

8. Development Permit Area Guidelines

8.3 Hillside Hazard Development Permit Area

8.3.1 Category

The Hillside Hazard Development Permit Area is designated under Section [488\(1\)\(b\)](#) (protection of development from hazardous conditions) of the [Local Government Act](#).

8.3.2 Area

Unless exempted, the areas designated as Hillside Hazard Development Permit Area are illustrated on Schedule E4.

8.3.3 Justification

The City of Quesnel continues to be affected by sensitive building areas with hazardous conditions. One of the most significant effects is from moderately sloped hillsides subject to gradual ground movement. Subsurface ground movement on hillsides may pose hazardous to buildings, structures, and other development located on or near these sites. Disturbed hillside areas may also be subject to erosion if not properly rehabilitated. In addition to protecting development from hazardous conditions, the following guidelines establish impact mitigation objectives of development. Due to the hazardous nature of hillside development in the City of Quesnel, a development permit is required.

In response to known geotechnical issues in the community, as in many areas of B.C, the City utilized geotechnical mapping from the province to identify areas that require a geotechnical report and professional foundation design and developed the West Quesnel Land Stability Study Area to manage these areas for hazardous conditions.

Although the priority intent of these Guidelines is to protect development from unnecessary risk of hazards, an integral component can also include controlling the quality of development on hillsides, especially with respect to how these projects are integrated into the natural environment.

West Quesnel Uplands Stability Study Area

The area of West Quesnel currently impacted by ground movement includes an established residential community in the Uplands area with about 940 parcels of land, 750 homes, one elementary school and several businesses included in the Study Area. The total value of the land, improvements, services and infrastructure in the West Quesnel study area exceeds \$100 million. Note that the West Quesnel area is also important to the economic and social viability of the City of Quesnel and is home to almost 25% of the City's population.

Ongoing ground movement has had significant effects on these buildings and supporting civic infrastructure, with the potential for structural damage over time. Note that soil movement and associated impacts may also change from year to year: in 2020, there was an average of 84 mm of ground movement, which has increased over the 13 mm yearly average between 2013 to 2019, and was likely linked to the high rainfall and snowfall amounts in 2019.

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Since 2006, the Provincial, Federal and local governments have committed vast financial resources to the West Quesnel Stability Program, which has involved maintaining de-watering infrastructure such as pumping wells, horizontal fans, and related facilities, as well as improved stormwater systems. This also includes ongoing monitoring and studies which have been developed by the City of Quesnel to provide background to this matter. Supporting information from the City is available to guide potential construction in this hazard area, especially if allowable extensions or additions to existing structures are being considered.

These guidelines should be considered best practices for development in areas with hillside hazards. However, there are also legal requirements for property owners and developers to use qualified professionals and undertake geotechnical and geohazard assessments for any consideration of construction or development in this area of Quesnel, or wherever the Hillside Hazard DPA is applied through the Official Community Plan in the City of Quesnel.

8.3.4 Objective

The following guidelines are necessary to protect future development from gradual ground movement and to preserve existing buildings and infrastructure. These guidelines can also help ensure the preservation of the natural landscape of hillsides through appropriate design and consideration for the visible landscape.

While development is still possible in the Hillside Hazard Development Permit Area, future development will be subject to strict guidelines and the results of professional study as noted above.

8.3.5 Application

A development permit is required prior to the following activities:

- a. Subdivision (as defined in section [455](#) of the [Local Government Act](#)).
- b. Construction of, addition to, or alteration of a building or other structure.
- c. Alteration of land, such as the removal, disruption, or destruction of vegetation or soils.

8.3.6 Exemptions

A Hillside Hazard Development Permit will not be required for:

- a. The cutting of hazardous trees that present an immediate danger to the safety of persons or are likely to damage public or private property, as determined by a certified Arborist.
- b. Actions and activities that are necessary to prevent immediate threats to life or property.

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- c. Projects where geotechnical and geohazard assessments are not required by the Chief Building Official due to the site having no signs of differential movement on or near that site and include only:
 - i. renovation of existing buildings where there is no expansion of the footprint of the existing principal building;
 - ii. accessory buildings where there is no human occupation; or
 - iii. mobile homes as long as they are built to CSA-Z240 mobile home specifications, subject to Z240.10.1-08 site preparation and foundation requirements, and include flexible utility connections.

8.3.7 Guidelines

Development permits issued in this area shall be in accordance with the following guidelines:

Assessing the Site

1. Provide a Topographic Survey to assess and plan the site in a manner that respects the slope and special features. If land is located in the Hillside Hazard Development Permit Area LiDAR must be flown and recorded, if LiDAR is not already provided for that area.
2. Provide a Geotechnical Assessment to identify and avoid hazardous areas, to make the site safe for human use, and to maintain environmental quality. The City of Quesnel must be contacted to gain a complete understanding of what is required in the preparation of a Geotechnical Report. (See Preparation of Geotechnical Report, City of Quesnel Development Services Department). Also reference Guideline #40 and #41 – Geotechnical.
3. Provide an Environmental Assessment to identify existing ecosystems and special natural and cultural features of a site.
4. Evaluate the soil and rock characteristics that support re-use for construction, and their depth and stability.

Site Design and Planning

5. Show native slope, depth of topsoil/depth to rock, soil type on a Grading and Subdivision Development Plan.
6. Develop a land clearing and Tree Retention and Removal Plan.
7. Obtain a Soil Removal and Deposit Permit unless otherwise specifically permitted under the most current Soil Removal and Deposit Bylaw.
8. The municipality may place a covenant against any property within the Hillside Hazard Development Permit Area to address City liability for damage from the identified hazard.

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Earthworks and Grading

9. Avoid grading or alteration of key topographic features (e.g., knolls, ridgelines, talus slopes, bedrock outcrops, cliffs, and ravines) determined in the Geotechnical and Environmental Assessments.
10. Preserve any slopes greater than 30% as undisturbed unless roads are required to access developments.
11. Avoid grading that results in terrain forms that are not characteristic of the natural topography (i.e. flat, linear terraced benches with no undulations or irregularities).
12. Position driveways to minimize lot grading requirements and reduce the impact on adjoining properties.
13. Avoid significant or mass grading of hillsides for development (see Erosion Control below).

Erosion Control

14. An Erosion Control Plan is required for development within the Hillside Hazard Development Permit Area.
15. Re-vegetate exposed slopes as quickly as possible to prevent erosion and slope stability problems, even for temporary topsoil stockpiles.

Storm Water Management and Drainage

16. A Storm Water/ Drainage Management Plan may be required for the entire site and downstream drainage areas, given the size, location, and complexity of the development site conditions.
17. Water and stormwater services are to be located under the street wherever possible and directed to City infrastructure.

Services and Utilities

18. Provide municipal services and utilities that minimize redundancy and provide cost efficient maintenance and future replacement through common trenching (where appropriate).
19. Services and utilities requiring underground piping must use alternative and flexible piping materials to minimize the risk of leaks or cracking caused by ground movement

Vegetation Removal and Replacement

20. Removal of trees and vegetation should be coordinated with development construction phases.
21. Only clear trees and vegetation necessary to install services, address site design needs, and comply with FireSmart principles.

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22. Buildings and roads should be sited to preserve trees and natural vegetation where possible.
23. Replace trees in a manner that helps to restore the natural character of the hillside site.
24. If removal of trees and other vegetation is necessary, plan revegetation that will not encroach on viewscales.
25. Arrange trees in natural groupings or clusters rather than in lines or formal arrangements.
26. Where vegetation has been removed from dry or south facing slopes, replant with appropriate drought tolerant and fire-resistant species.

Landscaping

27. Incorporate native species into landscaping to blend in with existing vegetation and minimize large areas of formal landscaping.
28. Incorporate landscaping that enhances the building design and its architectural elements.
29. Incorporate landscaping that meets the intent of FireSmart guidelines.
30. Minimize the impact of development by screening structures through the effective use of landscaping materials.

Building Aesthetics

31. Buildings must have a pitched roof, horizontal siding and be a minimum of 24 feet wide.