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Item No. 10
Halifax Regional Council
January 12, 2016

TO: Mayor Savage and Members of Halifax Regional Council

SUBMITTED BY: Original Signed
Martin Ward, Q.C. Acting Director of Legal Insurance & Risk Management Services

DATE: January 12, 2016

SUBJECT: Halifax Regional Water Commission (HRWC) Application to the NSUARB for an Order Approving Revisions to the Cost of Service Manual and Rate Design for Stormwater Service

INFORMATION REPORT

ORIGIN

The HRWC has made an application to the NSUARB for an Order approving revisions to the Cost of Service Manual and Rate Design for Stormwater Service.

The Hearing in this matter is scheduled to commence on February 16, 2016. The purpose of the rate design hearing is to develop an approach or methodology to be used as the basis of a stormwater rate. When the approach to designing the rate is confirmed by the NSUARB, a formal rate hearing will be required to approve any new rates.

HRM filed a Notice of Intervention which allows the Municipality to fully participate in the hearing process. As an Intervenor, HRM is able to file its own evidence for the consideration of the Board. The Attached evidentiary submission/documentation has been filed with the Board on behalf of HRM and a copy of same is provided as an attachment to this report for the information of Council.

LEGISLATIVE AUTHORITY

Utility and Review Board Act
Halifax Regional Municipality Municipal Planning Strategy (2014 Regional Plan) – Chapter 8

BACKGROUND

The 2014 Regional Plan contains policies with respect to stormwater management. Council has provided direction to staff to implement the Regional Plan policies through a Lot Grading By-Law and a Stormwater Management By-Law (September 11, 2013 Staff Report to Environment and Sustainability Standing Committee and Halifax Regional Council September 8, 2015 Item No. 11.14 Lot Grading and Stormwater Management By-Laws).

Council has directed that low density residential development be subject to the Lot Grading By-law and that all other development (referred to as non-residential) be subject to the Stormwater Management By-Law.

In its application to the NSUARB the HRWC has proposed a credit system for all non-residential development which is in keeping with the approach of Council, and Policy SU12 of the Regional Plan which calls for HRM to support the efforts of HRWC to create a rate structure for stormwater management services that provides incentives for the retention of on-site stormwater.

DISCUSSION

The attached document sets out for the NSUARB that Municipal Policy supports a rate structure that provides incentives for managing stormwater at source, and that HRM supports the proposed non-residential Credits and recommends that any credit system should be developed in consultation with the Municipality to ensure maximum alignment with HRM by-laws.

FINANCIAL IMPLICATIONS

There are no budget implications associated with this report.

COMMUNITY ENGAGEMENT

N/A

ATTACHMENTS

Attachment A - Halifax Regional Municipality Intervenor Evidence filed with the NSUARB

A copy of this report can be obtained online at http://www.halifax.ca/council/agendasc/cagenda.php then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

Report Prepared by: E. Roxanne MacLaurin – Senior Solicitor HRM Legal Services 902.490-4226

2015 M07147

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF: The Public Utilities Act

-and-

IN THE MATTER OF: AN APPLICATION of the HALIFAX REGIONAL WATER COMMISSION for An Order Approving Revisions To The Cost of Service Manual And Rate Design for Stormwater Services

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HALIFAX REGIONAL MUNICIPALITY
INTERVENOR EVIDENCE

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I BACKGROUND

The Halifax Regional Municipality's Regional Plan was adopted in 2006 as a framework for future growth and development. Through the Regional Plan, policies of regional significance were adopted that enabled regulations and direction concerning matters in the areas of housing, transportation, the environment, the economy, the Regional Centre, culture, heritage, and governance.

In 2014 a revised Regional Plan was adopted which strengthened the main concepts and components of the original Regional Plan. Key changes to the Regional Plan fell into one of four broad categories.

1. An increased focus on optimizing the environmental, economic, social and cultural sustainability of future growth and development. This includes standards for low impact "green" development, ensuring that new development pays its fair share in order to protect the tax rate, expanded tools for the provision of housing affordability and heritage protection, and support for cultural programs;

2. Enhancing the Regional Centre by providing regulation and guidelines that support residential and commercial development of an appropriate scale and quality;

3. Improved suburban and rural community design that will lead to more attractive and sustainable "green" communities, which are more walkable and complete communities; and,

4. Ensure that land use and transit are mutually supportive by directing growth to centres and corridors that have existing infrastructure and services, and supporting this growth with transit service and active transportation infrastructure.

The 2007 transfer of municipal wastewater and stormwater services from HRM to the Halifax Regional Water Commission "HRWC" is reflected in Chapter 8 of the 2014 Regional Plan. HRWC is recognized as a separate corporate entity which reports to a board of directors. Close co-operation between the planning and operational activities of HRM and HRWC is required in order to achieve Regional Plan objectives.

Chapter 8 of the 2014 Regional Plan lays out policies and programs in support of effective service delivery relating to water supply, wastewater management, stormwater management, solid waste management and communication facilities. Regional Plan objectives include the coordination of municipal initiatives with the HRWC to provide water, wastewater and stormwater services in a cost-effective manner; recoup growth related costs from benefitting property owners; and reduce degradation to the natural environment; management of growth to make the best use of existing water, wastewater and stormwater infrastructure and avoidance of unnecessary or premature expenditures; and to support environmentally sustainable practices for developments serviced with onsite water and wastewater services.

Although HRWC is responsible for the operation and administration of publicly owned stormwater facilities HRM continues to play an important role in stormwater management. Section 8.4 of the Regional Plan is intended to reflect an appropriate role for HRM in stormwater management. Of particular interest to the matter before the Board, policies SU-7 and SU-12 relate directly to the proposed credit program.

Policy SU-7 provides the framework for a stormwater management and erosion and sedimentation control by-law (Stormwater By-law). The Stormwater By-law would strive to protect watercourses from the effects of development, including preserving water quality, preventing erosion, preventing flooding, and promoting groundwater recharge. Best management practices that manage stormwater at source, before stormwater enters a public storm sewer often have the same effect as decreasing the amount of impervious area.

Policy SU-12 provides that HRM shall support the efforts of HRWC to create a rate structure for stormwater management services that provides incentives for the retention of on-site stormwater.

II HALIFAX REGIONAL COUNCIL

Regional Council is currently considering an approach to implement the 2014 Regional Plan policies which relate to stormwater management. In accordance with Council's direction, there will be two by-laws. Low density residential development will be subject to the provisions of a Lot Grading By-law, the primary objective of which, is the protection of property from flood damage and erosion, and safe and convenient use of property. All other developments will be subject to the Stormwater By-law.

The development of a consolidated Lot Grading By-law and a new Stormwater Management By-law are part of Regional Council's approach to an integrated stormwater policy which strives to protect public safety, protect the environment, and encourage economic development.

The approach for the Stormwater By-law that is currently being considered by Council contains three broad sets of provisions:

1. Provide standards and requirements for stormwater management and erosion control plans prior to development;

2. Establish requirements for on-going maintenance of privately owned stormwater systems; and,

3. Implement recommendations made in watershed studies for specific areas.

III APPLICATION BY HRWC

A. Stormwater Credits

HRWC's application acknowledges that a credit should align with aspects of HRWC service that cause it to expend revenue, and it is assumed that credits would be limited to actions or programs that reduce the quantity or rate of stormwater flow into the HRWC system. Municipal policy as set out in the 2014 Regional Plan, however, is much broader and strives to reduce overall impacts on water resources and the natural environment.

The proposed credits for non-residential development are consistent with the outcomes contained in HRM's approach to a Stormwater By-law. In fact, the best management practices that reduce the rate or quantity of stormwater discharged into a public system can also have a positive impact

on water quality. In particular, stormwater rate credits may be a valuable incentive-based tool for implementing site-specific recommendations contained in the type of watershed study that is referenced in Regional Plan policy SU-7.

Additionally, Regional Council has discussed the need to regulate the depth of topsoil in a lot grading by-law that would relate to residential development. Discussion on this issue was deferred until direction is received from the NSUARB regarding stormwater credits in general.

For the reasons discussed above, if credits are approved by the NSUARB, the methodology for calculating credits must be carried out in full alignment with development of a Stormwater By-law.

B. Asset Renewal as a Basis for a Credit

The HRWC application acknowledges that private systems will reduce the size of public facilities built by developers, and as donated assets they are not depreciated. The application also states that this does not result in any immediate savings to revenue requirements, and concludes that asset renewal is not a basis for a credit. However the fact remains that public storage facilities will need to be renewed or replaced eventually. Furthermore, private facilities that reduce the size of public facilities will place a downward pressure on future renewal costs and should be acknowledged as a basis for a credit.

C. Long Range Program Responsibility

The current division of responsibilities between HRM and HRWC has HRWC owning the storage facilities needed for stormwater management, and HRM retaining prime responsibility for overland flow management.

The technical memorandum *Stormwater Program and Rate Structure: Analysis and Recommendations* prepared by Amec Foster Wheeler recommends that over the longer term HRWC should "formalize its participation in the ongoing water resource efforts by HRM and others"[1]. This would align much better with the watershed approach to land use planning contained in Regional Plan policy, and make it easier to achieve the policy objectives related to protection of public safety, protection of property, and protection of water resources from the impacts of development.

This natural progression towards managing water resources may alter some of the current roles and responsibilities between HRWC and HRM, particularly related to overland flow.

IV SUMMARY

In summary, Municipal policy supports a rate structure that provides incentives for managing stormwater at source. Furthermore, the proposed non-residential Credits can support a municipal Stormwater By-law that strives to prevent flooding and meet water quality objectives, and the credit system should be developed in consultation with the Municipality to ensure maximum alignment.

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[1] P.32, "Stormwater Program and Rate Structure: Analysis and Recommendations", Amec Foster Wheeler, October 2015

V ATTACHMENTS

1. Halifax Regional Municipal Planning Strategy Chapter 8;

2. September 11, 2013 Staff Report to Environment & Sustainability Standing Committee; and

3. Halifax Regional Council September 8, 2015 Item No. 11.1.4 Lot Grading and Stormwater Management By-laws;

Attachment "1"

HALIFAX

Regional Municipal Planning Strategy

OCTOBER 2014

CHAPTER 8: MUNICIPAL WATER SERVICES, UTILITIES AND SOLID WASTE

8.0 INTRODUCTION

This Chapter lays out policies and programs in support of effective service delivery relating to water supply, wastewater management, stormwater management, solid waste management and communications facilities.

8.1 OBJECTIVES

1. **Coordinate municipal initiatives with the Halifax Regional Water Commission (Halifax Water) to:**

   (a) provide water, wastewater and stormwater services in a cost-effective manner;
   (b) recoup growth related costs from benefitting property owners; and
   (c) reduce degradation to the natural environment.

2. **Manage growth to make the best use of existing water, wastewater and stormwater infrastructure and avoid unnecessary or premature expenditures;**

3. **Support environmentally sustainable practices for developments serviced with on-site water and wastewater services;**

4. **Reduce above grade electrical and telecommunication lines;**

5. **Encourage the development of an comprehensive natural gas distribution system; and**

6. **Reduce the amount of solid waste generated and operate solid waste facilities in an environmentally responsible and cost-effective manner.**

8.2 THE TRANSFER AGREEMENT

In 2007, HRM entered into an agreement with Halifax Regional Water Commission (Halifax Water) for the following purposes:

(a) to transfer municipal waste-water facilities and municipal stormwater facilities and their operation and administration to Halifax Water from HRM to better serve the public interest;
(b) to have such facilities operated as a public utility integrated with Halifax Water's existing water utility facilities to the extent deemed appropriate by the Utility and Review Board;
(c) to evolve the operation and administration of municipal wastewater services and municipal stormwater services towards a system whereby the general taxpayer of HRM does not subsidize the utility rate payer of Halifax Water and the utility rate payer of Halifax Water does not subsidize the general tax payer of HRM; and
(d) to have HRM pay a fee for service on full cost recovery basis for waste-water and stormwater services made necessary by the operation of other municipal services, including, but not restricted to, solid waste management services, and parks and recreation services.

Upon execution of the Transfer Agreement, Halifax Water became the first regulated water/ waste-water/ stormwater utility in Canada. Its jurisdiction applies to a core area, as set out in the transfer agreement, which broadly encompasses lands within the commutershed of the Regional Centre. Outside this area, the public stormwater facilities – comprised primarily of ditches and culverts within road right-of-ways – are owned and maintained by HRM or the N.S. Department of Transportation and Infrastructure Renewal.

Halifax Water has been established pursuant to the *Halifax Regional Water Commission Act* and is regulated by the Nova Scotia Utility and Review Board (the Review Board). The *Public Utilities* Act applies to Halifax Water and any water, wastewater or stormwater facility or system owned, operated, managed or controlled by Halifax Water is deemed to be a public utility. The Review Board establishes policies, rules and regulations governing the operations of Halifax Water which includes approvals for operating and capital budgets, user fees and charges that can be levied for new connections to its facilities.

Halifax Water is expected to finance its operations through the user fees and charges it levies. It must also comply with all provincial and federal regulations established for the design and operation of municipal water, wastewater and stormwater systems.

Halifax Water is a separate corporate body and reports to a Board of Directors. This governance model will require close co-operation between the planning and operational activities of HRM and Halifax Water if the objective of this Plan to manage development in a fair and cost effective manner is to be realized.

SU-1 HRM shall work with Halifax Water to coordinate municipal land use planning and development initiatives with the planning and development of municipal water, waste-water and stormwater facilities in a manner that is consistent with the objectives of this Plan, the Transfer Agreement and can satisfy policies and regulations of Halifax Water and the Review Board.

8.3 WATER, WASTEWATER AND STORMWATER SERVICES: PLANNING FOR GROWTH IN SERVICED AREAS

This Plan seeks to focus development in areas where infrastructure can be provided in a cost-effective manner with consideration given to both capital and operating costs. HRM also seeks to support a competitive housing market by maintaining a 15 year supply of serviced lands. A primary tool for achieving these objectives will be directing the supply and location of lands to be serviced with wastewater and water services.

SU-2 HRM shall establish an Urban Service Area under the Regional Subdivision By-law to designate those areas within the Urban Settlement Designation and the Harbour Designation where municipal wastewater collection and water distribution systems are to be provided. The Area shall initially include all lands within existing service boundaries established under secondary planning strategies at the time of adoption of this Plan. Lands within the Urban Service Area shall only be developed with municipal wastewater collection and water distribution systems. Any service boundary established under existing secondary planning strategies shall be replaced by the Urban Service Area boundary in the Regional Subdivision By-law.

SU-3 HRM shall seek to prevent premature development with on-site services on lands designated Urban Settlement but not yet within the Urban Service Area by establishing an Urban Settlement Zone over these lands under the applicable land use by-law. This zone shall permit public parks and playgrounds but restrict new development to single unit dwellings serviced with on-site sewage disposal systems and wells on two hectare lots on existing roads.

In 2010, the Review Board directed Halifax Water, in consultation with stakeholders, to prepare a long term infrastructure plan estimating capital expenditure requirements for municipal water, waste-water and stormwater infrastructure. Key drivers in developing this Integrated Resource Plan (IRP) are regulatory compliance, asset renewal and growth related costs.

The IRP (Genivar/XCG/Halcrow, October 2012) outlines a 30 year capital program for Halifax Water. The growth related cost estimates are proposed to be used for the development of a regional development charge that will replace the existing charges. Halifax Water also anticipates that area charges will be sought, as required, to pay for service upgrades associated with planned municipal growth through the adoption of secondary planning strategies.

SU-4 When considering any expansion of the Urban Service Area, HRM shall have regard to the following:

(a) that a Secondary Planning Strategy for the lands to be included within the Urban Service Area has been adopted by HRM except that this requirement may be waived where, in the opinion of HRM, the proposed extension represents a minor adjustment to the Area;
(b) the financial ability of HRM to absorb any costs relating to the extension;

(c) if required, a watershed or sub-watershed study has been completed in accordance with Policy E-23;
(d) that, if required to pay for growth-related municipal infrastructure costs, a municipal infrastructure charge area has been established or is adopted concurrently with the boundary amendment;
(e) the need to oversize the water, wastewater or stormwater systems to allow for future development within an Urban Settlement or Urban Reserve designation; and
(f) a charge needed to pay for growth related improvements to the water, wastewater or stormwater systems has, where required, been approved by the Review Board.

SU-5 Within the Urban Service Area, where a new Secondary Planning Strategy or an amendment to an existing Secondary Planning Strategy is proposed to accommodate future growth, no approval shall be granted unless:

(a) a by-law has been established or is proposed concurrently to pay for growth related municipal infrastructure or HRM has determined that a by-law is not warranted; and
(b) a charge needed to pay for growth related improvements to the water, wastewater or stormwater services has been, where required, been approved by the Review Board.

Due to constraints in the Sackville wastewater collection system, there are properties in Middle Sackville which are within the Urban Service Area but cannot be developed until capacity becomes available. Special provisions shall be made to allow for development of these properties if capacity becomes available.

SU-6 HRM shall, through the Sackville Land Use By-law, establish a CDD (Comprehensive Development District) Zone over a portion of PID No. 41071069 and the whole of PID No's. 40281479, 40875346, 41093733, 40695504, 41089012 and 41089004 located in Middle Sackville. HRM shall consider the extension of municipal wastewater and water distribution services to these properties to allow for a residential subdivision by development agreement subject to the following criteria:

(a) the types of land uses to be included in the development and that, where the development provides for a mix of housing types, it does not detract from the general residential character of the community;
(b) that adequate and useable lands for community facilities are provided;
(c) any specific land use elements which characterize the development;
(d) the general phasing of the development relative to the distribution of specific housing types or other uses;
(e) that the development is capable of utilizing existing municipal trunk sewer and water services without exceeding capacity of these systems;
(f) for any lands outside the Urban Settlement Designation, as shown on Map 2 of this Plan, or outside the Urban Service Area of the Regional Subdivision By-law, the requirements of Policies S-1 and SU-4;
(g) that, if required by Halifax Water, a sewage flow monitoring program is established for the development and that provisions are made for its phasing in relation to achieving sewage flow targets;

(h) that the sewage flow monitoring program proposed by the developer for implementation under clause (g) addresses, in a form acceptable to Halifax Water, target sewage flows to be achieved in relation to development phasing and the method, duration, frequency and location of monitoring needed to verify that target sewage flows have been achieved;
(i) provisions for the proper handling of stormwater and general drainage within and from the development; and
(j) any applicable matter as set out in Policy G-14 of this Plan.

8.4 STORMWATER MANAGEMENT: A MUNICIPAL ROLE

Although the Transfer Agreement delegates responsibility for the operation and administration of publicly owned stormwater facilities to Halifax Water within the core boundary, HRM can play an important role in stormwater management. On a broadest level, a commitment has been made to undertake watershed studies where new growth areas are being considered (Section 2.4 of this Plan). An appropriate stormwater management strategy is to be included in the recommendations.

A study prepared for HRM identified source control measures that could reduce the quantity and improve the quality of runoff being directed to public stormwater systems and watercourses. One of the recommended implementation tools is a stormwater management and erosion control by-law whereby control of lot grading could be among the stormwater management measures. Other regulatory and operational measures were also identified as components of a more comprehensive approach that could be considered.

With varying levels of development throughout HRM and watersheds with differing sensitivities, a standardized approach to the application of these tools would not be appropriate. Similarly, the municipal approach will evolve with experience and as new technologies become available.

In developed areas, retrofitting existing stormwater systems may be a viable option to reduce the quantity and improve the quality of stormwater entering a watercourse. However, unless required for regulatory compliance with provincial environmental standards, it is unlikely that Halifax Water will be in a position to expend resources to do this. The Province does not currently have any stormwater quality standards but has stated that these may be considered in the future. In the interim, HRM may consider paying for retrofits to improve water quality in receiving watercourses, particularly in urbanized watersheds, if justified and affordable.

Consideration should also have to be given to the potential impacts of climate change on stormwater management systems. The *Climate Risk Management Strategy for HRM* (see Section 2.5.1) projected that HRM could experience an increase of up to 12% in total precipitation accompanied with increased rainfall intensity over the next 80 years.

Support for day lighting of streams and rivers will also be considered where doing so would enhance the aesthetics of the area or further restoration of a heritage resource.

SU-7 HRM shall consider adopting a stormwater management and erosion control by-law with provisions made that may be area specific and may vary by type of development and, where required, be subject to approval by the Review Board. When considering adoption or amendments to the by-law, the following matters may be considered:

(a) the cost and effectiveness of methods to reduce increased stormwater flows caused by development with consideration given to problems associated with downstream flooding, stream bank erosion, groundwater contamination and inflow and infiltrations into wastewater systems;
(b) the potential for employing naturally occurring soils and native plant species in stormwater management plans;
(c) means to reduce site disturbance and impervious surfaces in new developments;
(d) methods of reducing sediments, nutrients and contaminants being discharged into watercourses; and
(e) the recommendations contained in a watershed study undertaken pursuant to policy E-23 of this Plan.

SU-8 HRM may consider regulatory and operational measures to reduce the quantity and improve the quality of stormwater entering public stormwater facilities and watercourses including, but not limited to, public education programs, animal waste control, spill prevention plans, removing illegal connections, enhanced street sweeping, reduction in road salts, land use restrictions and revisions of development standards. Any such measures may apply in whole or in part of HRM and may require approval of the Review Board.

SU-9 HRM may consider supporting retrofits to existing stormwater facilities where it has been determined that such retrofits could be expected to mitigate flooding or to improve the quality of stormwater entering watercourses.

SU-10 Where public stormwater collection infrastructure must undergo significant repair or replacement, HRM may consider supporting funding for daylighting of the watercourse involved with consideration given to:

(a) feasibility in relation to the surrounding environment, land use and ownership, adequacy of space, drainage and potential flooding issues, safety and other practical or engineering considerations as appropriate.
(b) replacement of culverts with bridges or a three-sided culvert rather than straight pipe is preferred wherever possible;
(c) the potential for legal and liability issues arising; and
(d) costs and the availability of funding.

SU-11 In the event that the Province of Nova Scotia considers imposing standards on the quality of stormwater entering watercourses, HRM shall participate in consultations and shall consider amending any stormwater management by-law approved pursuant to Policy SU-7 to be consistent with or complement standards adopted by the Province of Nova Scotia.

SU-12 HRM shall support efforts by Halifax Water to create a rate structure for stormwater management services that provides incentives for the retention of on-site stormwater and may consider any amendments to municipal by-laws which would assist in facilitating these efforts.

8.5 RURAL SERVICES

The capability of the land to support rural settlement throughout the Rural Commuter, Rural Resource, and Agricultural Designations (refer to Chapter 3) is constrained to varying degrees by soil, surface water, and groundwater conditions for development. The *Options for On-site and Small Scale Wastewater Management Study*[32] concluded that there are very few inland communities where a municipal wastewater system can be developed. This is due to low flows in river systems during the summer months and provincial requirements for both the dilution of treated wastewater as well as the removal of phosphorous from wastewater that rely on land-based effluent dispersal. However, alternative treatment technologies may be feasible for servicing the levels of wastewater expected from the centres, including those inland from the coast.

Similarly, there are areas with varying degrees of groundwater quality because of the predominant geology. Most areas of HRM require some mitigation of groundwater quality. Others have a higher risk for groundwater quality problems due to the presence of radionuclides, base metals or contamination from former mining operations.

8.5.1 Water Service Areas

Although this Plan encourages a more compact urban form in which development is serviced with wastewater and water distribution systems, it recognizes that developments already exist that are serviced with a water distribution system and on-site sewage disposal systems.

However, the risk of inadequate performance of on-site sewage disposal systems in areas which are serviced with a central water supply is of concern. According to the Dillon Consulting HRM *Water Resource Management Study* [34], there is a higher degree of risk of on-site sewage disposal system failure in areas serviced with central water because the unlimited source of water can cause hydraulic overloading.

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[32] Land Design Services, Ekistics Planning and Design, John Zuck and Associates and Spatial Metrics Atlantic. *Halifax Regional Municipality Options for On-site and Small Scale Wastewater Management.* 2004. Halifax.

[34] Dillon Consulting Ltd. 2002. Ibid

HRM intends to recognize the established Water Service Districts and allow for consideration of further extensions in accordance with the following policies:

SU-13 In recognition of the Water Service Districts established under the former Halifax County Municipality Subdivision By-law, HRM shall, through the Regional Subdivision By-law, establish Water Service Areas where development shall be permitted which is serviced by a public water distribution system but without a municipal wastewater system. Within these areas, a water distribution system shall be required to service all new developments located adjacent to an existing water distribution system where a new or extended public street or highway is proposed. Further, no water distribution system shall be permitted to extend outside of a Water Service Area.

SU-14 HRM may consider establishing new Water Service Areas, subject to the financial ability of HRM to absorb any related costs, provided a wastewater management plan is also considered in accordance with Policy SU-20, if:

(a) (i) the area is within a Rural Commuter, Rural Resource or Agricultural centre and it has been determined through a secondary planning process that new growth is to be encouraged in this area; or
(ii) the lands are adjacent to an existing Water Service Area and a Classic Conservation Design development is proposed; or
(iii) the lands are adjacent to an existing Water Service Area and a Classic Conservation Design development is proposed within an Urban Reserve designation, subject to the provisions of clause (d) of policy G-16; and
(b) the new service area and a charge needed to pay for growth related improvements to the water or stormwater services has, where required, been approved by the Review Board.

SU-15 HRM may consider expanding existing Water Service Areas to existing communities, subject to the financial ability of HRM to absorb any costs related to the expansion, if:

(a) the lands are in proximity to a water transmission main planned or constructed by Halifax Water to improve the performance of the water distribution system;
(b) a study has been prepared by a qualified person verifying that there is a water quality or quantity problem that cannot reasonably be rectified by an alternative means;
(c) there are environmental concerns related to the long-term integrity of on-site sewage disposal systems and a wastewater management plan is also considered in accordance with Policy SU-19; and
(d) an area charge needed to pay for growth related improvements to the water, or stormwater services has been approved by the Review Board or Halifax Water has advised that an area charge is not required.

The Enfield and Dutch Settlement communities are not located near an existing Water Service Area owned by Halifax Water. However, both communities are close to a water distribution system that is owned and maintained by the Municipality of East Hants. Some residents of these areas experience poor water quality and quantity and are now on a private water distribution system. To address these concerns and the uniqueness of the situation, HRM and Halifax Water need to work with East Hants to investigate options for providing Enfield and Dutch Settlement with a water distribution system.

SU-16 HRM shall, through the secondary planning process, investigate options to extend a water distribution system to the Dutch Settlement and Enfield communities. In doing so, HRM shall seek the cooperation of the Municipality of East Hants. No water distribution system shall be extended to these communities unless a Water Service Area has been established in accordance with Policy SU-15.

8.5.2 Private On-site Sewage Disposal Systems and Wastewater Facilities

Malfunctioning on-site sewage disposal systems may cause bacteria and other contaminants to enter groundwater and surface water which may pose health risks and cause environmental degradation. Contamination has resulted in closures to swimming and shellfish harvesting and has increased the eutrophication process of lakes and estuaries. HRM may seek measures to reduce the risk of these occurrences.

SU-17 HRM shall encourage, where appropriate soil conditions exist, the development of conservation design developments serviced by private wastewater facilities on lands within the Rural Commuter, Rural Resource and Agricultural Designations, provided that the systems comply with the requirements of the Nova Scotia Department of Environment.

SU-18 HRM shall, through secondary planning processes, consider the potential for establishing Wastewater Management Districts within Rural Commuter, Rural Resource and Agricultural Centres.

SU-19 HRM may consider establishing Wastewater Management Districts in areas that have failing on-site sewage disposal systems that cannot be remediated by private on-site sewage disposal systems.

SU-20 To protect public health and the environment, HRM shall investigate a means to ensure that private on-site sewage disposal systems are maintained. Without limiting the generality of the foregoing, consideration shall be given to adopting a private on-site sewage disposal system by-law, establishing Wastewater Management Districts and establishing a mechanism for funding and administration.

8.5.3 Ground Water Supplies

The Municipality seeks to ensure that development in rural areas has an adequate and sustainable water supply. Hydrogeological studies can address this objective through testing to assess long-term sustainable yield of larger subdivisions with many lots or any potential impact on existing wells in adjacent subdivisions. By an amendment to the Charter, the Province has enabled HRM to require hydrogeological studies as a condition of subdivision approval.

SU-21 HRM shall require a hydrogeological assessment for all subdivision applications to be serviced with on-site wells where the number of dwelling units consists of ten or more. Subdivision approval will only be granted where the study determines that the quantity and quality of the groundwater source is sufficient to service the proposed development without adversely affecting groundwater supply in adjacent developments.

SU-22 HRM shall request that the Province of Nova Scotia establish a network of groundwater observation wells to monitor the effects of development on the groundwater table and natural groundwater flows.

8.6 UTILITIES

8.6.1 Electrical and Telecommunication Lines

Various initiatives have been undertaken in the past to provide underground utilities, primarily in urban and commercial centres. Some areas in Downtown Dartmouth and Halifax have underground services. Underground lines may be installed in new subdivision developments at the request of the developer, who pays a capital cost contribution to help off-set future replacement costs. This practice is not widespread in HRM.

HRM has commissioned various studies [38] to examine the costs and benefits of underground utilities in terms of cost, reliability, and aesthetics and has decided on a two phased approach to implementation in new subdivision developments. Initially, undergrounding will be required from the pole to the home and then, after further consultation with the development community, consideration may be given to total undergrounding within the street right-of-way.

SU-23 When planning streetscape improvement projects for commercial areas or heritage districts within HRM, consideration shall be given to the underground placement of electrical and communication lines. Highest priority shall be given to projects within the Regional Centre. HRM shall work with utilities that have overhead wiring infrastructure to develop a design standard for underground retrofitting and a policy respecting ownership of underground wiring under the municipal right of ways.

[38] Kinetrics Inc. *HRM Underground Utilities Feasibility Study*. 2005. Halifax. Marbec; Economic Implications of Buried Electric Utililites.2007; Stantec. Engineering Study of Joint Gas, Power, and Communication Trench. 2007; Dillon. Underground Utilities Funding/Management Best Practices Review. 2010.

SU-24 HRM may consider amendments to the Downtown Halifax Secondary Municipal Planning Strategy and Land Use By-law to create incentives for the underground placement of electrical and communication lines by private developments and to make provision for cost-sharing with HRM where funds are available and additional areas can benefit.

SU-25 HRM shall, under the Regional Subdivision By-law, require the underground placement of electrical and communication distribution lines from the poles within the street right-of –way to the property line for subdivision applications in which new streets are proposed within the Urban Service Area. HRM may consider future amendments to the Regional Subdivision By-law to require the underground placement of all electrical and communication lines within street right-of-ways or rear lot servicing.

8.6.2 Communication Towers and Antenna

Communication facilities are regulated by Industry Canada which has recognized that municipalities may have an interest in the siting of these facilities, particularly with regard to aesthetic impacts on the built form and landscapes. A federal policy has been established that encourages consultation between proponents and local governments before a decision is made whether to grant a license. The means of consultation is not specified but left for the Municipality to decide upon.

SU-26 HRM shall, in cooperation with Industry Canada and industry stakeholders, work to create an effective consultation approach for the siting of telecommunication towers and antenna.

8.6.3 Natural Gas

HRM has supported the development of a comprehensive natural gas distribution system in the municipality since the year 2000. Over the past 14 years, the distribution infrastructure has expanded from Dartmouth to Halifax, and most recently Bedford West, providing access to an alternate fuel source for many residents and businesses.

HRM will continue to encourage the expansion of Heritage Gas' distribution infrastructure to realize increased access for both residents and businesses in urban communities. As stated in HRM's revised *Community Energy Plan* municipal focus will include:

- providing access to the municipal right of way
- switching fuel sources where economic opportunities exist
- encouraging the expansion of in-fill opportunities
- participating in joint projects
- working with Heritage Gas and provincial regulators to improve access to this alternate fuel option for HRM's urban communities.

SU-27 HRM shall work with Heritage Gas and provincial regulators to increase access to a comprehensive natural gas distribution system within the HRM's Urban Service Area.

HALIFAX
REGIONAL MUNICIPALITY

P.O. Box 1749
Halifax, Nova Scotia
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Environment & Sustainability Standing Committee
October 3, 2013

TO: Chair and Members of Environment & Sustainability Standing Committee

SUBMITTED BY: Original Signed
Peter Stickings, Acting Director, Planning & Infrastructure

DATE: September 11, 2013

SUBJECT: **Regulatory and Policy Strategy: Stormwater Management**

ORIGIN

- Regional Plan, SU-28: HRM shall, in consultation with the Nova Scotia Provincial Government, prepare a Stormwater Management Functional Plan with recommendations to be considered for adoption under the Municipal Service Systems Specification document or HRM's operational and administrative programs and land use policies and regulations;
- April 16, 2013, Environment & Sustainability Standing Committee;
- October 6, 2011, Environment & Sustainability Standing Committee; and
- June 25, 2013, Regional Council.

LEGISLATIVE AUTHORITY

HRM Charter, Power to make By-Laws, 188

RECOMMENDATION

It is recommended that the Environment and Sustainability Standing Committee recommend to Regional Council to direct staff to:

1. Prepare, for Public Hearing, a consolidated Regional Lot Grading By-Law based on the objectives outlined in this report;
2. Develop a Memorandum of Understanding on Erosion and Sedimentation Control with Halifax Water, Nova Scotia Environment, Clean Nova Scotia, and the Nova Scotia Homebuilders Association;
3. Continue to develop a Stormwater Management By-Law based on the objectives outlined in this report;
4. Develop a standardized Environmental Section template for consideration of objectives outside the scope of the Lot Grading By-Law or Stormwater Management By-Law, for future secondary planning projects; and

(continued on next page)

5. Align the Streets By-Law to the Wastewater Rules and Regulations with respect to substances originating on private property, crossing the right-of-way and entering the storm system.

BACKGROUND

Currently, the Municipality administers a number of By-Laws with respect to Lot Grading and Stormwater Management including the following:

- HRM By-Law L300, Respecting Lot Grading and Drainage
- HRM By-Law S300, Respecting Streets
- City of Dartmouth W100, Obstruction of Waterflow
- City of Halifax Ordinances 142, Streams and Drains
- Halifax County By-Law 40, Topsoil
- Halifax County By-Law 41, Excavation
- Town of Bedford By-Law 23290, Grade Alteration
- 22 Land Use By-Laws
- Regional Subdivision By-Law

The intent of this policy project is to consolidate the approach to meet the current community objectives with respect to stormwater management.

DISCUSSION

Objectives: At the June 25, 2013, Regional Council meeting, a motion was passed directing staff to undertake consultation and prepare a report for the consideration of Regional Council with respect to the objectives of a Stormwater Management and Lot Grading By-Law. The Community Engagement section of this report overviews the results of the consultation. Summarily, there are three primary public service objectives of a Stormwater Management and Lot Grading By-law:

1. Public Safety;
2. Protection of Environment; and
3. Encouragement of Economic Development

Recommendation #1: **Prepare, for Public Hearing, a consolidated Regional Lot Grading By-Law based on the objectives outlined in this report:**

Lot Grading By-Law: Based on best practices review, and community consultation, Staff is recommending the development and preparation of a standard Lot Grading By-Law that addresses the following objectives, focusing primarily on Public Safety:

- Simplified to focus solely on activity of Lot Grading in two instances:
    - Alignment with Development Agreement Master Grading Plans; and
    - Lot grading on property where there is no Master Grading Plan.
- Includes all of HRM;

- Streamlines the deposit system and considers an alternative remedy approach to meet compliance objectives;
- Provides clear technical requirements by embedding the instructions from the Lot Grading and Drainage General Specifications;
- Includes a conservative minimum soil depth;
- Tightens the time frame and requirements for unfinished grading/landscaping; and
- Continues to outsource approval (Qualified Individual).

The expected outcome of this regulation will be an effective by-law that is efficiently administered and achieves the stormwater management objectives of flood protection. The primary outcome of good lot grading is maximizing the use of overland flow for protection of homeowners and the public. This by-law would be prepared by HRM Legal Services and return to Regional Council for Public Hearing process. This would be completed within this HRM fiscal year.

The key primary progressions to the By-Law from the consolidation will be:

Extension across the municipality
The developed by-law will, as per direction from Regional Council, cover the entire municipality.
Streamlining of the deposit system by considering alternative remedy approaches
The existing deposit system was articulated by industry as a barrier to business and is administratively cumbersome to manage. Alternative remedy solutions may be considered to achieve the compliance objectives of the by-law. This may include removal or reduction of the deposit system with a legislated ability for the municipality to affect remedy and recoup via lien. The streamlining of the system will enhance economic development in HRM and improve compliance. The current deposit system requires homebuilders to provide a deposit of $1,000 per property to guarantee completion of the Lot Grading Certificate. The deposit system neither provides sufficient funding to complete lot grading/landscaping requirements nor an efficient means to achieve the desired outcomes.
Tightening of requirements for acceptance of Undertaking of Completion (unfinished landscaping at time of issuance of Occupancy Permit)
Experience suggests that there are too many lots obtaining an occupancy permit and not completing lot grading in a timely or compliant manner. This is a public safety risk, due to increased flooding risk exposure and a threat to environmental protection (relating to erosion and siltation exposure on unfinished homes). The development of a solution that enables the clear obligation transfer from owner to homeowner will ensure that homeowners understand what they need to do with respect to lot grading. The primary challenge stems from homeowners looking to complete landscaping on their own (through sweat equity) and not being aware of lot grading requirements or obligations. An information activity will need to support the regulation.

Minimum soil depth
Having good soil depth provides a number of benefits to residents and the municipality including: • Healthier Lawns and less pests and pressures for pesticide control • Better water absorption to reduce storm water impacts on municipal infrastructure • Filtering pollution There are other Canadian municipalities that have introduced minimum soil depth regulations in recent years. Staff recommends presenting a by-law with a minimum 4" soil depth (compacted) to achieve this objective. The cumulative outcome of reduced rainwater leaving properties helps reduce impacts on stormwater systems, including infrastructure and the natural environment.

Recommendation #2: **Develop a Memorandum of Understanding on Erosion and Sedimentation Control with Halifax Water, Nova Scotia Environment, Clean Nova Scotia and the Nova Scotia Homebuilders Association:**

The prevailing community concern with respect to environmental protection objectives related to stormwater management is improved Erosion and Sedimentation control and behaviour. The prevailing instruction and standard on this activity, related to construction and development, is the Nova Scotia Erosion and Sedimentation Control Guidelines. There are two tools the municipality can consider with respect to this objective: regulatory/enforcement and information/education.

Staff is recommending a focus on the information/education tool at this time, and have broached stakeholders from Nova Scotia Environment and Nova Scotia Homebuilders Association regarding a collaborative approach towards increased information and education. With Regional Council approval, a Memorandum of Understanding will be drafted with the stakeholders and returned to Regional Council. This would be completed within this HRM fiscal year. The improved collaboration will enable an integrated enforcement approach.

Recommendation #3: **Continue to develop a Stormwater Management By-Law based on the objectives outlined in this report:**

Upon best practices review and informed by community consultations, there are a number of options and topics to improved stormwater management behaviour that can be considered in a Stormwater Management or Drainage By-Law. This scope of tools aligns well with the integrated Stormwater Policy in development between Halifax Water and HRM.

Potential options identified include:

- Mandatory Downspout disconnection
- Foundation drainage disconnections
- Downspout distances
- Roof drainage disconnections
- Pool emptying restrictions
- Pet Waste
- Stormwater Treatment
- Maintenance of interceptors
- Prohibited materials
- Car washing

- Snow Disposal
- Sump Pumps
- Storm retention
- Stormwater Source Control
- Tree removal
- Solutions to Infill projects
- Erosion control measures

Development of this By-Law would continue in conjunction with the Integrated Stormwater Policy, and presentation for Public Hearing would be expected in conjunction with the Policy delivery to Regional Council in 2014/15. Further consultation is required on this By-Law, which would require input from business, Regional Watershed Advisory Board, and the general public. Some of the aforementioned items are complex and further analysis is required.

Recommendation #4: **Develop a standardized Environmental Section template for consideration of objectives outside the scope of the Lot Grading By-Law or Stormwater Management By-Law for future secondary planning projects:**

In preparation of future community planning projects, staff are reviewing and comparing the 22 Land Use By-Laws and the policy direction provided for environmental objectives. Included in that scope, is management of stormwater. Topics identified during consultations on Stormwater Management include the following items: Riparian Buffers; Low Impact Development solutions; Urban Forestry Objectives; Bioretention Ponds/Swales; and Policy triggering Pollution Prevention Plans.

Preparation of a draft Environmental Section template for the consideration in future Secondary Plan revisions can be completed during the preparation of the integrated stormwater policy. Further consultation with Developers and the Regional Watershed Advisory Board is required.

Recommendation #5: **Align the Streets By-Law to the Wastewater Rules and Regulations with respect to substances originating on private property, crossing the right-of-way, and entering the storm system:**

It is recommended that HRM extend the prohibition of substances entering the stormsystem, as outlined in the Halifax Water Rules and Regulations, to be prohibited from entering the entire Right-of-Way and develop an aligned enforcement service delivery with Halifax Water.

Integrated Stormwater Policy: All five recommendations align with the recommended scope for the Integrated Stormwater Policy project.

FINANCIAL IMPLICATIONS

Lot Grading By-Law: No financial impacts have been identified at this time. However, any that arise will be presented with the drafted By-Law to Council.

Stormwater Management By-Law: This By-Law may consider options that are currently not enforced or programmed that may have future financial implications, which would be articulated upon development.

Erosion and Sedimentation Control MOU: No financial impact to the 2013/14 Operating or Project budget but may have future financial implications, which would be articulated in the presentation of the MOU to Regional Council for approval.

Standardized Environmental Section, Land Use By-Laws: No financial impact.

Alignment of Streets By-Law with Halifax Water Rules & Regulations: The impact of this activity would be addressed under the Roles and Responsibilities Agreement with Halifax Water.

COMMUNITY ENGAGEMENT

Nova Scotia Home Builders Association: On August 8, 2013, NSHBA held a two hour lunch presentation and discussion on objectives for a municipal stormwater by-law. Primary comments included:

- Administration of deposits
- Challenge with infill lots
- Sharing of information
- Educational opportunities (for homeowners and builders)
- Challenge of impacts from other stakeholder (i.e. homeowner changing grade post-closing)
- Challenge of surveyors/landscapers complying to master lot grading plan
- Challenge of updating "as builts" to master lot grading plan

Public Comments: from mid-July until September 15, 2013, HRM provided a Survey on www.halifax.ca, a summary of comments includes:

- Environmental protection
- Protection of property
- Public Safety
- Consistency
- Use of current technology and practices
- Fair to residents
- Information sharing
- Reuse stormwater to recharge groundwater

Regional Watershed Advisory Board: On August 14, 2013, The Board provided comments related to Stormwater Regulations. A summary of comments included:

- Environmental Protection and importance of balancing water flows
- Clear jurisdiction and roles
- Minimize sediment impacts
- Information sharing
- Training
- Practices during construction/development
- Reporting metrics
- Improved solutions: green roofs, engineered wetlands, permeable pavement

Halifax Water: Halifax Water staff has been engaged during the development of this report and will continue to provide comment and input to policy development.

It should be noted that there was a high degree of commonality between groups consulted, specifically the need for enhanced information sharing, environmental protection, flood protection, and efficiency.

Upon development of a draft by-law, there is further Public Engagement opportunity through the Public Hearing process required in the repeal and adoption of By-Laws.

ENVIRONMENTAL IMPLICATIONS

This policy work has implications on stormwater quantity (flooding) and water quality.

ALTERNATIVES

Council has a variety of alternatives with respect to exclusion or inclusion of specific topics in the respective prepared policy.

ATTACHMENTS

None

A copy of this report can be obtained online at http://www.halifax.ca/commcoun/cc.html then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Original Signed

Richard MacLellan, Manager, Energy & Environment, 490-6056

HALIFAX

P.O. Box 1749
Halifax, Nova Scotia
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Item No. 11.1.4
Halifax Regional Council
September 8, 2015

TO: Mayor Savage and Members of Halifax Regional Council

SUBMITTED BY: Original signed by
Richard Butts, Chief Administrative Officer

Original Signed by
Mike Labrecque, Deputy Chief Administrative Officer

DATE: July 5, 2015

SUBJECT: Lot Grading and Stormwater Management By-laws

ORIGIN

October 22, 2013 Motion moved and passed by Regional Council directing staff to:

1. Prepare, for Public Hearing, a consolidated Regional Lot Grading By-law based on the objectives outlined in the September 11, 2013 staff report;
2. Develop a Memorandum of Understanding on Erosion and Sedimentation Control with Halifax Water, Nova Scotia Environment, Clean Nova Scotia and the Nova Scotia Homebuilding Association;
3. Continue to develop a Stormwater Management By-law based on the objectives outlined in the September 11, 2013 staff report;
4. Develop a standardized Environment Section template for consideration of objectives outside the scope of the Lot Grading By-law or Stormwater Management By-law, for future secondary planning projects; and
5. Align the Streets By-law to the Wastewater Rules and Regulations with respect to substances originating on private property, crossing the right-of-way and entering the storm system.

LEGISLATIVE AUTHORITY

Halifax Regional Municipality Charter, 2008. C. 39. section 353 allows Council to make by-laws regarding stormwater management, grading and drainage.

RECOMMENDATION

Recommend that Regional Council:

1. Move first reading and schedule a public hearing to consider the adoption of the proposed By-law L-400 – A By-law Respecting Lot Grading, as contained in Attachment A, to replace By-law L-300 – A By-law Respecting Lot Grading and Drainage;

RECOMMENDATION CONTINUED PAGE 2

2. Repeal By-law L-300 – A By-law Respecting Lot Grading and Drainage, the existing by-law that regulates lot grading; and
3. Direct staff to begin consultations with the Development Liaison Group concerning the content of a Stormwater By-law as outlined in this report.

BACKGROUND

Development of a consolidated Lot Grading By-law and a new Stormwater Management By-law are two actions previously approved by Regional Council which are part of a consolidated approach to an integrated stormwater policy. This policy approach strives to protect public safety, protect the environment, and encourage economic development.

Other key actions include clarifying roles and responsibilities relating to stormwater services, and developing a long term funding plan to address flooding problems.

Lot Grading and Drainage By-law
Regional Council has given direction for staff to develop a consolidated Lot Grading By-law, with specific objectives that include the following:

- Include the entire Municipality (refer to Attachment A, page 3: Application and Administration - Section 3);
- Streamline the deposit system and consider an alternative approach to remedy (refer to Attachment A, page 5: Orders by the Engineer -Sections 15 & 16);
- Include a requirement for minimum soil depth; and,
- More effectively address uncompleted landscaping (refer to Attachment A, page 5: Orders by the Engineer -Sections 15 & 16).

Stormwater Management By-law
The Regional Plan includes policy that establishes objectives for a stormwater management by-law as follows:

- Methods to reduce increased stormwater flow, flooding, erosion, groundwater contamination, and inflow into wastewater systems caused by development;
- Using naturally occurring vegetation in stormwater management plans;
- Reducing site disturbance in new developments;
- Reducing sediments, nutrients and contaminants being discharged to watercourses; and,
- Recommendations specific to a development area made in a watershed study carried out as part of a detailed planning exercise.

DISCUSSION

In broad terms the objective of a **stormwater management by-law** is to protect water quality, reduce flooding, and prevent any detrimental effects of uncontrolled runoff associated with land development.

A stormwater management by-law achieves this by:

- Requiring best management practices when land is developed;
- By requiring sedimentation and erosion control plans during construction activities; and,
- Requiring on-going maintenance of privately owned stormwater systems.

"Best management practices" are design features intended to control run-off at the source and include roof top storage, infiltration areas, retention areas, catch basin restrictors, oil and grit separators, etc. A list of common best management practises is provided on Attachment B.

The primary objectives of a **lot grading by-law** are protection of property from flood damage and erosion, and safe and convenient use of property.

Notwithstanding, provisions of a lot grading by-law such as reduced slopes and disconnection of roof leaders are typically all that are needed for stormwater control associated with low density residential development.[1] For this reason, the Stormwater Management By-law does not need to apply to low density residential development, if a consolidated lot grading by-law is adopted.

The first part of this report deals with a lot grading by-law for low density residential development, and the second part deals with a stormwater management by-law to address the balance of land development.

PART I - LOT GRADING BY-LAW

A working committee of the Development Liaison Group was formed to facilitate focused stakeholder review of the by-law. The draft by-law that is attached to this report has not been released prior to this Council meeting, but the Development Liaison Group is in general agreement with the approach and provisions in the draft by-law. The provisions of the draft by-law, as they relate to the objectives previously approved by Regional Council are discussed below.

Include the entire Municipality
(Refer to Attachment A, page 3: Application and Administration - Section 3)

The current Lot Grading By-law applies to 1 and 2 unit residential development, where the buildings are connected to a central wastewater system, and does not apply to the former Town of Bedford where the Grade Alteration By-law is in effect.

Regional Council has previously given direction to extend the by-law to include the entire municipality. This gives rise to two key areas that need to be considered for inclusion in a consolidated lot grading by-law as discussed below:

1. *Former Town of Bedford*

   The former Town of Bedford is subject to a grade alteration by-law which regulates all grade alteration whether or not the grading is related to a development approval. For practical purposes, lot grading approvals for low density residential development in the former Town of Bedford follow the same process and have been subject to the same standards as lot grading in the rest of the serviced areas of the municipality.

   The new Lot Grading By-law will now apply to low density residential development in the former Town of Bedford. The balance of the provisions of the Grade Alteration By-law would remain in place on an interim basis, and reviewed during the development of a Stormwater Management By-law.

2. *Areas not serviced with a central wastewater system*

   The Environment and Sustainability Standing Committee (ESSC) previously discussed the need to extend the by-law to development beyond the Urban Service Area, which is not serviced with a central wastewater system.

   A review of drainage complaints since 2005 indicates that on average 50 drainage complaints per year have been received from properties that are NOT served with a central wastewater system. Of this amount, approximately 30 per year appear to be related to deficiencies in the road or ditch drainage system and would not be addressed by a lot grading and drainage by-law. A computerized work management system is scheduled to be implemented in 2015/2016 which will

[1] Stormwater Management Guidelines, Dillon Consulting, March 2006

help determine the exact nature and extent of drainage complaints, but the data collected since 2005 indicates that drainage complaints in these areas are not widespread. For this reason, the proposed by-law does not propose to extend to developments beyond the Urban Service Area.

Alternatively, it is recommended that a communication strategy for homeowners be developed in conjunction with the Nova Scotia Homebuilders Association. The effectiveness of this approach will be monitored and a report can be provided at a future date on the specific need for lot grading regulations in areas with private well and septic systems.

Deposit System and Remedy Provisions
(Refer to Attachment A, page 5: Orders by the Engineer -Sections 15 & 16)

It is fairly common that a residence is occupied prior to completing lot grading, typically due to either freeze-up conditions, or a homeowner wishes to complete landscaping on their own. The current by-law requires a $1,000 deposit if an occupancy permit is required prior to completion of the lot grading.

This provision has been in place since the original lot grading by-law was adopted in 1996 and has proven ineffective at achieving completion of lot grading after occupancy of the building. The amount is too little to affect repairs, and while the current by-law provides for the Municipality to repair or correct defective work the municipality must take legal action to recover costs.

Additionally, the deposit is often paid by the builder, is not a deterrent to the home owner, and has only served to impose an administrative burden on the Municipality.

The proposed by-law removes the requirement for the $1,000 deposit, but includes remedy provisions which allow the municipality to carry out surveys and correct defective or un-completed work if needed; and place a lien on the property to recover costs. The proposed by-law also no longer refers to an occupancy permit, and uses the act of simply occupying a building as the appropriate trigger for compliance.

Top Spoil Depth
Providing adequate top soil is critical to support vegetation, as well as for effective infiltration of stormwater. The ESSC previously discussed the benefits of establishing a minimum top soil depth of 4 inches in a consolidated by-law which is consistent with current practice in the development industry. Typically, 3 -4 inches of top soil is placed prior to laying sods which, in tum, includes an additional 1 inch of top soil "packed" with the sod.

However, this provision is very burdensome and time-consuming to enforce and is not common in other jurisdictions. The Municipality does not have the resources to carry out the required measurements in the field, and certification of soil depth would be an added cost of compliance for the homeowner. In order to be meaningful, a professional must either install grade stakes and witness the placing of the top soil or conduct before and after surveys.

For this reason, the proposed by-law attached to this report does not stipulate a minimum depth of top soil.

Sedimentation and Erosion Control
Disturbed surfaces are required to be stabilized in the current by-law as a requirement of the Lot Grading General Specifications. This requirement will remain, however formal sedimentation and erosion control plans are not required on an individual lot basis.

In addition, in large scale developments the majority of control structures should already have been in place prior to the construction of roads and services. For this reason, relying on the lot grading by-law for sedimentation and erosion control can be ineffective in large scale developments.

A more comprehensive approach to sedimentation and erosion control will be taken under the Stormwater Management By-law as discussed below. Developing a stormwater management by-law will include an examination of sedimentation and erosion control requirements, including what types of development should be subject, at what stage of development, and will determine the appropriate by-law or regulation.

Definition of Low Density Residential
(refer to Attachment A, page 3: Application and Administration - Section 3)

Currently the Lot Grading By-law applies only to 1 and 2 unit residential development, and staff is recommending expanding the definition of low density residential development to be consistent with the National Building Code. Part 9 of the National Building Code defines a *"Small Buildings"* category as buildings that do not exceed 600 sq. m. (6,460 s.f.) in area and three storeys in height. This provides a rational basis on which to define *"Low Density"*, so the proposed by-law applies to all residential development that is less than 600 sq. m., does not exceed 3 storeys in height, and is connected to a central sewer.

Buildings not covered by the definition of "Small Buildings" are larger multi-unit residential, institutional, commercial or industrial development (MICI), and are required to involve the appropriate design professionals for building design, site servicing and grading.

This approach has the added benefit of creating clear lines of regulatory control between a lot grading by-law, and a potential stormwater management by-law for MICI sites, as discussed in Part II of this report.

Homeowner Education
As previously mentioned, a joint education program in conjunction with the NS Homebuilders Association is recommended to reinforce the importance of lot grading in rural areas.

There has also been a need identified to inform homeowners of their obligations under the by-law in the Urban Service Area, particularly in the case where a home owner agrees to complete their own landscaping.

Examples of collaborations in recent years include the RainYards Homeowners Stormwater Management Awareness program with Clean Foundation and with Ecology Action Centre on public stormwater management.

PART II - STORMWATER MANAGEMENT BY-LAW

As mentioned previously, a stormwater management by-law does not generally need to apply to low density residential development. The balance of the discussion in this report is intended to apply to multiple-unit, institutional, commercial, and industrial (MICI) development.

In order to satisfy the requirements of Regional Plan Policy, the by-law should contain three broad sets of provisions:

1. Provide standards and requirements for stormwater management and erosion control plans prior to development;
2. Establish requirements for on-going maintenance of privately owned stormwater systems; and,
3. Implement recommendations made in watershed studies for specific areas.

Each of these sets of provisions is discussed below.

Stormwater Management and Erosion Control Plans

Water quality is a Provincial matter, but the Province of Nova Scotia does not have strict end-of-pipe discharge standards for stormwater in the same manner as treated wastewater effluent. Rather, the Province regulates the construction of stormwater systems and requires that the owner of the system is capable of owning and maintaining the system. This approach is consistent with other Provinces.

Prior to approving the installation of a new stormwater system, the Province requires a developer to show that post-development run-off will not exceed pre-development levels. The most effective way to balance pre- and post- development impacts is to manage stormwater at the source when individual sites are being developed. There is however no consistent approach or requirement for managing stormwater at source in private developments, which often necessitates publicly owned retention ponds or a reliance on natural features to manage stormwater runoff from a development.

Stormwater management for private development is delegated to the municipality in the HRM Charter, but to date has not been applied consistently to all forms of development. Provisions and standards are found in various legislation and specifications including the Subdivision By-law, the Municipal Service Systems General Design Guidelines, the Halifax Water Design and Construction Specifications, site-specific development agreements, and to some extent the National Building Code.

The approach described above overlooks best management practices that control runoff at source in a much more effective and less costly manner.

A stormwater by-law that applies consistent standards for managing stormwater runoff at source will allow the Province to rely on source control in private developments as well, thus eliminating or reducing the need for expensive publicly owned infrastructure to balance pre and post development impacts.

The municipality also regulates development activities in very limited circumstances that may give rise to sediments and other pollutants leaving a construction site. For example, the Top Soil Removal By-law of the former Halifax County Municipality regulates stripping of top soil from land parcels greater than 1 acre in specific areas as defined in the by-law. In addition, development agreements may contain provisions relating to erosion control and other best management practises aimed at improving water quality.

The Stormwater By-law contemplated by the Regional Plan will provide comprehensive standards and requirements for stormwater management plans and erosion control for all site disturbance activity; whether or not related to a development proposal. This includes building site development, installing roads and services as part of a subdivision approval, stripping top soil in general, or any other stand-alone site development such as constructing a parking lot.

In broad terms, the standards currently exist, and the by-law will apply them on a consistent basis to the appropriate types of development.

Maintenance of Private Stormwater Systems

The effectiveness of stormwater systems on removing pollutants almost always relies on regular maintenance. Features such as catch basin sumps, oil and grease separators, and dynamic grit separators all require routine cleaning and grit removal in order to function properly. Requirements for on-going maintenance of privately owned stormwater systems are often found in development agreements to varying degrees, but the approach is ad hoc and inconsistent. A by-law would apply a consistent set of maintenance standards and obligations to all privately owned systems in the municipality.

For example, a privately owned shopping mall that was required to install a proprietary grit removal system as part of a development agreement would now be required to keep the chamber free from accumulated grit and other debris such as lumber and bricks.

Watershed Studies

As previously mentioned, impacts to water quality that arise from the development of land are not regulated by strict end-of-pipe standards. Alternatively in detailed plan areas, the nature and form of development is regulated and the impact on receiving waters is measured. Watershed studies are used to inform the land use policies, and it is anticipated that a by-law will be an effective tool to implement specific recommendations related to site design criteria.

Similar provisions are currently found in some development agreements, and the policy anticipates that these provisions should be included in a by-law.

In addition to the Top Soil Removal By-law (former County of Halifax), overlapping provisions are also found in the Grade Alteration By-law (former Town of Bedford). A review of these by-laws and possible repeal will be undertaken during the development of a Stormwater Management By-law.

FINANCIAL IMPLICATIONS

The effort needed to administer a consolidated Lot Grading By-law will be accommodated within existing 2015-16 Planning & Development resources.

Additional costs for homeowner education – estimated at $5,000/year for three years – will be funded from cost centre D935, Energy and Environment.

The resource and financial implications of the future Stormwater By-law will be provided at a later date, as the contents and approach of the by-law are developed.

COMMUNITY ENGAGEMENT

Focussed discussions with the development have occurred through an internal staff committee known as the Development Liaison Group. Formal community engagement will occur with the formal by-law adoption process.

ENVIRONMENTAL IMPLICATIONS

Adopting a regional lot grading by-law will reduce drainage complaints, protect property, and promote protection of the environment by decreasing stormwater run-off and increasing soil adsorption of stormwater.

Developing a regional stormwater by-law will protect water quality and is in accordance with the Regional Plan, Policy SU-7.

ALTERNATIVES

1. Council could decide not to adopt the proposed Lot Grading By-law. This option is not recommended for the reasons outlined in this report.

2. Council could decide to amend the proposed by-law. This option is not recommended for the reasons outlined in this report.

3. Council could decide not to direct staff to begin consultations with the Development Liaison Group concerning the content of a Stormwater By-law as outlined in this report. This option is not recommended for the reasons outlined in this report.

ATTACHMENTS

Attachment A – By-law L-400, the Lot Grading By-law

Attachment B – Summary of Most Frequently Used Best Management Practices

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A copy of this report can be obtained online at http://www.halifax.ca/commcoun/index.php then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

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Original Signed

HALIFAX REGIONAL MUNICIPALITY
BY-LAW L-400
RESPECTING LOT GRADING

Short Title

1. This By-law shall be known as By-law L-400 and may be cited as the "Lot Grading By-law".

Interpretation

2. In this By-law:

(a) "Approved Subdivision Grading Plan" means a grading plan, which is approved at the time of final subdivision approval and as may be amended from time to time by the Municipality which illustrates the drainage systems and patterns common to two or more lots in a subdivision;

(b) "building area" means the greatest horizontal area of a building above grade within the outside surface of exterior walls;

(c) "building height" means the number of storeys contained between the roof and the floor of the first storey;

(d) "Committee" means the Appeals Committee established pursuant to By-law A-100, the *Appeals Committee By-law*;

(e) "Council" means the Regional Council of the Municipality;

(f) "deficiency report" means a report prepared by a Nova Scotia Land Surveyor, a Landscape Architect, or a Professional Engineer describing the uncompleted construction requirements, as related to the grading and drainage works shown on the Lot Grading Plan;

(g) "development" means the definition found in the *Halifax Regional Municipality Charter* as amended from time to time;

(h) "drainage" means a system of natural or artificial drains;

(j) "Engineer" means the definition found in the *Halifax Regional Municipality Charter* as amended from time to time;

(k) "first storey" means the upper most storey having its floor level not more than two (2) metres above grade;

(l) "grade" means, as applied to the determination of building height, the lowest of the average levels of finished ground adjoining each exterior wall of a building but does not include localised depressions for vehicle or pedestrian entrances;

(m) "grading" means the alteration of land levels, including the addition or removal of topsoil or other material of any kind;

(n) "Landscape Architect" means a person who is a member in good standing in the Canadian Society of Landscape Architects;

(o) "Lot Grading and Drainage General Specification" means the latest edition of the specifications contained in Schedule A to this By-law;

(p) "Lot Grading Certificate" means a plan or report, prepared in accordance with the Lot Grading and Drainage General Specification and in a form acceptable to the Engineer, depicting the recorded grading and drainage works on a lot of land as proposed on the Lot Grading Plan;

(q) "Lot Grading Permit" means a permit issued under the provisions of this By-law;

(r) "Lot Grading Plan" means a plan of final grading of land for an individual lot of land prepared in accordance with the Lot Grading and Drainage General Specification;

(s) "Municipality" means Halifax Regional Municipality;

(t) "Nova Scotia Land Surveyor" means a registered or licensed member, in good standing, of the Association of Nova Scotia Land Surveyors;

(u) "owner" includes as it refers to the owner of property:

(i) a part owner, joint owner, tenant in common or joint tenant of the whole or any part of land or a building,

(ii) in the case of the absence or incapacity of the person having title to the land or building, a trustee, an executor, a guardian, an agent, a

mortgagee in possession or a person having the care or control of the land or building,

(iii) a person who occupies shores, beaches or shoals, and

(iv) in the absence of proof to the contrary, the person assessed for the property;

(v) "person" means a natural person, corporation, partnership, an association, society, firm, agent, trustee, or registered Canadian charitable organization as defined in section 3(bc) of the *Charter*, and includes the heirs, executors or other legal representatives of a person, or owner;

(w) "Professional Engineer" means a registered or licensed member in good standing of the Association of Professional Engineers of Nova Scotia;

(x) "residential building" means any structure used or intended to be used for supporting a principally or majority residential use but excludes commercial residential uses such as a hotel, motel or hostel;

(y) "sanitary sewerage system" means a system which is publicly owned and maintained and which consists of pipes or conduits receiving or carrying water-borne wastes and includes any trunk sewers, pumping stations and treatment plants; and

(z) "subdivision" means the division of any area of land into two or more parcels, and includes a resubdivision and a consolidation of two or more parcels.

Application and Administration

3. This By-law shall apply to the development of all lots in the Municipality where the structure is:

(a) a residential building;

(b) less than 600 square metres in building area;

(c) three (3) or fewer storeys in building height; and

(d) located within an area where a sanitary sewerage system is provided or is to be provided anywhere in the Municipality.

4. Notwithstanding section 3, this By-law shall not apply to the following:

(a) a renovation of an existing building that does not involve changes to the building footprint or changes to the lot grading and drainage patterns;

(b) new building construction where lot grading is regulated by a Development Agreement; and

(c) a building designed to be situated on a site conforming with CSA Z240.10.1, Site Preparation, Foundation, and Anchorage of Manufactured Homes.

General Requirements

5. Nothing in this By-law shall exempt any person from complying with any other by-law or requirement of the Municipality, or from obtaining any license, permission, permit, authority or approval required by any other by-law of the Municipality or statute or regulation of the Province of Nova Scotia.

6. Where the provisions of this By-law conflict with those of any other By-law of the Municipality or any statute or regulation of the Province of Nova Scotia, the more stringent requirements shall prevail.

Lot Grading Permit Application Procedure

7. Subject to section 3, no lot shall be developed unless a Lot Grading Permit has been issued by the Municipality.

8. An application for a Lot Grading Permit shall be made at the time of application for a building permit.

9. An application for a Lot Grading Permit shall include the following:

(a) a Lot Grading Plan prepared in accordance with the Lot Grading and Drainage General Specification as follows:

(i) where an Approved Subdivision Grading Plan exists, and the drainage patterns depicted on the approved Subdivision Grading Plan are to be preserved, the Lot Grading Plan is to be prepared by a Nova Scotia Land Surveyor, a Landscape Architect, or a Professional Engineer; or

(ii) where an Approved Subdivision Grading Plan does not exist, or the drainage patterns depicted on the Approved Subdivision Grading Plan are to be varied, the Lot Grading Plan is to be prepared by a Professional Engineer.

10. Where an Approved Subdivision Grading Plan exists, the Lot Grading Plan shall be consistent with the Approved Subdivision Grading Plan, subject to variations approved by the Municipality.

11. A Lot Grading Plan is deemed to be approved when it meets the requirements of this By-law and a Lot Grading Permit has been issued by the Municipality.

Lot Grading Certificate

12. (1) No person shall occupy a building as set out in Section 3 unless a Lot Grading Certificate has been submitted to the Municipality.

(2) The Lot Grading Certificate shall confirm that the lot has been constructed in accordance with the Lot Grading Plan and shall be prepared by a Nova Scotia Land Surveyor, a Landscape Architect, or a Professional Engineer.

13. Where variations depicted on the Lot Grading Plan exist the Lot Grading Plan shall be subject to review and approval by the Municipality.

14. Notwithstanding section 12, a residential building may be occupied prior to receipt of a Lot Grading Certificate where the following is filed with the Municipality:

(a) a deficiency report prepared by a Nova Scotia Land Surveyor, a Landscape Architect, or a Professional Engineer, in a form acceptable to the Engineer, setting forth details of the work to be completed; and

(b) an undertaking by the owner stating that:

(i) the uncompleted work required by the Lot Grading Plan and the deficiency report will be completed, and

(ii) the Lot Grading Certificate shall be submitted

within a period of nine (9) months.

Orders by the Engineer

15. (1) When the owner fails to comply with this By-law the Engineer may issue an Order to the owner and the owner shall, at the owner's sole expense, bring the lot into compliance with the by-law.

(2) An Order issued pursuant to subsection (1) of this section shall specify the date on which the lot is to be brought into compliance.

(3) (a) An owner may, within fourteen (14) calendar days of being served with an Order that was issued pursuant to subsection (1) of this section, appeal the Order of the Engineer to the Committee.

(b) The day an owner receives a notice shall not be counted in determining the fourteen (14) calendar day period.

(c) Where the fourteenth calendar day falls on a day that the Municipal Clerk's office is not open, the final appeal date is the next business day.

(4) An appeal pursuant to subsection (3) shall be commenced by filing a written notice with the Municipal Clerk which clearly states the grounds for the appeal.

(5) If the owner files an appeal, but the Committee is not scheduled to meet before the date on which the lot is to be brought into compliance, the Order shall be held in abeyance until the Committee has rendered its decision on appeal.

(6) After hearing an appeal pursuant to subsection (3) of this section the Committee may:

(a) deny the appeal,

(b) allow the appeal and reverse the decision of the Engineer, or

(c) make any decision the Engineer could have made under this By-law.

(7) The Engineer may cause the lot to be brought into compliance if the owner does not comply with an Order to bring the lot into compliance on the date specified in the Order

16. Where the Municipality lawfully causes work to be done pursuant to this By-law, the cost of the work, with interest at the rate determined by the Council, by policy, from the date of the completion of the work until the date of payment, is a first lien on the property upon which, or for the benefit of which, the work was done.

Permit Fees

17. An application for a Lot Grading Permit shall be accompanied by a payment of the prescribed fee as set out in Administrative Order 15.

18. Notwithstanding the provision of section 17, no Lot Grading Permit fee shall be required where the Lot Grading Permit is for lands owned by the Municipality.

Offence and Penalty

19.

(1) A person who

(a) violates a provision of this By-law, Lot Grading Permit, undertaking or an order in force in accordance with this By-law;

(b) fails to do anything required by a Lot Grading Permit, undertaking or order in force in accordance with this By-law;

(c) permits anything to be done in violation of this By-law, Lot Grading Permit, undertaking or order in force in accordance with this By-law; or

(d) obstructs or hinders any person in the performance of their duties under this By-law, Lot Grading Permit, undertaking or order in force in accordance with this By-law,

is guilty of an offence.

(2) A person who commits an offence is liable, upon summary conviction, to a penalty of not less than one hundred dollars and not more than ten thousand dollars and in default of payment, to imprisonment for a term of not more than two months.

(3) Every day during which an offence pursuant to subsection (1) continues is a separate offence.

(4) In addition to any other remedy provided for by this By-law, Council may authorize an action or other legal proceeding to be brought in the Supreme Court of Nova Scotia for any or all of the remedies provided by this Section.

(5) In addition to a fine imposed for contravening a provision of this By-law, a judge may order the person to comply with the provision or order, under which the person was convicted, within the time specified in the order.

Repeal Of By-Laws

20. The following By-law is hereby repealed:

Halifax Regional Municipality By-law L-300

Done and passed in Council this ___day of _____, 2015.

_____
MAYOR

_____
MUNICIPAL CLERK

I, Cathy Mellett, Municipal Clerk for the Halifax Regional Municipality, hereby certify that the above-noted by-law was passed at a meeting of the Halifax Regional Council held on_____, 2015.

_____
Cathy Mellett
Municipal Clerk

SCHEDULE A

LOT GRADING GENERAL SPECIFICATION

1. INTRODUCTION

1.1. General

A storm drainage system is as a group of interacting, interrelated, and interdependent elements carrying discharges in response to rain and snow. These discharges include overland flow, subsurface flow, and snowmelt.

A complete and properly functioning Storm Drainage System includes a variety of components which may be grouped into two categories:

"Community Systems" being those elements which serve two or more lots. For example, roadside ditches, culverts, roadways, curbs and gutters, street and backyard catchbasins, pipes or conduits, retention ponds, watercourses, floodplains, and drainage swales and ground elevations along common lot lines or in easements.

"Individual Lot Systems" being those elements which serve a single lot and are contained within its limits. For example, swales contained within lot limits, gently graded lot areas, slopes, roof downspouts, individual seepage pits, French Drains, building lateral, parking lot catchbasins and conduits.

1.2. Objectives

The Storm Drainage Systems, be they Community Systems or Individual Lot Systems, design within the context of the Lot Grading By-law, and the siting and grading of the house, shall achieve the following objectives:

(a) To prevent loss of life and to protect structures and property from significant damage and expense, including that which is expected to be experienced during the 1 in 100 year storm event.

(b) To provide for convenient and reasonable use of lot areas during and following rain and snow events and from subsurface or groundwater flow, e.g. continuously saturated backyard, significant continuous icing.

(c) To provide for safe use of lot and street areas, e.g. excessive depth of flow or water storage, significant continuous icing.

(d) To avoid drainage problems or other conditions that result in unreasonable maintenance obligations on the Owner or Municipality, e.g. significant or regular de-icing operations.

(e) To provide protection from erosion from surface flow, subsurface flow, or groundwater, e.g. slope stabilization.

(f) To direct water away from buildings in order to especially prevent basement flooding and damage to the foundation drain.

(g) To prevent standing water and soil saturation detrimental to buildings, driveways, walkways, landscaped areas and other use of the lot.

In addition to the foregoing, and with particular relevance in areas where an Approved Subdivision Grading Plan does not exist, the Municipality may require information to demonstrate that the overall Storm Drainage System Objectives are achieved:

(a) To adequately convey flow from upstream sources.

(b) To prevent and/or mitigate the adverse effects of stormwater flow on downstream or adjacent properties, such as erosion, or flooding due to inadequate downstream capacity or grading.

(c) To preserve natural watercourses.

(d) To minimize the long term effect of development of receiving watercourses and groundwater.

(e) To maintain pre-development drainage patterns unless some motivating factor to change the pattern exists, e.g. conflict with other objectives (capacity).

In the case where an Approved Subdivision Grading Plan exists and Community Systems have been designed and/or constructed, it shall be an objective that the Individual Lot Systems conform to the Community Systems. Grades established at the lot limits by the Approved Subdivision Grading Plan are to be maintained, subject to variations permitted under Section 6.0.

In the preparation of a design that meets the above objectives, an attractive living environment is important and consideration should be given to the following factors:

(a) Aesthetic conditions relating to lot grading, e.g. creating space on the lot that is convenient as a play area, usually in the back yard.
(b) The preservation of desirable site features where practical, e.g. minimizing disturbance, retaining trees.
(c) Providing for variance in front yard setbacks along a street and for establishing a roof profile which is aesthetically pleasing.
(d) Locating slopes and boundary lines such that tops and bottoms of slopes are at property boundaries.
(e) Avoiding excessive deep swales.
(f) Placing easements on one side of boundary line.
(g) Where swales and French Drains are contemplated at the base of a significant slope, it is recommended that the swale be located at the toe of the slope.

(h) Locating driveways to allow convenient and safe ingress and egress.
(i) Creating consistent grading lot to lot.

Those above items are desirable but not addressing these factors fully will not lead to rejection or approval of a Lot Grading Plan.

2. DESIGN CRITERIA – LOT GRADING

The Design Criteria for lot grading are to cover the more common aspects of design encountered in lot grading and drainage development. Local conditions may influence the Design Criteria and design requirements, for example, circumstances where soils are not free draining may require a flatter maximum permissible slope. In cases where these Criteria need to expanded or additional criteria are required, the Recommendations and Stormwater Policy manual prepared by Halifax County Storm Drainage Task Force and the latest edition of Municipal Design Guidelines, and the latest edition of the Halifax Regional Water Commission Design and Construction Specifications shall be used as appropriate. Additional requirements affecting design are contained in other relevant documents, such as the National Building Code.

The Design Criteria reflect the experience of Halifax Regional Municipality as related to typical design requirements. The Criteria are provided for information and will serve as the benchmark for review of Lot Grading Plans in typical circumstances. However, the Design Criteria are not considered rigid. To better meet the objectives, alternate design approaches may be proposed. This will not be discouraged by the municipality.

The purpose of the Design Criteria is to provide guidance in the provision of drainage systems offering acceptable service which is consistent with the lowest possible initial construction and ongoing maintenance costs and effort.

The Design Criteria as outline herein, are not intended to eliminate the necessity for detailed design, rather they are intended to standardize the approaches, design criteria, and methods of construction to be utilized in the installation of drainage systems. Further, it is not the intention of the Municipality to stifle innovation. Where variations from this document are justified or required and where alternate approaches can produce the desired results, such approaches will be considered for approval. In considering requests for variations from these design criteria, the Engineer shall take into consideration such factors as safety, nuisance, system maintenance, life cycle costs, environmental issues, natural topography, etc. Designs shall be accompanied by statements of certification to the effect that designs have been completed in accordance with these guidelines. Where standards other than those outlined in this document are used, all appropriate documents and plans shall clearly indicate those areas of difference. The acceptance by the Municipality of the design of the proposed drainage systems shall not relieve the designer of the responsibility of proper design. The designer retains full responsibility and liability for his/her work.

2.1. Community Systems

In most instances where an Approved Subdivision Grading Plan exists, the design of Community Systems will not be required as they will have been established by the Approved Subdivision Grading Plan. However, in certain instances, most likely in the case of new building construction on previously approved or in-fill lots, the design of Community Systems may be required in order to meet the objectives of the Lot Grading By-law.

In designing Community Systems, the focus is on those drainage elements which affect more than one property, e.g. common backyard swales/catchbasins, grading along common property boundaries. **It is critical that the designer ensure that sufficient Community Systems are in place and/or contemplated and depicted such that individual Lot Systems can be designed and constructed in a fashion that allows for a properly functioning overall Storm Drainage System for the Owner while striving for an attractive living environment. It is intended that Community Systems will not have to be altered as a consequence of design of detailed Individual Lot Systems (although this is provided for in Section 6.0). Therefore, it is strongly recommended to carry out preliminary design of the Individual Lot Systems serving the lots in accordance with the requirements of the Lot Grading By-law.**

Community Systems are to be designed in accordance with the Municipal Design Guidelines and in accordance with the following criteria:

Ground Surface

- The area between the street right of way and the curb shall slope towards the curb at a maximum slope of 2% but not greater than 4%.

- The maximum slope shall be 3:1 (H:V) unless constructed on in situ rock or unless otherwise approved by the Engineer (certification of slope stability by a geotechnical engineer may be required for approval). The top and bottom of banks shall be rounded for convenient maintenance. Notwithstanding the foregoing, a suitably graded slope is required with appropriate surface treatment to provide for long term stability.

- Where required, retaining walls shall be designed with due consideration given to soundness of material, stability, safety (including provision for a handrail or safety fencing), maintenance, and other relevant factors. Retaining walls with a height greater than 1 metre shall be designed by and the construction certified by a Professional Engineer, and shall be located completely on private property including footings.

- Where a cut intercepts the groundwater table creating potential drainage and icing problems, special measures will be required to address potential drainage problems.

- Where areas are disturbed, stabilization is to be provided to prevent erosion.

Swales Applied to Residential Dwellings

- Swales shall be blended into the landscape to the greatest extent possible in order to provide a natural appearance (See Figure 1a: Swale Cross Section).

- The minimum grade along any swale shall be 2%. The minimum grade maybe reduced to 1% where underdrains are incorporated (See Figure 1b: Swale and Underdrain Cross Section). Grades are encouraged to be, where possible, steeper than the minimum.

- Where the swale intercepts subsurface water, the swale shall incorporate underdrains, regardless of slope (See Figure 1b: Swale and Underdrain Cross Section).

- The side slope for any swale shall be flatter than 33% (3 horizontal: 1 vertical).

- The maximum depth of flow in any swale shall be 250 mm in the 1 in 100 year storm.

- All swales shall be designed to accommodate the 1 in 100 year stormwater flow.

- An overflow route shall be provided to direct overflow to major drainage systems. The 1 in 100 year water level along such route shall be lower than the lowest opening to the adjacent buildings.

- Sharp corners shall be avoided in swale design.

- Steeply sloping swales shall have appropriate surface treatment to prevent erosion.

Underdrains

- Underdrains, as detailed in Figure 1b: Swale and Underdrain Cross Section, are to be used to remove surface and subsurface water to drain wet areas and other areas of poor drainage, or where minimum slopes with respect to lot surface or swales cannot be achieved.

- Underdrains are not permitted to discharge onto street surfaces, walkways, private properties, or any other location where there would be an impact inconsistent with the objectives of the Lot Grading By-law.

- Underdrains shall be located a sufficient distance from any part of the building foundation to avoid impacts to building foundations and/or adjacent structures when the underdrain is replaced.

Easements

- Easements shall be provided for all swales which in the opinion of the Engineer require such legal conveyances. Generally, easements will be required when a significant number of lots depend on the swale.

- Public easements shall be provided for all catchbasins and associated stormwater pipes constructed in conformance with the HRM and Halifax Water standards.

- A minimum easement width of 6 metres is required for public easements as per HRM and Halifax Water requirements.

- A minimum easement width of 4.5 metres is required for private easements.

2.2. Individual Lot Systems

During design of Individual Lot Systems, the focus is on the lot and house grading and house locations inside the lot boundaries. It is intended that there be no change to the grading along the exterior boundary (Community System) or other Community System located within the lot, subject to the provisions of Section 6.0 – Variances.

Individual Lot Systems are to be designed in accordance with the Design Criteria for Community Systems with the following additions:

Buildings

- Building and site design should respect the topography and natural drainage of the site in order to reduce the magnitude of lot grading required, the need for retaining walls, and the need for piped drainage systems.

- To promote groundwater recharge and to minimize the increase in peak runoff, roof downspouts are not to be connected to the piped storm sewer system subject to variation approved by Halifax Regional Municipality.

- Roof downspouts are to be positioned such that, where possible, discharge onto driveways or adjoining property is avoided. It is recommended that roof downspouts are discharged to splash pads.

- The interrelationship of the house location and the Storm Drainage Systems is important in achieving the objectives of the Lot Grading By-law. Strategically locating the house can allow for Storm Drainage Systems to be constructed

which are relatively inexpensive and require a low level of maintenance. On the other hand, a poorly selected house location may require that elaborate systems be constructed which will require significant on-going maintenance. With this in mind, and within the context of the Lot Grading By-law, the house location will be examined with a view of addressing the objectives of the Lot Grading By-law.

- Entrance elevation to building openings, e.g. windows, doors, stairwells, garage entrances, shall be set such that the objectives of the Lot Grading By-law are met.

Ground Surface

- All surfaces must slope away from the building as follows:

  - Front yard – the front yard shall be continuously graded to drain away from the building towards the street.
  - Back yard – the back yard shall be graded to drain away from the building for a minimum distance of 3 metres with a minimum drop of 150 mm.
  - Side yard – where permitted by applicable land use by-law and/or by development agreement, the side yards shall be graded to drain away from the building a minimum distance of 1.2 metres with a minimum drop of 150 mm.

- All landscaped lot surfaces shall have a minimum slope of 2%, unless otherwise provided for in this Schedule. Grades are encouraged to be, where possible, steeper than the minimum.

- The maximum slope on any lot surface shall be 3:1 (H:V) unless constructed on in situ rock or unless otherwise approved by the Engineer. Certification of slope stability by a geotechnical engineer may be required for approval as well as consideration of other issues such as maintenance and erosion. The top and bottom of banks shall be rounded for convenient maintenance. Notwithstanding the foregoing, t a suitably graded slope is required with surface treatment to provide for long term stability.

- Where areas are disturbed, stabilization is to be provided to prevent erosion.

Driveways/parking/Open Areas

- The portion of the driveway within the front yard shall be graded to drain away from the building towards the street and to prevent the direct discharge of water onto adjacent property.

- Driveway slopes shall not be less than 2%.

- For paved or impervious areas greater than 100 square metres, additional information and design requirements with respect to grading and drainage may be required.

3. INFORMATION REQUIREMENTS

Several documents are to be prepared during the process outlined in the Lot Grading By-law: Lot Grading Plan; Lot Grading Certificate; Deficiency Report; and, Owner Undertaking for Completion. Indicative samples of each of these documents are found under Figure 2 through Figure 5.

3.1. Lot Grading Plan (See Figure 2 for sample)

The Lot Grading Plan illustrates the Individual Lot Systems for a lot of land and its relationship to the Community Systems surrounding and within the lot of land. The Lot Grading Plan generally illustrates a specific building type for the lot and how the grading fits into the Approved Lot Grading Plan when one exists, and/or the adjacent existing topography.

General

- The Lot Grading Plan shall be drawn at a scale of 1:250 (1 inch = 20 feet) and is to be displayed on ledger paper (280 mm x 430 mm)(11" x 17"). One lot is to be shown on each Lot Grading Plan. The layout of the information on the Lot Grading Plan shall conform to that shown on Figure 2.

- A Title Block shall be used indicating the following:

  - The name of the Subdivision, Approved Lot Number, Street, and the community.

  - The name of the Building Permit Owner.

  - The name, firm, and address of the professional preparing the plan.

  - Scale

  - Date (original and revisions)

- A grid north arrow shall be shown.

- Existing and proposed elevations are to be related to geodetic datum or the datum of the Approved Subdivision Grading Plan, if not geodetic.

- A legend giving an explanation of symbology is to be provided. The standard Legend depicted on Figure 2 is to be used.

- Appropriate notes relative to construction requirements are to be provided.
- Distances along the exterior boundary of the lot are to be shown.
- PID number is to be shown.

Existing Conditions

- Existing Information, to be field collected and representative of conditions at the time of Lot Grading Permit Application, is to be expressed as spot elevations and contours at maximum 750 mm intervals on the specific lot and adjacent lots to adequately illustrate the drainage interrelation between properties with common property lines and the existing topography.
- Centreline street elevations and related to the chainage on the profile record drawings where such drawings exist.
- Top of curb elevations at sideline extensions and driveway cuts.
- Existing Storm Drainage System Elements, e.g. catchbasins, swales.
- Public or private easements or rights-of-way.
- Utility poles, fire hydrants, traffic signs, or other surface features adjacent to the lot.
- Where a lot is adjacent to a watercourse or a major drain system exits on the lot, the normal water elevation in the 1 in 100 year water levels.
- Where buildings exist on adjacent lots, the elevation at the adjoining corners of the building if located within 10 metres of the lot limit.
- Any other items affecting stormwater drainage. As a minimum, existing elevation information is to extend 6 metres onto adjacent properties.

Proposed Grading

- The proposed elevations for all lot corners as well as intermediate points of grade change on all lot lines and sloped surfaces. The frequency of proposed elevations shall depend upon the degree of development (with developed areas requiring more detailed information) and also upon the topography. Where an Approved Subdivision Grading Plan exists, the proposed elevations along the lot limits are to conform to the Approved Subdivision Grading Plan, subject to Section 6.0 – Variances.

- All swales along the proposed elevations at all lot lines or changes in direction of slope of the swale.
- All catchbasins, or other drainage structures, within and adjacent to the lot along with the grade elevation of the catchbasins and the invert of all inlet and outlet pipes.
- All areas that are to be left in an undisturbed condition.
- Significant proposed slopes greater than 4:1 (H:V).
- Proposed surface treatment of disturbed areas is to be indicated.
- Direction of surface flow to be indicated by arrows so that the proposed drainage patterns on all areas of the lot are clearly indicated.
- Split in drainage direction is to be shown.

Proposed Building and Appurtenances

- The exact outline of the building, walkways, driveways, and external appendages (decks).
- The horizontal relationship of the main building to the lot limits.
- The proposed basement floor elevation(s) together with the floor elevation(s) of garages (if any).
- The elevation and configuration of basement walls.
- Where openings in the basement are proposed e.g. windows, doors, information is to be included on the Lot Grading Plan relating to the location and construction of the opening to ensure the requirements of the Lot Grading By-law are met.
- Roof downspout locations and direction.
- The proposed ground elevations at the building corners and other appropriate points of grade change along the building walls.
- Proposed grading and design details of any retaining walls.
- The location of the lateral trench accessing the building and the existing lateral or mainline elevations at the point of service connection.
- Design details and location information for any other drainage appurtenance.

3.2. Lot Grading Certificate (See Figures 3a and 3b)

The Lot Grading Certificate shall provide certification that the Storm Drainage Systems on the lot have been constructed in accordance with the Approved Lot Grading Plan and is to be prepared as presented in either Figure 3a or 3b. The Certificate is to be issued only when the works have been completed and deficiency items do not exist.

Tolerances

Proposed grading and slope information is to be confirmed as being constructed on the Lot Grading Certificate as follows:

- Where the as-built design elevation or slope is within the indicated tolerance, a graphical or written confirmation is acceptable. All changes of elevations on the approved Lot Grading Plan shall be identified in red adjacent to the original elevation.

- Where the as-built design elevation or slope is not within the indicated tolerance, the as-built result is to be specifically shown.

    - Constructed elevation at lot lines shall match the proposed elevation as indicated on the Approved Lot Grading Plan within 5 cm.
    - Grades along sloped surfaces or swales that are at the minimum or maximum allowable grades shall match the grades indicated on the Approved Lot Grading Plan, or deviate to the permitted side of the minimum or maximum.
    - Additional elevations or slopes not covered above must meet the intent of the Approved Lot Grading Plan.

3.3. Deficiency Report (See Figure 4)

A Deficiency Report, prepared as presented in Figure 4, is to be shown when construction has not been fully completed in accordance with the Approved Lot Grading Plan and Occupancy is being sought. The Deficiency Report must itemize the work not completed.

The Deficiency Report is to also include statements to the effect that, although full construction is not completed, the condition of the lot relative to lot grading and drainage does not create an unsafe situation for the occupant of the lot of adjoining owners.

3.4. Owner Undertaking for Completion (See Figure 5)

The Owner Undertaking for Completion, prepared as presented in Figure 5, is to accompany the Deficiency Report when an Occupancy is being sought.

This document is to provide a statement by the Owner confirming the following:

a) That they will cause to completion of the construction to take place within a nine (9) month period from the date of occupancy; and,
b) In the event that completions do not occur, The Owner agrees that the Municipality may construct the deficient works.

4. VARIANCES

It is anticipated that site conditions and/or innovative building techniques may justify variations to the Individual Lot Systems and possibly the Community System to enable a lot to be developed in a specific manner. In considering variances to Community Systems of previously approve Individual Lot Systems, the objectives outline in Section 3.0 of the Specification must be met and be demonstrated as proven to be met by the Owner.

In addition to the overall objectives of the Lot Grading By-law, specific requests for variances to the Individual Lot Systems and Community Systems must address the following points:

1. What aspect or component of the existing Individual Lot System or Community System is being requested to be modified in order to achieve the owner's desired development?

2. Will any main or accessory buildings on adjoining properties be affected with respect to any flood risk damage as a result of the requested variance?

3. Will any municipal infrastructure be placed in a greater flood risk potential as a result of the requested variance?

4. Where appropriate, calculations must be provided indicating the design capacity of the receiving systems with and without the requested variance.

5. Information must be provided with respect to major and minor watersheds contributing to the specific site of the variance.

6. Where required by the Municipality, proof/acknowledgement that abutting property owners have been informed about the variance request (include names of contact persons and telephone numbers).

Following receipt of this information, the Engineer will review all of the information provided and determine if the variance to the Individual Lot System or Community Systems will be permitted.

It should be understood that the review process associated with a Lot Grading Permit, in cases where variances have been applied for, will be in excess of the normal review time for those owner requesting approval that confirm with the Community Systems and Individual Lot Systems established.

FIGURE 1a: SWALE CROSS SECTION

N.T.S

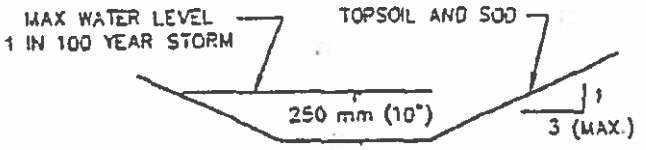


FIGURE 1b: SWALE AND UNDERDRAIN CROSS SECTION

N.T.S

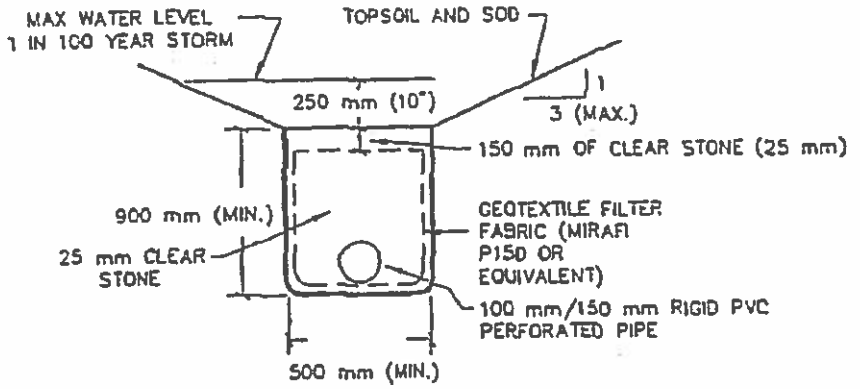


FIGURE 2

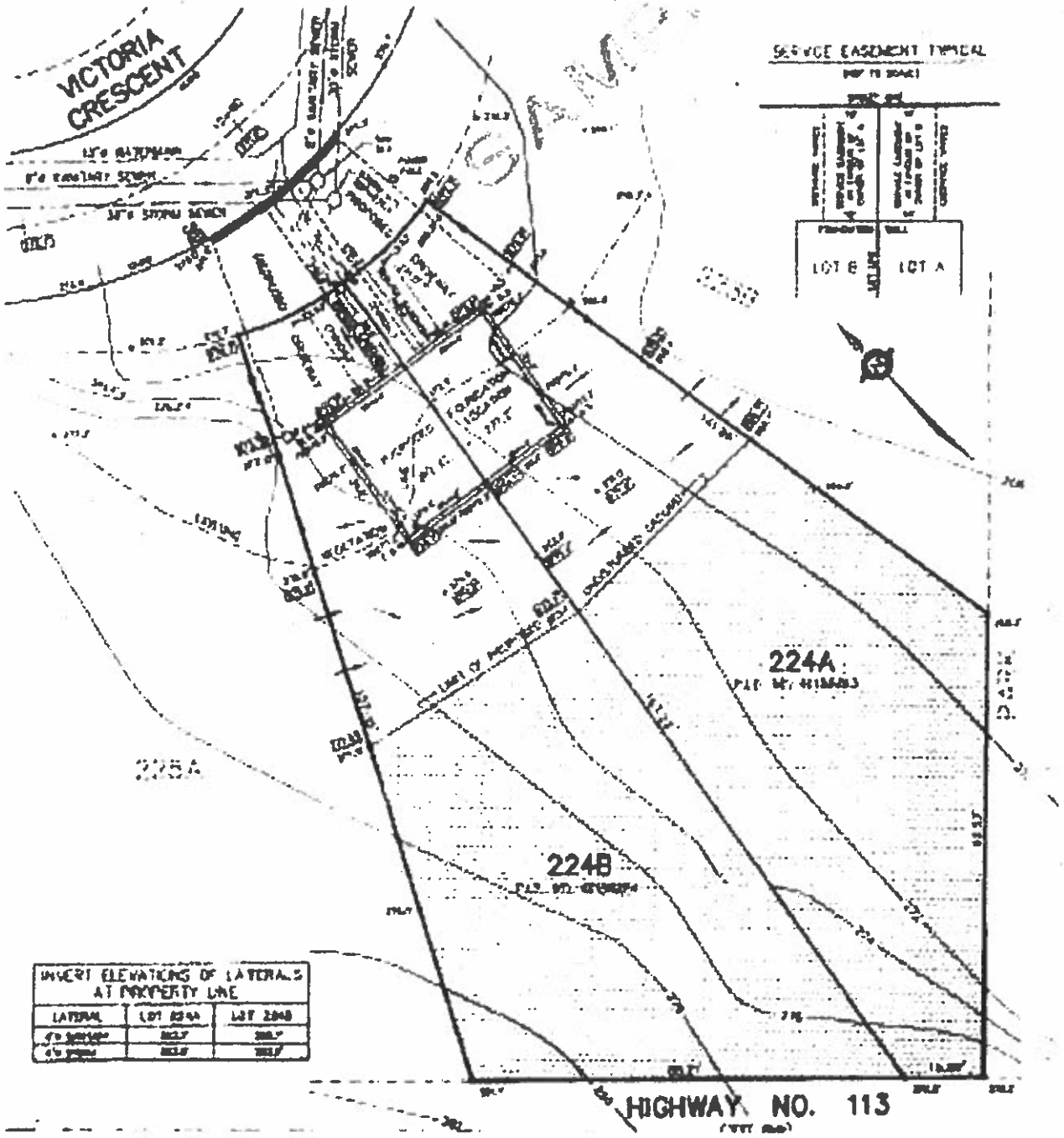
VICTORIA ESTATES – PHASE 2

LOT GRADING PLAN SHOWING
PROPOSED DWELLING LOCATION ON
LOTS 224A and 224B
VICTORIA CRESCENT
TUPPERLEA, HALIFAX COUNTY
PROVINCE OF NOVA SCOTIA

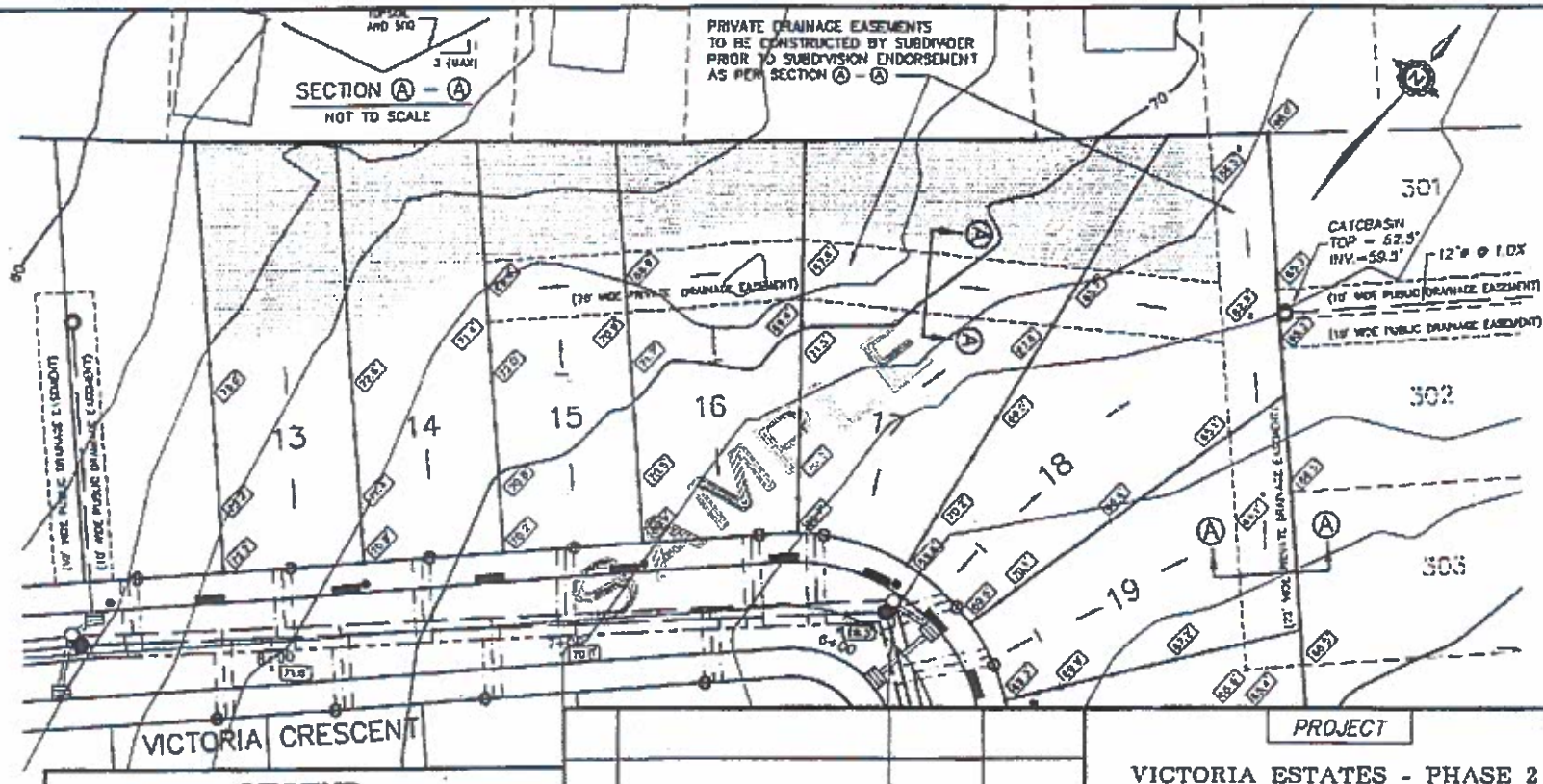
123 PROJECT CONSULTANTS

MUNICIPALITY USE ONLY:

STAMP



INVERT ELEVATIONS OF LATERALS AT PROPERTY LINE		
LATERAL	LOT 224A	LOT 224B



LEGEND

DESCRIPTION	SYMBOL
DRIVEWAY CUT (10'ENCL.,15'DBL.)	
EXISTING GRADE CONTOUR	60
DIRECTION OF SURFACE DRAINAGE	
SWALE ON PROPERTY LINE	
EXISTING ELEV. , DESIGN ELEV.	+ 71.2' +70.1
APPROXIMATE LIMIT OF PROPOSED UNDISTURBED AREAS	
SELECTED SLOPES STEEPER THAN 4H:1V	

CONTOURS ARE BASED ON FIELD SURVEY AND REPRESENT PRE-CONSTRUCTION EXISTING GRADE.
CONTOUR INTERVAL = 2 FEET

NO.	REVISION	APP'D	DATE
0	ISSUED FOR REVIEW		04/28/96

123 PROJECT CONSULTANTS
QUINCY PLACE, SUITE 1280
2387 WYSE ROAD
DARTMOUTH, NOVA SCOTIA
B5T 6Y3
PH: (902) 555-1234
FAX: (902) 555-4321

REGISTERED PROFESSIONAL ENGINEER – PROVINCE OF NOVA SCOTIA – DATE – STAMP

PROJECT

VICTORIA ESTATES - PHASE 2
TIMBERLEA, HALIFAX COUNTY
REGAL DEVELOPMENTS LIMITED

SHEET DESCRIPTION

SUBDIVISION GRADING PLAN
LOTS 11–19

DATE APRIL 28, 1996
HORZ. SCALE 1"=40'
VERT. SCALE 2' INT.
DRAWN T.L.M.
CHECKED R.A.H.
DWG. # 95073-G1

FIGURE 2

SHEET 1 OF 1

FIGURE 3A

LOT GRADING CERTIFICATE

<LOCATION OF PROPERTY INCLUDING LOT NUMBER AND SUBDIVISION NAME IF APPLICABLE>

Relating to the Lot Grading Plan dated <DATE>, and prepared by < NAME OF PROFESSIONAL ENGINEER, NS LAND SURVEYOR, OR LANDSCAPE ARCHIECT>

With respect to the foregoing, I provide herein the following statements:

(1) That I have performed sufficient site inspections, including a final inspection on _____, 20___, to confirm that the lot grading and drainage works for the subject lots have been substantially constructed in accordance with the above referenced Lot Grading Plan.

(2) That I have reviewed the design depicted on the Lot Grading Plan, and confirm that the intent of this design has been met.

(3) That sufficient field measurements have been taken such that I can state that substantive deviations from the Lot Grading pan, and described in the "Tolerances" section of the Lot Grading and Drainage General Specification do not exist.

_____ ***STAMP***

Signature

Name:

Date:

FIGURE 3B

LOT GRADING CERTIFICATE

<LOCATION OF PROPERTY INCLUDING LOT NUMBER AND SUBDIVISION NAME IF APPLICABLE>

Relating to the Lot Grading Plan dated <DATE>, and prepared by <NAME OF PROFESSIONAL ENGINEER, NS LAND SURVEYOR, OR LANDSCAPE ARCHIECT>

With respect to the foregoing, I provide herein the following statements:

(1) That I have performed sufficient site inspections, including a final inspection on _____, 20___, to confirm that the lot grading and drainage works for the subject lots have been substantially constructed in accordance with the above referenced Lot Grading Plan.

(2) That I have reviewed the design depicted on the Lot Grading Plan, and confirm that the intent of this design has been met.

(3) That, based on field measurements taken, deviations from the Lot Grading Plan, beyond those described in the "Tolerances" section of the Lot Grading and Drainage General Specifications exist. It is my professional opinion that the deviations are not substantive in nature as related to the performance of the works in meeting the objectives of the Lot Grading By-law. In making this statement, I accept responsibility for the impact of the deviations only and report that I have advised the <NAME OF PROFESSIONAL ENGINEER, NS LAND SURVEYOR, OR LANDSCAPE ARCHIECT> of the deviations. Responsibility for the Lot Grading Plan resides with the <NAME OF PROFESSIONAL ENGINEER, NS LAND SURVEYOR, OR LANDSCAPE ARCHIECT>. For clarity, the deviations as related to the Community Systems are depicted on the attached copy of the Lot Grading Plan.

_____ ***STAMP***

Signature

Name:

Date:

FIGURE 4

DEFICIENCY REPORT

<LOCATION OF PROPERTY INCLUDING LOT NUMBER AND SUBDIVISION NAME IF APPLICABLE>

Relating to the Lot Grading Plan dated <DATE>, and prepared by <NAME OF PROFESSIONAL ENGINEER, NS LAND SURVEYOR, OR LANDSCAPE ARCHIECT>

I, _____, hereby confirm that I have performed site inspections at the subject lots to state that the following items are not completed as of _____, 20 ____ as related to required construction in accordance with the Lot Grading Plan.

[PROVIDE LISTING OF UNCOMPLETED WORKS]

[ESTIMATED COSTS ARE NOT REQUIRED]

I further confirm that it is my professional opinion that the conditions of the site relative to lot grading and drainage do not represent an undue hazard to the occupants of the dwellings on these or adjoining lots.

_____ ***STAMP***

Signature

Name:

Date:

FIGURE 5

OWNER UNDERTAKING FOR COMPLETION

<LOCATION OF PROPERTY INCLUDING LOT NUMBER AND SUBDIVISION NAME IF APPLICABLE>

Relating to: (a) Lot Grading Plan dated <DATE>, and prepared by <NAME OF PROFESSIONAL ENGINEER, NS LAND SURVEYOR, OR LANDSCAPE ARCHIECT>
(c) Deficiency Report dated _____, 20_____.

I, _____, hereby confirm that I am the Owner for the above indicated Lot and provide herein the following statements:

a) That I have reviewed the aforementioned Deficiency Report and undertake to cause the identified construction to be completed within nine (9) months from the date of this document.

b) That at the completion of construction, I shill cause a Lot Grading Certificate to be prepared and forwarded to the Municipality in accordance with the requirements of the Lot Grading By-law.

c) That I undertake that I shall provide a copy of this Undertaking:

   a. to any person who obtains an interest in the property, and
   b. to their legal representative, if applicable

   if the lot is conveyed or transferred prior to the issuance of a Lot Grading Certificate.

_____ ***STAMP***

Signature

Name:

ATTACHMENT B

SUMMARY OF MOST FREQUENTLY USED BEST MANAGEMENT PRACTISES

Urban Stormwater Management Alternatives		
Source Control	**Conveyance Control**	**End of Pipe Control**
• Rooftop Runoff • Disconnection of Foundation Drains • Catchbasin Restrictors • Lot Control • Rooftop Detention • Permeable Pavers • Slope Stabilization and Erosion Control Measures • Compost Berm • Rain Garden	• Vegetated Swales • Channel/Outlet Protection • Pervious Pipe Systems • Pervious Catchbasins • Wet Swale • Permanent Check Dams	• Detention/Retention Facilities • Underground Tanks • Wetlands • Infiltration Basins/Trenches • Filter/Buffer Strips • Sand Filters • Oil and Grit Separators

Source: Stormwater Management Guidelines, Dillon Consulting, March 2006