Coquitlam

Guide to Best Site Development Practices

(Formerly Hillside Development Standards & Guidelines)

April 2005

A Note to the Reader

As the title suggests, this guide is a consolidation of existing City requirements related to site development. Initially prepared to fulfil policy in the City's Northeast Coquitlam Area Plan, it was determined through public consultation to be appropriately applied across the City. Best practices to limit impacts on the existing site conditions are included and organized through the two major stages of site development:

1. Subdivision and/or Rezoning – lot design and zoning

2. Building and/or Conservation Permits – construction on sites following subdivision or rezoning.

Subdivision or rezoning of property provides opportunities for planning and design or re-planning and redesign of a site. Hence the focus of the Guide is on these two key approvals, with follow-up at the construction stages of Building or Conservation Permits.

A summary of requirements is provided in three appendices. These serve as handy checklists for professional surveyors and other consultants to use when surveying and assessing a development site. The information required is needed in stages, depending on what is identified at the previous stage. Not every site will require every review, report or plan listed.

A Frequently Asked Question

What approvals might I need to develop my property?

The number and type of approvals depend on

- What an owner wishes to construct; and
- What the Official Community Plan and Zoning Bylaw say about the property i.e. the land use and zoning.

Here are some of the approvals that may be required (as applicable):

Rezoning

- If the proposed development of a property is different or varies from what the Zoning Bylaw currently permits.

Subdivision

- If the property is large enough and the owner wishes to create more parcels;
- Other situations may also require an owner to go through the subdivision process.

Development Permit

- In some cases, the Official Community Plan says an additional approval is needed, usually for environmental or design reasons.

Conservation Permit

- For the required deposit and removal of soil;
- Some filling and excavation may not necessarily require a Conservation Permit.

Building Permit and/or Plumbing Permit

- To construct a new structure or make changes to an existing structure;
- Many other alterations and demolitions require Building and/or Plumbing Permits.

For more information on all situations that require development approval, please call the Planning and Development Department at:

Rezoning Subdivision Development Permit	604-927-3430
Conservation Permit	604-927-3466
Building Permit	604-927-3441 or 604-927-3451

Table of Contents

1.0 Introduction

This document contains guidelines and standards specific to subdivision and land development in the City of Coquitlam. It was prepared initially for the area defined by the Citywide Official Community Plan (CWOCP) as Northeast Coquitlam. However, Council has directed that the document be applied Citywide as it is a consolidation of existing City requirements intended to encourage development practices sensitive to natural terrain and habitat conditions.

This document was developed to provide consistency for subdivision and development applications, as well as require planning and design that is sensitive to and recognizes many of Coquitlam's existing natural conditions.

This Guide is intended to assist both the applicant and the City through a consolidation of existing standard requirements and guidelines that will be used to evaluate and identify existing natural conditions and areas of sensitivity that need more detailed consideration as part of the subdivision and development review and approval process.

It does not replace other City policies and bylaws that are further discussed in the next sections. It is the applicant's responsibility to ensure they have obtained and reviewed all other applicable bylaws and requirements in conjunction with associated subdivision and development applications.

1.1 Goal

The goal of this guide is to build upon and consolidate established land use policies and bylaws related to the physical construction of buildings and infrastructure, and to ensure appropriate development design and review is conducted to limit potential impact of these works on the natural terrain and habitat conditions.

1.2 Applicable City Policies and Objectives

The City of Coquitlam has a number of existing polices and objectives that have been defined in the City of Coquitlam's Strategic Plan, the Citywide Official Community Plan and the Northeast Coquitlam Area Plan. The following is a summary of these policies and objectives:

Citywide Official Community Plan
3.4 Natural Hazards Management

Objective 1

- To enhance the City's response to geotechnical and natural safety issues which could affect development and infrastructure.

Policies

a) Explore establishing a terrain and watershed evaluation system to create terrain and watercourse suitability and geotechnical hazard mitigation plans for designated areas or watersheds within the City.
b) Recognize the importance of vegetation in maintaining slope stability
c) Encourage retention of topsoil in new developments.
d) Ensure public safety through appropriate local regulations and compliance inspections.

Objective 2

- To preserve hazard lands as ESA's (Environmentally Sensitive Areas) that serve as wildlife corridors or contain important habitat, where appropriate.

Policies

a) Continue to provide for safe tree retention, where appropriate
b) In areas to be replanted, encourage the use of appropriate native vegetation.

Northeast Coquitlam Area Plan

Policy A-2.2.10 Residential Hillside Development Guidelines

a) In order that the visual impact of future residential development in Northeast Coquitlam is suitable to the hillside conditions of the area, the city will develop Residential Hillside Development Guidelines to ensure that house design is sensitive to the area's natural features and steep topography and that significant trees are retained when it is safe and practical.

This document should be read in conjunction with the others on this list to obtain a complete understanding of all land development requirements.

1.3 Applicable City Documents and Bylaws

In addition to the documents referred to in Section 1.2, a number of other existing city bylaws and documents provide standards and other requirements related to land development. These include but are not limited to:

- Citywide Official Community Plan
- Subdivision and Development Servicing Bylaw No. 3558, 2003
- City Stormwater Management Policy and Design Manual
- City of Coquitlam Supplementary Specifications and Detailed Drawings to MMCD 2000 Edition
- Master Municipal Construction Documents 2000 Edition
- Conservation Bylaw No.2454, 1994
- Building Bylaw No. 3598, 2003
- Stream and Drainage Protection Bylaw No. 3447, 2001
- Zoning Bylaw No. 3000, 1996, as amended
- Tree Cutting Permit Bylaw No. 2169, 1990 and amendments
- Hyde Creek Integrated Watershed Management Plan, April 2004
- Upper and Lower Hyde Creek Village Neighbourhood Plans
- Low Impact Development Policy and Procedure Manual (Dec. 2004)

The above documents and others as applicable will need to be referred to for a full understanding of all city development requirements.

Guidelines:
- recommended best practices for site development. It is every applicant's responsibility to demonstrate how best practices have been used.

1.4 Guidelines versus Standards

For the purpose of this document, standards will be considered mandatory requirements and must be followed. References to guidelines are more discretionary, however it will be the applicant's responsibility to demonstrate with their application how the guidelines have been adequately addressed.

Standards:
Mandatory requirements that must be followed.

2.0 Issues and Considerations

Several design issues and considerations need to be reviewed and addressed for subdivision, rezoning, conservation permit and building permit applications. It is important to keep in mind that the goal and intent of this document is to assist in providing both the applicant and City an overview of issues and considerations that need to be appropriately reviewed to limit the impact of land development on the existing natural condition and to help ensure a sustainable and cost effective result. Five specific issues require detailed consideration and review:

1) Site Topography and Planning
2) Significant Natural Features
3) Geological Features
4) Site Grading and Retaining Walls
5) Drainage and Sediment Control

It is understood that these issues are interrelated and both the applicants and the City need to recognize that decisions made on any one issue can have a considerable impact on others. Review of these issues in the early planning stages will assist in mitigating conflicts in the later stages of detailed design and physical site development.

A subdivision and/or development application must demonstrate to the City how all five development issues have been addressed.

All of the above issues are covered in more detail in the following section and a subdivision and/or development application will be required to demonstrate to the City how all issues have been appropriately addressed. The following section provides both the applicant and City staff with guidance related to the review of issues, application requirements and general goals and objectives; however, it is the applicant's responsibility to initiate early discussion of these issues as failure to address them may result in delays to application processing.

3.0 Guidelines and Standards

The guidelines and standards outlined below have been organized into the five issues identified in Section 2.0 of the document. This guide addresses each of these issues for two categories of development. Section 3.1 will discuss goals, guidelines and standards as they relate to subdivision and rezoning applications. Section 3.2 will concentrate on the later stage of building and conservation permit applications. As lot ownership and responsibility can change, the need to ensure that preliminary design, studies and requirements are carried through to final building construction is critical to ensure a fully integrated result that recognizes all issues and considerations.

It is critical to recognize the distinction between the two categories of development as the property owner or applicant and their professional consultants making a building permit application may not be fully aware of design issues and constraints that were reviewed and addressed with the initial subdivision review.

Checklists for the two categories of development are provided in Appendices A and B of this document. These checklists are to be used by both the applicant and the City to facilitate compliance with the Guidelines and standards. **Applicants must review these checklists in the initial stages of site development and they must be completed by the applicants and submitted to the City with their application.** This will assist the City in reviewing the application and show how all issues and constraints are being satisfied.

3.1 Subdivision and Rezoning Applications

This section outlines goals, guidelines and standards which must be met and/or considered as they relate to submitting subdivision and / or rezoning application.

3.1.1 Topography and Site Planning

The existing natural site conditions in Coquitlam can create challenges for design and construction, and they can also provide added value and enhancements to the site planning process. Views, streetscapes and building character when carefully considered into site design can provide added neighbourhood value. Careful consideration of the site's topography in the preliminary stages is critical in setting the foundation for subsequent stages of development. If not carefully examined and planned, conflicts can have significant adverse impact on the end product and result in unnecessary modifications to existing natural site conditions.

Goals

1) To ensure that new development recognizes existing topography with minimum physical impacts to the existing site; and
2) To identify topographical considerations that will require further evaluation and guide the site planning through a multidisciplinary approach that includes Planners, Engineers, and Landscape Architects.

Guidelines

1) Land development and infrastructure planning that includes lot layout and roads need to recognize the existing topographic conditions and be located in a manner that minimizes the need for significant cuts and fills.
2) Modification to the existing topographic condition should be limited as much as possible.

Standards

1) Topographic survey plans prepared by a registered BC Land Surveyor will be required for all subdivision* and rezoning applications and will include at a minimum:

    - existing and proposed lot dimensions;
    - proposed lot areas;
    - location of all survey monuments;
    - boundaries of any registered easements, rights-of-way and covenant areas;
    - building envelope indicating all required Zoning Bylaw setbacks;
    - existing elevations at each corner of the lands and proposed lots;
    - location of existing structures which are to remain following subdivision of land;
    - existing contours at 1.0m intervals;
    - location and elevation of crest and toe of slopes and degree of slopes at regular intervals.

* Please note that additional site survey information may be required with the subdivision application as identified under the following Significant Natural Features Section 3.1.2.

3.1.2 Significant Natural Features

A vast variety of vegetation, geologic and hydrologic natural features contribute to the valuable and distinctive characteristics of Coquitlam's landscape. With development, there is a need to identify these significant natural features (SNFs) in the early stages of the planning process and to establish appropriate mechanisms to protect them where it is safe and practical to do so. Where full retention is not practical, methods to mitigate impacts on identified natural features are necessary.

Goals

1) To identify and protect watercourses, groundwater sources, and upland wetlands that have not previously been identified and that have ecological value;
2) To identify and protect and/or mitigate impacts to significant vegetation features that provide ecological and aesthetic benefits to the community; and
3) To identify and protect and/or mitigate impacts to significant landform and geological features that provide ecological, slope stabilization or aesthetic benefits to the community.

Guidelines

1) Watercourses beyond those referenced in the Citywide Official Community Plan may be identified during more detailed development applications and further evaluation may be needed to determine fish and wildlife habitat values.
2) Vegetation across existing and developing neighbourhoods should be retained, protected and replaced, where possible, to ensure the health and integrity of the urban forest and topography.
3) The landform across which developing neighbourhoods are built should be analyzed to ensure safe and practical accesses are built and that hydrologic, environmental and geological impacts are mitigated.

Standards

1) A site survey completed by a registered BC Land Surveyor will be required for all subdivision and rezoning applications and will include at a minimum:
   - Location of all trees with a diameter of trees > or = 20cm diameter at breast height, actual tree size, elevation of the ground at the base of these trees, the outside edge of the tree canopy, species, and an identification number
   - Outside canopy edge of all contiguous trees where the combined canopy has an area > or = $75m^2$
   - Elevations and locations of the centreline, high water mark and top-of-bank of any watercourses (includes both permanent and ephemeral/intermittent watercourses) to record all changes in direction at intervals not exceeding 15m
   - The natural boundary of wetlands > or = $25m^2$ (includes both permanent and ephemeral wetlands)
   - Elevation and location of groundwater wells and springs
   - Exposed rock formations > or = $25m^2$

2) If the SNF will be impacted or cannot be fully retained, then analysis of the SNF will be required to assess the value and retention capacity. The subdivision or rezoning application must include documentation of the SNF inventory and mitigation measures applied to the site design. If the City requests this further study, the applicant will need the assistance of a qualified professional consultant to perform an assessment of the SNFs within the proposed development or subdivision area. Assessment reports must also provide recommendations for protection of SNFs and or mitigation of impacts. Options for protection must be exhausted before consideration of mitigation measures will be considered. The feature may be eliminated if it is adequately demonstrated to have no or limited ecological, slope stabilization or aesthetic value. If a SNF exists and is identified for retention the site design will need to integrate the SNFs.

3) The City will review the analysis and recommended impact mitigation measures and will set requirements and approve recommendations for retention, mitigation of impacts, or removal of the feature. These recommendations will be included as conditions of subdivision or rezoning approval and securities may be obtained prior to final approvals to ensure retention or mitigation.

4) Securities will be released upon execution and inspection of works and services associated with the subdivision or rezoning application.

3.1.3 Geological Features

Coquitlam is characterized by slopes, plateaus and mountains interspersed with low lying areas. Variations in soil conditions, groundwater conditions, and topography can be expected and detailed investigation of each site is warranted. Development in Coquitlam needs to recognize the natural constraints of the varied landscape in order to ensure hazardous situations are avoided.

Goals

1) To ensure the potential for hazardous situations related to geological conditions are avoided or mitigated; and

2) To review existing site soil conditions to ensure limited impact to the existing geological condition, identify site development constraints and review potential to implement low impact development techniques associated with stormwater capture and disposal.

Guidelines

1) At areas where new development is proposed adjacent to steep slopes and /or watercourses, geotechnical setbacks and vegetation protection measures will be established to separate the proposed development from creek, slope, and geological related hazards.

2) Construction must be avoided in areas where geological hazards are identified in site specific geological investigations and reports unless adequate mitigation measures are proposed and approved by the City.

3) Locate buildings and roads away from critical areas and undisturbed soils that provide effective infiltration.

Standards

1.) Detailed geotechnical and hydrogeological investigations will be conducted by the applicant's professional geotechnical consultants in the preliminary stages of site development. These detailed geotechnical assessments will include, but will not be limited to, review of:

- Subsurface soil profile condition including the presence of fill or other imported materials
- Areas of significant natural (geological) features to be protected from development
- Construction and building setbacks from top and bottom of slopes and ravines (refer to City Zoning Bylaw).
- Existive groundwater location and a review of springs, natural watercourses or wetlands and existing hydrologic patterns and features
- Review and recommendations related to site development requirements including building and site servicing (roads)
- Requirements for site earthworks (grading and retaining)
- Review of offsite hazards that could adversely impact or be impacted by site development
- Review of and recommendations related to soil infiltration rates to establish representative soil infiltration potential (refer to City of Coquitlam Low Impact Development Policy and Procedure Manual)

3.1.4 Site Grading and Retaining Walls

Site and lot grading review that is discussed in Section 3.1.1 of this guide, further to the topographic base plans, is a critical component of the land development review as any removal or deposit of soil has the potential to significantly alter and impact the existing topography and characteristics of the site. Plan views and cross sections can be utilized to explore the impact of required earthworks and establish mitigation measures in the early stages of planning to ensure the least impact to the existing site condition.

Goals

1) To ensure that new development respects the existing topography with minimum impacts to the site physically and visually;

2) To design site grading to respect existing site conditions and limit excessive earthworks.

Guidelines

1) Overlay building concepts and infrastructure including roads to limit earthworks and set elevations that will reduce future disruption and regrading at the building permit stage of site developments.

2) Retaining structures can be used to reduce the amount of site earthworks and protect the existing topography or identified natural features.

3) Designs should limit the height and mass of retaining structures by using terraced retaining or stepped retaining. Landscaping of the terraces can also be utilized to reduce the appearance of the retaining structures.

4) Uniform and/or sharp transitions between existing and proposed grades should be avoided and smooth transitions utilized.

5) Overall grades for individual building lots being created as a condition of subdivision should not exceed 20% and the use of retaining wails should not exceed 1.2m in height. Terraced retaining walls and stepped building foundations should be utilized as much as possible.

6) Significant bulk grading, stripping of topsoils and vegetation will be avoided.

Standards

1) Site grading plans will be required for all subdivision and rezoning applications and will contain at a minimum the following information. Please note that reference to the City Subdivision and Development Servicing Bylaw and Stormwater Management Policy and Design Manual is needed for further details (available for purchase at City Hall or online at www.coquitlam.ca).

    - Existing topographic information including 1.0m contours
    - Cross sections for lots in excess of 15% and or lots requiring significant cuts and fills
    - All proposed finished corner elevations using 20% as a guide and indicating required cuts and fills with the objective to limit earthworks
    - Minimum basement elevations, finished rear yard elevations and driveway grades
    - Direction of surface drainage with sodded swales and lawn basins indicated to prevent surface water run-off flowing onto adjacent lands. Drainage rights-of-way or easements may be provided as necessary
    - Developer and builder obligations need to be clearly defined
    - Locations of all covenants, easements, and rights-of-ways.
    - Locations of cuts and fills with recommendations provided by geotechnical consultant
    - Locations of all retaining walls and details including drainage noting all walls over 1.2m will need to be engineered and permitted.
    - Proposed site development including location of roads, lots and dimensions, building envelopes, etc.
    - Indication of all significant natural features, protected areas, mitigation and protection measures
    - Reference to all applicable geotechnical reports and recommendations
    - Locations where native (existing) soils can be retained without removal

3.1.5 Surface Drainage and Sediment Control

The City of Coquitlam has recently approved the Stormwater Management Policy and Design Manual to provide guidance, goals and recommendations related to the management of stormwater. The City is also undertaking integrated watershed management plans in an (IWMP) to provide for the orderly and cost effective development of each watershed while protecting environmental and community values.

The IWMP's along with the City Stormwater Policy and Design Manual and subsequent Low Impact Development Policy and Procedures Manual provide the guidance and procedures to address these issues. It is the applicant's responsibility to review these documents and ensure full integration of all issues into land development applications.

The following discussion relates specifically to surface drainage and sediment control issues that will need to be considered at subdivision design and construction, stages.

Goals

1) To control site drainage through the subdivision and development construction stages that recognizes the existing natural condition;

2) Mitigate surface drainage impacts on the upslope and downstream adjacent properties both pre and post construction; and

3) Provide for temporary capture and treatment of surface drainage flows to mitigate site erosion.

4) Retain and incorporate natural topographic and drainage features that slow, store and infiltrate water.

Guidelines

1) Subdivision servicing and lot grading plans will recognize the need to control surface drainage both pre and post construction and indicate how stormwater run off will be impacted by the subdivision and /or development.
2) Reference can be made to the GVRD's "Best Management Practices Guide for Stormwater" and the separately bound "Appendix H: Construction Site Erosion and Sediment Control Guide (Dayton & Knight Ltd. et al, 1999)". (This is available for reference at www.gvrd.bc.ca/sewerage/stormwater_reports.htm)
3) Professional geotechnical input should be provided in the preliminary stages to understand the existing soil condition, impact of surface drainage flows and potential for erosion.
4) Retain existing vegetation and landscape exposed surface as soon as possible to decrease duration of exposure. Minimize extent of disruption at one time.
5) Recognize the construction schedule and timing of physical site development should be sensitive to seasonal weather conditions.

Standards

1) Lot grading plans will need to clearly define surface drainage controls and mitigation measures that may include sodded swales (i.e. grass-lined shallow depressions designed to catch surface drainage) and catch basins for both the construction and the permanent conditions.
2) Compliance with all City documents and requirements related to stormwater management including but not limited to: the relevant Integrated Watershed Management Plan, Low Impact Development Policy and Design Manual, and the City Stormwater Management Policy and Design Manual,
3) Sediment Control Plans will be required with all subdivision and development applications in compliance with the City of Coquitlam Bylaw No. 3447, 2001.
4) Sediment Control Plans must be prepared by a Professional Engineer and include all applicable information including:
    - Works and measures required during construction work to prevent the discharge of prohibited materials into the drainage system;
    - Monitoring program;
    - Operation and maintenance program; and
    - Letter of undertaking signed by a Professional Engineer which commits to undertake a program of management of the plan;
5) The sediment control works must be maintained and operated for the duration of the construction work.
6) The sediment control plan must include hydro seeding or other suitable erosion protection and restoration landscaping where it is deemed necessary.

3.2 Building and Conservation Permit Applications

This section will concentrate on building upon the goals and guidelines already defined for the various issues and considerations identified in Section 2.0 and provide an overview of typical City Standards as they relate to the later stage of Building Permit and Conservation Permit Applications.

3.2.1 Topographic and Site Planning

Building upon guidelines, requirements and design established in all the preliminary studies and plans, this is the critical stage when buildings and structures start to be physically constructed within a development site. Establishing clear information and documentation at this stage is critical to ensure that owners, designers and builders on the site realize a final product consistent with previous development approvals and established requirements.

Goals

1) To ensure that appropriate information related to topography is provided with building permit applications to facilitate City review;

2) To provide information and details on building plans to assist contractors and builders in site design and planning; and

3) Identify constraints, restrictions and requirements to ensure appropriate and complementary building design with the pre and post construction stages.

Guidelines

1) Applicants will review all relevant studies, documents, plans, and information related to the site prior to making a building permit application. Incomplete applications and lack of detail may result in returned applications and longer processing times for building permit applications;

2) Buildings shall be located in a manner that minimizes the need for grading and preserves the existing topography and features such as vegetation and topsoils to the maximum extent possible.

Standards

1) Applications for Building and Conservation Permit* will include all relevant site information including (but not limited to):

- copy of lot grading plan for the lot established with subdivision,
- location and dimensions of building and structures,
- the dimensions of the parcel on which the building is to be located and location of the building relative to the parcel's property lines,
- the grades and elevations of the roads and utilities abutting the parcel,
- cross section drawings through the parcel and building from property line to property line, showing in detail existing and proposed grades adjacent to the building,
- location and dimension of all statutory rights-of-way, easements, covenants and setback requirements,
- watercourse setbacks where the City's land use regulations (Zoning Bylaw) establish siting requirements related to flooding, erosion, or the protection of riparian areas,
- the existing and finished ground levels to an established datum at or adjacent to, the parcel and the geodetic elevation of the underside of the floor system,
- location, dimensions and gradient of parking and driveway access, and
- contain any and all other information necessary to establish compliance with the City Building Bylaw, Provincial Code and any other applicable City Bylaws.

* Note all survey information is to be completed and prepared by a professional British Columbia Land Surveyor.

2) In addition to the above requirements, where the parcel contains slopes in excess of 15%, and upon the request of the City, applications will be accompanied by plans showing:

- 0.5 metre contours of the existing ground surface of the parcel,
- 0.5 metre contours of the proposed final grading,
- the elevations of building, garage and carport slabs.

3.2.2 Significant Natural Features

In order to ensure Significant Natural Features (SNFs) identified in Section 3.1.2 are adequately protected, certain measures may need to be implemented and recognized through the Building Permit or Conservation Permit process. Two different scenarios may exist for a site as it relates to this guide and a Building Permit or Conservation Permit.

1) The site has gone through a previous subdivision or rezoning application and SNFs were **not** identified; or
2) The site has been subject to initial subdivision or rezoning application and SNFs were identified.

The following section outlines information requirements related to scenario 2) above. If a site has been subject to a review under Section 3.1.2 and SNFs have not been identified, no further information or review is needed as it relates to this issue.

Goals

1) To ensure SNFs identified in preliminary planning and subdivision or rezoning stages are adequately identified and protected during physical site development and construction stages.

Guidelines

1) Respect the existing environment and minimize impact on local vegetation and watercourses.

Standards

1) Site survey to be provided consistent with requirements in Section 3.2.1.
2) If SNFs have been identified for protection in preliminary subdivision or rezoning reviews, all applicable requirements and information must be provided with the building permit or conservation permit applications, including demonstration of compliance with all protection requirements.

3.2.3 Geological Features

The need for detailed geological or geotechnical sub-surface investigations as they relate to building permit applications will generally be identified in the subdivision stages of the development process. Geotechnical requirements will be established in the subdivision stages and mitigation strategies such as soil preparation and building locations will be identified as they relate to the land use. Conservation Permit applications will generally require geotechnical review.

Goals

1) To ensure building design is compatible with existing geological conditions;
2) To ensure stormwater capture and disposal methods (low impact development techniques) are suitable for the existing geological and hydrogeological conditions; and
3) To review, as needed, geotechnical considerations and requirements identified in previous investigations and subdivision applications to ensure building and development compliance with requirements.

Guidelines

1) Geotechnical reports submitted in support of a Building or Conservation Permit application must be of high quality and comprehensive. The proper characterization of existing geological conditions and constraints is crucial to ensuring appropriate building design, site earthworks and mitigation measures.

Standards

1) Compliance with conditions established in geotechnical investigations including the submission of professional letters of undertaking, geotechnical inspection and certification by a professional engineer with expertise in geotechnical engineering where determined by the City is required.

3.2.4 Site Grading and Retaining Walls

Many of the goals and discussion in Section 3.1.4 related to site grading and retaining walls in the subdivision stages can be carried through to the Building Permit application. Establishing detailed review and analysis of the site before building design is critical to ensuring limited site impact and the design of appropriate construction. Section 3.2.1 sets the framework for appropriate site planning while this section concentrates on ensuring the achievement of those goals in the process of construction.

Goals

1) To ensure design objectives and requirements stipulated in the subdivision process are maintained through the physical building construction stages; and

2) To ensure site grading and retaining wall construction works are minimized to the greatest extent possible with limited visual impact to adjacent properties and no physical impact to protected areas.

Guidelines

1) Use stepped foundations and terraced retaining to help the structures conform to the natural slope of the hillside;
2) Grading plans should include provisions for restoration of vegetation on cut and fill slopes;
3) Uniform and abrupt cuts and fills should be avoided while smooth and irregular transitions between natural and regraded areas should be utilized;
4) Graded areas should not be larger than the area of the footprint of the house, plus the areas necessary for driveways and parking;
5) Retaining structures regardless of height should always be founded on suitable soils and include provisions for adequate granular backfill and subsurface drainage; and
6) Building and retaining structure design and finish should consider both physical and visual impact on adjacent properties and /or adjacent natural areas.
7) Site planning requirements must coordinate with construction activities.

Standards

1) All site regrading must be completed in compliance with requirements established with the approved subdivision lot grading plan if one exists and the Building Permit application will need to demonstrate compliance. Fencing of protection areas to be completed prior to site construction works.
2) No driveway or other private access to any parcel or building will exceed an average slope grade of 15% and a maximum slope grade of 20% at any point.
3) Any re-grading or recontouring of the parcel must not result in slopes exceeding 2 horizontal to 1 vertical in cuts in native soil material, or 3 horizontal to 1 vertical in man-made fills unless a report is submitted by a professional geotechnical engineer verifying that the parcel is stable and suitable.
4) Retaining walls must not be constructed of uncemented rock or boulder piles and creosoted timbers.
5) Building permits and engineered design is required for all retaining walls or combination of retaining walls in excess of 1.2m in finished height and accompanied by necessary geotechnical, structural and drainage plans prepared and sealed by an Engineer.
6) Within building lots, retaining wall height and locations shall be as specified in the City Zoning Bylaw.

3.2.5 Surface Drainage and Sediment Control

Refer to the applicable Integrated Watershed Management Plan and Low Impact Development Guidelines for recommendations and requirements related to stormwater management.

As described in Section 3.1.5, the City addresses drainage and sediment control as part of stormwater management in each watershed. The IWMP's and subsequent Low Impact Development Guidelines provide guidance, recommendations and requirements related to stormwater management and stormwater disposal that will need to be reviewed and complied with for any subdivision and development application.

The following relates to surface drainage and sediment control issues that will need to be considered in relation to building construction and regrading works at Building Permit Application.

Goals

1) To ensure appropriate control, capture and disposal of surface and subsurface drainage flows to mitigate adverse downstream impacts during site development and building construction; and
2) To minimize impact of drainage flows on adjacent properties and established retention areas.

Guidelines

1) Stormwater runoff should be dispersed within the property to the greatest extent feasible.
2) Reference can be made to the GVRD's "Best Management Practices Guide for Stormwater" and the separately bound "Appendix H: Construction Site Erosion and Sediment Control Guide (Dayton & Knight Ltd. et al, 1999)".
3) Professional geotechnical input should be provided in the preliminary stages to understand the existing soil condition, impact of surface drainage flows and potential for erosion.
4) Retain existing vegetation and landscape exposed surfaces as soon as possible to decrease duration of exposure.
5) Recognize the construction schedule and time of year site development may be proposed. Site earthworks should be limited in times of heavy rain to reduce potential for uncontrolled drainage and sedimentation.

Standards

1) Compliance with all requirements related to drainage and sediment control established at the time of subdivision is required.
2) Sediment traps and temporary filtration devices shall be used to capture stormwater runoff.
3) Sediment Control Plans will be required with all Building Permit applications in compliance with the City of Coquitlam Stream and Drainage Protection Bylaw No. 3447, 2001.
4) Compliance with City single lot erosion and sediment control guidelines is required.
5) Where a building will require fill or excavation of the parcel, including reshaping, recontouring or regrading the contours of the parcel, applications must include drainage design drawings that show the drainage control measures that must accompany the fill, excavation or re-contouring so as to:

    i) reduce run-off to adjacent parcels and highways to pre-development quantities and locations,
    ii) eliminate concentrations of runoff to adjoining parcels and highways that constitute or may constitute a hazard or nuisance, and
    iii) provide an emergency flow path for excessive run off from major precipitation to a one hundred year occurrence level.

This Guide was prepared by the Development Services Division, Planning and Development Department. For further information about development and construction standards and guidelines in Coquitlam please call 604-927-3430.

Appendix A

Subdivision and Rezoning Application Checklist

This list is provided for reference and general summary of information that may be needed with your subdivision or rezoning application. Some of the listed items may not be applicable to your site or application, however this list is provided to capture issues and considerations that may need to be addressed or reviewed with your application further to the detail discussed within the Guide. More detailed information may be requested further to review of initial application information.

Please note that this checklist is specific to the Guide to Best Site Development Practices in Coquitlam and other requirements exist with regards to Subdivision and Zoning applications that will need to be reviewed with City Development Planning Staff. It is the applicant's responsibility to review and comply with any and all other City requirements and bylaws.

Project Address: _____

Applicant's Name: _____

Stage 1

- Site survey plan (See Appendix C)

Stage 2

☐ Significant Natural Features Assessment Report (where applicable, as determined by City Environmental Services after initial application review)

☐ Arborist review (where applicable, as determined by City Environmental Services after initial application review)

☐ Geotechnical and Hydrogeological investigation to confirm feasibility of proposed development and Low Impact Development Techniques (where applicable, see Low Impact Development Policy and Procedure Manual)

☐ ***Preliminary*** site and/or lot grading plans by Civil Engineer (see Section 3.1.4)

☐ ***Preliminary*** site servicing and road layout concepts by Civil Engineer

Appendix B

Building and Conservation Permit Application Checklist

This list is provided for reference and general summary of information that may be needed with your building or conservation permit application. Some of the listed items may not be applicable to your site or application, however this list is provided to capture issues and considerations that may need to be addressed or reviewed with your application further to the detail discussed within the Guide to Best Site Development Practices document. More detailed information may be requested further to review of initial application information.

Please note that this checklist is specific to the Guide to Best Site Development Practices Document and other requirements exist with regards to Building Permit and Conservation Permit applications that will need to be reviewed with Development Services staff. It is the applicant's responsibility to review and comply with any and all other City requirements and bylaws.

Project Address: _____

Applicant's Name: _____

- ☐ Copy of approved Lot Grading Plan for the lot established with subdivision
- ☐ Site Survey Plan (see Appendix C)
- ☐ Where a building will require fill or excavation of the parcel, including reshaping, re-contouring or regrading the contours of the parcel, applications must include drainage design drawings that show the drainage control measures that must accompany the fill, excavation or re-contouring so as to:
    - i) reduce run-off to adjacent parcels and highways to pre-development quantities and locations,
    - ii) eliminate concentrations of runoff to adjoining parcels and highways that constitute or may constitute a hazard or nuisance, and
    - iii) provide an emergency flow path for excessive run off from major precipitation to a one hundred year occurrence level.

- ☐ Locations of any identified Significant Natural Features noting any associated requirements
- ☐ Low Impact Development (LID) requirements identified and implemented. (review of any LID requirements registered on title)
- ☐ Geotechnical review and design (as determined through Subdivision process for building permit applications)
- ☐ Landscape Architect review and design (as determined through Subdivision process for building permit applications)
- ☐ Sediment control plans
- ☐ Contain any and all other information necessary to establish compliance with the City Building Bylaw, Provincial Code and any other applicable City Bylaws or requirements.

Appendix C

Survey Plan Requirements

***Please note that all of the information below will need to be prepared and completed by a registered BC Land Surveyor*.**

Items listed below are identified as minimum requirements the BC land surveyor will need to identify on their survey plan submission. Further information and details may be needed further to submission review.

I. Subdivision and Rezoning Applications

- ☐ Existing and proposed lot dimensions
- ☐ Proposed lot areas
- ☐ Location of all survey monuments
- ☐ Boundaries of any registered easements, rights-of-way and covenant areas
- ☐ Building envelope(s) indicating all required Zoning Bylaw setbacks
- ☐ Existing elevations at each corner of the lands and proposed lots
- ☐ Location of existing structures which are to remain following subdivision of land
- ☐ Existing contours at 1.0m intervals, if land contains or abuts watercourse or ravines or slopes in excess of 15%
- ☐ Location and elevation of crest and toe of slopes and degree of slopes at regular intervals
- ☐ Location of all trees with a diameter of trees > or = 20cm diameter at breast height, actual tree size, elevation of the ground at the base of these trees, the outside edge of the tree canopy, species, and an identification number
- ☐ Outside canopy edge of all contiguous trees where the combined canopy has an area > or = $75m^2$
- ☐ Elevations and locations of the centreline, high water mark and top-of-bank of any watercourses (includes both permanent and ephemeral/intermittent watercourses) to record all changes in direction at intervals not exceeding 15m
- ☐ The natural boundary of wetlands > or = $25m^2$ (includes both permanent and ephemeral wetlands)
- ☐ Elevation and location of groundwater wells and springs
- ☐ Exposed rock formations > or = $25m^2$

II. Building Permit and Conservation Permit Applications (submitted subsequent to a Subdivision or Rezoning of the property)

- ☐ Location and dimensions of all building and structures
- ☐ The dimensions of the parcel on which the building is to be located and location of the building relative to the parcel's property lines
- ☐ The grades and elevations of the roads and utilities abutting the parcel
- ☐ Cross section drawings through the parcel and building from property line to property line, showing in detail existing and proposed grades adjacent to the building
- ☐ Location and dimension of all statutory rights-of-way, easements, covenants and setback requirements
- ☐ Watercourse setbacks where the City's land use regulations (Zoning Bylaw) establish siting requirements related to flooding, erosion, or the protection of riparian areas.
- ☐ The existing and finished ground levels to an established datum at or adjacent to the parcel and the geodetic elevation of the underside of the floor system
- ☐ Location, dimensions and gradient of parking and driveway access
- ☐ In addition to the above requirements, where the parcel contains slopes in excess of 15%, and upon the request of the City, applications will be accompanied by plans showing:
    - 0.5 metre contours of the existing ground surface of the parcel,
    - 0.5 metre contours of the proposed final grading,
    - the elevations of building, garage and carport slabs.
- ☐ For Conservation Permit applications refer to Schedules A through E of Conservation Bylaw No. 2454, 1994