



Bulletin: Geotechnical Engineering Requirement

Purpose

To inform owners, contractors, and the public to when District regulations may require a Geotechnical engineer and Geotechnical covenants as part of a building permit.

Background

Many areas in the District are subject to hazardous development conditions including but not limited to threat of flooding, landslide, rock fall, debris torrents and wildfire. The climate, topography, long wildland and lake interfaces, natural drainage and multiple significant watercourses making their way from hillsides through the community to Okanagan Lake create many of these hazards. Given the long linear shape of the community and multiple experiences with wildland/development interface fires, wildfire mitigation is a huge priority in Peachland.

The District also contains many environmentally significant areas including both aquatic/riparian and terrestrial areas that provide biological diversity supporting valuable ecosystems (i.e., stream and shoreline spawning areas and wildlife corridors).

The District of Peachland is situated in a unique geological area with:

- High soil hazard areas impacting slope stability, rock fall, debris torrents
- Lakes and creeks exposing buildings and structures to flooding,
- High water table affecting foundation design, and on-site drainage control, and
- Environmentally sensitive areas, such as Riparian areas, requiring development permits.



The District has also seen an increase in storm events, steep slope development and higher density infill land projects, which require a higher level of geotechnical and hydrological assessments, on-site storm water management and protection of neighbouring properties.



Steep Slope Development



Bulletin: Geotechnical Engineering Requirement



References

- [BC Building Code](#)
 - Section 2.2 Administration, Section 4.2 Foundations,
 - Part 8 – Safety Measures at Construction and Demolition Sites
 - Part 9 - Structural and Drainage requirements
- [Building Bylaw 2273, 2020 Part 9 and Part 10](#)
- [Zoning Bylaw 2100, 2014](#)
- [Official Community Plan Bylaw 2220, Consolidated](#)
- [Subdivision, Development and Servicing Bylaw No. 1956](#)
- [Section 56 of the Community Charter](#)
- [WorkSafe BC](#)

Unsafe condition means any condition that could cause undue hazard to the life, limb or health of any person authorized or expected to be on or about the premises. (BC Building Code)

[PART 20 OHS Regulation](#)

All excavations must conform to WorkSafe BC excavation regulation which can be found in Part 20 from [Section 20.78 to 20.95 of the Occupational Health and Safety Regulation](#) posted on the WorkSafe BC website. Excavations deeper than 1.2m must be carried out in accordance with the written recommendation of a *Geotechnical Professional Engineer* before workers enter the excavations.

IMPORTANT NOTE: A **Shoring System or Slope Excavation Plan** may be required prior to start of construction due to the difference in existing grades and proposed basement elevations; and including proximity to neighbouring buildings, structures, or Statutory Right of Ways and Easements that may be affected by the excavation.

• **Geotechnical – Temporary** – for some infill projects (*excavation, shoring, underpinning, temporary construction dewatering*). A Geotechnical Engineer will need to assess the property and provide a report, a Schedule “B” and design based on their findings and recommendations applicable to the property.



Bulletin: Geotechnical Engineering Requirement

Implementation

Buildings and accessory structures: Except as noted below, all new buildings, and additions will require the involvement of a Geotechnical Engineer for soil bearing capacity, excavation reviews, and storm water management plans.

Exception: Foundation and excavation components of new simple buildings and additions less than 55m² to simple buildings in accordance with the Building Code; except where an unsafe condition may exist.



High Water in Excavation

Retaining Walls: An engineered design will be required as part of retaining wall permits in excess of 1.22 meters high (4ft) or superimposed loading. Situations such as mass wall design or other topographical situations may dictate the involvement of an Engineer specializing in Geotechnical or Hydrological expertise.



“Mass” Retaining Wall

Driveways or parking lots (large, paved surfaces): A geotechnical and/or hydrological assessment with design of storm water management may be required. This typically involves the engagement of a Civil Engineer.

Earthworks: Refer to [Soil Deposit and Removal Bylaw No. 1934](#) and [Blasting Bylaw No. 701](#)



Bulletin: Geotechnical Engineering Requirement

PROCESS:

PRIOR to submitting a *Building Permit Application* CHECK with the [Planning Dept.](#) (email) or phone **250-767-3707** for information on land use planning and development. This includes requirements for Development Permits and Development Variance Permits. See [Development Application Guides](#)

DEVELOPMENT PERMIT

If you are in a Development Permit Area, this may affect your ability to apply for a Building Permit. A Technical Development Permit is required for any intended alteration of land, subdivision, construction or significant alteration of a building or structure on land located within a protected sensitive environment, foreshore, or hazardous Development Permit Area (DPA). Minor Form & Character Development Permits may also be issued as Technical Development Permits.

Note: You will need a Development Permit (DP) or an exemption from the Planning Dept. to submit with your Building Application.

DEVELOPMENT VARIANCE PERMIT

A **Development Variance Permit (DVP)** allows for specific changes to municipal regulations including zoning bylaw provisions, servicing requirements and/or signage regulations. A DVP may not vary density of development (number of units permitted) or permitted uses. These must be changed through a zoning amendment.

Note: You may need a Development Variance Permit (DVP) from the Planning Dept. to vary things such as setbacks or other zoning regulations and if it is approved the DVP will need to be submitted along with your Building Application. Approvals are not always the case and, in that event, you will need a redesign of your building project to meet the zoning regulations.

PERMITS

What is required for a Permit application?

In addition to a full permit application, an Owner/Agent shall include at minimum, Schedule B – Letter of Assurance (LOA) and copy of Insurance. A separate storm water management plan shall be included or as part of the project site plan. In some instances, a site evaluation report particularly for infill development excavations within 3m of property lines/structures or steep lots may also be required.

The Letters of Assurance shall indicate (at minimum) design and field reviews for:

- Plumbing
 - 4.1 Roof drainage systems
 - 4.2 Site and foundation drainage systems,
- Geotechnical – Temporary – for some infill projects (excavation, shoring, underpinning, temporary construction dewatering)
- Geotechnical – Permanent as applicable to project.



Bulletin: Geotechnical Engineering Requirement

Permit Issuance:

Usually, a Hillside Development Permit or an exemption from the Hillside DPA is required before a Building Permit application will be accepted. The designation is shown in purple and can be viewed by selecting the following layers from the menu at the top of the page *Planning/ Zoning > Peachland > Dev. Permit Areas (PCH)* on the RDCO public [GIS](#) here.



Where there is deemed a potential unsafe condition, or the project is within a designated sensitive area (red zone). A geotechnical report and covenant will be required to be registered prior to the release of a building permit. See Geotechnical Covenant below.

Site Inspections:

Owner/Agent will be required to provide field reviews from the *Registered Professional* prior to pouring footings, backfilling, drainage, and completion of the project. A Schedule C-B will be required prior to the initial Occupancy inspection.

Failure to provide information as required will result in a stop work notice placed on the project.

Where the Building Code does not require a Geotechnical Schedule B/Schedule C-B, but the Community Charter allows a "Report certified by a qualified professional" the District requires that this report be accompanied with a Schedule B, and Schedule C-B, to provide consistency in the project documentation.

When is a Geotechnical Covenant required?

Where the following conditions may occur, a building official may issue a building permit if a qualified professional certifies that the land may be used safely for the use intended if the land is used in accordance with the conditions specified in the professional's report (See Appendix A).

Potentially hazardous conditions triggering a geotechnical report:

- Typically, a Hillside DP, triggered by development altering the grade on areas of a site with greater than 20% slope for greater than 10m.
- High Hazard soil areas,
- Riparian Areas,
- Surcharges from adjacent structures or properties,
- 10m of a toe or crest of slope exceeding 10 degrees,
- Areas prone to high water tables,
- Non-engineered land alterations (no earthworks permit), or
- As other potential hazards outlined within the Geotechnical Report.



Bulletin: Geotechnical Engineering Requirement

The building permit may only be issued when:

- the owner of the land covenants with the District to use the land only in the manner certified by the qualified professional as enabling the safe use of the land for the use intended;
- the covenant contains conditions respecting reimbursement by the owner for any expenses that may be incurred by the municipality as a result of a breach of a covenant; and
- the covenant is registered under section 219 of the Land Title Act

If a qualified professional determines that the land may not be used safely for the use intended, a building official must not issue a building permit.

Covenant Registration The following are the steps involved for processing Geotechnical Covenants:

- Original sealed and signed Geotechnical report required with payment of processing fees,
- Applicant's lawyer to prepare legal covenant document, (the District will provide a covenant document template),
- Two signed copies are to be submitted to the District,
- Covenant must be registered with priority, so note that any banks or mortgage holders will need to sign the documents,
- Originals are returned to the District for signatures,
- The covenant signed by all parties is then provided to the applicant and the applicant's lawyer must register it at the Land Title Office,
- Confirmation of registration is required, including a registered copy of the covenant and a new Title Certificate,
- Building permit issued with confirmation of registration and new Title Certificate.



Bulletin: Geotechnical Engineering Requirement

Appendix A

Geotechnical Report Checklist

A Geotechnical Report (the “Report”) is required to confirm that the land may be used safely for the intended use without undue risk of hazards. The Report shall be prepared at the cost of the applicant by a professional engineer registered in British Columbia with qualifications and experience in geotechnical engineering (the “Engineer”).

Professional Reports and Technical Studies. Read this document to determine the general expectations for the reports that may be required as part of the Development Approval Process:

[Terms of Reference – Professional Reports & Technical Studies](#)

A Geotechnical report is required on sites that exceed 20% natural grade for more than 10m. Development is prohibited on lands with 30% or greater grade (except for small steep pockets within an area with gentle slope – a maximum of 10 % of terrain required for building envelope can be altered per [Subdivision, Development and Servicing Bylaw No. 1956](#) Schedule D Section 1.6)

The Engineer shall inspect the property, supervise the geotechnical site investigations and the Report shall clearly state all relevant restrictions, conditions and/or limitations to the proposed development of the land. The geotechnical site investigations and the Report shall be completed in accordance with good engineering practice.

The Report shall address the following minimum criteria and if they are applicable to the particular project:

1. Identify any hazards which may affect the safe development of the land including, but not limited to:
 - a. flooding
 - b. mud flows
 - c. debris flows
 - d. debris torrents
 - e. erosion
 - f. land slip
 - g. ground water flows
 - h. rock falls
 - i. subsidence
 - j. avalanche
 - k. earthquakes

2. Identify any natural areas that require protection including, but not limited to:
 - a. Foreshore areas
 - b. Steep slopes or other sensitive areas
 - c. Riparian
 - d. Areas prone to High water table.

These are designated in our development permit areas in our OCP: a) and c) are designated in our **Sensitive Aquatic Development Permit Area**. Usually, the requirement to address development concerns is a report by a Qualified Professional (typically a Registered Professional Biologist). These



Bulletin: Geotechnical Engineering Requirement

reports often have to go to the province for initial approval either due to Riparian Area Protection Act or Water Sustainability Act concerns. Provincial approvals take minimum 30+ days.

b) is designated by the **Hillside Development Permit Area in the OCP**. This area designates any area with greater than 20% slope for a linear distance greater than 10m. Small scale development (sheds, garden suites), that avoids the hillside area, does not alter site grading, and does not present any additional safety risk in the event of land slippage can be exempted from the DP requirement upon submission and review of a site grading plan. The plan must show all cuts, fills, pre-development and post-development contours, the finished grade and sometimes site cross-sections.

Retaining walls greater than 1.8m require a Hillside DP to address visual impacts to neighbouring properties (by using small scale textured blocks, i.e. Allan blocks, Basalite blocks or equivalent). Most other Hillside DP's require a geotechnical report from a Qualified Registered Professional.

3. Provide recommendations to reduce the risk of damage to the land, buildings and the Works and Services in regard to:

- a. identifying of any part of the Works and Services which require inspection by specialized personnel and outline a recommended inspection program during the development of the land;
- b. further geotechnical investigations and reports;
- c. recommendations for on-site storm management;
- d. restricting the use of the land, buildings or the Works and Services;
- e. design soil bearing capacity;
- f. remediation of any unstable or potentially unsuitable soils; and
- g. further reports during the maintenance period.

4. Evaluate the development plans for the property using the relevant District bylaws, the Environmentally Sensitive Area (ESA) and Natural Hazard Area (NHA) designations and the Development Permit guidelines of the Official Community Plan to determine the suitability of the land to accommodate the use intended.

5. Establish a safe setback line from any watercourses, steep slopes or hazard areas to protect the land, buildings and inhabitants from the risk of injury or damage that may, in the opinion of the Engineer, be caused by the hazards of flooding, mud flows, debris flows, debris torrents, erosion, land slip, ground water flows, rock fall, subsidence, avalanche, earthquake, or any combination thereof. The recommended setback cannot diminish the minimum setback requirements established by the municipal bylaws.

This is done through a **RAPR** report submitted to the province by a Qualified Registered Professional.

6. Quantify the risks of a geotechnical failure or any substantial hazard.

7. Certify that "the land is safe for the use intended".

The Engineer's recommendations and the conclusions of the Report must:

1. Acknowledge that the District, its Approving Officer and Building Officials may rely upon the Report when making a decision on applications for the subdivision or development of the land;



Bulletin: Geotechnical Engineering Requirement

2. **Certify the land is safe for the use intended** with the probability of a geotechnical failure resulting in property damage of less than:

- a. 2% in 50 years for geotechnical hazards due to seismic events, including slope stability; and
- b. 10% in 50 years for all other geotechnical hazards;

3. Reference the Association of Professional Engineers and Geoscientists of British Columbia's (APEGBC) "Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia" where slope stability is identified as a hazard;

4. Identify any deficiency in the design of the buildings, the proposed water, sewer, drainage, access and road works (the "Works and Services") or the construction standards intended for the development; and

5. Prescribe the geotechnical works and any changes in the standards of the design of the development which are required to:




- a. ensure the land, buildings and the Works and Services are developed safely for the use intended; and
- b. maintain the safety of the land, buildings and any Works and Services as a condition of the approval of the development.

The Report and two duplicate copies shall be provided to the District for consideration of the approval of the application. If the Report identifies any hazards or site conditions which, in the opinion of the Engineer or the District, may impact the safe development of the land or an adjacent property unless restrictions on development are established, the Report together with a Section 219 covenant may be required to be registered on the title of the property pursuant to the Land Title Act.

Registration of a covenant and/or the approval of an application does not warrant or represent that the land may be developed and used safely without risk of damage from hazardous conditions.

Notwithstanding the registration of a covenant, a further Report could be required by the District if there is a change in the conditions or if some other circumstances arise which are substantially different than those anticipated by the Report

Resources:

-  [GUIDE TO THE LETTERS OF ASSURANCE IN THE BC BUILDING CODE 2018 AND VANCOUVER BUILDING BY-LAW 2019 v6.1 Feb 11-22](#)
-  [GEOTECHNICAL ENGINEERING SERVICES FOR BUILDING PROJECTS v2.1 Sept 22-2021](#)
-  [***Terms of Reference – Professional Reports & Technical Studies***](#)

Please note: Building Bulletins are prepared to provide convenient information for clients and should not be considered a replacement for reviewing the bylaw or associated legal documents. If there is any contradiction between this guide and relevant municipal bylaws and/or applicable codes, please refer to the bylaws and/or codes for legal authority.

Contact Information

District of Peachland

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