

Natural Hazards (NH)

Introduction

The District is susceptible to a wide range of natural hazards, including flooding, earthquakes, landslides and wildfire. Natural hazard events can lead to a loss of human life and result in damage to property, and infrastructure and the wider environment.¹ Critical infrastructure is required to be resilient to ensure these facilities and services can function to the fullest possible extent after a natural hazard event. It is therefore important to reduce the risks associated with natural hazards by identifying known and potentially affected areas, and restricting or managing subdivision, use and development, including infrastructure, relative to the natural hazard risk posed.

The natural hazards managed by this chapter of the District Plan are:

- flood hazards;
- surface fault rupture as a result of earthquakes;
- liquefaction as a result of earthquakes; and
- wildfire hazards.

The District Plan takes a risk-based approach which factors in the need to allow people and communities to use their property and undertake activities, while also reducing the likelihood of harm to people or damage to assets as a result of a natural hazard event. For instance, the District Plan maps identify part of the district that may be subject to flooding. It does not identify high flood hazard areas, rather high flood hazard areas are identified through the site specific flood hazard assessment process. This enables the most up-to-date technical information to be used. Information showing the modelled flood characteristics within specific parts of the district is publicly available online via Canterbury Maps. This information is indicative only and will be updated to reflect the best information as it becomes available.

There are a number of active faults in the District. ~~The definite, likely and possible faults are mapped, and All mapped faults, whether definite, likely or possible, are identified in the Fault Hazard (Critical Infrastructure) Assessment² Overlay. Definite or likely faults that are well or moderately expressed in the ground surface³ and have an estimated recurrence interval of less than 5000 years are identified in the and⁴ Fault Hazard (Subdivision) Assessment⁵ Overlay.~~ Detailed mapping of the Ostler Fault is identified in the Ostler Fault Hazard Area Overlay, which is located west of Twizel township. Activities in these overlays will be managed to reduce damage to property arising from surface fault rupture hazard. Liquefaction risks to new buildings are managed within the Liquefaction Assessment⁶ Overlay at the time of subdivision to ensure, where required, buildings have suitable foundations.

The District Plan assists with managing the risk of wildfire spread by managing vegetation at the rural-urban interface which is identified in the Rural—Urban Interface Overlay⁷, and requiring water supply for firefighting and managing the planting of wilding conifers.⁸ These hazards are primarily

¹ DOC (42.05)

² Clause 16(2)

³ NHC (29.08)

⁴ NHC (29.08)

⁵ Clause 16(2)

⁶ Clause 16(2)

⁷ CRC (50.18)

⁸ DOC (42.09)

managed by other statutory instruments or processes including the Building Act 2004, Civil Defence Emergency Management Act 2002 and the Local Government Act 1974.

The provisions in this chapter apply in addition to the provisions of the other chapters in the District Plan. This chapter does not apply to works within the beds of lakes and rivers, as they are managed under the regional planning framework.⁹ Earthworks, buildings and structures that will divert water including floodwaters may require resource consent under the Canterbury Land and Water Plan.¹⁰

Objectives and Policies

Objectives	
NH-O1	Risk from Natural hazards
	<p>New subdivision, land use and development <u>(excluding critical infrastructure)</u>¹¹:</p> <ol style="list-style-type: none"> 1. is avoided in areas where the risks from natural hazards to people, property and infrastructure are assessed as being unacceptable; and 2. in all other areas, is undertaken in a manner that ensures that the risks of natural hazards to people, property and infrastructure are avoided or appropriately mitigated.
NH-O2	Critical Infrastructure, Major Hazard Facilities¹² and Specific Buildings in Natural Hazard Overlays
	<ol style="list-style-type: none"> 1. Critical infrastructure is <u>not located in areas of high natural hazard risk unless there is a functional need or operational need to be at the location</u>¹³; 2. <u>If there is a functional need or operational need to be within areas of high natural hazard risk the critical infrastructure must, as far as practicable,</u>¹⁴ <u>be and designed to be as</u> resilient to the effects of natural hazards <u>as possible</u>, while achieving the objectives of the critical infrastructure¹⁵; 3. <u>New critical infrastructure avoids increasing the risks of natural hazards to people, property and infrastructure or, where avoidance is not practicable, mitigation measures minimise such risks;</u>¹⁶ and 2. 4. Major hazard facilities, healthcare facilities, emergency services facilities¹⁷, education facilities or visitor accommodation activities avoid locating in areas of high natural hazard risk associated with surface fault rupture where the effects on occupants and neighbours are assessed as being unacceptable.
NH-O3	Natural Hazard Mitigation
	<p>Methods to mitigate the effects of natural hazards do not create or exacerbate adverse effects on other people, property, infrastructure, or the environment.</p>
NH-O4	Natural Hazard Mitigation Works

⁹ OWL (64.10)

¹⁰ CRC (50.30)

¹¹ Meridian (39.08)

¹² Clause 16(2)

¹³ CRC (50.20), Transpower (31.05)

¹⁴ Meridian (39.09)

¹⁵ The Telco's (35.06)

¹⁶ Meridian (39.09)

¹⁷ NHC (29.11)

Natural hazard mitigation works and systems are <u>enabled and</u> ¹⁸ <u>maintained</u> to reduce the impact of natural hazards on people, communities, property and infrastructure.	
Policies	
NH-P1	Identification of Natural Hazards
Identify areas of natural hazards risk through the use of natural hazard overlays <u>and natural hazard assessments</u> ¹⁹ , and use the most up to date information available to provide site specific natural hazard assessments.	
NH-P2	Climate Change
Recognise that climate change will alter the frequency and severity of some natural hazards, and ensure that natural hazard assessments, and any mitigation works, take into account the effects of climate change.	
NH-P3	Risk Based Approach
Take a risk-based approach to natural hazards commensurate with the sensitivity and scale of development, whereby the level of risk is assessed as the combination of the likelihood of a natural hazard event occurring and the consequences of that event, for people and communities, property, <u>and infrastructure and the wider environment</u> ²⁰ .	
NH-P4	Flood Hazards
Within the Flood Hazard Assessment Overlay Area ²¹ (except High Flood Hazard Areas), enable: <ol style="list-style-type: none"> 1. new non critical infrastructure, or the operation, maintenance, repair, replacement, upgrading of non critical infrastructure where the infrastructure does not increase flood risk on another site <u>or property</u>²²; 2. the <u>development</u>,²³ operation, maintenance, repair, replacement, upgrading of critical infrastructure where the infrastructure does not increase flood risk on another site <u>or property</u>;²⁴ and 3. any other new subdivision, use and development only where every new natural hazard sensitive building has an appropriate floor level above the 500 year ARI design flood level. 	
NH-PX	Critical Infrastructure in High Flood Hazard Area
<u>Enable the operation, maintenance, repair, replacement and upgrading of critical infrastructure within High Flood Hazard Areas where the infrastructure does not increase flood risk on surrounding properties.</u> ²⁵	
NH-P5	High Flood Hazard Area
Within any High Flood Hazard Area avoid any: <ol style="list-style-type: none"> 1. extensions to existing natural hazard sensitive buildings unless: <ol style="list-style-type: none"> a) minimum floor levels, as determined by a Flood Hazard Assessment are incorporated into the design of the development to ensure buildings are located above the flood level so that the risk to life and potential for property damage from flooding is mitigated; b) the risk to surrounding properties is not significantly increased; and c) the development is not likely to require new or upgraded public natural hazard mitigation works to be undertaken by a local authority. 2. subdivision and new natural hazard sensitive buildings unless it is: <ol style="list-style-type: none"> a) not likely to result in loss of life or serious injuries; and 	

¹⁸ CRC (50.21)¹⁹ CRC (50.22)²⁰ DOC (42.06)²¹ Clause 16(2)²² DOC (42.07)²³ Nova (56.05)²⁴ DOC (42.07)²⁵ Transpower (31.08)

- b) not likely to suffer significant damage or loss; and
- c) not likely to require new or upgraded public natural hazard mitigation works to be undertaken by a local authority to mitigate or avoid the natural hazard; and
- d) not likely to exacerbate the effects of the natural hazard.

3. subdivision unless it is:

- a) managed to ensure land use enabled by subdivision does not result in an unacceptable risk to people and property that cannot be mitigated to an acceptable level.

4. new critical infrastructure unless:

- a) there is a functional need or operational need to locate in that environment; and
- b) the infrastructure is designed to be resilient to flood hazard as far as is practicable; and
- c) the infrastructure is designed so as not to increase flood risk to people and property.

NH-P6	Natural Hazard Mitigation Works
Enable natural hazard mitigation works which must consider:	
<ul style="list-style-type: none"> 1. approaches to risk management that reduce the need for physical works and engineering interventions; 2. the nature of the natural hazard risk and how it might change over at least a 100-year timeframe, including the potential effects of climate change; 3. the potential for adverse effects on the values of outstanding natural landscapes and features, areas of significant indigenous vegetation and significant habitats of indigenous fauna, SASM, or HH-SCHED2 sites and heritage areas; and 4. the physical works necessary to ensure that the form and location of any structure is designed to minimise adverse effects on the environment. 	
NH-P7	Fault Hazard
Subdivision, land use and development, <u>except as provided for by policy NH-P8²⁶</u> , is:	
<ul style="list-style-type: none"> 1. managed in the Fault Hazard (Subdivision) <u>Assessment²⁷</u> Overlay to ensure land use enabled by subdivision does not result in an unacceptable risk to people and property; and 2. avoided in the Ostler Fault Hazard Area Overlay if the subdivision, use or development increases risks associated with the surface fault rupture that cannot be mitigated to an acceptable level. 	
NH-P8	Fault Hazard Risk to Critical Infrastructure and Specific Buildings
<ul style="list-style-type: none"> 1. Critical Infrastructure only locates within the Fault Hazard (Critical Infrastructure) <u>Assessment²⁸</u> Overlay where: <ul style="list-style-type: none"> a) there is a functional need or operational need to locate in that environment; and b) the infrastructure is designed to be resilient to surface fault rupture hazard as far as is practicable. 2. <u>²⁹Any buildings used for critical infrastructure, major hazard facilities, education facilities or visitor accommodation activities</u> only locate within the Fault Hazard (Critical Infrastructure) <u>Assessment³⁰</u> Overlay where: 	

²⁶ Transpower (31.09)

²⁷ Clause 16(2)

²⁸ Clause 16(2)

²⁹ Clause 16(2)

³⁰ Clause 16(2)

<p>a) the building can be designed to manage the risks <u>resulting from a surface fault rupture hazard</u>³¹ to people and property, and buildings on adjoining sites, to an acceptable level.</p>	
NH-P9	Subdivision within the Liquefaction <u>Assessment</u>³² Overlay
<p>Manage subdivision within the Liquefaction <u>Assessment</u>³³ Overlay to ensure it does not result in an unacceptable risk to people and property.</p>	
NH-P10	Wildfire
<p>Control planting at the urban-rural interface to assist with reducing the spread of wildfire.</p>	

Rules

NH-R1	New Natural Hazard Sensitive Buildings	
Flood Hazard Assessment Overlay	Activity Status: PER Where: <ol style="list-style-type: none"> 1. A Flood Hazard Assessment is issued in accordance with NH-S1 and is provided to Council; and 2. The building is located outside of a High Flood Hazard Area as stated in a Flood Hazard Assessment issued in accordance with NH-S1; and 3. The building has a finished floor level equal to or higher than the minimum floor level as stated in a Flood Hazard Assessment issued in accordance with NH-S1. 	Activity status when compliance is not achieved with R1.1: refer to standard Activity status when compliance is not achieved with R1.2: NC Activity status when compliance is not achieved with R1.3: RDIS Matters of discretion are restricted to: <ol style="list-style-type: none"> a. NH-MD1
NH-R2	Extensions to Existing Natural Hazard Sensitive Buildings	
Flood Hazard Assessment Overlay	Activity Status: PER Where: <ol style="list-style-type: none"> 1. The extension does not increase the floor area by more than 25m² in any continuous 5-year period; or 2. The extension has a finished floor level equal to or higher than the minimum floor level as stated in the Flood Hazard Assessment issued in accordance with NH-S1, and the assessment is provided to Council. 	Activity status when compliance is not achieved with R2.1 – R2.2: RDIS Matters of discretion are restricted to: <ol style="list-style-type: none"> a. NH-MD1

³¹ Meridian (39.12)

³² Clause 16(2)

³³ Clause 16(2)

NH-R3	New non critical infrastructure, or the operation, maintenance, repair, replacement, upgrading of non critical infrastructure and the operation, maintenance, repair, replacement, upgrading of critical infrastructure	
Flood Hazard Assessment Overlay	Activity Status: PER Where: <ol style="list-style-type: none"> 1. The activity does not result in the permanent raising of the ground level. 	Activity status when compliance is not achieved with R3.1: RDIS Matters of discretion are restricted to: <ol style="list-style-type: none"> a. NH-MD1
NH-R4	New Critical Infrastructure	
Flood Hazard Assessment Overlay	Activity Status: PER Where: <ol style="list-style-type: none"> 1. It is located outside a High Flood Hazard Area as stated in a Flood Hazard Assessment issued in accordance with NH-S1; and 2. The Flood Hazard Assessment is provided to Council. 	Activity status when compliance is not achieved with R4.1 - R4.2: RDIS Matters of discretion are restricted to: <ol style="list-style-type: none"> a. The extent to which infrastructure increases the natural hazard risk or transfers the risk to another site. b. The ability for flood water conveyance to be maintained. c. The extent to which there is a functional or operational requirement for the infrastructure to be located in the High Flood Hazard Area. d. The extent to which the location and design of the infrastructure can address relevant natural hazard risk and appropriate measures that have been incorporated into the design to provide for the continued operation of the infrastructure. e. Any positive effects from the proposal.
NH-R5	Natural Hazard Mitigation Works	
All Zones	Activity Status: PER Where:	Activity status when compliance is not achieved with R5.1 - R5.2³⁶: RDIS

³⁶ CRC (50.28)

	<p>The works are:</p> <ol style="list-style-type: none"> 1. The maintenance or operation of any existing natural hazard mitigation works, or 2. The upgrading of any or establishment of new natural hazard mitigation works administered by a Regional Council or Territorial Authority. ³⁴ <p><u>3. New natural hazard mitigation works administered by a Regional Council or Territorial Authority provided:</u></p> <ol style="list-style-type: none"> a. <u>the works are outside of an area identified as SASM, ONL or ONF; and</u> b. <u>the works are soft engineering natural hazard mitigation</u> <p>Note: The earthworks provisions in Earthworks Chapter shall not apply to any activity permitted under NH-R5.<u>1, 5.2 and 5.3.</u>³⁵</p>	<p>Matters of discretion are restricted to:</p> <ol style="list-style-type: none"> a. NH-MD2
All Zones	<p>Activity Status: RDIS</p> <p>Where:</p> <p>The works are:</p> <p><u>34. The upgrading or establishment of any new natural hazard mitigation works not administered by a Regional Council or Territorial Authority.</u></p> <p>Matters of discretion are restricted to:</p> <ol style="list-style-type: none"> a. <u>NH-MD2</u>³⁷ 	<p>Activity status when compliance is not achieved with R5.3: DIS</p>
NH-R6	<p>New critical infrastructure, major hazard facilities, education facilities and visitor accommodation activities or extensions to existing critical</p>	

³⁴ CRC (50.28)

³⁷ Clause 10(2)(b) relating to CRC (50.28)

	infrastructure and major hazard facilities, education facilities and visitor accommodation activities	
Fault Hazard (Critical Infrastructure) <u>Assessment</u>³⁸ Overlay	<p>Activity Status: RDIS</p> <p>Matters of discretion are restricted to:</p> <ul style="list-style-type: none"> a. The extent to which there is a functional need or operational need for the critical infrastructure to be located in the Fault Hazard (Critical Infrastructure) <u>Assessment</u>³⁹ Overlay. b. The extent to which the location and design of the critical infrastructure, major hazard facility, education facility or visitor accommodation activities addresses relevant natural hazard risk and appropriate measures that have been incorporated into the design to provide for the continued operation of the infrastructure or building <u>in a fault rupture event</u>.⁴⁰ c. The location of the critical infrastructure, major hazard facility, education facility or visitor accommodation activities and the extent to which the siting and layout of the development will reduce the effects of surface fault rupture and tilting on people and their property. d. The extent to which geotechnical and/or engineering reports show that: <ul style="list-style-type: none"> i. risks to the structural integrity of the critical infrastructure, major hazard facility, education facility or visitor accommodation activities can be appropriately managed <u>in a fault rupture event</u>⁴¹, and ii. the safety of occupiers of the critical infrastructure, major 	

³⁸ Clause 16(2)³⁹ Clause 16(2)⁴⁰ NHC (29.19)⁴¹ NHC (29.19)

	<p>hazard facility, education facility or visitor accommodation activities can be provided for; and</p> <p>iii. buildings on adjoining sites of the critical infrastructure, major hazard facility, education facility or visitor accommodation activities can be protected.</p> <p>e. <u>Any positive effects from the proposal⁴².</u></p>	
NH-R7	New and Relocated Residential Units, Minor Residential Units	
Ostler Fault Hazard Area Overlay	Activity Status: DIS	
NH-R8	Buildings and Structures <u>Not Provided for by NH-R6 or⁴³ Not Otherwise Provided For</u>	
Ostler Fault Hazard Area Overlay	<p>Activity Status: RDIS</p> <p>Matters of discretion are restricted to:</p> <p>a. The location of the building and the extent to which the siting and layout of the development will reduce the effects of surface fault rupture and tilting on people and their property.</p> <p>b. The extent to which geotechnical and engineering reports show that risks to buildings and the safety of occupiers and neighbours can be appropriately managed or reduced to an acceptable level.</p>	
NH-R9	Residential Visitor Accommodation	
Ostler Fault Hazard Area Overlay	Activity Status: DIS	
NH-R10	Planting within Te Manahuna/Mackenzie Basin ONL	
Te Manahuna/Mackenzie Basin ONL	<p>Activity Status: PER</p> <p>1. Only low flammable plants listed in SCHED-NH1 shall be planted within 6m of the following zones:</p> <p>a. RESZ;</p>	<p>Activity status when compliance is not achieved with R10.1: RDIS</p> <p>Matters of discretion are restricted to:</p>

⁴² Transpower (31.11)

⁴³ Meridian (39.15)

	<ul style="list-style-type: none"> b. GIZ; c. CMUZ; and d. SPZ. 	<ul style="list-style-type: none"> a. The effectiveness of alternative plants or methods proposed to manage the spread of wildfire.
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Standards

NH-S1	Flood Hazard Assessment	Activity Status where compliance not achieved:
Flood Hazard Assessment Overlay	<p>1. A Flood Hazard Assessment has been issued (that is valid for three <u>five</u>⁴⁴ years from the date of issue) which specifies:</p> <ul style="list-style-type: none"> a. Whether or not the activity is located on land that is within a High Flood Hazard Area; and b. A minimum finished floor level for any new building or extension (or part thereof) that is 300mm above the 500 year ARI flood event level. <p>Note: Compliance with this standard shall be demonstrated by a Flood Hazard Assessment prepared by a person or organisation that has been certified by the Mackenzie District Council as being suitably qualified and experienced, or Canterbury Regional Council: https://www.ecan.govt.nz/do-it-online/property-information/flood-hazard-assessments/</p> <p>Note: A Flood Hazard Assessment can either be issued on an individual project basis or on a site-wide basis (as determined by the author of the assessment)⁴⁵</p>	NC

⁴⁴ NZDF (65.07)

⁴⁵ NZDF (65.07)

Matters of Discretion

NH-MD1 Activities in Flood Hazard Assessment Overlay

- a. The likely nature and extent of flooding on the site and the potential to worsen flooding on another site.
- b. The extent to which the free passage of floodwaters is likely to be exacerbated.
- c. The nature, design, and intended use of the building and its susceptibility to damage.
- d. Proposals to mitigate any risk arising from natural hazards on the site, including risk to the health and safety of occupants.
- e. Any positive effects from the proposal.

NH-MD2 Natural Hazard Mitigation Works

- a. The effectiveness of any proposed natural hazard mitigation works and the alternative design options considered, including low impact design.
- b. Any adverse effects on the environment of any proposed mitigation measures.
- c. The extent to which the mitigation works transfer, or create, unacceptable hazard risk to other people, property or infrastructure.
- d. The potential for the proposal to exacerbate natural hazard risk, including transferring risk to any other site.
- e. Whether or not the work would be carried out under the supervision of either a Chartered Professional Engineer with experience in geotechnical engineering or a Professional Engineering Geologist (IPENZ registered).

Schedule

SCHED-NH1

LOW FLAMMABLE PLANTS	<ul style="list-style-type: none">• <i>Plagianthus regius</i> (ribbonwood, manatu, hou, manau manatu, puruhi or whauwhi)• <i>Fuchsia excorticata</i> (tree fuchsia, New Zealand fuchsia or kōtukutuku)• <i>Pseudopanax crassifolius</i> (horoeka or lancewood)• <i>Pseudopanax arboreus</i> (five finger, puahou or whauwhaupaku)• <i>Coprosma robusta</i> (karamu)• <i>Coprosma autumnalis</i> (kanono or raurēkau)• <i>Geniostoma ligustrifolium</i> (hangehange or native privet)• <i>Coprosma australis</i> (kanono or raurēkau)• <i>Coprosma propinqua</i> (mingimingi)• <i>Coprosma repens</i> (tree bedstraw, taupata, mirror bush, looking-glass bush, New Zealand laurel or shiny leaf)• <i>Carpodetus serratus</i> (putaputawētā, marbleleaf or bucket-of-water-tree)• <i>Corynocarpus laevigatus</i> (karaka or New Zealand laurel)• <i>Griselinia littoralis</i> (kapuka, New Zealand broadleaf or papauma)• <i>Griselinia lucida</i> (puka, akapuka or shining broadleaf)• <i>Myrsine australis</i> (mapou or red matipo)• <i>Piper excelsum</i> (pepper tree or kawakawa)
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	<ul style="list-style-type: none">• <i>Pennantia corymbosa</i> (kaikomako, bellbird tree)• <i>Solanum aviculare</i> (New Zealand nightshade or poroporo)• <i>Sophora microphylla</i> (kowhai)• <i>Coprosma crassifolia</i> (mikimiki)• <i>Solanum laciniatum</i> (poroporo, Tasmanian kangaroo apple)• <i>Aristotelia fruticosa</i> (mountain, shrubby wineberry)• <i>Coprosma arborea</i> (mamangi, tree coprosma)• <i>Dysoxylum spectabile</i> (kohekohe, NZ mahogany)• <i>Pittosporum divaricatum</i>
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