108553

Subdivision and Building Natural Hazard Risk Management Methods

Natural Hazard	Susceptibility Data Set	Data Sets			Citywide Risk Assessment Outcome	Risk Management Method						
						City Plan - Subdivision	RMA 91 - Subdivision	City Plan - Land Use	Building Act 04	IDC (generally allied with subdivision)	Resilience Programme	CDEM (BOPCDEM Group Plan)
Coastal Erosion (Open Coast)	1.25m SLR; P5%	Current	Primary	P66%	Low	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8B - Objective 8B.1.1 requires avoidance of effects of coastal erosion on land buildings and structures. CHEPA defines Current, 50 year and 100 year Erosion Risk Zones with specific controls in place. Subdivision is Prohibited in the Current ERZ. Subdivision is RDA in the 50 year and 100 year ERZ must provide a safe building site outside ERZ. Matters of Discretion in Section 12A.6.3 The CHEPA does not currently provide for susceptibility to 2130. If this were to be updated it would avoid the need for site based risk assessment.	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards, including erosion. Section 106 does not prescribe quantitative natural hazard parameters such as erosion probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). Of the commonly studied parameters, the following are likely to be the most appropriate "triggers" for individual assessment under section 106: Timeframe: 2130 (100 years) - because the life of the subdivision will exceed 50 years Event: P5% as a baseline - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR - consistent with the MfE guidance on adaptation planning as follows: Coastal subdivision, greenfield development and major infrastructure - 1.6 metres Intensification: RCP based on risk assessment - All SLR scenarios Existing coastal development - 1.25 metres Non-habitable short-lived assets with functional need to be at the coast - 0.8 metres **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against erosion under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to: • avoid or mitigate effects, • recognise functional need to locate some activities in hazard prone areas, • and to reduce risk over time. Section 8B CHEPA defines Current, 50 year and 100 year Erosion Risk Zones with specific controls in place. In the CERZ: Land use other than dune enhancing works are generally non-complying prohibited. New dwellings are prohibited. Additions to existing dwellings up to 20m2 require RDA resource consent and must prove no increase in risk. RC process creates an opportunity to impose retreat conditions for at risk buildings. In the 50 year and 100 year ERZ: New dwellings require RDA resource consent and must be able to retreat to an alternative building site outside the ERZ. Triggering criteria for monitoring establish the retreat timeframe. Additions to existing dwellings require RDA resource consent and must prove no increase in risk.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to structural stability. Most relevantly, clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." Of the commonly studied parameters, the following should be used to determine compliance: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: P5% as a baseline which is subject to individual assessment - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR: 1.25 - because it is closest to established engineering practice and a cautious approach is appropriate There may also be other Building Code clauses that are relevant, for example B2 Durability. **Sections 71-73** Special considerations apply where the land is "likely to be subject to 1 or more natural hazards". The definition of natural hazard includes erosion. Applicants must make "adequate provision" to protect the land and building work from the natural hazard or building consent will be granted subject to a notice registered on the title under section 73. Consent cannot be granted unless the design will comply with the Building Code or the building consent authority considers it reasonable to grant a waiver. The following parameters should be used for assessments of whether the land is likely to be subject to a natural hazard: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: P5% as a baseline which is subject to individual assessment, depending on building design and location - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR: 1.25 - because it is closest to established engineering practice and a cautious approach is appropriate	DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection DS-10.4 Landform Classification System Slope failure and seismic DS-10 - Appendix C - Geo-Professional Accreditation System	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	Medium Priority Hazard
			Secondary	P5%								
		Future	Primary	1.25m SLR; P66%	Medium							
			Secondary	1.25m SLR; P5%								
Coastal Erosion (Inner Harbour)	1.25m SLR; P5%	Current	Primary	P66%	Medium	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Rule 12B.3.1.5. requires safe building platform where there is any inundation risk.	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards, including erosion. Section 106 does not prescribe quantitative natural hazard parameters such as erosion probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). The following parameters from the Tauranga Harbour Coastal Hazards Study are likely to be the most appropriate "triggers" for individual assessment under section 106: Timeframe: 2130 (100 years) - because the life of the subdivision will exceed 50 years Event: P5% as a baseline - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR - consistent with the MfE guidance on adaptation planning as follows: Coastal subdivision, greenfield development and major infrastructure - 1.6 metres Intensification: RCP based on risk assessment - All SLR scenarios Existing coastal development - 1.25 metres Non-habitable short-lived assets with functional need to be at the coast - 0.8 metres **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against erosion under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Objectives and policies need to be considered on all discretionary and non-complying activities.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to structural stability. Most relevantly, clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." The following parameters from the Tauranga Harbour Coastal Hazards Study should be used to determine compliance: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: P5% as a baseline which is subject to individual assessment - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR: 1.25 - because it is closest to established engineering practice and a cautious approach is appropriate There may also be other Building Code clauses that are relevant, for example B2 Durability. **Sections 71-73** Special considerations apply where the land is "likely to be subject to 1 or more natural hazards". The definition of natural hazard includes erosion. Applicants must make "adequate provision" to protect the land and building work from the natural hazard or building consent will be granted subject to a notice registered on the title under section 73. Consent cannot be granted unless the design will comply with the Building Code or the building consent authority considers it reasonable to grant a waiver. The following parameters from the Tauranga Harbour Coastal Hazards Study should be used for assessments of whether the land is likely to be subject to a natural hazard: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: P5% as a baseline which is subject to individual assessment, depending on building design and location - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases. SLR: 1.25 - because it is closest to established engineering practice and a cautious approach is appropriate.	Design Standards > DS-10 Natural Hazards & Earthworks > DS-10_1 General DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	Medium Priority Hazard
			Secondary	P5%								
		Future	Primary	1.25m SLR; P66%	High							
			Secondary	1.25m SLR; P5%								
Coastal Inundation (Open Coast)	0.2% AEP (500-yr ARI); 1.25m SLR	Current	Primary	1% AEP (100-yr ARI)	No Data	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8B Objective 8B.1.1 requires avoidance of effects of coastal inundation on land buildings and structures. CHEPA defines Current, 50 year and 100 year Erosion Risk Zones with specific controls in place. Subdivision is Prohibited in the Current ERZ. Subdivision in the 50 year and 100 year ERZ must provide a safe building site outside ERZ. Rule 12B.3.1.5. requires safe building platform where there is any inundation risk. The CHEPA does not currently provide for susceptibility to 2130. If this were to be updated it would avoid the need for site based risk assessment.	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards, including flooding. Section 106 does not prescribe quantitative natural hazard parameters such as flood probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). Of the commonly studied parameters, the following are likely to be the most appropriate "triggers" for individual assessment under section 106: Timeframe: 2130 (100 years) - because the life of the subdivision will exceed 50 years Event: 1% AEP - because 0.2% AEP events are too rare or infrequent and 1% AEP events are frequently used when preparing planning documents SLR: consistent with the MfE guidance on adaptation planning as follows: Coastal subdivision, greenfield development and major infrastructure - 1.6 metres Intensification: RCP based on risk assessment - All SLR scenarios Existing coastal development - 1.25 metres Non-habitable short-lived assets with functional need to be at the coast - 0.8 metres **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against flooding under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8B CHEPA defines Current, 50 year and 100 year Erosion Risk Zones with specific controls in place. Inundation risk is also included in the CHEPA, recognising that erosion will be accompanied by inundation. In the CERZ: Land use other than dune enhancing works are generally non-complying prohibited. New dwellings are prohibited. Additions to existing dwellings up to 20m2 require RDA resource consent and must prove no increase in risk. RC process creates an opportunity to impose retreat conditions for at risk buildings. In the 50 year and 100 year ERZ: New dwellings require RDA resource consent and must be able to retreat to an alternative building site outside the ERZ. Triggering criteria for monitoring establish the retreat timeframe. Additions to existing dwellings require RDA resource consent and must prove no increase in risk.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to flooding. Most relevantly, clause E1.3.2 of the Building Code provides that: "Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter buildings. Performance E1.3.2 shall apply only to housing, communal residential and communal non-residential buildings." Of the commonly studied parameters, the following should be used to determine compliance: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: 2% AEP - because that is specified in clause E1.3.2 of the Building Code SLR: 1.25m - because it is closest to established engineering practice and a cautious approach is appropriate The Building Code has provisions relating to structural stability. Most relevantly, clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." The following parameters from the Tauranga Harbour Coastal Hazards Study should be used to determine compliance: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: 1% AEP - because 2% AEP events are relatively likely to occur over the life of the building but 0.2% AEP events are relatively rare or infrequent SLR: 1.25m - because it is closest to established engineering practice and a cautious approach is appropriate There may also be other Building Code clauses that are relevant, for example B2 Durability, or E2 External Moisture. **Sections 71-73** Special considerations apply where the land is "likely to be subject to 1 or more natural hazards". The definition of natural hazard includes inundation. Applicants must make "adequate provision" to protect the land and building work from the natural hazard or building consent will be granted subject to a notice registered on the title under section 73. Consent cannot be granted unless the design will comply with the Building Code or the building consent authority considers it reasonable to grant a waiver. The following parameters should be used for assessments of whether the land is likely to be subject to a natural hazard: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: 1% AEP - because MBIE Determinations have concluded that this reflects the "likely" test SLR: 1.25m - because it is closest to established engineering practice and a cautious approach is appropriate *Note: Compliance with the Building Code (i.e. floor level above the 2% AEP flood plain) must be accepted as adequate provision to protect the building under section 71. However, clause E1.3.2 of the Building Code applies to buildings and not land - MBIE Determinations have held that adequate provision to protect the land is to be assessed using the 1% AEP event .*	The CHEPA does not currently provide for susceptibility to 2130. If this were to be updated it would avoid the need for site based risk assessment.	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	
			Secondary	2%AEP (50-yr ARI); 0.2% AEP (500yr ARI)								
		Future	Primary	1% AEP (100-yr ARI); 1.25m SLR	No Data							
			Secondary	2% AEP (50-yr ARI), 1.25m SLR; 0.2% AEP (500-yr ARI), 1.25m SLR								
Coastal Inundation (Harbour)	0.2% AEP (500-yr ARI); 1.25m SLR	Current	Primary	1% AEP (100-yr ARI)	High	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8C Flood Hazard Plan Area requires effects of harbour inundation in defined areas to be avoided. There are no subdivision rules in Section 8C. Rule 12B.3.1.5. requires safe building platform where there is any inundation risk (not limited to FHPA).	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards, including flooding. Section 106 does not prescribe quantitative natural hazard parameters such as flood probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). The following parameters from the Tauranga Harbour Coastal Hazards Study are likely to be the most appropriate "triggers" for individual assessment under section 106: Timeframe: 2130 (100 years) - because the life of the subdivision will exceed 50 years Event: 1% AEP - because 0.2% AEP events are too rare or infrequent and 1% AEP events are frequently used when preparing planning documents SLR: consistent with the MfE guidance on adaptation planning as follows: Coastal subdivision, greenfield development and major infrastructure - 1.6 metres Intensification: RCP based on risk assessment - All SLR scenarios Existing coastal development - 1.25 metres Non-habitable short-lived assets with functional need to be at the coast - 0.8 metres **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against flooding under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8C Flood Hazard Plan Area requires effects of harbour inundation in defined areas to be avoided. Any building in the FHPA is RDA, with discretion on managing consequences of flood event for the activity and surrounding land. City Plan Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Objectives and policies need to be considered on all discretionary and non-complying activities.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to flooding. Most relevantly, clause E1.3.2 of the Building Code provides that: "Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter buildings. Performance E1.3.2 shall apply only to housing, communal residential and communal non-residential buildings." The following parameters from the Tauranga Harbour Coastal Hazards Study should be used to determine compliance: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: 2% AEP - because that is specified in clause E1.3.2 of the Building Code SLR: 1.25m - because it is closest to established engineering practice and a cautious approach is appropriate The Building Code has provisions relating to structural stability. Most relevantly, clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." The following parameters from the Tauranga Harbour Coastal Hazards Study should be used to determine compliance: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: 1% AEP - because 2% AEP events are relatively likely to occur over the life of the building but 0.2% AEP events are relatively rare or infrequent SLR: 1.25m - because it is closest to established engineering practice and a cautious approach is appropriate **Sections 71-73** Special considerations apply where the land is "likely to be subject to 1 or more natural hazards". The definition of natural hazard includes inundation. Applicants must make "adequate provision" to protect the land and building work from the natural hazard or building consent will be granted subject to a notice registered on the title under section 73. Consent cannot be granted unless the design will comply with the Building Code or the building consent authority considers it reasonable to grant a waiver. The following parameters from the Tauranga Harbour Coastal Hazards Study should be used for assessments of whether the land is likely to be subject to a natural hazard: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: 1% AEP - because MBIE Determinations have concluded that this reflects the "likely" test SLR: 1.25m - because it is closest to established engineering practice and a cautious approach is appropriate *Note: Compliance with the Building Code (i.e. floor level above the 2% AEP flood plain) must be accepted as adequate provision to protect the building under section 71. However, clause E1.3.2 of the Building Code applies to buildings and not land - MBIE Determinations have held that adequate provision to protect the land is to be assessed using the 1% AEP event.*	DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	
			Secondary	2%AEP (50-yr ARI); 0.2% AEP (500yr ARI)								
		Future	Primary	1% AEP (100-yr ARI); 1.25m SLR	High							
			Secondary	2% AEP (50-yr ARI), 1.25m SLR; 0.2% AEP (500-yr ARI), 1.25m SLR								
Rising Groundwater Table	95th Percentile Groundwater table; 1.25m SLR (where G/W depth <0.5m BGL)	Current	Primary	95th Percentile groundwater table	Medium	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Rule 12B.3.1.5. requires safe building platform where there is any inundation risk (not limited to FHPA).	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards. Rising groundwater table (and associated flooding, subsidence, etc) is an earth or water related occurrence that may adversely affect human life, property, or other aspects of the environment and therefore comes within the definition of natural hazard. Section 106 does not prescribe quantitative natural hazard parameters such as timeframes, water levels or probabilities. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against rising groundwater table under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8C Flood Hazard Plan Area requires effects of harbour inundation in defined areas to be avoided. Any building in the FHPA is RDA, with discretion on managing consequences of flood event for the activity and surrounding land. City Plan Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Objectives and policies need to be considered on all discretionary and non-complying activities.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to structural stability and surface water. Most relevantly, clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." Clause E1.3.2 of the Building Code provides that: "Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter buildings. Performance E1.3.2 shall apply only to housing, communal residential and communal non-residential buildings." There may also be other Building Code clauses that are relevant, for example B2 Durability, or E2 External Moisture. **Sections 71-73** Special considerations apply where the land is "likely to be subject to 1 or more natural hazards". The definition of natural hazard only applies to rising groundwater table to the extent that it causes erosion, subsidence, inundation or slippage. Applicants must make "adequate provision" to protect the land and building work from the natural hazard or building consent will be granted subject to a notice registered on the title under section 73. Consent cannot be granted unless the design will comply with the Building Code or the building consent authority considers it reasonable to grant a waiver.	DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection DS-5.4.6 High Levels of Groundwater If there is a need to lower groundwater levels then designers shall provide a method of allowing the groundwater into the stormwater system in a controlled manner. Such a solution may incorporate perforated inlet pipes together with drainage rock and geotextile.	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	Medium Priority Hazard
			Secondary	n/a								
		Future	Primary	95th Percentile groundwater table; 1.25m SLR	High							
			Secondary	n/a								
Earthquake - Liquefaction	All Land within extent of Opus Report (2003) or T+T (2018b)	Current	Primary	0.1% AEP (1000-yr ARI)	High	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Rule 12B.3.1.5. requires safe building platform where there is any instability risk (not limited to FHPA).	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards. Earthquakes come within the definition of natural hazard because they are one of the specified occurrences which will or may adversely affect human life, property, or other aspects of the environment. Earthquakes may generate such adverse effects directly as a result of ground-shaking or, where soil conditions are conducive, less directly as a result of liquefaction caused by ground-shaking. Section 106 does not prescribe quantitative natural hazard parameters such as earthquake probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). The presence of liquefiable soils, or liquefaction-prone land, could potentially exacerbate material damage in terms of an assessment under subsection (1A). Controls imposed by the consent authority must be for a resource management purpose that is not a purpose of the BA04. This requires a comparative analysis between the two legislative frameworks e.g. whether proposed controls have a purpose that goes beyond matters regulated by the BA04, such as the safety and integrity of structures, "building work" as defined in the BA04, the building site, building design and construction etc. **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against natural hazards under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8C Flood Hazard Plan Area requires effects of harbour inundation in defined areas to be avoided. Any building in the FHPA is RDA, with discretion on managing consequences of flood event for the activity and surrounding land. City Plan Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Objectives and policies need to be considered on all discretionary and non-complying activities.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to structural stability. Most relevantly: Clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." The following parameters should be used to determine compliance: Event: 1/500 year earthquake - because that is consistent with AS/NZ 1170 Ultimate Limit State SLR: 1.25m over 100 years as a starting point - because clause B1.3.1 applies to buildings "throughout their lives" and this is supported by established engineering practice Clause B1.3.2 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of causing loss of amenity through undue deformation, vibratory response, degradation, or other physical characteristics throughout their lives, or during construction or alteration when the building is in use." The following parameters should be used to determine compliance: Event: 1/25 year earthquake - because that is consistent with AS/NZ 1170 Serviceability Limit State SLR: 1.25m over 100 years as a starting point - because clause B1.3.2 applies to buildings "throughout their lives" and this is supported by established engineering practice Clause B1.3.3 requires account to be taken of all physical conditions likely to affect the stability of buildings, building elements or sitework, including earthquake. There may also be other Building Code clauses that are relevant, for example B2 Durability, or E2 External Moisture.	DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	Medium Priority Hazard
			Secondary	0.1% AEP (1000-yr ARI)								
		Future	Primary	0.1% AEP (1000-yr ARI)	High							
			Secondary	0.1% AEP (1000-yr ARI)								
Earthquake - Lateral Spread	All Land within extent of Opus Report (2003) or T+T (2018b)	Current	Primary	0.1% AEP (1000-yr ARI)	High	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Rule 12B.3.1.5. requires safe building platform where there is any instability risk (not limited to FHPA).	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards. Earthquakes come within the definition of natural hazard because they are one of the specified occurrences which will or may adversely affect human life, property, or other aspects of the environment. Earthquakes may generate such adverse effects directly as a result of ground-shaking or, where soil conditions are conducive, less directly as a result of liquefaction caused by ground-shaking. Section 106 does not prescribe quantitative natural hazard parameters such as earthquake probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). The presence of liquefiable soils, or liquefaction-prone land, could potentially exacerbate material damage in terms of an assessment under subsection (1A). Controls imposed by the consent authority must be for a resource management purpose that is not a purpose of the BA04. This requires a comparative analysis between the two legislative frameworks e.g. whether proposed controls have a purpose that goes beyond matters regulated by the BA04, such as the safety and integrity of structures, "building work" as defined in the BA04, the building site, building design and construction etc. **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against natural hazards under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8C Flood Hazard Plan Area requires effects of harbour inundation in defined areas to be avoided. Any building in the FHPA is RDA, with discretion on managing consequences of flood event for the activity and surrounding land. City Plan Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Objectives and policies need to be considered on all discretionary and non-complying activities.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to structural stability. Most relevantly: Clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." The following parameters should be used to determine compliance: Event: 1/500 year earthquake - because that is consistent with AS/NZ 1170 Ultimate Limit State SLR: 1.25m over 100 years as a starting point - because clause B1.3.1 applies to buildings "throughout their lives" and this is supported by established engineering practice Clause B1.3.2 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of causing loss of amenity through undue deformation, vibratory response, degradation, or other physical characteristics throughout their lives, or during construction or alteration when the building is in use." The following parameters should be used to determine compliance: Event: 1/25 year earthquake - because that is consistent with AS/NZ 1170 Serviceability Limit State SLR: 1.25m over 100 years as a starting point - because clause B1.3.2 applies to buildings "throughout their lives" and this is supported by established engineering practice Clause B1.3.3 requires account to be taken of all physical conditions likely to affect the stability of buildings, building elements or sitework, including earthquake. There may also be other Building Code clauses that are relevant, for example B2 Durability, or E2 External Moisture.	DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	Medium Priority Hazard
			Secondary	0.1% AEP (1000-yr ARI)								
		Future	Primary	0.1% AEP (1000-yr ARI)	High							
			Secondary	0.1% AEP (1000-yr ARI)								
Tsunami	Maximum credible event; 1.25m SLR	Current	Primary	0.1% AEP (1000-yr ARI)	Medium		**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards. Tsunami come within the definition of natural hazard because they are one of the specified occurrences which will or may adversely affect human life, property, or other aspects of the environment. Section 106 does not prescribe quantitative natural hazard parameters such as tsunami probability. Rather, it incorporates a risk-based		Not a hazard able to be considered under the Building Act			High Priority Hazard
			Secondary	0.1% AEP (1000-yr ARI)								
		Future	Primary	0.1% AEP (1000-yr ARI)								

		Future	**Secondary**	0.1% AEP (1000-yr ARI)	**High**		Section 106 does not prescribe quantitative natural hazard parameters such as tsunami probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). Low-likelihood and high-consequence natural hazards, such as tsunami, could potentially be considered under section 106. **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against natural hazards under section 220(1)(d).					
Slope Instability	All land within spatial extent of 1(V):2H upslope, 1(V):3(H) upslope; and 1(V):4(H) downslope projection lines	**Current**	**Primary**	0.1% AEP (1000-yr ARI)	**Low**	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Rule 12B.3.1.5. requires safe building platform where there is any instability risk (not limited to FHPA).	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards. Landslips come within the definition of natural hazard because they are one of the specified occurrences which will or may adversely affect human life, property, or other aspects of the environment. Section 106 does not prescribe quantitative natural hazard parameters such as landslip probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). Controls imposed by the consent authority must be for a resource management purpose that is not a purpose of the BA04. This requires a comparative analysis between the two legislative frameworks e.g. whether proposed controls have a purpose that goes beyond matters regulated by the BA04, such as the safety and integrity of structures, "building work" as defined in the BA04, the building site, building design and construction etc. **Section 220** Irrespective of activity status, a consent authority may impose conditions for protection against natural hazards under section 220(1)(d).	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Section 8C Flood Hazard Plan Area requires effects of harbour inundation in defined areas to be avoided. Any building in the FHPA is RDA, with discretion on managing consequences of flood event for the activity and surrounding land. City Plan Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Objectives and policies need to be considered on all discretionary and non-complying activities.	**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to structural stability. Most relevantly, clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." There may also be other Building Code clauses that are relevant, for example B2 Durability. **Sections 71-73** Special considerations apply where the land is "likely to be subject to 1 or more natural hazards". The definition of natural hazard includes erosion, subsidence and slippage. Applicants must make "adequate provision" to protect the land and building work from the natural hazard or building consent will be granted subject to a notice registered on the title under section 73. Consent cannot be granted unless the design will comply with the Building Code or the building consent authority considers it reasonable to grant a waiver.	DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection	The resilience project uses updated data on natural hazards and quantifies their impact on the city's infrastructure assets and determines how to mitigate these risks. Most major hazards are now mapped, and the main asset databases now have criticality ratings embedded. The outcomes of the resilience project will be fed into the next LTP. Currently 300 resilience-centric projects are being scoped, costed, programmed and rated ready for selection decisions for the 2021 LTP. This will provide a baseline of how TCC will deliver infrastructure, long term, across the City to ensure the City's infrastructure is able to operate following natural hazard disasters. Implementation of infrastructure resilience projects will largely occur through Council's renewals program, which will improve infrastructure resilience overtime. In addition, specific projects identified as having an extreme or high risk may need to progress more urgently, with these subject to Annual Plan and Long-Term Plan funding availability.	Medium Priority Hazard
			Secondary	0.1% AEP (1000-yr ARI)								
		Future	**Primary**	0.1% AEP (1000-yr ARI)	**N/A**							
			Secondary	0.1% AEP (1000-yr ARI)								
Flooding from Intense Rainfall	0.2% AEP (500-yr ARI); 1.25m SLR	**Current**	**Primary**	0.1% AEP (1000-yr ARI)	**High**	**City Plan** Section 8A General objective management of hazard on people, property and infrastructure. Policies seek to avoid or mitigate effects, recognise functional need to locate some activities in hazard prone areas, and to reduce risk over time. Rule 12B.3.1.5. requires safe building platform where there is any inundation risk (not limited to FHPA). Appendix 12B: Performance Standard, Stormwater iv) The overall stormwater management system shall be designed to accommodate and contain flows from a 2% AEP (1 in 50 year) rainfall event with the primary conveyance system being designed to accommodate flows from a 10% AEP (1 in 10yr) design rainfall event unless b(i) applies; v) The stormwater management system for the Wairakei Urban Growth Area and the Te Tumu Future Urban Zone shall be designed to accommodate flows from a 1% AEP (1 in 100 year) return period rainfall event;	**Section 106** Section 106 overrides the usual process of assessing subdivision applications under the district plan. The consent authority may refuse to grant subdivision consent, or may grant subdivision consent subject to conditions if there is "significant risk" (i.e. important enough to merit attention) from natural hazards, including erosion. Section 106 does not prescribe quantitative natural hazard parameters such as erosion probability. Rather, it incorporates a risk-based approach to natural hazards. This requires an individual assessment of likelihood and material damage under subsection (1A). Of the commonly studied parameters, the following are likely to be the most appropriate "triggers" for individual assessment under section 106: Timeframe: 2130 (100 years) - because the life of the subdivision will exceed 50 years Event: P5% as a baseline - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR - consistent with the MfE guidance on adaptation planning as follows: Coastal subdivision, greenfield development and major infrastructure - 1.6 metres Intensification: RCP based on risk assessment - All SLR scenarios Existing coastal development - 1.25 metres Non-habitable short-lived assets with functional need to be at the coast - 0.8 metres Section 220 Irrespective of activity status, a consent authority may impose conditions for protection against erosion under section 220(1)(d).		**Building Code** Building consent must be refused if the building consent authority is not satisfied on reasonable grounds that the Building Code will be complied with: section 49 of the BA04. The Building Code has provisions relating to structural stability. Most relevantly, clause B1.3.1 of the Building Code provides that: "Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives." Of the commonly studied parameters, the following should be used to determine compliance: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: P5% as a baseline which is subject to individual assessment - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR: 1.25 - because it is closest to established engineering practice and a cautious approach is appropriate There may also be other Building Code clauses that are relevant, for example B2 Durability. Sections 71-73 Special considerations apply where the land is "likely to be subject to 1 or more natural hazards". The definition of natural hazard includes erosion. Applicants must make "adequate provision" to protect the land and building work from the natural hazard or building consent will be granted subject to a notice registered on the title under section 73. Consent cannot be granted unless the design will comply with the Building Code or the building consent authority considers it reasonable to grant a waiver. The following parameters should be used for assessments of whether the land is likely to be subject to a natural hazard: Timeframe: 2130 (100 years) - because the life of a building is usually indefinite but exceeds 50 years Event: P5% as a baseline which is subject to individual assessment, depending on building design and location - because the P66% line is likely to be exceeded and therefore may not capture relevant hazard risk in some cases SLR: 1.25 - because it is closest to established engineering practice and a cautious approach is appropriate	DS-10.2 Landform Development Every parcel of land shall possess a nominated building platform suitable for the erection thereon of buildings / structures appropriate to its zoning. DS-10.3 Performance Criteria Slope failure Settlement Flood protection DS-5.4.5 Freeboard Above Design Flood Level This freeboard measurement applies to the nominated building platform. The minimum freeboard height applied to the calculated top water level shall be as outlined in Table 2: Freeboard Heights. Where designs require a nominated building platform, the minimum freeboard shall be measured from the top water level to the finished level of the nominated building platform. This provides an easier, cost efficient situation to meet the freeboard requirements of the Building Code when placing a building or structure on top of the nominated building platform. Table 2: Freeboard Heights Type of StructureFreeboard to Applied Design Storm Non-habitable residential buildings, detached garages and carports -200mm Commercial and industrial buildings -300mm Habitable dwellings/structures and attached garages -500mm		Flooding River/Stream - High Priority Hazard Flooding Urban/Rural Ponding - Medium Priority Hazard
			Secondary	0.1% AEP (1000-yr ARI)								
		Future	**Primary**	0.1% AEP (1000-yr ARI)	**High**							
			Secondary	0.1% AEP (1000-yr ARI)								