# To the Planning Team, Manawatū District Council

Name of submitter: Sarah-Jayne McCurrach

Organisation: Natural Hazards Commission Toka Tū Ake

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Date: 18 July 2025

Thank you for the opportunity to submit on Plan Change B: General Residential (PC-B).

## About the Natural Hazards Commission Toka Tū Ake (NHC)

The Natural Hazards Commission Toka Tū Ake (NHC) is a Crown Entity responsible for providing residential property owners (who have a current contract of fire insurance for their residential property) with insurance against damage from natural hazards, covered by the Natural Hazards Insurance Act 2023 (NHI Act). NHC provides limited cover for:

- building and land damage from earthquakes, landslides, tsunami, volcanic and hydrothermal activity, and fire following these hazards, and
- land damage only from storm or flood, and
- fire following these hazards.

## Why NHC is providing this submission

NHC's primary objective is to *'reduce the impact of natural hazards on people, property, and the community'*. To achieve this objective, NHC's functions, as set out in the NHI Act, include: facilitate research and education, and contribute to the sharing of information, knowledge, and expertise (with the Crown, public and private entities, and the public generally), including in relation to:

- natural hazards and their impacts,
- community resilience to natural hazards, and
- planning for, and recovering from, natural hazards.

As NHC is the 'first loss' insurer for residential damage resulting from natural hazards listed in the NHI Act, NHC carries financial risk on behalf of the Crown. We also see the impacts of natural hazards in the insurance claims we receive. This means that NHC has leading insights and a strong interest in reducing risk from, and building resilience to, natural hazards across New Zealand.

Our investments in research and education about natural hazards enable us to use and translate this information to support evidence-based, policy and planning. Our focus is on ensuring long-term resilience by encouraging building in areas that will remain safe and sustainable for future generations. Developing in zones at high risk from natural hazards exposes future owners to complex and potentially hazardous situations, which could compromise the longevity and safety of these developments.

Climate change is also increasing the occurrence and severity of natural hazards covered by the NHC Scheme. Therefore, we support clear, risk-based policy frameworks that reduce natural hazard risks,

allow for resilient and sustainable land use planning to manage risk, and support community education and resilience towards natural hazards.

When we make submissions on council strategies and plans, our submissions relate to the suitability of the land proposed for development *without* mitigations. We do not submit on any individual planned or proposed developments. It is up to councils to decide whether the risks can be managed, and if the appropriate mitigations and management strategies are in place for individual consent applications.

Our advice and recommendations are not intended to impede development, but to highlight the importance of careful and precautionary choices to ensure resilient and sustainable communities in the future. Our goal is to support councils to ask the right questions and make risk-informed decisions.

Therefore, our advice to councils is to consider the risks and impacts on communities the district plan may create for the future. We encourage councils to ensure that they are satisfied that:

- Natural hazard risk has been assessed on a multi-hazard basis, over multiple timeframes, to at least 50, or preferably 100, years into the future, and using multiple climate change scenarios.
- Risks are mitigated to tolerable levels for the community and council. For example, is 'nuisance flooding' tolerable if it is ongoing?
- New developments do not create new/further risks to neighbouring suburbs, now, or in the future.
- There is a plan for managing any residual risks after mitigation.
- 'Status quo' of risk and risk tolerance are acceptable where long-term decisions are being made. E.g., an existing community being flood-, liquefaction-, or tsunami-prone is not justification for a new development having the same risks.

We advise councils to engage with private insurers to assess their tolerance for providing insurance to locations, risks, and developments. Insurability should be a key consideration when thinking about the risks and impacts on communities that are being created for the future.

The Manawatū District is exposed to a range of different natural hazards including fault rupture, ground shaking, liquefaction, tsunami, and flooding. Flooding in 2004 caused severe damage throughout the district, with 200 homes damaged and large-scale evacuations of affected communities. Climate change is projected to bring more intense and frequent rainfall events to the region, highlighting the need to have policies and rules in place to manage natural hazard risk now and in the future.

NHC encourages territorial authorities to use risk-based frameworks in district plans to reduce risk and increase resilience to natural hazards. PC-B contains provisions that we support in this regard, and we have provided suggestions in other areas that could be improved.

Please feel free to contact us at any time if you would like to discuss our submission.

Yours sincerely,

Sarah-Jayne McCurrach, Head of Risk Reduction, Natural Hazards Commission Toka Tū Ake

# Form 5, Clause 6 of Schedule 1, Resource Management Act 1991

**Natural Hazards Commission Toka Tū Ake Submission on Plan Change B: General Residential**

**To:** Manawatū District Council

via Council submission email: districtplanreview@mdc.govt.nz

**Submitter:** Natural Hazards Commission Toka Tū Ake (NHC)

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1. **This is a submission on the following:**

The Plan Change B: General Residential notified on 19 June 2025.

2. **NHC could not gain an advantage in trade competition through this submission.**

3. **NHC does not wish to be heard in support of this submission.**

4. **This document and the attached Appendices comprise the NHC submission. This submission relates to Plan Change B: General Residential in its entirety.**

5. **The submission from NHC is:**

NHC supports, is neutral, and opposes the Plan Change B: General Residential to the extent outlined in this submission.

a) **Stormwater Provisions** - NHC generally supports the stormwater provisions that are included for the General Residential Zone. The outlined provisions will be effective at managing stormwater and reducing the impacts to people and property in future flood events.

b) **Flood Inundation Areas** - NHC recommends updating the Flood Inundation Areas to be the same as what is provided by Horizons Regional Council. This would expand the likely inundation extent beyond existing waterways to include all areas of inundation during a flood event. This would support a precautionary approach to hazard risk management.

c) **Fault Avoidance Zone** – NHC recommends adding a new rule to restrict development and subdivision within Fault Avoidance Zones. Fault Avoidance Zones, provided by Horizons Regional Council, are located within the General Residential Zone and should be avoided as fault rupture can cause significant damage to people and property.

d) **Liquefaction Prone Areas** – NHC recommends amending liquefaction related provisions so that development is restricted in liquefaction prone areas. This will ensure they align with relevant guidance documents and will reduce the impacts to people and property in future hazard events.

Appendix 1 provides a table containing submission points that address the above, and other matters of relevance.

**6. NHC seeks the following decision from the local authority:**

That the specific amendments, additions or retentions outlined in Appendix 1, are accepted and adopted into Plan Change B: General Residential. This includes further, alternative, additional, or consequential relief as may be necessary to fully achieve the relief sought in this submission.

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| Date: | 18/07/2025 |
| Address for service: | Natural Hazards Commission Toka Tū Ake<br>PO Box 790,<br>Wellington<br>6140 |
| Contact person: | Sarah-Jayne McCurrach |
| Email: | resilience@naturalhazards.govt.nz |

## Appendix 1

| Provision | Description | Support/ Oppose/ Amend | Reasoning | Requested Action |
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| **GRZ-General Residential Zone** | | | | |
| GRZ-P3.3 Stormwater is appropriately managed to avoid adverse effects on the surrounding environment and occurs in an integrated manner by: | Prior to any development occurring, an integrated Stormwater Management Plan is submitted to Council that includes, as a minimum:<br>i. A detailed design of the stormwater treatment.<br>ii. Proposed low impact design methods to reduce stormwater runoff volumes and peak flow rates with improvement of the quality of stormwater runoff.<br>iii. How stormwater treatment and attenuation areas are to be maintained and managed.<br>iv. Whether specific freeboard and finished floor levels are required to manage flooding. | **Amend** | We support requiring a Stormwater Management Plan to outline how to reduce stormwater runoff volumes and peak flow rates. Managing runoff and peak flow rates is an effective way to manage storm water and flooding, to reduce the impacts to people and property in future flood events. However, we recommend that the Council provides clear guidance for freeboard and finished floor levels to avoid confusion and ensure the consistent application of rules and policies.<br>For example, the Australian Institute for Disaster Resilience[1] recommends a freeboard of 0.3-0.6m above the modelled flood level. We also recommend using at least a 1% AEP flood event to determine floor levels. This is becoming standard in New Zealand with Wellington City Council, Auckland Council, and Whangārei District Council also adopting rules for a 1% AEP flood.<br>[1]Australian Institute for Disaster Resilience. Managing the floodplain: A guide to best practice in flood risk management in Australia | The Council provides guidance on specific freeboard and finished floor level requirements and requires at least 1% AEP flood modelling. |

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| Guidance Note 7. | Rules relating to hazard sensitive activities and less hazard sensitive activities are managed by the Natural Hazards Chapter. | **Support** | We support the Council providing clear direction about when to apply the Natural Hazards Chapter of the district plan. This will avoid confusion and ensure the consistent application of rules and policies. Having the Natural Hazards Chapter prevail also ensures that robust policies and rules will be applied to managing natural hazard risk and reduce the impact to people and property in future natural hazard events. | Retain the provision. |
| GRZ-R1.1 Residential Activity, Residential and Minor Residential Units | Activity Status: Permitted<br><br>Where compliance is achieved with:<br><br>GRZ-ST10 – Stormwater Management and Impervious Surfaces | **Support** | We support requiring compliance with a standard for Stormwater Management and Impervious Surfaces as this will be able to reduce the impacts of flooding to people and property. However, we have provided recommended amendments to GRZ-ST10 as part of our submission. | Retain the provision; provided our requested amendments for GRZ-ST10 are accepted. |
| GRZ-MD8 Residential Activity, Residential and Minor Residential Units<br><br>Matters of Discretion | Avoidance or mitigation of flood hazard and stormwater inundation. | **Support** | We support maters of discretion including avoidance and mitigation of flood hazard and stormwater inundation. Considering avoidance and flood hazard mitigation in this way is an effective way to reduce the impacts to people and property in future flood events. | Retain the provision. |
| GRZ-MD9 Residential Activity, Residential and Minor Residential Units<br><br>Matters of Discretion | The disposal of stormwater and the supply, storage, and use of non-potable water to the residential unit. | **Support** | We support this mater of discretion. Effective stormwater disposal is essential for reducing flooding onsite and can reduce the impact to people and property in future flood events. | Retain the provision. |
| GRZ-MD10 Residential Activity, Residential and | The extent of impervious surfaces and landscaping and the suitability of any | **Support** | We support this matter of discretion. Impervious surfaces can increase the amount of runoff and surface flooding during a flood event. Therefore, to reduce the impacts to people and | Retain the provision. |

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| Minor Residential Units<br><br>Matter of Discretion | alternative stormwater management options. | | property in future flood events, the extent of impervious areas must be managed. | |
| GRZ-MD12 Residential Activity, Residential and Minor Residential Units<br><br>Matters of Discretion | Avoidance or mitigation of flood hazard and stormwater inundation. | **Support** | We support maters of discretion including avoidance and mitigation of flood hazard and storm water inundation. This is because avoidance of flood water and stormwater inundation is the most effective technique for reducing the impact to people and property in future flood events. | Retain the provision. |
| GRZ-R2.1 Building and structures (accessory buildings and non-residential buildings) | Activity Status: Permitted<br><br>Where: the building or structure is associated with or ancillary to a permitted activity, and where compliance is achieved with:<br><br>GRZ-ST10 – Stormwater Management and Impervious Surfaces | **Support** | We support accessory and non-residential buildings being a permitted activity. These structures represent areas that are non-habitable which means that people will be less exposed to any potential natural hazards in these buildings.<br><br>We also support requiring compliance with a standard for Stormwater Management and Impervious Surfaces as this will be able to reduce the impacts of flooding to people and property. However, we have provided recommended amendments to GRZ-ST10 as part of our submission. | Retain the provision; provided our requested amendments for GRZ-ST10 are accepted. |
| GRZ-MD18 Building and structures (accessory buildings and non-residential buildings)<br><br>Matters of Discretion | The management of stormwater, including extent & location of impervious surfaces. | **Support** | We support stormwater management and the location and extent of impervious surfaces as a matter of discretion. Impervious surfaces can increase the amount of runoff and surface flooding during a flood event. Therefore, to reduce the impacts to people and property in future flood events the extent of impervious areas must be managed. | Retain the provision. |
| GRZ-MD19 Building and structures (accessory buildings and non- | Avoidance or mitigation of flood hazard and stormwater inundation. | **Support** | We support maters of discretion including avoidance and mitigation of flood hazard and stormwater inundation. Avoidance of flood water and stormwater inundation is the | Retain the provision. |

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| residential buildings)<br><br>Matters of Discretion | | | most effective technique for reducing the impact to people and property in future flood events. | |
| GRZ-R6 Buildings in land identified as subject to inundation in GRZ-APP1 | Activity Status: Restricted Discretionary<br><br>Where compliance is achieved with:<br><br>GRZ-ST1 to GRZ-ST10 | **Support** | We support buildings in the identified inundation zones being a restricted discretionary activity. A restricted discretionary activity status is sufficient to restrict development in these areas and to reduce the impacts to people and property in future flood events. However, we have provided recommended amendments to the Standards and GRZ-APP1 as part of our submission. | Retain the provision; provided our requested amendments to GRZ-APP1 are accepted. |
| GRZ-MD33 Buildings on land identified as subject to inundation in GRZ-APP1<br><br>Matters of Discretion | The design, construction, and location of buildings having regard to their potential effect on flood water flows. | **Amend** | We support considering how buildings can affect flood water flows, as buildings can displace water to cause impacts to other downstream properties. However, we recommend expanding this matter to also include other structures such as fences. Fences have the potential to block flood water flows and cause additional ponding and/or inundation of water. Therefore, to reduce the impacts to people and property in future flood events the design, location, and construction of fences should also be considered. | The following amendment is made:<br><br>The design, construction, and location of buildings <u>and other structures including, but not limited to, fences and walls,</u> having regard to their potential effect on flood water flows. |
| GRZ-MD34 Buildings on land identified as subject to inundation in GRZ-APP1<br><br>Matters of Discretion | The minimum floor level of buildings. Hazardous sensitive buildings should be designed so as not to be entered by a 100-year flood (i.e. a flood event with a 1% annual probability of occurring). | **Amend** | We support assessing minimum floor levels, as raising floor levels can be an effective way to reduce the impact to people and property in future flood events. We also support requiring the modelled flood event to be at least 1% AEP, as this is becoming standard across the country. However, we recommend providing a clear definition for what the Council means as 'hazardous sensitive buildings' to avoid confusion and ensure consistent application of rules and policies. For example, Wellington City Council provides a list of hazard sensitive activities[1] that could be considered for this plan:<br><br>*a. Childcare Services*<br><br>*b. Community Facility* | The Council uses the following to provide a clear definition for hazardous sensitive buildings:<br><br>a. Childcare Services<br><br>b. Community Facility<br><br>c. Educational Facility<br><br>d. Emergency Service Facilities<br><br>e. Hazardous Facilities and Major Hazardous Facilities<br><br>f. Healthcare facility<br><br>g. Hospital |

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| | | | *c. Educational Facility*<br>*d. Emergency Service Facilities*<br>*e. Hazardous Facilities and Major Hazardous Facilities*<br>*f. Healthcare facility*<br>*g. Hospital*<br>*h. Marae*<br>*i. Multi-unit housing*<br>*j. Places of Worship*<br>*k. Residential Units and Minor Residential Units (including those associated with Papakainga)*<br>*l. Retirement Village*<br>*m. Visitor Accommodation*<br>[1]Wellington City Council Operative District Plan | h. Marae<br>i. Multi-unit housing<br>j. Places of Worship<br>k. Residential Units and Minor Residential Units (including those associated with Papakainga)<br>l. Retirement Village<br>m. Visitor Accommodation |
| GRZ-MD36 Buildings on land identified as subject to inundation in GRZ-APP1<br>Matters of Discretion | The management of stormwater, including extent & location of impervious surfaces. | **Support** | We support stormwater management and the location and extent of impervious surfaces as a matter of discretion. Impervious surfaces can increase the amount of runoff and surface flooding during a flood event. Therefore, to reduce the impacts to people and property in future flood events the extent of impervious areas must be managed. | Retain the provision. |
| New rule GRZ-R9<br>Buildings on land identified as within a Fault Avoidance Zone | Proposed new rule to manage development in Fault Avoidance Zones. | **Amend** | We recommend the Council adds a new provision that will manage development in areas identified on the Horizons Regional Council Natural Hazards Viewer[1] as within Fault Avoidance Zones. Much of the General Residential Zone is located within Fault Avoidance Zones (see Appendix 2) these areas must be avoided to reduce impacts to people and property. The effects from fault rupture include significant ground movement (often >5m of horizontal movement[2]), which would destroy buildings and infrastructure. There is no way of accurately predicting how and where ground deformation will occur in an earthquake, as each earthquake event is unique. | The Council adds a new rule to manage development in Fault Avoidance Zones. |

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| | | | Development in Fault Avoidance Zones should follow MfE's guidance document for planning around active fault traces[2]. Specifically, for ensuring setback of future allotments, buildings and infrastructure is at least 20m from the fault and for establishing building importance categories that subsequently manage certain types of development.<br><br>[1]Horizons Regional Council Natural Hazards Viewer.<br><br>[2]Ministry for the Environment (2003). Planning for development of land on or close to active faults. | |
| New rule GRZ-R10<br><br>Buildings in land identified as liquefaction prone | Proposed new rule to manage development in liquefaction prone areas. | **Amend** | We recommend that the Council adds a new provision that will manage development in areas identified as liquefaction prone.<br><br>NHC analysis of insurance claims from the Canterbury Earthquake Sequence shows that liquefaction damage claims amounted to around 15% of all claims, but accounted for approximately 55% of the total losses. These losses show that properties suffered significant damage where liquefaction was present. This suggests that the biggest determinant of loss was therefore not so much how a structure was built, but where it was built.<br><br>Rules for development within liquefaction prone areas should follow the MBIE/MfE Planning and Engineering Guidance for Potentially Liquefaction Prone Land[1]. Notably, areas assigned a high liquefaction classification should require a site-specific assessment of liquefaction issues.<br><br>[1]MBIE & MfE (2017). Planning and engineering guidance for potentially liquefaction-prone land Resource Management Act and Building Act aspects. | The Council adds a new rule to manage development in liquefaction prone areas. |
| GRZ-R7 Medium density development and Retirement Villages | Activity Status: Restricted Discretionary<br><br>Where compliance is achieved with: | **Support** | We support medium density development and retirement villages being restricted discretionary as these developments often have high levels of risk from increased exposure and/or increased levels of vulnerability. | Retain the provision. |

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| | GRZ-ST11 – Integrated Stormwater Management Plan<br><br>GRZ-ST14 – Context Analysis | | | |
| GRZ-MD42 Medium density development and Retirement Villages<br><br>Matters of Discretion | The management of stormwater, including extent & location of impervious surfaces. | **Support** | We support stormwater management and the location and extent of impervious surfaces as a matter of discretion. Impervious surfaces can increase the amount of runoff and surface flooding during a flood event. Therefore, to reduce the impacts to people and property in future flood events the extent of impervious areas must be managed. | Retain the provision. |
| **Standards** | | | | |
| GRZ-ST10.1 Stormwater Management and Impervious Surfaces | Where a connection to the Council's reticulated stormwater system is not available, all developments must be on a site of sufficient size to enable on site detention and disposal of stormwater (as measured in a 10% AEP). | **Amend** | We support requiring sites to have onsite detention and disposal of stormwater. However, we recommend that sites should be able to enable the detention and disposal of stormwater in at least a 1% AEP event. We recommend at least a 1% AEP event as it represents a larger flood than a 10% AEP event, and climate change is expected to bring more frequent and intense rainfall events to the Horizons region[1], which could exacerbate the effects of flooding. Therefore, to reduce the impacts to people and properties in future flood events, now, and into the future, developments should be able to manage stormwater in at least a 1% AEP event onsite, if they are not connected to the Council stormwater system. Further, planning for at least a 1% AEP is becoming standard across the country, with many Councils adopting this threshold (e.g. Wellington City Council, Auckland Council, and Whangārei District Council).<br><br>[1]NIWA (2019). Climate change implications for the Manawatū-Whanganui region. Prepared for Horizons Regional Council. | The following amendment is made:<br><br>Where a connection to the Council's reticulated stormwater system is not available, all developments must be on a site of sufficient size to enable on site detention and disposal of stormwater (as measured in at least a ~~10%~~ 1% AEP). |
| GRZ-ST10.2 Stormwater Management and | Stormwater from buildings and hard surfaces shall be managed and attenuated on-site using water sensitive | **Amend** | We support ensuring that pre-development peak flow and total discharge is not increased after development. However, we recommend amending this provision so that pre-development peak flow levels are reduced. Existing levels of risk should not | The following amendment is made:<br><br>Stormwater from buildings and hard surfaces shall be managed and |

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| Impervious Surfaces | urban design measures such that pre-development peak flow and total discharge from the site is not exceeded post-development, and all stormwater shall be disposed in accordance with the standards set out in SUB – Subdivision. | | be accepted when there are opportunities to reduce natural hazard risk. This amendment will contribute to reducing the impacts to people and property in future flood events. | attenuated on-site using water sensitive urban design measures such that pre-development peak flow and total discharge from the site is reduced ~~not exceeded post-development~~, and all stormwater shall be disposed in accordance with the standards set out in SUB – Subdivision |
| GRZ-ST10.3 Stormwater Management and Impervious Surfaces | All buildings and activities must provide the means for treatment, catchment, and disposal of stormwater from all impervious or potentially impervious surfaces, including, but not limited, to structures, compacted soils, and sealed surfaces, which shall be in accordance with Council Engineering Standards. | **Support** | We support buildings and activities providing for the catchment and disposal of stormwater from all impervious or potentially impervious surfaces. Impervious surfaces can exacerbate flooding by increasing runoff and limiting the absorption and drainage capacity for a site. Managing stormwater in this way can reduce the impacts to people and properties in future flood events. | Retain the provision. |
| GRZ-ST10.4 Stormwater Management and Impervious Surfaces | Where the means of stormwater disposal is to ground, that area must be able and suitable to accommodate the stormwater discharge, and shall not be subject to instability, slippage, or inundation, or used for the disposal of wastewater. | **Support** | We support ensuring that areas designated to accommodate stormwater are appropriate. Disruptions and/or issues within a stormwater system can exacerbate flood issues and impacts to people and property. An effective way to reduce the impacts to people and property in future flood events is to require the ground to be suitable to accommodate stormwater discharge. | Retain the provision. |

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| GRZ-ST10.7 Stormwater Management and Impervious Surfaces | The impervious area within the site does not exceed 65% of the net site area. | **Support** | We support the Council providing a limit to the amount of impervious area. Impervious surfaces can exacerbate flooding by increasing runoff and limiting the absorption and drainage capacity for a site. Limiting the size of impervious surfaces can be an effective way to reduce the impacts to people and property in future flood events. | Retain the provision. |
| GRZ-ST10.8 Stormwater Management and Impervious Surfaces | The impervious area is set back at least 5m from Mean High Water Springs and the top of the bank of any river that has a width exceeding 3m (excluding bridges, culverts and fences). | **Support** | We support impervious surfaces being set back from water bodies. Impervious surfaces can exacerbate flooding by increasing runoff and limiting the absorption and drainage capacity for a site. Requiring these to be setback from Mean High Water Springs and rivers, which are prone to flooding, can reduce flooding and the impacts to people and property. | Retain the provision. |
| GRZ-ST10.9 Stormwater Management and Impervious Surfaces | At least 30% of the net site area of any site or unit site area must be grassed or otherwise landscaped in a manner that retains the permeable nature of the surface. | **Support** | We support the Council setting a minimum area that must retain a permeable nature. Permeable surfaces can contribute to reducing the impacts from flooding by decreasing the amount of surface runoff and increasing the absorption capacity of a site. | Retain the provision. |
| GRZ-ST11 Integrated Stormwater Management Plan | For any resource consent application, the application must include an integrated stormwater management plan completed by a suitably qualified person. | **Amend** | We support requiring a stormwater management plan. However, we recommend strengthening the wording in this standard to ensure that all stormwater management plans contain the same information to the same standard. For example, Palmerston North City Council outlined specific requirements of stormwater management plans as part of Plan Change I[1]:<br><br>*Site-specific stormwater management plan prepared by a suitably qualified stormwater design consultant (preferably with experience in water sensitive design concepts and elements) identifies:*<br><br>*1. the location, scale and nature of the development proposed for the site;* | The following amendment is made:<br><br>For any resource consent application, the application must include an integrated stormwater management plan ~~completed by a suitably qualified person.~~ prepared by a suitably qualified stormwater design consultant (preferably with experience in water sensitive design concepts and elements) identifies:<br><br>1. the location, scale and nature of the development proposed for the site; |

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| | | | *2. the extent of flood and/or overland stormwater flow hazards;*<br>*3. the on-site and off-site effects of the proposed development on people, property and the environment;*<br>*4. recommended mitigation measures to remedy or mitigate the on- and off-site effects of the development; and*<br>*5. demonstrates that the on- and off-site adverse effects will be appropriately mitigated.*<br>[1]PNCC Plan Change I: Increasing housing supply and choice, MRZ-S9. | 2. the extent of flood and/or overland stormwater flow hazards;<br>3. the on-site and off-site effects of the proposed development on people, property and the environment;<br>4. recommended mitigation measures to remedy or mitigate the on- and off-site effects of the development; and<br>5. demonstrates that the on- and off-site adverse effects will be appropriately mitigated. |
| GRZ-APP1 Land Subject to Inundation | - | **Amend** | The land subject to inundation according to these maps is only the land that immediately surrounds the Makino Stream, Oroua River, and the Kiwitea Stream. However, when consulting flood hazard maps from Horizons Regional Council, the potential area that could be inundated is much larger than in APP1 (see Appendix 3). The modelling provided by Horizons Regional Council is a 0.5% AEP flood event and was conducted in response to the identified gaps in flood risk knowledge following the 2004 floods in the Manawatū-Whanganui region. We recommend updating the flood inundation mapping to be the same as provided by Horizons Regional Council. Using this modelling would represent a precautionary approach to managing flood hazard and can reduce the impacts to people and property by reducing the level of exposure of the built environment to flood hazard (as per GRZ-R6). | The land subject to inundation is changed to include the flood hazard mapping from Horizons Regional Council. |
| **Subdivision** | | | | |
| SUB-GRZ-O2.3 | Urban environments that support reductions in greenhouse gas emissions | **Support** | We support urban environments that can reduce greenhouse gas emissions and are resilient to the current and future effects of climate change. Climate change is expected to bring more | Retain the provision. |

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| | and are resilient to the current and future effects of climate change. | | intense and frequent rainfall events to the Manawatū-Whanganui region, which can exacerbate impacts during flood events. Therefore, as part of reducing the impacts from natural hazards events greenhouse gas emissions need to be reduced. | |
| SUB- GRZ-O3 | Subdivision in the General Residential Zone creates resilient communities and manages the risks from natural hazards. | **Amend** | We support resilient communities and managing the risks from natural hazards. However, this objective could be strengthened to encompass reducing natural hazard risk. Land use planning is a key tool that can be used to reduce natural hazard risk, by reducing exposure to hazards. Risk from natural hazards should not be tolerated or managed at existing levels when there are opportunities to reduce risk and reduce the impacts to people and property in future events. The following objective from Hamilton City Council Plan Change 14[1] could be adapted to strengthen SUB-GRZ-O3;<br><br>*Risks from natural hazards are managed in a way that:*<br><br>*i. do not increase the potential for adverse effects to people, property and the environment.*<br><br>*ii. where practicable reduce risks arising from natural hazards to minimise the adverse effects on people, property, and the environment.*<br><br>*iii. increase community resilience to natural hazards including the effective and efficient response and recovery from the adverse effects of natural hazard events.*<br><br>[1]Hamilton City Council. Plan Change 14 – Flooding. Objective 22.2.1 | The following amendment is made:<br><br>Subdivision in the General Residential Zone creates resilient communities and manages the risks from natural hazards <u>in a way that:</u><br><br><u>i. does not increase the potential for adverse effects to people, property and the environment.</u><br><br><u>ii. where practicable, reduces risks arising from natural hazards to minimise the adverse effects on people, property, and the environment.</u><br><br><u>iii. increases community resilience to natural hazards, including the effective and efficient response and recovery from the adverse effects of natural hazard events.</u><br><br><u>iiii. Manages residual risk to acceptable levels.</u> |
| SUB-GRZ-P6.1 Subdivision avoids, or is designed to mitigate, risks from natural hazards by: | Ensuring land being subdivided, including any potential structure on that land, is not subject to significant risk of material damage by the effects of natural hazards, including | **Amend** | We support ensuring that land being subdivided is not subject to significant risk of material damage. However, it is important to clearly define what level of natural hazard risk is "significant" to avoid confusion and ensure consistent application of rules and policies.<br><br>NHC has developed a Risk Tolerance Methodology[1] that is deigned to integrate a risk tolerance assessment into existing | The following amendments are made:<br><br>Include a definition and/or metric to determine what natural hazard risk is deemed "significant" by the council. |

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| | flooding, inundation, erosion, subsidence or slippage, liquefaction risk and earthquake faults. | | risk management approaches. This methodology could be used by the Council to develop a metric to determine "significant" risk.<br><br>We also recommend expanding this policy to include more than just 'material damage'. Natural hazards can cause economic risk, life safety risk, environmental risks as well as social and cultural risks. Therefore, expanding the wording of this policy may be more effective in reducing the impacts to people and property in future natural hazard events.<br><br>[1]NHC Toka Tū Ake Risk Tolerance Methodology | Ensuring land being subdivided, including any potential structure on that land, is not subject to significant risk ~~of material damage by the effects of~~ from natural hazards, including flooding, inundation, tsunami, erosion, subsidence or slippage, liquefaction risk and earthquake faults. |
| SUB-GRZ-P6.2 Subdivision avoids, or is designed to mitigate, risks from natural hazards by: | Demonstrating appropriate mitigation measures proportionate to the risks associated with the hazards. | **Amend** | We recommend providing a definition for 'appropriate mitigation measures' to avoid confusion and ensure the consistent application of rules and policies.<br><br>A definition for what to consider in appropriate mitigation works could be adapted from Mackenzie District Council Plan Change 28[1]:<br><br>*a. The effectiveness of any proposed natural hazard mitigation works, and the alternative design options considered, including low impact design.*<br><br>*b. Any adverse effects on the environment of any proposed mitigation measures.*<br><br>*c. The extent to which the mitigation works transfer, or create, unacceptable hazard risk to other people, property or infrastructure.*<br><br>*d. The potential for the proposal to exacerbate natural hazard risk, including transferring risk to any other site.*<br><br>*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).* | The Council provides a definition or explanation for appropriate mitigation measures using the following criteria:<br><br>a. The effectiveness of any proposed natural hazard mitigation works, and the alternative design options considered, including low impact design.<br><br>b. Any adverse effects on the environment of any proposed mitigation measures.<br><br>c. The extent to which the mitigation works transfer, or create, unacceptable hazard risk to other people, property or infrastructure.<br><br>d. The potential for the proposal to exacerbate natural hazard risk, |

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| | | | [1]Mackenzie District Council Plan Change 28: Hazards and Risks, Historic Heritage and Notable Trees. NH-MD2 | including transferring risk to any other site.<br><br>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). |
| SUB-GRZ-P6.3 Subdivision avoids, or is designed to mitigate, risks from natural hazards by: | Providing for subdivision on land where liquefaction risk has been identified and can be appropriately managed. | **Amend** | Subdivision should be managed in areas prone to liquefaction to ensure that the impacts to people and property in future natural hazard events can be reduced.<br><br>NHC analysis of insurance claims from the Canterbury Earthquake Sequence shows that liquefaction damage claims amounted to around 15% of all claims but accounted for approximately 55% of the total losses. These losses show that properties suffered significant damage where liquefaction was present. This could suggest that the biggest determinant of loss was therefore not so much how a structure was built, but where it was built.<br><br>Rules for development within liquefaction prone areas should follow the MBIE/MfE Planning and Engineering Guidance for Potentially Liquefaction Prone Land[1]. Notably, areas assigned a high liquefaction classification should require a site-specific assessment of liquefaction issues.<br><br>We also recommend that the council provides a definition or direction what it considers to be 'appropriately managed'. Direction from this could be taken from Mackenzie District Councils Plan Change 28[2]: | The following amendment is made:<br><br>~~Providing~~ Managing subdivision on land where liquefaction risk has been identified and can be appropriately managed. ~~and can be appropriately managed.~~ Appropriate mitigation will be assessed using the following criteria:<br><br>a. The effectiveness of any proposed natural hazard mitigation works, and the alternative design options considered, including low impact design.<br><br>b. Any adverse effects on the environment of any proposed mitigation measures.<br><br>c. The extent to which the mitigation works transfer, or create, unacceptable hazard risk to other people, property or infrastructure. |

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| | | | *a. The effectiveness of any proposed natural hazard mitigation works, and the alternative design options considered, including low impact design.*<br>*b. Any adverse effects on the environment of any proposed mitigation measures.*<br>*c. The extent to which the mitigation works transfer, or create, unacceptable hazard risk to other people, property or infrastructure.*<br>*d. The potential for the proposal to exacerbate natural hazard risk, including transferring risk to any other site.*<br>*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).*<br>[1]MBIE & MfE (2017). Planning and engineering guidance for potentially liquefaction-prone land Resource Management Act and Building Act aspects.<br>[2]Mackenzie District Council Plan Change 28: Hazards and Risks, Historic Heritage and Notable Trees. NH-MD2 | d. The potential for the proposal to exacerbate natural hazard risk, including transferring risk to any other site.<br>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). |
| SUB-GRZ-P6.4 Subdivision avoids, or is designed to mitigate, risks from natural hazards by: | Maintaining the function of overland flow paths to safely convey flood waters while taking into account the likely long-term effects of climate change. | **Support** | We support maintaining the function of overland flow paths. Overland flow paths represent low points in terrain where surface runoff will flow. Maintaining their function can reduce the impacts to people and property in flood events from ensuring water can flow and preventing buildings and other structures being placed in high hazard areas. | Retain the provision. |
| SUB-GRZ-P6.5 Subdivision avoids, or is designed to mitigate, risks from natural hazards by: | Ensuring that any measures used to manage the risks of natural hazards avoid any further adverse environmental effects. | **Support** | We support ensuring that natural hazard risk reduction actions avoid adverse environmental effects. | Retain the provision. |

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| SUB-GRZ-R1 Any General Residential Zone Subdivision | Activity Status: Restricted Discretionary<br>Where compliance is achieved with:<br>SUB-GRZ-ST1 to SUB-GRZ-ST9 | **Support** | We support subdivision in the General Residential Zone being a restricted discretionary activity, provided it complies with SUB-GRZ-ST6 Stormwater and SUB-GRZ-ST7 Integrated Stormwater Management Plan. However, we have provided recommended amendments to SUB-GRZ-ST6 and SUB-GRZ-ST7 as part of our submission. | Retain the provision; provided our requested amendments for SUB-GRZ-ST6 and SUB-GRZ-ST7 are accepted. |
| SUB-GRZ-MD Any General Residential Zone Subdivision<br>Matters of Discretion | Where a connection to a Council stormwater network is not available, provision for sustainable stormwater management and water sensitive (low impact) design principles. | **Support** | We support stormwater management being a matter of discretion. Effective stormwater management is important to reduce the impacts to people and property in future flood events. | Retain the provision. |
| SUB-GRZ-MD9 Any General Residential Zone Subdivision<br>Matters of Discretion | Effects on natural hazard risk and the matters set out in SUB-GRZ-P6. | **Support** | We support the effects on natural hazard risk being a matter of discretion. However, we have provided recommended amendments to SUB-GRZ-P6 as part of our submission. | Retain the provision; provided our requested amendments for SUB-GRZ-P6 are accepted. |
| SUB-GRZ-R2 Subdivision for the purpose of medium density development | Activity Status: Restricted Discretionary<br>Where compliance is achieved with:<br>SUB-GRZ-ST6 – Stormwater<br>SUB-GRZ-ST7 – Integrated Stormwater Management Plan<br>SUB-GRZ-ST8 – Context Analysis | **Support** | We support subdivision for the purpose of medium density development being restricted discretionary, if compliance is achieved with SUB-GRZ-ST6 and SUB-GRZ-ST7. However, we have provided recommended amendments to SUB-GRZ-ST6 and SUB-GRZ-ST7 as part of our submission. | Retain the provision; provided our requested amendments for SUB-GRZ-ST6 and SUB-GRZ-ST7 are accepted. |

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| New rule SUB-GRZ-R3<br><br>Subdivision on land identified as within a Fault Avoidance Zone | Proposed new rule to manage subdivision in Fault Avoidance Zones | **Amend** | We recommend the Council adds a new provision that will manage development in areas identified on the Horizons Regional Council Natural Hazards Viewer[1] as within Fault Avoidance Zones. Much of the General Residential Zone is located within Fault Avoidance Zones (see Appendix 2) these areas must be avoided to reduce impacts to people and property. The effects from fault rupture include significant ground movement (often >5m of horizontal movement[2]), which would destroy buildings and infrastructure. There is no way of accurately predicting how and where ground deformation will occur in an earthquake, as each earthquake event is unique. Development in Fault Avoidance Zones should follow MfE's guidance document for planning around active fault traces[2]. Specifically, for ensuring setback of future allotments, buildings and infrastructure is at least 20m from the fault and for establishing building importance categories that subsequently restrict certain types of development.<br><br>[1]Ministry for the Environment (2003). Planning for development of land on or close to active faults. | The Council adds a new rule to manage subdivision in Fault Avoidance Zones. |
| New rule SUB-GRZ-R4<br><br>Subdivision on land identified as subject to inundation in GRZ-APP1 | Proposed new rule to manage subdivision in areas subject to inundation. | **Amend** | We recommend the Council adds a new provision to manage subdivision in areas identified as subject to inundation in GRZ-APP1. However, we have also provided recommended amendments to GRZ-APP1 as part of this submission. Managing subdivision on land that is likely to be flooded can reduce natural hazard risk by limiting the amount of exposure. | The Council adds a new rule to manage subdivision in areas subject to inundation.<br><br>Our requested amendments to GRZ-APP1 are accepted. |
| **Standards** | | | | |
| SUB-GRZ-ST6.2 Stormwater | Where a connection to Council's reticulated stormwater network is not possible, all allotments must provide for the treatment, catchment, and disposal of stormwater on-site through | **Support** | We support the use of green infrastructure to manage stormwater. Green infrastructure is a useful way to manage stormwater and flooding by increasing the absorption capacity of the ground and reducing runoff. | Retain the provision. |

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| | green infrastructure measures. | | | |
| SUB-GRZ-ST6.3 Stormwater | Where a connection is not available, provide the means for treatment, catchment, and disposal of stormwater from all impervious or potentially impervious surfaces, including, but not limited, to structures, compacted soils and sealed surfaces, within the net site area of the allotment. | **Support** | We support requiring the treatment, catchment, and disposal of stormwater from all impervious or potentially impervious surfaces. Impervious surfaces can exacerbate flooding by increasing runoff and limiting the absorption and drainage capacity for a site. Managing stormwater in this way can reduce the impacts to people and properties in future flood events. | Retain the provision. |
| SUB-GRZ-ST6.4 Stormwater | Where the means of stormwater disposal is to ground, the area used for stormwater disposal must not be subject to instability or inundation or used for the disposal of wastewater. | **Support** | We support providing clear guidance for the stormwater disposal to the ground. Disruptions and/or issues within a stormwater system can exacerbate flood issues and create more damage to people and property. An effective way to reduce the impacts to people and property in future flood events is to require the ground to be suitable to accommodate stormwater discharge. | Retain the provision. |
| SUB-GRZ-ST7 Integrated Stormwater Management Plan | For any resource consent application, the application must include an integrated stormwater management plan completed by a suitably qualified person. | **Amend** | We support requiring a stormwater management plan. However, we recommend strengthening the wording in this standard to ensure that all stormwater management plans contain the same information to the same standard. For example, Palmerston North City Council outlined specific requirements of stormwater management plans as part of Plan Change I[1]:<br><br>*Site-specific stormwater management plan prepared by a suitably qualified stormwater design consultant (preferably with experience in water sensitive design concepts and elements) identifies:*<br><br>*1. the location, scale and nature of the development proposed for the site;* | The following amendment is made:<br><br>For any resource consent application, the application must include an integrated stormwater management plan ~~completed by a suitably qualified person.~~ prepared by a suitably qualified stormwater design consultant (preferably with experience in water sensitive design concepts and elements) identifies:<br><br>1. the location, scale and nature of the development proposed for the site; |

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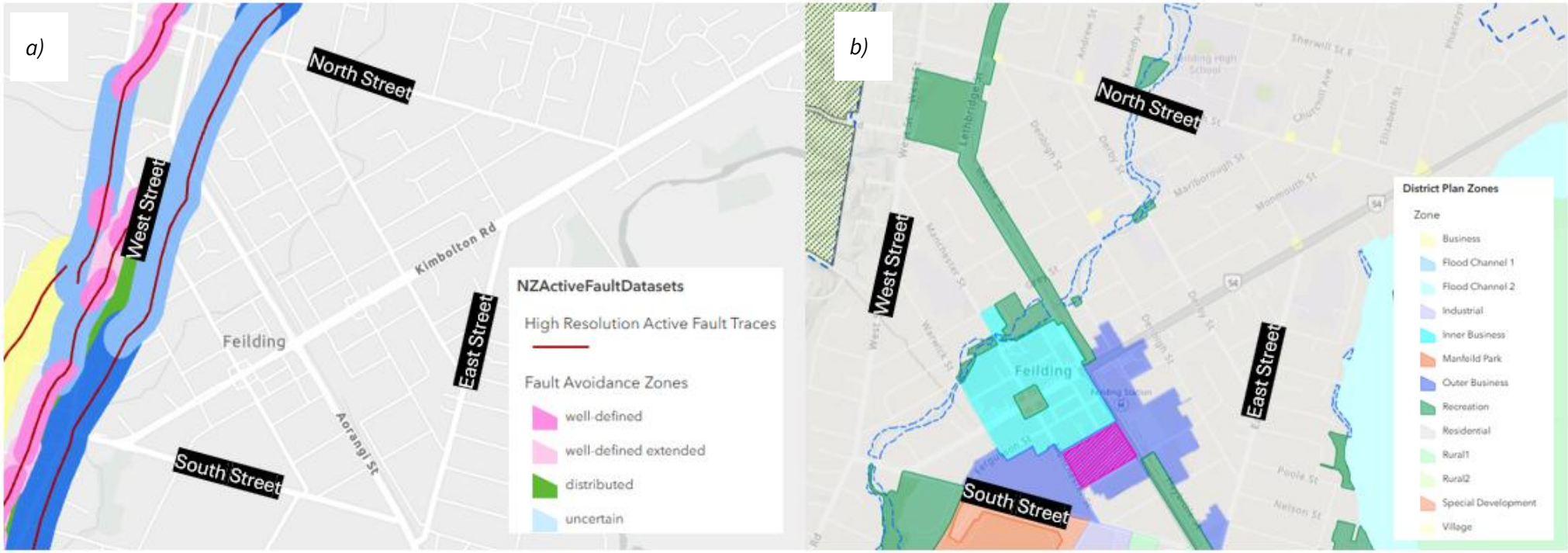
| | | | *2. the extent of flood and/or overland stormwater flow hazards;*<br>*3. the on-site and off-site effects of the proposed development on people, property and the environment;*<br>*4. recommended mitigation measures to remedy or mitigate the on- and off-site effects of the development; and*<br>*5. demonstrates that the on- and off-site adverse effects will be appropriately mitigated.*<br>[1]PNCC Plan Change I: Increasing housing supply and choice, MRZ-S9. | 2. the extent of flood and/or overland stormwater flow hazards;<br>3. the on-site and off-site effects of the proposed development on people, property and the environment;<br>4. recommended mitigation measures to remedy or mitigate the on- and off-site effects of the development; and<br>5. demonstrates that the on- and off-site adverse effects will be appropriately mitigated. |

**Appendix 2**




a) Active faults through Fielding, as per the Horizons Regional Council Natural Hazards Viewer. b) General Residential Zone in Fielding located in the same area as known active faults.

**Appendix 3**


a) Flood inundation (0.5% AEP) as provided by Horizons Regional Council Natural Hazards Viewer. b) Land subject to inundation as per Manawatū District Council GRZ-APP1 (which is considerably less than in (a)).