



Green Infrastructure Partnership

Topsoil: *Just How Do You Obtain a Performing Topsoil Layer, to Advance Rainwater Management & Water Conservation Goals?*

A Law and Policy Primer for Municipal Staff and Designers



February 2010

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Preface

An absorbent topsoil layer has emerged as a fundamental building block for achieving *water sustainability outcomes* through implementation of green infrastructure practices:

- **Rainwater Management:**
An absorbent topsoil layer serves as a sponge when it is raining, results in healthier landscaping, and contributes to *sustainability of aquatic habitat*.
- **Water Conservation:**
Well-rooted landscaping then requires less irrigation water, stays green longer during a drought, and contributes to *sustainability of water supply*.

In collaboration with three municipalities (City of Surrey, City of Courtenay and District of North Vancouver) that have pioneered absorbent topsoil requirements, the Green Infrastructure Partnership has developed two primers to assist local government staff and designers: this one deals with *Law and Policy*, while the other is a *Technical Primer*.

The co-leads for this initiative were **Susan Rutherford** (Staff Counsel with West Coast Environmental Law Research Foundation) and **Rémi Dubé** (Acting Manager for Development Services, City of Surrey). Their efforts are greatly appreciated.

Raymond Fung, P.Eng., Chair
Green Infrastructure Partnership
February 2010



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Introduction: Topsoil to Increase Absorbency and Save Water

Conserving the existing, improving or adding “topsoil”¹ to a site is one means² of achieving on-site source control of rainwater. Adequate depth of good quality topsoil on new or existing (re)developments has many benefits. Upping absorbency, the topsoil layer assists³ community rainwater management infiltration objectives and supports strategies to conserve water which may be in scarce supply. Lawns⁴ built to meet a topsoil standard are also less prone to weeds or chemical interventions (herbicides and pesticides) – an additional environmental and health benefit.

But how do local governments ensure that a healthy layer of topsoil is a priority for, and survives, the development and re-development⁵ processes? In this Primer, local governments that have grappled with that challenge share lessons learned on law and policy considerations for achieving a layer of topsoil as an objective. An accompanying **Technical Primer** sets out technical considerations involved in implementing a topsoil objective. Strategies that worked well for those communities may also reap results in your community. One key to obtaining results seems to be to recognize that responsibilities are shared and actions are most successful when aligned with actions and policies at other levels of government, as well as the understanding and actions of the development, building and professional consulting communities. When objectives are tackled jointly, results are more quickly realized.



The actions described in this summary are not listed in sequential order. Your community’s circumstances may require a different order or emphasis.

Regional Context and Other Senior Government Support

Because liquid waste/resource management and watershed management impact us on a regional basis and are often planned on a regional basis,⁶ watershed health goals and objectives (e.g. biodiversity protection, improved water quality) will reinforce, and their own achievement will

* **These Green Infrastructure Partnership (GIP) Primers** are built on the experience the GIP has gained, since 2004, in promoting green infrastructure approaches to development in British Columbia, through series such as its [“Showcasing Innovation – Celebrating Green Infrastructure”](#) series. In spring 2009, following the [Surrey Water Balance Model Forum](#), the GIP Steering Committee and other Forum organizers realized there could be a benefit to providing municipal staff and the professional design community with a succinct statement of all of the legal, policy and technical “essential elements” necessary to successfully implement a specific green infrastructure objective. The Topsoil Primer set is the fruit of that idea, and the first in what the GIP hopes will become a series of Primers. The Primers are premised upon the theme of *shared responsibility* – essentially recognizing that the responsibility for ensuring that development is sustainable rests with *all* who make decisions or take actions that impact the development process, from elected representatives, to staff and consulting professionals. The GIP thanks the City of Surrey, the City of Courtenay and the District of North Vancouver for their support and sharing of lessons learned in preparing the Topsoil Primer set.



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be mutually supported by, local actions such as the achievement of topsoil objectives. A coordinated, regional/local team approach may facilitate the sharing of overlapping responsibilities. For example, the Okanagan Basin Water Board's [Sustainable Water Strategy](#) reflects and supports the region's priority of reducing water demand and all local actions complementary or further to that priority.

Understanding and support for topsoil strategies by senior governments and review agencies may provide additional incentive for municipal action to meet watershed objectives.

INTERNAL COLLABORATIONS

Key Planning Documents

Since the Official Community Plan (OCP) provides key direction to municipal regulation⁷ and action, inserting supportive policy in the OCP becomes critical. For example, the City of Courtenay's [OCP](#) not only endorses the [Water Balance Model](#), it also specifies minimum topsoil depths (300mm for groundcover and grass; 450mm around shrubs). These minimums are routinely incorporated into development permits.

To achieve agreement on OCP policy, solicit both inter-departmental staff support as well as policy leadership from elected representatives.

If your municipality has a Sustainability Charter, ensure mention of soil and benefits. Similarly, integrate topsoil requirements into all planning documents (guidelines used for design or applications such as, engineering, parks, building services) and policies until it becomes an integral part of planning, development and review.

Educate City Hall – gain inter-departmental support for your objective

Experience has proven it is not enough to have the City Engineering department alone understanding the importance of the topsoil layer. Gaining inter-departmental understanding and support is critical not only when overarching guidance policies are put into place (e.g. in an OCP or Sustainability Charter), but also in ongoing operations.

Local governments that have had success achieving topsoil objectives recommend:

- **Generally, communicate objectives and establish joint expectations and understanding across all relevant departments**, so all staff comprehend the issue and how their plans, operations and actions are needed to support (or otherwise may hinder) the advancement of topsoil objectives. **Specifically, for any new project, proposal or application, consult EARLY with other departments up-front and discuss the details and implications of a topsoil objective.** Successful municipalities have worked in a collaborative way to share topsoil objectives with staff in the following departments or functions: Engineering, Planning, Parks, Roads and Transportation, Operations and Maintenance, Construction Inspection, Building Inspection, Environmental, Front Counter, By-law Enforcement.
- **Clarify the benefits associated with topsoil.** If possible, quantify the benefits in terms of costs and savings. Make sure you've canvassed and fully understand all of the benefits yourself, before attempting to convince others, as others may not need to understand the details as long as they understand the overall objectives and benefits.
- **Face to face education/communication is best** and will not only reinforce written communications but also respond to questions or concerns. For example, you might start by circulating a Backgrounder, then hold a meeting, or a series of meetings.
 - Sample corporate report
<http://www.waterbucket.ca/gi/sites/wbcgi/documents/media/275.pdf>



BCWWA



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- Sample educational powerpoint (See the “Rain and Drainage Simulator” on “Sustainability in My Backyard” – an educational resource from the City of Surrey at <http://sustainabilityinmybackyard.ca/>)

REGULATIONS

Bylaws and Permitting Systems

Local governments need to plan for how they are going to enforce bylaw requirements. An education and outreach program that communicates topsoil benefits effectively will inspire change and long-term compliance; a regulatory underpinning provides a backbone.

Note that all regulatory approaches will necessarily be subject to detailed engineering that addresses suitability and feasibility of topsoil objectives.

One approach for accomplishing topsoil objectives is to employ the regulatory mechanism of a development permit.⁸ Design guidelines are stipulated and frame specific permit requirements. One disadvantage to using a development permit system as the sole mechanism for achieving topsoil objectives is that while non-compliance may be enforced at the outset through non-issuance of the permit, action later entails civil court action, which is unwieldy.



A further approach is to incorporate objectives as requirements into a Subdivision Standards Bylaw.⁹ However, this approach has some of the disadvantages of a development permit system, in that its focus is very “front end” biased.

Another approach is to use a regulatory tool such as an Environmental Bylaw¹⁰ or a Soil Permit Bylaw,¹¹ with appropriate enforcement and penalty provisions built in to address non-compliance. For example, a bylaw might stipulate that a single family home must obtain a soil permit to move greater than 18 cubic metres of soil on or off the property. The first option to explore is conservation of soil,

but that is not always feasible. A bylaw might address management or storage options for good topsoil that is scraped off as part of an excavation, or consider a bonus if it is provided. The bylaw might also stipulate requirements with respect to controlling sediment and erosion.¹² Forms and flyers may facilitate communication of very specific requirements - whether for individual property owners or more sophisticated developers. Permit requirements and consequences (fines, etc.) for non-compliance can all be stipulated in the bylaw.

Note that a permitting system may create a fee revenue opportunity¹³ for a municipality, which may assist in partially offsetting the costs of staff bylaw inspection, compliance and enforcement activities. The latter may be carried out by building inspection staff, environmental staff, or other designated or bylaw enforcement officers.

North Vancouver is currently investigating options for placing topsoil requirements on redevelopment applications.

Finally, some municipalities may find it helpful to use *Land Title Act* conservation covenants¹⁴ registered against the title to properties to ensure owners of land are bound to maintain topsoil presence, standards and effective drainage performance in perpetuity.



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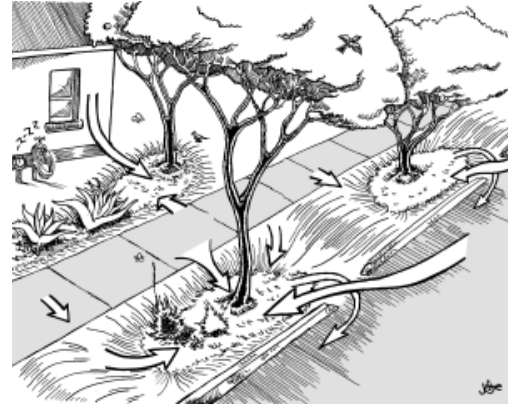
Financial Security – Give the regulation teeth

Taking financial security is a key element to securing performance. Security may be taken by a local government further to the authority of a bylaw¹⁵ or further to terms provided in a contract between a developer and a builder. At least one developer has realized it serves their company's best interests (increased value and lowered unpredictable costs) to take security in an amount equal to 4-5 times the cost of the soil. This developer also documents its 'contractor expectations', including soil specifications, to all builders that work with the developer, and the developer also regularly undertakes compliance activities on the development site.

Performance Standards

Local governments need to identify¹⁶ what constitutes acceptable performance for release of financial security. Issues that need policy/management include:

- Responsibility for placement on-lot and off-lot;
- Site grading;
- Quality of topsoil – sourcing, grade, certification, evaluation of native soil or soil remediation;
- Protection of topsoil to prevent compaction until construction is completed.



Our accompanying **Technical Primer** provides more detailed considerations regarding performance and other considerations.

A need exists to ensure that project designs as built meet the stipulated standard. Many municipalities find that it helps to have a bylaw that places the responsibility on the developer's Engineer of Record or Qualified Professional, to be accountable for professionally certifying that the project's performance will achieve the goals and objectives set out in the performance standard.¹⁷

EXTERNAL COLLABORATIONS

Educate and/or Collaborate with Consulting, Development and Building Professionals

Because a range of people are engaged in planning and working on the land base, it becomes important to communicate with stakeholders and to establish joint expectations. This group includes land or home owners, developers, builders and the full suite of consulting professionals.

Be clear: identify acceptable minimum standards and methodologies for design and installation, and communicate regulations and policies, together with the objectives and benefits to be gained from the program, to all affected or interested parties.

Solicit ideas: listen to ideas and concerns and incorporate them into the plan.

Through targeted presentations and municipal examples, educate and train consultants with information that is consistent with municipal expectations.



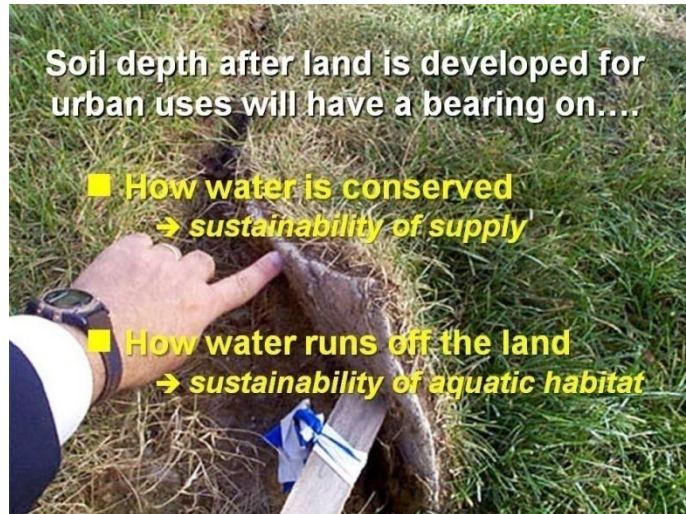
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Communicate with Neighbours and Home Owners

Experience has confirmed that communication to the public of topsoil requirements may help to advance achievement of the objective and reinforce compliance efforts, thus reducing the need for enforcement activities. Engaging more people means more eyes are able to observe neighbourhood activity.

Strategies for public communication might include signage, education and other strategies:

- Posting signs with pictures depicting the objective and benefits to be derived;
- Posting contact phone numbers at which inspectors can be reached;
- Engaging local environmental groups;
- Informing and educating home owners about onsite rainwater management and water conservation, and how topsoil fits into that context. Understanding will build support for long term maintenance (See the “Rain and Drainage Simulator” on “Sustainability in My Backyard” – an educational resource from the City of Surrey at <http://sustainabilityinmybackyard.ca/>).



Note that providing ongoing notification of the bylaw and accompanying bylaw enforcement activities will reinforce the message that your municipality is committed to implementation and to achievement of the bylaw’s objectives.

¹ “Topsoil” has multiple technical and lay definitions and names. For purposes here, we are referring to

² Topsoil is but one of many considerations in a source control strategy: elevations, permeable surface area, tree cover, etc. are other considerations.

³ Benefit is positively correlated with the percentage of permeable surface. (e.g. If the topsoil only covers a surface area of one square meter and the rest of the site is impermeable, little is accomplished.)

⁴ Healthy (topsoiled) lawns are one means to achieve absorbency. Landscaping with native, drought-resistant species (xeriscaping) or building rock and rain gardens are other low impact strategies.

⁵ Redevelopment presents an important moment/opportunity to improve the performance of the existing developed land base which, in some communities, constitutes a large percentage of overall community land base. E.g. in the District of North Vancouver it is a critical component: 85% of the overall land base is currently developed as single-family residential.

⁶ For example, in Metro Vancouver, the Greater Vancouver Sewerage and Drainage District and its members submit a Liquid Waste Management Plan (and updates thereto) to the Minister of Environment further to section 24 of the *Environmental Management Act*. Once approved, such Plans become part of local liquid waste regulation and actually replace regulation by the *Municipal Sewerage Regulation*.

⁷ Section 884(2) of the *Local Government Act* requires that all municipal bylaws adopted or works undertaken by a Council after an OCP must be consistent with the relevant plan.

⁸ See section 920 of the *Local Government Act* for details about development permits and guidelines.

⁹ See section 938 of the *Local Government Act* for local government authority to prescribe standards in a bylaw relating to subdivision servicing.

¹⁰ For municipal authority re: the environment, see sections 8 and 9 of the *Community Charter* together with the *Spheres of Concurrent Jurisdiction – Environment and Wildlife Regulation*, BC Reg. 144/2004



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¹¹ See sections 8 and 9 of the *Community Charter* regarding fundamental powers to make bylaws in relation to soil removal and deposit. Section 195 of the *Community Charter* provides authority to charge fees in relation to soil removal or deposit.

¹² Sediment and erosion control bylaws are authorized pursuant to section 907 of the *Local Government Act* which addresses authority to regulate runoff and stormwater management. Section 909 is also relevant, as it enables local governments to regulate landscaping to preserve, protect or restore the natural environment. In addition, section 69 of the *Community Charter* provides municipalities with specific authority in relation to drainage.

¹³ For example, the District of North Vancouver charges \$171 for residential soil permits and \$351 for commercial-industrial ones. Charging municipal fees is authorized by section 194 of the *Community Charter*.

¹⁴ See section 219 of the *Land Title Act*. The opportunity to impose a covenant may arise as part of a rezoning approval, for example.

¹⁵ Section 8(8) of the *Community Charter* provides that the power to “regulate, prohibit and impose requirements” under section 8 (fundamental powers) includes the power to “... require persons to do things with their property, to do things at their expense and to provide security for fulfilling a requirement.”

¹⁶ Note that most municipalities only reference MMCD standards for municipal land (e.g. sidewalk to curb) and not for on-lot land; however, these standards could be extended to other applications.

¹⁷ The authority of municipalities to rely on the opinions of qualified professionals in the building permit process is set out in section 55 of the *Community Charter*.

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