormwater or effluent wastewater into or over the area) on the whole slope.
  - g. Definite conclusions and recommendations on any development restrictions, specifically addressing section 106 of the Resource Management Act.
4. A site suitability report certifying EARTH-REQ1.1(a)(ii) shall include the following:
- a. Any potential stability effects of access alignment, design and construction, including on the stability of identified building areas and any existing buildings.
  - b. Definite conclusion and recommendations on any access development restrictions, specifically addressing section 106 of the Resource Management Act.