



22 Natural Hazards

22.1 Purpose

- a) This chapter establishes a city-wide framework for managing the use, development and subdivision of land affected by natural hazards.
- b) A natural hazard is the result of natural processes that form, shape and alter the environment. Natural hazards are any atmospheric, earth or water-related occurrence that may adversely affect human life, property or the environment. They include earthquakes, tsunamis, erosion, volcanic and geothermal activity, landslips, subsidence, sedimentation, wind, drought, fire, and flooding.
- c) Flooding and land instability (erosion, landslips and subsidence) are natural hazards of particular relevance to Hamilton. It is these hazards that this chapter focuses on. Other natural hazards are managed by other statutory instruments or processes.
- d) Land may fall within one or more hazard areas identified within the Planning Maps. These are:
 - i. High Flood Hazard Area.
 - ii. Medium Flood Hazard Area.
 - iii. Low Flood Hazard Area.
 - iv. Temple View Flood Hazard Area.
 - v. Culvert Block Flood Hazard Area.
 - vi. Waikato Riverbank and Gully Hazard Area.

Flood Hazard Areas

- e) The Low, Medium and High Flood Hazard Areas have been identified using flood hazard modelling. The flood hazard modelling covers five areas of the City and the Waikato River corridor. These Flood Hazard Areas show land predicted to be affected by river flooding, water ponding or overland flowpaths in a storm event that has a 1% chance of occurring in any one year. New development on sites predicted to be affected will need to comply with minimum floor level standards.
- f) The Low, Medium and High categories of Flood Hazard Areas are based on combinations of water depth and speed, and proximity to the Waikato River. Generally, the deeper or faster the water the greater the consequence if people or property are exposed to it (i.e. the greater the risk). This is reflected in the policies and rules that relate to Flood Hazard Areas whereby a more restrictive approach exists within High Flood Hazard Areas compared with the Medium or Low Flood Hazard Areas.
- g) The modelling process on which the Low, Medium and High categories are based will be undertaken for the rest of the City over time.

- h) For the rest of the City, specific Flood Hazard Areas have been derived from the Operative District Plan 2012, which identified areas of potential flooding in Temple View and if specific culverts become blocked in a storm event.
- i) The Temple View Flood Hazard Area applies to parts of Temple View that are susceptible to flooding. These areas are associated with small-scale farm dams and secondary flow paths that are part of the Waipa Flood Prevention Scheme.
- j) The Culvert Block Flood Hazard Areas apply upstream of significant culverts along the gully system. These represent the maximum effect of a culvert becoming blocked whereby water backs up the gully until it eventually overtops the accessway or transport corridor above the culvert.

Waikato Riverbank and Gully Hazard Area

- k) The slopes and soil types of the Waikato Riverbank and Gully systems potentially make these areas more susceptible to land instability (erosion, land slips and subsidence). In addition to controls within the Waikato Riverbank and Gully Hazard Area there are setbacks for nearby new development.

Note

1. Subdivision and development may also be managed with respect to natural hazards under s106 of the Act, and the Building Act 1991.
2. The boundaries for all hazard areas are derived from information that Council currently holds.
3. Details about the flood hazard modelling methodology, assumptions, limitations and validation, and a more detailed breakdown of flood water depth and speed components of the flood hazard mapping are held by Council.
4. There is no guarantee that specific sites outside the identified hazard areas will be unaffected by flooding or land instability during a natural hazard event.

22.2 Objectives and Policies: Natural Hazards

Objective	Policies
<p>22.2.1 Manage activities to avoid or mitigate adverse effects on, and minimise risk to:</p> <ul style="list-style-type: none"> • People; • Property; and • The environment, <p>from natural hazards, in order to increase community resilience, reduce the risks from natural hazards, and support effective and efficient response and recovery from natural hazard events.</p>	<p>22.2.1a Subdivision, use and development shall be managed to reduce the risks from natural hazards to an acceptable level, including by:</p> <ul style="list-style-type: none"> i. Ensuring risk and likely effects are assessed for new activities on land subject to natural hazards. ii. Reducing the risk to which existing use and development is exposed to tolerable or acceptable levels where these risks are considered unacceptable. iii. Controlling new use and development in areas subject to significant natural hazards to ensure that the natural hazard risk does not exceed acceptable levels. iv. Taking a precautionary approach by

	<p>minimising the vulnerability of new development adjoining natural hazard areas.</p> <ul style="list-style-type: none"> v. Recognising that sites may be subject to multiple hazards and the potential cumulative effect this may create. vi. When mitigation options are being considered in response to unacceptable hazard risks, giving priority to the use of non-structural solutions over new construction of natural hazard protection works or structures. vii. Recognising, maintaining or enhancing the role of natural features to avoid or minimise natural hazards. viii. Ensuring new activities do not create new or exacerbate existing natural hazards. ix. Having regard to the actual or potential effects of climate change on the occurrence or severity of natural hazards. x. Recognising that providing for redevelopment resulting in an increased level of development on site may create opportunities to reduce the overall level of existing risk.
	<p>Subdivision 22.2.1b Subdivision that increases the demand or potential for a greater number or extent of buildings and structures within the High Flood Hazard Areas shall be avoided.</p>
	<p>22.2.1c Subdivision creating new allotments shall ensure building platforms are identified and located on parts of the site that are free from any Hazard Area.</p>
	<p>22.2.1d Subdivision within a Flood Hazard Area shall only be allowed when:</p> <ul style="list-style-type: none"> i. The adverse effects of a flood event have been minimised and risk reduced to an acceptable level. ii. The activity does not create a new or exacerbate existing flood hazards.

	<p>Flood Hazard Areas</p> <p>22.2.1e New use and development that is vulnerable to the adverse effects of flooding events (including but not limited to residential units, child care facilities, community centres, schools and health care services) shall avoid High and Medium Flood Hazard Areas, Culvert Block Flood Hazard Areas and the Temple View Flood Hazard Area.</p> <p>22.2.1f Recognise that there are some new uses and development that are resilient to the adverse effects of flooding events and can be carried out in Flood Hazard Areas.</p> <p>22.2.1g New essential service infrastructure shall avoid Flood Hazard Areas if the infrastructure could become unusable or inaccessible during flood events.</p> <p>22.2.1h New regionally significant infrastructure shall be allowed within a Flood Hazard Area only when:</p> <ul style="list-style-type: none"> i. The infrastructure can not reasonably or practicably be located elsewhere. ii. The adverse effects of a flood event on the infrastructure are minimised to the extent practicable. <p>22.2.1i New use and development within a Flood Hazard Area shall only be allowed when:</p> <ul style="list-style-type: none"> i. The adverse effects of a flood event have been minimised and risk reduced to an acceptable level. ii. The activity does not create a new or exacerbate existing flood hazards. <p>22.2.1j New development shall avoid overland flow paths.</p> <p>22.2.1k New development shall be considered in areas subject to ponding hazards only where:</p> <ul style="list-style-type: none"> i. The extent of ponding is localised and not part of a widespread and contiguous ponding hazard. ii. The ponding depth does not hinder safe
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	<p>movement by the expected users of the development and evacuation routes are maintained.</p>
	<p>Waikato Riverbank and Gully Hazard Area 22.2.1l New use and development which is vulnerable to the adverse effects of land instability shall avoid the Waikato Riverbank and Gully Hazard Area, where the adverse effects and risks have not been minimised to an acceptable or tolerable level.</p>
	<p>22.2.1m New use and development which is resilient to the adverse effects of land instability shall be provided for in the Waikato Riverbank and Gully Hazard Area.</p>

Explanation

The potential consequences of allowing activities within areas affected by natural hazard events vary according to the nature and scale of the proposed activity. The hazard areas identified within this District Plan are affected by potentially significant hazards. Most activities within these areas will involve the preparation of a Risk Assessment Report as part of information requirements for building and resource consents.

Climate change can have the effect of increasing the occurrence or severity of natural hazards. When assessing risk of any activity, the effects of climate change should be considered. In addition to Ministry for Environment guidance reports, the Hamilton City Infrastructure Technical Specifications contain guidance on determining the effects of climate change on rainfall and how to reflect this in the design of stormwater infrastructure.

Some land uses have the effect of concentrating people into defined locations. Concentrating people in locations (e.g. residential activities at urban densities) that may be subject to natural hazards creates a greater risk than if the land was used only for lower population density uses.

Some activities are vital for emergency response and disaster recovery, including hospitals, emergency service facilities, and lifeline utilities. These activities need to be located in areas where their exposure to natural hazards is minimised. In some situations it will be impossible to provide lifeline utility services to the City without entering a hazard area (e.g. Three Waters infrastructure or the strategic transport network crossing the Waikato River). Where it has been established that there is no reasonable or practical alternative that would avoid a hazard area, then the activity should be allowed to proceed in a manner that minimises the level of risk.

Some activities are not sensitive to the effects of natural hazards and are considered low risk. These should be allowed to occur in hazard areas. For example outdoor recreational spaces and their associated activities. This ensures that the land is still able to contribute towards the functioning of the City while minimising the consequences of a natural hazard event.

New activities should not be allowed to create a new, or exacerbate an existing, hazard, e.g. development which diverts flood water on to a neighbouring site or alters the hydrological capacity of a flood plain. These include walls, fences, earthworks, vegetation removal, construction of buildings and structures, and increasing impervious surfaces.

The policy of minimising the vulnerability of new development beyond the identified hazard layers is a precautionary approach intended to respond to potential inaccuracies in modelling and data, and the uncertainty that exists with designing for hazard events.

In some situations redevelopment on a site affected by a natural hazard may provide an opportunity to reduce the overall level of existing risk. For example, the added risk from increasing the amount of habitable floor area on land in a flood hazard area may be offset by the reduction in overall risk if the redevelopment also involves raising floor levels of existing habitable areas to meet minimum freeboard levels.

22.3 Rules – Activity Status Table

Activity	Hazard Areas					
	High Flood	Medium Flood	Low Flood	Temple View Flood	Culvert Block Flood	Waikato Riverbank and Gully
Trees and Other Vegetation						
a) Removal of trees or other vegetation	P	P	P	P	P	P
b) Planting of trees or other vegetation	P	P	P	P	P	P
c) Trimming and maintenance of existing trees or other vegetation	P	P	P	P	P	P
d) Pest control	P	P	P	P	P	P
e) Removal of dead, diseased or damaged trees or other vegetation where this is necessary to: <ul style="list-style-type: none"> i. Avoid the death, destruction or irreparable damage of remaining trees or vegetation ii. Where it constitutes an imminent hazard to people and property iii. Where it affects the operation of existing network utilities, or iv. For the purpose of maintaining existing tracks and fencing 	P	P	P	P	P	P
f) Removal of vegetation as part of any farming, horticultural or domestic gardening activity	P	P	P	P	P	P

Activity	Hazard Areas					
	High Flood	Medium Flood	Low Flood	Temple View Flood	Culvert Block Flood	Waikato Riverbank and Gully
g) Removal, trimming or maintenance of trees and vegetation identified in: <ul style="list-style-type: none"> Volume 2, Appendix 9, Schedule 9C: Significant Natural Areas, or Volume 2, Appendix 9, Schedule 9D: Significant Trees 	Refer to Chapter 20: Natural Environments.					
Building, Structures, Earthworks and Development						
h) New buildings	NC	D	P	D	P	D
i) Replacement or rebuilding of existing lawfully established buildings	P	P	P	P	P	P
j) Alterations or additions to buildings which results in: <ul style="list-style-type: none"> i. Greater building site coverage, or ii. An increase in habitable floor area 	NC	D	P	D	P	D
k) Other alterations or additions to buildings	P	P	P	P	P	P
l) Demolition or removal of buildings	P	P	P	P	P	P
m) Maintenance or repair of buildings	P	P	P	P	P	P
n) Demolition, removal, maintenance, repair, alterations or additions to buildings identified in Volume 2, Appendix 8, Schedule 8A: Built Heritage	Refer to Chapter 19: Historic Heritage					
o) Earthworks ancillary to a permitted activity in this table	P	P	P	P	P	P
p) Earthworks not otherwise identified in this table	D	D	D	D	D	D
q) Flood protection structures	D	D	D	D	D	D
r) Ancillary residential structures (excluding swimming pools, walls and fences)	P	P	P	P	P	P
s) Soil conservation, river and erosion control works	P	P	P	P	P	P
t) Walkways and cycle paths	P	P	P	P	P	P
u) Swimming pools	P	P	P	P	P	PD
v) Fences and walls	RD	RD	P	P	P	P

Activity	Hazard Areas					
	High Flood	Medium Flood	Low Flood	Temple View Flood	Culvert Block Flood	Waikato Riverbank and Gully
w) External storage of goods and materials (excluding hazardous facilities – refer Chapter 25.4: City-wide – Hazardous Facilities)	P	P	P	P	P	P
Land Uses – Tolerant						
x) Recreational activities	P	P	P	P	P	P
y) Farming, horticultural or domestic gardening activities	P	P	P	P	P	P
z) Events	Refer to Chapter 25.3: City-wide - Events and Temporary Activities					
aa) All temporary activities						
Land Uses – Vulnerable						
bb) Any residential activity	NC	NC	P	NC	P	D
cc) Any industrial activity	NC	D	P	D	P	D
dd) Any retail activity	NC	D	P	D	P	D
ee) Childcare facility	NC	NC	P	NC	P	D
ff) Community centre	NC	D	P	D	P	D
gg) Health care services	NC	D	P	D	P	D
hh) Offices	NC	D	P	D	P	D
ii) Schools	NC	NC	P	NC	P	D
Activities on the Surface of Water						
jj) Events or activities associated with events on the Waikato River or Lakes (motorised or non-motorised)	Refer to Chapter 25.3: City-wide - Events and Temporary Activities					
kk) Private recreation on the surface of water	Refer to Chapter 15: Open Space Zones					
ll) Commercial activities on the surface of water						
mm) Pontoon/jetty						
Land Uses – Essential Services and Regionally Significant Infrastructure						
nn) Emergency service facilities	NC	NC	P	NC	P	NC
oo) Hospitals	NC	NC	P	NC	P	NC
pp) Lifeline utilities – excluding stormwater infrastructure (at ground level)	NC	NC	P	NC	P	NC

Activity	Hazard Areas					
	High Flood	Medium Flood	Low Flood	Temple View Flood	Culvert Block Flood	Waikato Riverbank and Gully
qq) Lifeline utilities – stormwater infrastructure only (at ground level)	P	P	P	P	P	NC
rr) Lifeline utilities (above ground level)	P	P	P	P	P	P
ss) Lifeline utilities (below ground level)	P	P	P	P	P	NC
tt) Maintenance and repair of existing lifeline utilities	P	P	P	P	P	P
uu) Regionally Significant Infrastructure (not otherwise covered in this table)	NC	NC	P	NC	P	NC
All Activities and Structures						
vv) Any activity not listed above	NC	NC	NC	NC	NC	NC

Note

1. This chapter focuses on the hazard risk element of land-use management. Activities identified in the table above may also be subject to standards within the relevant zone or other City-wide chapters. When there is a more onerous rule in another chapter then the more onerous rule prevails.
2. The Regional Plan also contains rules relevant to natural hazards.

22.4 Rules – General Standards

22.4.1 Impermeable Surfaces

- a) The maximum area of impermeable surface in that part of a site within a Hazard Area shall be 40%.
- b) This standard does not apply to transport corridors.

22.5 Rules – Specific Standards

22.5.1 Earthworks Ancillary to a Permitted Activity

- a) The following standards apply within the Waikato Riverbank and Gully Hazard Area only.

Earthworks must not exceed the following maximums	
i. Volume: <ul style="list-style-type: none"> • Per site per calendar year; or • Per 50m length of the watercourse or gully if part of an esplanade reserve or Open Space Zone per calendar year 	25m ³
ii. Cut depth	0.5m

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|----|------------------|------|
| b) | iii. Fill height | 0.5m |
|----|------------------|------|
- c) Earthworks shall be clean fill only.
- d) Earthworks shall not:
- i. Result in the subject site or any other site becoming unstable, or
 - ii. Create or exacerbate any natural hazards at the subject site or any other site.
- e) All bare earth shall be re-vegetated or re-grassed as soon as practicably possible and within one calendar month following the completion of earthworks.
- f) If this can not be achieved the area shall be temporarily covered by a surface suitable to protect against soil erosion until such time as re-vegetation or re-grassing can occur.

Note

1. Also refer to standards in Chapter 25.2: City-wide – Earthworks and Vegetation Removal.

22.5.2 Earthworks Ancillary to a Permitted Activity

- a) The following standards apply within Flood Hazard Areas only.
- b) Earthworks shall be clean fill only.
- c) Earthworks shall not:
- i. Raise natural ground level,
 - ii. Impede flood flows,
 - iii. Increase the adverse effects of flooding at the subject site, or
 - iv. Results in flood waters being diverted or displaced onto any other site to any greater degree.
- d) All bare earth shall be re-vegetated or re-grassed as soon as practicably possible and within one calendar month following the completion of earthworks.
- e) If this can not be achieved the area shall be temporarily covered by a surface suitable to protect against soil erosion until such time as re-vegetation or re-grassing can occur.

Note

1. Also refer to standards in Chapter 25.2: City-wide – Earthworks and Vegetation Removal.

22.5.3 External Storage of Goods and Materials

- a) The following standards apply within the Flood Hazard Areas only.
- b) In a 1% annual exceedance probability event goods or materials that are stored outside shall not:
- i. Be able to be mobilised by flood water,
 - ii. Impede flood flows,
 - iii. Increase the adverse effects of flooding at the subject site, or
 - iv. Result in flood waters being diverted or displaced onto any other site to any greater degree.

Note

1. Acceptable means of compliance with this standard includes storing goods and materials above the 1% annual exceedance probability event flood level on a structure designed to allow flood waters to pass beneath, through or around, in a manner that ensures flood waters are not diverted or displaced onto any other site.
- c) Rule 22.5.3(b) above shall not apply to the temporary storage of goods and materials for on-site construction work or as part of an event or temporary activity.

22.5.4 Removal of Trees and Other Vegetation

- a) The following standards apply within the Waikato Riverbank and Gully Hazard Area only.
- b) The removal of any tree or other vegetation shall not:
 - i. Result in the subject site or any other site becoming unstable, or
 - ii. Create or exacerbate any natural hazards at the subject site or any other site.

Note

1. In order to provide for people's health and safety and to minimise adverse effects on the stability of a site, the removal of any tree or other vegetation within the Waikato Riverbank and Gully Hazard Area should be undertaken by, or under the direction of, a suitably experienced person. In addition, the removal of large trees, or groups of smaller trees, on steep sites may require geotechnical engineering input.
- c) All bare earth shall be re-vegetated or re-grassed as soon as practicably possible and within one calendar month following the completion of earthworks.
- d) If this can not be achieved the area must be temporarily covered by a surface suitable to protect against soil erosion until such time as re-vegetation or re-grassing can occur.
- e) The area of vegetation clearance shall not exceed:
 - i. 50m² per calendar year, per site, or
 - ii. 100m² per calendar year for each 50m length of watercourse or gully that is part of an esplanade reserve or Open Space Zone.

Note

1. Also refer to standards in Chapter 25.2: City-wide – Earthworks and Vegetation Removal.

22.5.5 Fences and Walls

- a) All fences and walls within a Flood Hazard Area (excluding Low Flood Hazard Areas) shall be designed to allow flood waters, in a 1% annual exceedance probability event, to pass beneath, through or around, in a manner that ensures flood waters are not diverted or displaced onto any other site to any greater degree.

Note

1. Hedges are not affected by this standard.

22.5.6 New Buildings, Replacement or Rebuilding of Existing Lawfully Established Buildings, and Alterations or Additions to Existing Buildings

Displacement of Flood water and structural design

- a) New buildings, replacement or rebuilding of existing lawfully established buildings within any Flood Hazard Area shall:
- i. Ensure that floodwaters in a 1% annual exceedance probability event are not diverted or displaced onto any other site.
 - ii. Be structurally sufficient to withstand the effects of inundation in a 1% annual exceedance probability event.
 - iii. In the Low Flood Hazard Area, i) above does not apply where compliance with the building site coverage rules (if any) of the relevant zone are achieved, and ii) above does not apply at all.

Minimum floor heights and freeboard

- b) On any site that is fully or partly affected by the Culvert Block Flood Hazard Area the minimum floor levels shall be 150mm above the flood level shown on the Planning Maps.
- c) On any site that is fully or partly affected by any Flood Hazard Area (excluding the Culvert Block Flood Hazard Area) the following minimum freeboard heights shall be complied with, which are additional to the top water flood level of the 1% annual exceedance probability event.

Building use	Minimum freeboard height
i) Residential buildings (including attached garages)	0.5m
ii) Commercial and industrial buildings	0.3m
iii) Non-habitable residential buildings and detached garages	0.2m

Except that in the Low Flood Hazard Area i) and iii) shall not apply to:

- Habitable extensions and alterations to existing residential buildings, which instead shall be no lower than the floor level of the existing building.
- Non-habitable extensions and alterations to existing residential buildings.
- Detached garages and accessory buildings.

Note

1. Building Act provisions regarding minimum floor levels and freeboard will continue to apply for all buildings.
- d) Minimum freeboard heights shall be measured from the top water level of the 1% annual exceedance probability design storm to whichever is applicable of the following:
- i. Building platform level
 - ii. The underside of the floor joists, or
 - iii. Underside of the floor slab.
- e) As an alternative to the minimum freeboard heights contained in d) above the recommended freeboards of a site-specific flood risk assessment report prepared

in accordance with Information Requirements in Volume 2, Appendix 1.2.2.9, can be used.

22.5.7 Vulnerable Activities, Essential Services and Regionally Significant Infrastructure

- a) The following activities may operate from buildings on a site that is fully or partly affected by any Flood Hazard Area only if those buildings comply with the relevant standards in Rule 22.5.6:
 - i. Any residential activity
 - ii. Any industrial activity
 - iii. Any retail activity
 - iv. Childcare facility
 - v. Community centre
 - vi. Tertiary education and specialised training facilities
 - vii. Health care services
 - viii. Offices
 - ix. Schools
 - x. Emergency service facilities
 - xi. Hospitals
 - xii. Lifeline utilities – excluding stormwater infrastructure (at ground level)
 - xiii. Regionally Significant Infrastructure

22.5.8 Lifeline Utilities (Above Ground Level)

- a) Lifeline utilities (above ground level) shall be at least 1m above the top water flood level of the 1% annual exceedance probability event.
- b) Lifeline utilities (above ground level) in the Culvert Block Flood Hazard Area shall be at least 1m above the flood level shown on the Planning Maps.

22.6 Restricted Discretionary Activities: Matters of Discretion and Assessment Criteria

- a) In determining any application for resource consent for a restricted discretionary activity, Council shall have regard to the matters referenced below, to which Council has restricted the exercise of its discretion. Assessment Criteria within Volume 2, Appendix 1.3.3 provide for assessment of applications as will any relevant objectives and policies. In addition, when considering any Restricted Discretionary Activity located within the Natural Open Space Zone, Waikato Riverbank and Gully Hazard Area, or Significant Natural Area, Council will also restrict its discretion to Waikato River Corridor or Gully System Matters (see the objectives and policies of Chapter 21: Waikato River Corridor and Gully Systems).

Activity Specific	Matter of Discretion and Assessment Criteria Reference Number (Refer to Volume 2, Appendix 1.3.3)
i. Fences and walls	F – Hazards and Safety

22.7 Non-Complying Activities in a Flood Hazard Area

- a) A flood risk assessment report in accordance with Information Requirements in Volume 2, Appendix 1.2.2.9, submitted as part of an application for a non-complying activity may be considered by Council to satisfy itself, under section 104D of the Act, that either:
- i. The adverse effects of the activity on the environment will be minor, or
 - ii. The activity will not be contrary to the objectives and policies of the District Plan,

on the basis that the actual site specific flood hazard and risk is lower than the assessment and categorisation set out in Rule 22.3.

22.8 Other Resource Consent Information

Refer to Chapter 1: Plan Overview for guidance on the following.

- How to Use this District Plan
- Explanation of Activity Status
- Activity Status Defaults
- Notification Defaults
- Rules Having Early or Delayed Effect

Refer to Volume 2, Appendix 1: District Plan Administration for the following.

- Definitions and Terms Used in the District Plan
- Information Requirements
- Controlled Activities – Matters of Control
- Restricted Discretionary, Discretionary and Non-Complying Activities Assessment Criteria
- Design Guides
- Other Methods of Implementation