



Guidelines for the Preparation of Geotechnical Reports

1.0 Purpose

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 or damage to the environment, including risks to infrastructure and surrounding structures. 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 District is relying on the geotechnical engineer’s report to avoid, or at least mitigate as specified, any damage to property and/or injury to persons from occurring as a result of geotechnical concerns relating to proposed development.

This policy provides information to prospective applicants and their engineering professionals on when geotechnical reports are required and sets out the standards and requirements to be addressed in those reports.

2.0 Application

A geological and geotechnical review, report, study or site specific study is required by the District to support Development Permit, Building Permit, Rezoning, or Subdivision applications in areas as determined by the District from time to time. As outlined in Part 7 of the Official Community Plan, all areas designated as Development Permit Areas (DPAs 1 through 11) are designated as Development Approval Information Areas. In accordance with the *Local Government Act* S.460.1, the District may require development information to assess the suitability of an application and may require a range of technical studies and information including geotechnical reports.

A geological and geotechnical review may be required when any of the following conditions apply:

- a. The project is located within lands identified as Hazard Lands on OCP Maps D1-D3
- b. The project is located on or within 15 m of a natural, existing or proposed slope greater than 20%
- c. The project proposes to direct storm water to an existing or proposed slope greater than 20%
- d. The project will require site grading involving more than 500 m³ or cuts/fills in excess of 1.2 metres in depth or height
- e. The project will require pre-load or soil consolidation to support a foundation.

3.0 Qualified Professionals

A detailed geotechnical review and onsite investigation shall be undertaken by qualified professional geoscience or geotechnical engineers in order to determine whether the proposed development can occur in a safe manner and to describe mitigation requirements to be employed, where appropriate.

Where the application applies to areas subject to flooding, erosion or landslide activity, the District may seek Qualified Professionals with expertise in hydrology and coastal processes.

4.0 Geotechnical Report Requirements

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 and District of Sechelt bylaws. Incomplete reports will not be accepted which will result in processing delays.

The geotechnical report shall address the following:

1. Identify the scope and intent of the proposed development.
2. Evaluate the development plans for the property using the relevant bylaws (Zoning Bylaw and the Development Permit Area guidelines of the Official Community Plan) to determine the suitability of the land to accommodate the use intended.
3. Identify the hazards which may affect the safe development of the land including, but not limited to:
 - a. Flooding
 - b. Coastal hazards (e.g. sea level rise, storm surge, wave effects, erosion)
 - c. Ground and subsurface water flows
 - d. Mud flows, debris torrents
 - e. Erosion
 - f. Subsidence land slip and earthquake (address potential for sink holes)
 - g. Rockfall hazards
4. Identify any natural areas that require protection including, but not limited to:
 - a. Foreshore areas
 - b. Steep slopes
 - c. Riparian areas

Note: Development within Sechelt shall take place in a manner which maximizes the retention of existing vegetation in order to stabilize ground surface and enhance slope stability. Where there has been removal of the original vegetation or the removal of vegetation cannot be avoided in order to accommodate a development, an acceptable plan to re-vegetate and re-stabilize affected areas should be provided.

5. Provide recommendations to reduce the risk of damage to the land on and off the site, buildings and the works and services in regards to:
 - a. Identifying 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. Restricting the use of the land, buildings or the works and services;

- d. Remediation of any unstable or potentially unsuitable soils or natural areas requiring protection;
- e. Further reports required during the maintenance period.

Note: Steep slopes are often at risk during the construction phase due to excavations, land clearing and heavy equipment. To avoid causing slope instability a construction management plan must be developed and monitored by the applicant's geotechnical consultant.

6. Establish a safe setback line from any watercourses (coastal, lake and stream), 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, erosion, land slip, rock fall, subsidence, earthquake, mud flows, or any combination thereof. The recommended setback cannot reduce the minimum setback requirements established by Bylaw.
7. Quantify the risks of a geotechnical failure or any substantial hazard.
8. Certify the "the land is safe for the use intended".
9. The report must include a site plan illustrating the location of the proposed development as they relate to the geotechnical assessment.

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

1. Acknowledge that the District of Sechelt, its planning and engineering staff and the building inspectors 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 2% in 50 Years for geotechnical hazards due to seismic events, including slope stability.
3. Reference the Engineers & Geoscientists British Columbia (EGBC) guidelines for "Legislated Landslide Assessments for Proposed Residential Development in British Columbia" where slope stability is identified as a hazard;
4. Prescribe the geotechnical works and any changes in the standards of the design of the development which are required.
5. 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 covenant may be required to be registered on the title of the property pursuant to Section 219 of the Land Title Act.
6. 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.

5.0 Submission Requirements

1. The report in digital format and two duplicate paper copies shall be provided to the District for consideration of the approval of the application.
2. Information must be visible in black and white, including all text, figures, plans and photos.
3. The Report must clearly identify the subject property by citing the legal address, as printed on a recent title search print out and the civic address if one has been assigned.
4. The Report shall state that the professional geotechnical engineer has reviewed all information available to the consultant, including previous geotechnical reports and relevant materials located within the Districts document library. Each report shall describe the specific information reviewed and onsite tests conducted (include dates) to arrive at the conclusions and recommendations within the report.
5. The Report shall clearly present the hazards, consequences, risks and mitigative measures required to safely accommodate the proposed development. Include any other factors which the professional geotechnical engineer considers relevant to the review as well as mechanisms to guarantee ongoing maintenance of slope/soil stabilities over time (as per section 4.0)
6. Each report shall contain all logs of geotechnical explorations (boring, test pits, trench logs, etc.) conducted on the property, plus a statement explaining the sufficiency in number and depth in order to evaluate site conditions and acquire data to justify all conclusions and recommendations
7. Sign and seal each report submitted to the District of Sechelt

6.0 Professional Assurances

The professional geotechnical engineer **MUST** provide in writing the following specific geotechnical assurances to the District with each Report:

1. The professional geotechnical engineer has carried out all necessary surface and subsurface investigations that the Engineer considers necessary to provide the review, design and supervision undertaking being given and adherence to these guidelines.
2. The professional geotechnical engineer will provide the review, design and supervision such that, in the Engineer's opinion the site is suitable for the proposed development and the proposed development does not and will not compromise in any way the stability of the soil on-site or soil on lands which are becoming susceptible to land slip, land slide, rock fall, mud/land flow, debris flow, torrent, erosion, slumping, creeping, settling, or other such occurrence.
3. In the professional geotechnical engineer's opinion, in the event of an land slip, land slide, rock fall, mud/land flow, debris flow, torrent, erosion, slumping, creeping, settling, or other such

occurrence, which occurs after the proposed development is completed, the extent of the property damage and damage to life and limb which occurs is not likely to be in any way greater than the damage or harm which would occur prior to the development taking place.

4. The professional geotechnical engineer's undertaking that he/she is retained by the owner/developer to review, consult, design and fully supervise the construction of the proposed development, and that on completion of the work, he/she will confirm in writing that he/she has fulfilled the review, design and supervision undertakings and the proposed development can safely be used for its intended purpose, taking into consideration future changes which could reasonably occur to the proposed development over time. In the event the retainer is terminated for any reason by the owner/developer, the Engineer shall be obligated to immediately notify the District in writing of that fact.
5. The professional geotechnical engineer's undertaking that he/she shall notify the District if he/she becomes aware of changes or new information which could affect the outcome of their geotechnical review and recommendations.

Assurance Statements: The following assurance statements shall be included in the Report according to the relevant application:

In the case of an application for a Development Permit:

"Notwithstanding any other statement in this report, this report may be relied upon by the District of Sechelt in considering an application for a development permit as outlined in the District of Sechelt Official Community Plan for lands within Development Permit Area #(xx) – (DPA Name)."

In the case of an application for a Building Permit

"Notwithstanding any other statement in this report, this report may be relied upon by the District of Sechelt in considering an application for a building permit under Section 56 of the Community Charter."

In the case of an application for a Zoning Bylaw Amendment:

"Notwithstanding any other statement in this report, this report may be relied upon by the District of Sechelt in considering a zoning amendment application to rezone the subject property from (existing zone) to (proposed zone) as regulated by the District of Sechelt Bylaw No. 25, 1987.

In the case of an application for subdivision:

"Notwithstanding any other statement in this report, this report may be relied upon by the District of Sechelt in considering approval of elements as specified in Subdivision and Servicing Bylaw No. 430, 2003.

6.0 Professional Liability Insurance

The professional geotechnical engineer shall provide the District with evidence of occurrence based professional liability insurance coverage which does not lapse in the amount of \$2,000,000 as provided to their client.

7.0 Covenants

The owner/developer may be required by the District to register a covenant against the property title at the Land Titles Office as a notification to future land owners. The covenant will incorporate provisions included in the geotechnical report(s) and indemnify the District against all claims. During the construction phase enforcement of the covenant provisions are the joint responsibility of the owner/developer and the professional geotechnical engineer.

8.0 Security

The owner/developer may be required by the District to provide bonding as security for performance of the on-site and off-site construction works and secure the provisions outlined in the geotechnical report(s) pertaining to that construction.

9.0 Peer Review

The District may require a professional geotechnical engineer peer review for conformance to good engineering practice and adherence to these guidelines on a case by case basis. The peer review shall be completed by a qualified professional geotechnical engineer engaged directly by the District. Any costs incurred by the District to conduct a peer review shall be borne by the owner/developer. The Engineer engaged by the District shall notify the professional geotechnical engineer and owner/developer in writing of the peer review.

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