



Deep Roots
Greater Heights

Natural Features Development Permit Checklist 2008 Low Impact Development Guidelines for NFDP

This is an expanded document based on Schedule G of the Procedural Bylaw No. 5879-1999 with additional information added for clarity on the required low impact development guidelines.

The Natural Features Development Permit Area (NFDPA) is established for the preservation, protection, restoration and enhancement of the natural environment. It is also established for the protection of development from hazardous conditions. Applications for a Development Permit within the Natural Features Development Permit Area are to be made to the Planning Department.

A Natural Features Development Permit NFDP is required to be secured before any clearing, grading, or construction activity begins within the development permit area and before any subdivision of the lands. The following information is required:

Mandatory Information

- A completed application form with the prescribed fee;
- A Certificate of Title and a Consent Form (if the applicant is different from the owner shown on the certificate of title) plus copies of any restrictive covenant documents registered against title;
- A Site Profile;

The NFDP must be approved by the District's Environmental Department before any clearing, grading, or construction activity begins and before any permits or approvals are provided by the District for the development of the site.

1. **Survey Plans.** Two hard copies and one digital copy of a survey plan that has been prepared by a BC Land Surveyor illustrating the location of the following:
 - i) Areas found within the Floodplain boundary, forest lands found on OCP Schedule C or areas on site located within 50 metres from a designated Conservation or Park area;
 - ii) Watercourses, drainage channels, or wetland areas where applicable;
 - iii) Existing topographic features such as rock bluffs and contours with 1 metre intervals;
 - iv) Existing structures, infrastructure, and roads;
 - v) Existing slopes greater than 15% and existing slopes greater than 25% on the site, colour coded
2. Location of existing or proposed building structures, roads, septic or drainage facilities, as well as any right of ways, easements, restrictive covenants or existing or proposed equestrian trails .
3. An Environmental Assessment is required by the District based on the type, size, and location of the proposed development. It must be prepared by a qualified environmental professional.

Environmental Assessment

An Environmental Assessment will most often include a report with a bio-physical inventory and plan(s) showing the location of the following:

- a. Areas where the proposed development is going to require cutting, grading, or alteration of natural slopes > 15% will require a detailed geotechnical assessment

which must include use of a conservative factor of safety and illustration of geotech setback lines. Geotechnical recommendations must consider OCP hillside development objectives and the attached Low Impact Development Guidelines.

- b. A description of the type, size, and condition of vegetation on site. Healthy trees and shrubs are considered to be a significant resource by the District to be retained where possible and incorporated into the site design. The vegetation survey must include a Vegetation Retention Plan prepared by a qualified professional that addresses the following:
 - i. For sites that are larger than one (1) hectare, a Plan showing the location of significant tree stands on site that are being proposed for retention or removal outside the setback areas and within the WPDP area. Significant tree stands include unique mature tree stands (Sitka Spruce, Big Leaf Maple, Cedar, Old Growth) or stands where the average tree diameters are greater than 25cm (dbh).
 - ii. For sites less than one (1) hectare in size, a Plan that identifies significant individual trees over 25cm (dbh) that are located outside of the setback area but within the NFDP zone, to be retained or removed is required.
 - iii. A plan that illustrates where significant trees, tree stands, and shrubs are located on site relative to proposed building lots, structures, infrastructure, or roads.
 - c. Enhancement or restoration recommendations and plans within the NFDP area for replanting of sparsely vegetated or disturbed vegetated areas including removal of invasive vegetative species;
 - d. Protection of significant wildlife habitat areas or features found on the site such as raptor nests, wildlife trees, high probability habitat areas for species at risk, potential wildlife corridors that provide important links to neighbouring properties or adjacent habitat areas;
 - e. Assessment and mitigation for potential hazards on the site including unstable slopes, erosion areas, potential blowdown or windfall areas, or current floodplain areas;
 - f. Topographic or hydrological features such as rock outcroppings, ridgelines, bluffs, cliffs, watercourses, water bodies, or wetlands should be identified and protected;
 - g. The environmental assessment must include appropriate recommendations for phasing and timing of works for retention of vegetation where possible and to address potential impacts during critical bird nesting periods.
 - h. Fencing and conservation covenants are to be applied for protected areas or non disturbance areas including geotechnical covenanted areas and steep slopes > 25%. They must be fenced with a continuous temporary barrier not less than 1.5 metres in height to be replaced by permanent fencing such as post and rail fencing that has been approved by the District.
4. An arborist report and plan must be carried out and submitted to the District for approval once the environmental assessment, setbacks boundaries and general building envelopes have been established to ensure adequate protection and management of significant trees and tree stands where possible. The arborist report and environmental consultant must prepare mitigation recommendations that include the following:
- (i) short term and long term measures for the protection of significant tree stands and individual trees identified in protected areas, non-disturbance zones, or within the designated NFDP zones. Recommendations must include protection of root zones/drip lines and mitigation for blow down or windfall concerns.
 - (ii) removal or mitigation of potential hazard trees located within adjacent or proposed park lands that are within striking distance of the proposed building envelopes; and
 - (iii) appropriate on-site re-planting measures for sparsely vegetated areas or where trees or native vegetation is to be removed or potentially impacted by the potential development. Trees shall be replanted at a ratio of 2 new trees for every tree > 25cm (DBH) removed

within the NFDP zone and minimum tree size shall be 5 gallon. Larger sizes may be required when site conditions warrant.

5. An Environmental Impact Assessment (EIA) prepared by Qualified Environmental Professional(s) may be required by the District. This requirement will depend on the complexity of the site, the size of the proposed development, and/or the proximity of the site to protected or environmental sensitivity areas.

An EIA will automatically require information outlined previously in Section Four of the “Environmental Assessment”. An EIA is intended to address potential impacts and mitigation once the developable area has been established. An EIA will require that the following information is prepared and submitted to the District as outlined below:

Environmental Impact Assessment

A detailed environmental impact assessment for the proposed development may include an evaluation along with recommendations on the following items:

- a. The District may require a more detailed study or peer review where safety concerns or significant environmental impacts are being proposed. The District may also require additional expertise for the design or implementation of potential hazard mitigation, landscaping, or enhancement and restoration strategies;
 - b. Slope stabilization and re-planting strategy prepared by a qualified environmental professional for sparsely vegetated areas or disturbed slope areas > 15%;
 - c. Detailed risk management studies such as geotechnical assessment or hydro-geological assessments may be required at the cost of the developer which looks at the potential impacts to surrounding properties along with necessary protection and mitigation measures. Coordination may be required with other qualified professionals on recommendations for landscaping, storm water management, trail building, and restoration related works to ensure an integrated, safe, and comprehensive approach;
 - d. Visual impact assessment and landscape architecture design plans prepared by qualified professional(s) may be required that will meet the objectives of the current municipal OCP hillside management guidelines, applicable local neighbourhood plans, and natural features development permit area guidelines (see low impact development guidelines);
6. The District may require more detailed technical assessment and reports prepared by qualified Professional(s) for addressing additional impacts and recommendations for specific issues. The details of the studies will depend on the complexity of the site, the size of the development, and/or the environmental sensitivity of the site.
7. A conceptual stormwater / rainwater management plan must be submitted with site plans that comply with the current Watercourse Protection Bylaw. They should address the following:
- a. Identify potential stormwater related issues such as:
 - significant resources, natural features, or areas to be protected,
 - any new development plans in the neighbourhood that require integration of resources, and
 - potential drainage problems on site including high flooding risks, aquifer health issues.
 - b. Evaluate the opportunities for implementing stormwater source controls to achieve the following:
 - Incorporate provincial and regional stormwater/rainwater management standards and best management practices using infiltration and exfiltration controls where possible to improve water quality and restore watershed health over time.
 - Ensure appropriate design of stormwater management detention facilities to mimic natural features and integrate them in with natural landforms or surrounding topography, using safe, functional, and aesthetically pleasing designs. Ensure that facilities and infrastructure does not encroach into parks, conservation areas, or slopes > 25%.
 - Limit the total impervious area for the NFDP zone and site where possible, meeting the 10% runoff volume target and ensuring water quality issues have been addressed.

8. Grade changes over 0.50 metres will require a Building Permit as defined in the Building Bylaw or approval through a Subdivision Servicing agreement, rezoning agreement, or Highway Use permit.
 9. For large scale or multi phase developments, Pre and Post Development Monitoring of water volumes and water quality may have to be prepared by the environmental monitor or the engineer of record to help determine the adequacy of the existing and/or proposed facilities.
 10. A Restoration and Maintenance Agreement along with an environmental security deposit for DP areas where restoration or enhancement related works are required including maintenance periods. Replanting plans shall be carried out in accordance with District of Maple Ridge Landscape Standards.
 11. A copy of the attached Schedule "A" with the Natural Features agreement signed by the developer/landowner and the environmental consultant and submitted to the District's Planning Department.
 12. A copy of the Watercourse Protection Bylaw erosion and sediment control plan along with the appropriate schedules must be submitted and signed by the Engineer of record along with the qualified environmental professional that will be monitoring the site.
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A pre-application meeting with Environment and Planning staff prior to submission of an application is strongly recommended. Please see attached Low Impact Design Guidelines on site design and building form best management practices.



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NFDP SCHEDULE "A" ENVIRONMENTAL RESPONSIBILITIES

TO: District of Maple Ridge

DATE: _____

ATTENTION: Development Permit Application No. _____

We/I _____ confirm that we/I have been retained

(Environmental Monitor's name)

by _____ for the District Project No. _____

(Developer's name printed)

to provide inspection, assessment, and reporting services in accordance with the requirements of the Natural Features Development Permit. This includes the requirement to ensure compliance with the following:

- 1) Prior to any clearing and/or disturbance of the site, it must be inspected by the environmental monitor to ensure all necessary protective controls and mitigation measures are installed/constructed properly and in accordance with municipal requirements and the approved environmental Development Permit.
- 2) Regular inspections are required to ensure compliance with the approved DP. A final inspection and written letter of confirmation by the environmental monitor is required that provides assurance all environmental requirements and cleanup of the site and conservation areas have been adequately addressed and completed.
- 2) Development and site design must incorporate the best management practices found in the attached form entitled "Low Impact Design Guidelines for NFDP Areas". The environmental professionals of record for the site are responsible for overseeing the implementation of these practices, reporting on a regular basis to the District, and for sharing the responsibilities with the supervisor or foreman of the construction works.
- 3) To prevent damage or destruction to protected areas and natural features, it is the responsibility of the developer and the qualified environmental professional (QEP) to ensure protective temporary fencing and markers have been placed around protected areas, natural features, or infiltration areas to ensure these areas are protected and are not damaged during the development process. The developer is responsible for restoring or compensating for any damages or disturbance occurring within District of Maple Ridge lands or to their property.
- 4) The qualified environmental professional/monitor must have unconditional authority from Developer to modify and/or halt any construction activity necessary to ensure compliance with municipal environmental regulations. The QEP is required to contact municipal environmental staff directly within 24 hours of any incident that constitutes an infraction and that has not been remedied.

Environmental Consultant:

Name: _____

Signature: _____

Company: _____

Address: _____

Emergency Contact Phone Number _____

Developer/Project Manager:

Low Impact Design Guidelines For NFDPA “Schedule A” attachment Detailed Site Design and BMP’s For (NFDPA) Areas

The following guidelines and best management practices support and work in conjunction with the OCP Natural Feature policy guidelines. Applicants are encouraged to incorporate the following NFDPA design guidelines into their development proposals and as part of the Natural Features Development Permit application:

1. Hillside Management Guidelines and Best Management Practices:

Grading and Topography

- A. Geotechnical review and geotechnical setback lines should be required on all sites with proposed development on slopes > 15% to identify potential hazardous areas using a conservative factor of safety. Development is not encouraged by the District where average natural slopes are greater than 25 (%) percent. Grading of small areas or reclamation areas with slopes over 25% shall be reviewed by the District for potential development.
- B. New building sites should be graded such that they appear to conform to the natural topography with retention of vegetation and forest areas on the slopes as well as along the natural crest of the hill. Re-grading of upland sites should consider the topographic transition with adjacent lots.
- C. Any grading, soil deposition, or landscaping should be undertaken with consideration for opportunities to achieve a greater degree of pervious area, as a means of achieving overall stormwater management objectives.
- D. Grading plans for development on slopes > 15% should include comprehensive erosion control and innovative stormwater management plans that ensure preservation of natural drainage channels and protection of groundwater systems.
- E. The timing of grading and construction should be seasonally scheduled to avoid slope failure or erosion problems during servicing or construction periods.

Ecological Site Design and Visual Aesthetics

- A. The scenic qualities of hillside areas should be preserved by addressing the following:
 - Protection of natural landmarks such as watercourses, rock outcrops, significant view corridors, steep slopes >25%, mature trees, unique forest stands, or ridge lines;
 - The proposed development should consider significant adverse visual impacts from site design, modifications, vertical and horizontal size, or landscaping as viewed from all public viewing areas.
- B. Buildings, infrastructure, and accessories should blend with the natural hillside terrain and vegetation through use of building materials, the location of structures, size, colour, and alignment of materials.
- C. Multi story homes or tall building structures are not considered appropriate for ridgeline lots if they are setback less than 30 metres from the hill crest. Restoration and retention of natural vegetation, viewpoints, and natural heritage features is encouraged along hill crests or ridge lines.
- D. Landscaping that enhances natural features is to be encouraged.

- E. Public movement corridors within subdivisions should be encouraged to ensure access to natural amenities, trails, or park areas where possible and green corridor access widths should be a minimum of 30 metres wide where possible to encourage tree retention zones
- F. Water and energy conservation techniques (geo-thermal) is encouraged by the District and shall be utilized where possible, such as special irrigation techniques (e.g. drip irrigation), alluvial rockscaping, aqua-scaping, etc.

Vegetation Management and Drainage

- A. Setbacks along a hillcrest should take into consideration potential impacts from tree blow down, geotechnical concerns, groundwater concerns, stormwater management requirements, and consideration of aesthetic impacts for sites in view corridors.
- B. Mature trees or unique tree stands are considered a significant resource and should be retained and integrated into new development where possible. This guideline is not meant to stop removal of unhealthy or hazard trees where necessary. Mature trees are defined as anything > 25 cm in diameter at breast height or 5 feet about root crown.
- C. For lots larger than one acre in size, where significant trees have been identified, or areas intended for public use, the District may require protection of restoration areas or forested lands using a conservation covenant to ensure retention or restoration of these vegetated areas.
- D. Replanting plans should use irregular plant spacing to achieve a natural appearance on graded slopes and enhancement areas. A variety of vegetative sizes, shapes, and native species needs to be incorporated in the plan. Plant trees along contour lines using undulating groups to create grove effects which blur the distinctive line of the graded slope.
- E. Natural vegetation shall be maintained where possible. If removal is required, re-establishment of a compatible plant material will be required at a ratio of at least 2:1
- F. Plant materials should be selected where possible for their effectiveness of erosion control, fire resistance, and tolerance to local weather conditions.
- G. Hillside plant selection should consider neighbour's views and potential fire hazards.

Stormwater and Rainwater Management

- A. Stormwater should be collected and conveyed to on site and off site systems in a manner which will avoid negative impacts to natural features or adjacent properties, especially in and around sites within designated aquifer areas.
- B. Where infiltration ditches or bio-swales are required, these should be naturalized with plant materials and native rocks.
- C. Natural drainage and infiltration should be protected from grading activity and compaction through the development process and thereafter. Covenants may be required for the protection of stormwater and rainwater mitigation controls on lots.
- D. On site impervious surfaces should be minimized to reduce run-off.

- E. Stormwater from building roofs and impervious structures should be collected and conveyed to a comprehensive site drainage system that anticipates off site drainage impacts.
- F. Stormwater management plans should address the following components:
 - Written assurances from engineer the plan will meet DFO, Provincial, and GVRD standards for stormwater and rainwater management;
 - Rainwater management standards and mitigation should be designed and implemented for building structures, roads, and impervious surfaces.
 - For all non concealed surface parking areas, streets, and major institutional or commercial structures, functional infiltration and exfiltration areas should be incorporated into the design where possible and planted with a combination of trees and shrubs. An internal area equivalent to 10 - 15% of the total parking and roof top areas should be planted with a combination of infiltration and exfiltration facilities utilizing trees and shrubs where possible.

Roads and Infrastructure

- A. Exploration of narrower street widths should be encouraged when it can be proven that:
 - it will reduce grading impacts;
 - where there are a small number of lots served; and
 - the probable future traffic development is such that it justifies narrow widths and safety will not be compromised.
- B. Street layout should strive to conform to the natural grades and topography. Where possible, streets should flank open space areas that will provide future trail systems.
- C. Long stretches of straight road should be avoided by utilizing gentle horizontal and vertical curves where possible.

Retaining Walls and Fences

- A. Retaining walls should be designed with smooth, continuous lines that conform to the natural topography. Retaining walls and pony walls visible from off site should be of minimum height where possible.
 - B. Fences, walls, and accessory structures should be designed to be compatible with surrounding natural topography and buildings in terms of color, materials, and alignment.
 - C. Open fence design is encouraged on public streets to encourage opportunity for views.
- 2. Applicants for sites located within a floodplain area, on steep slopes, or within wildfire interface areas should refer to the Building Department for appropriate permits and requirements:**
- A. The Building Department has requirements for approval of plans on lands subject to flooding or geotechnical concerns. See Building Permit Requirements For Covenants.
 - B. Property owners and developers must identify development limits as defined by but not limited to steep slopes, geotechnical hazards, wildfire interface areas, and flood

plains prior to commencing design. Development activity, site design, and building forms must not have a negative impact or create additional risk to neighbouring properties and protected areas.

- 3. Applicants with sites located within 50 metres from a municipal, regional, or provincial park area or within 50 metres of designated conservation or forest area.**
 - A. Incorporate a vegetative edge and root protection zone back from these park and forest boundaries to these areas from encroachment, blow down impacts, pollution, noise, help support wildlife habitat, and provide stormwater management infiltration and exfiltration opportunities.

NFDP Schedule A – Development Standards For Maple Ridge

The District of Maple Ridge OCP and Watercourse Protection Bylaw require the use of low impact development practices which includes the following requirements and best management practices:

Timing of development activity and inventories during suitable periods.

Encourage land disturbance activity between June and September. Inventories or assessments also need to be carried out at an appropriate time of year.

Leave existing vegetation in place during the planning and approvals stages. Pre-clearing vegetation results in increased costs for temporary re-vegetation and erosion control, at the same time it increases runoff and sedimentation unnecessarily.

Clear the site in stages as development proceeds. For instance, for larger developments, clear only road and utility corridors during each phase of subdivision, leaving the future development parcels vegetated for as long as possible.

Identify areas where vegetation can permanently remain in the development or building area. These may be areas of steep slope, stream riparian or wetland areas, wildlife trees, significant greenway corridors, groves of mature trees, or site areas with topographical constraints.

Protect the soils under vegetation to be retained during construction. It is critical to the performance of stormwater management that designated areas of infiltration not be disturbed or compacted by equipment or storage during construction. Temporary protective fencing is likely required for these areas.

A phased construction schedule and plan will be prepared for each of the following development phases that demonstrates maximum retention of vegetation and minimal disruption to soils especially during rain periods:

- Clearing and grubbing
- Servicing works
- Construction of buildings

Slopes and soils must be stabilized and re-planting is required for all bare or sparsely vegetated areas within a watercourse protection or natural features development permit area. The slope stabilization and re-vegetation plan must be prepared by a qualified environmental consultant. Soil stabilization and re-planting is also immediately required for the following:

- Interim periods where development is not active for longer than 30 days
- Where construction activity has destroyed vegetation on slopes > 15%
- Encroachment into conservation or riparian protected areas

Coordination of professional consultants and their recommendations. This includes coordination of assessments and recommendations from the following:

- Environmental consultants and professional engineers
- Developers, architects, and landscape architects
- Specialized professionals that are required i.e.geotechnical professionals, hydrologists, arborists, etc.