Building Bulletin

penticton.ca

Bulletin No. 18-02

Geotechnical Requirements

Overview of when a geotechnical engineer may be required for Building Permits.

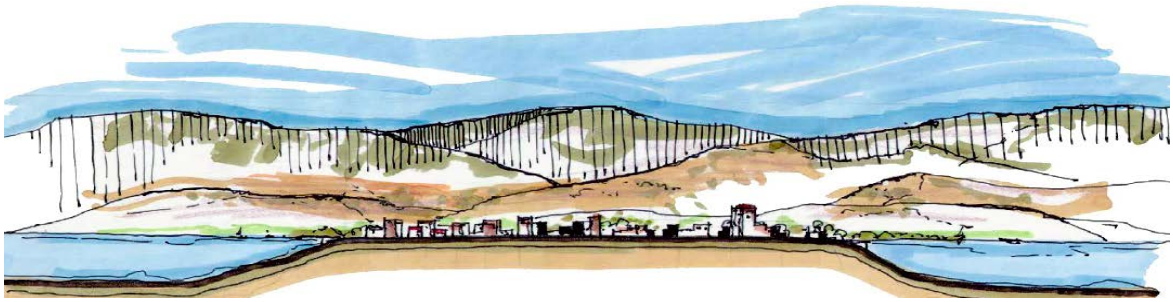
Purpose

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

Background

The City of Penticton is situated in a unique geological area with:

- High soil hazard areas (red zones) impacting slope stability and sink hole susceptibility,
- 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 City 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.

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 - Part 11 & 14
- Section 56 of the Community Charter

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)

Implementation – Effective Immediately

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 greater than 55m^2 to simple buildings in accordance with the Building Code; except where an unsafe condition may exist.

Retaining Walls: An engineered design will be required as part of retaining wall permits in excess of 1.2 meters high 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.

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 Earthworks Bylaw and Blasting Bylaw.

Example of "mass" retaining wall

High Water in excavation

Steep slope development - erosion

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
- Geotechnical – Permanent as applicable to project

Permit Issuance

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 "R*eport certified by a qualified professional*" the City 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**).

Potential hazardous conditions triggering a geotechnical report:

- High Hazard "red zone" 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

The building permit may only be issued when:

- the owner of the land covenants with the city 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: (please allow for up to 4 weeks to process)

- Original sealed Geotechnical report required with payment of processing fees
- City will prepare legal covenant document
- Copies for signing and contact made to the applicant/agent/owner to obtain signatures
- note that any mortgage holders will need to sign the documents
- Originals are returned to the Planning Clerk, who in turn, will obtain the Mayor and Corporate Officer's signatures on the three copies
- The signed covenant is forwarded to the City solicitor to register at the Land Titles Office
- The City solicitor will advise the Planning Clerk when the covenant is registered on the title of the property
- Building permit issued with confirmation of registration

Have questions? We're here to help. Please contact the Building Department at 250-490-2501 or buildinginfo@penticton.ca for further information

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").

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

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

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 City, 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;

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 City 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 City, 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 City if there is a change in the conditions or if some other circumstances arise which are substantially different than those anticipated by the Report.