P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Item No. 11.1.4
Halifax Regional Council
August 18, 2020
September 22, 2020

TO: Mayor Savage and Members of Halifax Regional Council

SUBMITTED BY: Original Signed
Caroline Blair-Smith, Acting Chief Administrative Officer

DATE: July 10, 2020

SUBJECT: **Grade Alteration By-law and Halifax Stormwater Standards for Development Activities**

ORIGIN

- February 26, 2013 Regional Council directed staff to develop an Integrated Stormwater Management Policy with Halifax Water.

- June 25, 2014 Regional Council directed staff to complete a best practice review of other jurisdictions and engage with the development and construction industry to assess the potential impacts on their business operations as it relates to the transport and dumping of fill in residential areas and provide recommendations for Council's consideration resulting in an amendment of the current Land Use by-law.

- October 2014 Regional Plan, Policy SU-7 states that 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; and

- On January 16, 2018 Regional Council endorsed the Policy Framework contained within the Environmental and Sustainability Standing Committee Report dated November 2, 2017 entitled "Halifax/Halifax Water Integrated Stormwater Management Policy", structured around the following themes:
  1. Capital Investment Strategy
  2. Ownership and Maintenance of Municipal Stormwater systems
  3. Land Development Practices
  4. Drainage on Private Property
  5. Wet Lands
  6. Combined Sewers
  7. Flood Resilient Design Standards

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LEGISLATIVE AUTHORITY

Regional Plan, Policy 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; and

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

RECOMMENDATION

It is recommended that Halifax Regional Council:

1. Adopt the proposed By-law G-200, A By-law Respecting Grade Alteration, as set out in Attachment A, the purpose of which is to set out grade alteration standards for the Municipality and to replace the following By-laws:

    (a) former Town of Bedford By-law 23290: *Respecting the Movement of Topsoil, the Movement of Earth and the Alteration of the Grade of Land*,

    (b) Halifax County Municipality By-law 40: *Respecting the Regulations and Controls of the Removal and Movement of Topsoil and Earth and the Alteration of the Grade of the Land*, and

    (c) Halifax County Municipality By-law 41: *Respecting Gravel Pits and Excavations*.

2. Adopt the Administrative Order 2020-010-OP for Halifax Stormwater Management Standards for Development Activities as set out in Attachment B;

3. Adopt By-law L-402, *Respecting Lot Grading*, the purpose of which is to amend By-law L-400, as set out in Attachment D;

4. Adopt By-law S-701, *Respecting Swimming Pools*, the purpose of which is to amend By-law S-700, as set out in Attachment F; and,

5. Adopt the Amending Administrative Order, the purpose of which is to amend Administrative Order 15, Respecting License, Permit and Processing Fees, to add Table 26, the fees for By-law G-200, as set out in Attachment G.

BACKGROUND

The creation of a stormwater management by-law originated in 2013 when Regional Council directed staff to develop an Integrated Stormwater Management Policy Framework (ISMP) with the Halifax Regional Water Commission (Halifax Water)[1], and was further supported in the 2014 Regional Plan which provides policy direction to consider adopting a stormwater management and erosion control by-law.[2] On January 16, 2018 Regional Council then passed the Integrated Stormwater Management Policy Framework.[3]

The policy framework states:

A stormwater policy should give specific regard to the following outcomes:

[1] http://legacycontent.halifax.ca/council/agendasc/documents/130226ca81.pdf
[2] Regional Municipal Planning Strategy October 2014. Section 8.4 Stormwater Management: A Municipal Role, Policy SU-7. Pg. 94 https://www.halifax.ca/sites/default/files/documents/about-the-city/regional-community-planning/RegionalMunicipalPlanningStrategy-19Nov30-RegionalCentrePlan-PackageA-TOCLinked_0.pdf
[3] https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/180116rc1431.pdf

- Prevent loss of life and property due to major storm events;
- Efficient and effective work management processes, with a clear delineation of responsibility between the Municipality and Halifax Water;
- Safe and convenient use of streets and other land areas before, during and after storm events; and,
- Mitigate the long-term impacts of development on natural systems and downstream properties.

To address these outcomes, the Integrated Policy will be structured around four main issues or themes:
1. A capital investment strategy for stormwater infrastructure;
2. Ownership and maintenance of stormwater systems;
3. Land Development Practices; and,
4. Drainage on private property.

Council's direction included the development of a stormwater policy which can be applied to site-specific development, stand-alone site improvements that are not related to land development applications, as well as grade alterations and top soil removal. It is also essential that the integrated stormwater policy approach ensures the protection of public safety and the environment, as well as encourages economical development.

DISCUSSION

The activities of grade alteration and stormwater management are very closely linked, as any grade changes will result in a change to the flow of stormwater. The proposed Grade Alteration By-law (Attachment A), will regulate the placing, dumping of fill, the removal of topsoil and the alteration of the grade of the land and will require that such activities comply with new stormwater management standards. These standards, entitled the "Halifax Stormwater Management Standards for Development Activities" (Appendix A of Attachment B), set requirements and offer guidance on stormwater management on private property and are adopted by the proposed Administrative Order 2020-010-OP (Attachment B).

Halifax Stormwater Management Standards for Development Activities

Stormwater flows from rooftops, paved areas, graveled areas, bare soil, and lawns. Stormwater gathers in increasingly large amounts along streets, drains, open channels, and sewers, and eventually discharges untreated into nearby waterbodies. However, in areas served by combined sewer systems, stormwater flows with wastewater to a wastewater treatment facility, where it may lead to a combined sewer overflow. Stormwater can pick up and carry pollutants (oil, grease, chemicals, dirt, sediment, nutrients, and pathogens). Without treatment, these pollutants can have a significant impact on downstream watersheds.

In urban areas, stormwater management is especially important due to decreases in natural surfaces and the increase of impervious surfaces like rooftops, sidewalks and asphalt which change the permeability of the landscape, preventing stormwater from infiltrating into the ground.

Scientific evidence indicates that climate change has already contributed to an increase in the severity and frequency of storm events, and will continue to do so. There is growing evidence to suggest that regulating site design features to promote control of stormwater at the source is more effective than public infrastructure at lessening effects.

Many North American municipalities have adopted stormwater management requirements that include capturing and treating the rain where it lands, using vegetation and filtration beds to improve the quality of stormwater runoff (for example, rain gardens, green roofs, and bioswales). This approach to stormwater management is commonly referred to as Stormwater Best Management Practices (BMPs). Stormwater BMPs aim to increase the amount of rain that can be absorbed on a specific site by soaking into the ground,

being absorbed by plants, or evaporating into the air. This can be achieved, in part, by reducing hard, impermeable surfaces such as asphalt.

The Halifax Stormwater Management Standards for Development Activities (HSMS) is a document prepared in partnership with Halifax Water. The HSMS are intended to provide design requirements and guidance to meet the following objectives:

- using design methods to reduce increased stormwater flow, flooding, erosion, groundwater contamination, and inflow into wastewater systems caused by development;
- using naturally occurring plants in stormwater management plans to filter run-off;
- site disturbance in new developments to reduce erosion; and,
- reducing sediments, nutrients and contaminants being discharged to lakes and rivers to improve water quality.

Currently stormwater management design requirements, as adopted in 2002, are to balance pre-and post-development flow leaving a development site, and to manage erosion and sedimentation as per Provincial regulations. In addition to balancing pre- and post-development flow, the HSMS will require development sites to retain the first 10 mm of rain on-site, and to remove on average 80% of total suspended solids from runoff leaving the site, using stormwater BMPs. Ideally, the first 25 mm of a storm would be captured, but with varying site conditions throughout HRM, 10 mm was selected as an initial achievable target. After several successful projects are completed under these regulations, staff can determine with confidence if the requirements can be increased.

The HSMS is proposed to apply to private properties being altered for the development of land, whether or not the land is associated with a permit. The scope of application of the HSMS is described in the proposed Grade Alteration By-law.

This is the first of several steps towards improving stormwater management and water quality in HRM, in accordance with the ISMP. Future plans include a public education campaign, adopting stormwater BMP standards for the public ROW, and working with Halifax Water and Nova Scotia Environment towards standards for naturalized stormwater ponds and artificial wetlands.

Grade Alteration By-law

When Halifax Regional Municipality amalgamated in 1996, various policies and procedures were carried forward from the four predecessor municipalities. This resulted in HRM administering four grade alteration regulations associated with land development activities throughout the region:

- HRM Lot Grading By-Law L-300 followed by L-400,
- Halifax County Topsoil By-law 40,
- Bedford Grade Alteration By-law, and
- Halifax County Gravel Pits & Excavations By-law 41.

These by-laws are similar in nature; however, each regulates various types of grade alteration in different areas of the Municipality. Additionally, there are areas of the Municipality where no grade alteration regulations exist. Staff are proposing to repeal the Bedford Grade Alteration By-law and the Topsoil By-law, and maintain provisions from these two by-laws which are still relevant and can continue to be applied with effect. The proposed grade alteration regulations would address application and administration shortfalls in each by-law, be applied consistently across the Municipality, and include the more detailed stormwater standards discussed above.

Staff recommend repeal of the Gravel Pits & Excavation By-law 41. This by-law originated in 1971 and was applied to former electoral districts within the County of Halifax. The by-law regulated the operation and excavation associated with gravel pits. This type of work is now regulated by the Province and as such, By-law 41 is no longer administered.

Staff are also proposing minor amendments to By-law L-400, the Lot Grading By-law, to align with the new Grade Alteration By-law; however the intent is to retain the Lot Grading By-law L-400 in its full capacity which will be discussed further below.

The proposed amendments to the existing by-laws are included in Attachments C through F.

Application

The intent of the proposed Grade Alteration By-law is to regulate the placing, dumping of fill, the removal of topsoil and the alteration of the grade of the land associated with grade alteration activities to ensure that:

- existing drainage patterns are maintained;
- interference and damage to water courses or waterbodies is limited;
- water quality is maintained;
- erosion and sedimentation are prevented;
- changes to drainage or grade are appropriate to protect natural topography features;
- the use of hazardous or improper fill is prevented;
- unanticipated drainage and site alteration changes are prevented; and
- nuisances associate with long term transport hauling of fill material are minimized.

For clarity, the proposed Grade Alteration By-law is intended to achieve the following:

- extend consolidated regulation to all areas throughout HRM;
- apply to the construction of retaining walls over 1 metre in height;
- apply to non-development related activities, such as the reconstruction or construction of parking lots;
- apply to the development of Multi-unit Residential, Institutional, Commercial, and Industrial projects which require a building permit;
- apply to the development of lands over 0.5 hectares in size; and
- apply conditions on hauling activities associated with excavation or topsoil removal work.

The proposed Grade Alteration By-law will not apply to the following activities:

- low density construction regulated under the Lot Grading By-law L-400;
- new building construction where grading is regulated by a Development Agreement;
- cultivation of garden beds or top dressing of lawns;
- bona fide agricultural, forestry, mining, or fishery related uses;
- gravel pits or quarries for which an approval is required by the Province; or
- water lot infilling for which approval is required by the Federal Government through the Halifax Port Authority and Transport Canada (Navigable Waters).

The proposed Grade Alteration By-law will not apply to low-density residential development, such as the construction of single-family homes. This type of development activity is currently regulated by the Lot Grading By-law L-400 which applies to residential properties located within an area where a sanitary sewer system is currently provided or will be provided. The Lot Grading By-law L-400 is a well-established by-law which focuses specifically on low-density development within the urban core where lots are generally smaller in size and homes are in closer proximity.

Swimming Pools, Accessory Buildings and Retaining Walls

Staff recommend including lot grading requirements within the Lot Grading By-law L-400 for the installation of swimming pools, the construction of residential accessory buildings, and the construction of retaining walls over 1 metre on properties located within the sanitary sewer service boundary. Staff are proposing lot grading requirements for these types of construction activities as a response to ongoing private property

drainage challenges which result from changes to the original lot grading and drainage patterns that may occur when swimming pools, accessory buildings and retaining walls are built. Lot grading requirements for these structures would also be consistent with the current application of the Bedford Grade Alteration By-law which requires grading information for each pool permit application, as well as where regrading of a property is required for the placement of a new accessory building. These grading requirements have demonstrated reduced private property drainage issues in the Bedford area compared to other areas of the Municipality within the urban core.

Permit Conditions and Long Term Hauling of Fill

In 2011[4] and 2014[5], Council raised safety and nuisance concerns with long term hauling of fill associated with development activities within residential and school areas, and asked staff to review the ability to amend the Land Use By-law to mitigate the nuisances caused by the transportation and hauling of material to commercial fill sites. Due to grandfathering rights for existing activities, it was determined that changes to the Land Use By-law to regulate the use of commercial fill sites would only apply to sites that were established after the by-law amendments were in place. Pre-existing activities would be exempt from these amendments. Accordingly, mitigating nuisances related to grade alteration activities is better achieved through changes to the general application by-law, such as the proposed Grade Alteration By-law, which will be applied throughout the Municipality regardless of the permitted land use.

As part of the development of the proposed Grade Alteration By-law, staff also reviewed regulations in similar jurisdictions and found that HRM's current grade alteration by-laws were in keeping with other municipalities. Staff did observe that a number of jurisdictions such as the City of Ottawa and the City of Kingston are in the process of refreshing their grade alteration by-laws with clarifications to permit conditions and enhancing environmental protection measures.

The current HRM by-laws do give the Engineer and Council power to impose terms and conditions to the permit such as: the period the permit will be in effect, methods of topsoil removal and alteration of the grade of the land, the period during which operations may be carried on, as well as additional erosion and environmental protective measures. Unfortunately, the current by-laws do not speak to the nuisance effects that the long term transporting of fill from development projects to commercial fill sites has on residential areas. There are a number of commercial fill sites in existence. These sites have historically received Grade Alteration Permits to allow for the receiving of fill material as required by the by-law. Staff have worked closely with these operations to mitigate the nuisances caused by this type of grade alteration work and the transporting of fill through the surrounding community. However, current regulations do not provide specific guidance for long term grading activities like a commercial fill site.

Typical grading activities for commercial sites and subdivision developments have a time frame of a few months to a year at most, which is considered temporary work with a defined completion date. The challenge with commercial fill sites is that they receive fill continuously every construction season, providing no relief for the neighbouring residents within the community. The proposed Grade Alteration By-law is responding to the need to mitigate nuisances associated with the prolonged transportation of fill through residential areas associated with lengthy construction projects or commercial sites which accept fill material. The proposed by-law will clarify the existing permit conditions and limit the Engineer to approve the duration of a Grade Alteration Permit for temporary grade alteration activities to one year.

Approval by Council

Grading activities that last longer than one year will be considered a commercial venture and will require Council approval to renew or allow grading activities for longer duration. Council will have the option to not allow the activity to continue, extend the time limit, or impose any other restrictions it deems fit to address community or safety concerns.

[4] http://legacycontent.halifax.ca/council/agendasc/documents/110920cai02.pdf
[5] http://legacycontent.halifax.ca/council/agendasc/documents/140624ca1161.pdf

The By-law provides for Council to consider the following conditions to mitigate nuisance and safety impacts of development and hauling activities associated with topsoil removal and grade alteration:

- limit Grade Alteration Permits to a period of one (1) year from the date of issuance;
- specify when hauling operations can take place, such as months, days, hours;
- specify number of trucks permitted to haul within a residential or school area per day;
- specify noise mitigation measures;
- specify dust control measures; and
- include additional environmental controls.

Securities and Remedy Provisions

A security deposit of $2,500 per 0.5 hectare of disturbed land is currently required under the Bedford Grade Alteration and Topsoil By-laws. This security is a guarantee of the performance of the applicant and the completion of the work. The value of the security represents the cost if the Municipality is required to enter the land for compliance reasons and stabilize the affected area with basic hydroseeding. Staff are recommending the same security deposit requirement and value continue to apply to the area of land to which the Grade Alteration permit will apply.

Regulatory Impact

The costs and benefits of the proposed By-law have been considered through a regulatory impact assessment (RIA) and the Charter of Governing Principles for Regulation AO was used as a decision-making “lens” when assessing this policy problem and considering the proposed set of regulations. The findings show that the proposed By-law and Stormwater Standards, combined with public education and additional information supports, such as on-line access to best practices, to help increase compliance, is the best approach for effectively managing stormwater in HRM and will not add unnecessary red-tape to those being regulated or to the Municipality.

The potential impact on HRM’s business customers such as land developers and construction-related companies has also been considered through a Business Impact Assessment (BIA) to determine any likely new costs and/or savings to businesses resulting from the new By-law. A BIA tool is known as a Standard Cost Model, used in Finance Departments to measure order of magnitude impacts from government regulation. It is best thought of as measuring “non-budgetary” costs. It uses Statistics Canada data on nominal wage rates based on categories of skilled (un-skilled) labour. Typically, private companies experience undue costs due to staff resources being used for compliance, rather than productive activity.

In this situation, the model indicated very minor impacts to construction firms through compliance with this by-law. Simply, private companies may experience a loss of staff hours through time required to understand the by-laws’ applications to new construction activity.

Based on a high-level understanding of construction firm activity and behaviour, the BIA tool suggests no up-front capital expenditures, as the per acre security deposit is not an incremental capital expenditure. Estimates suggest modest operating costs related to staff education of roughly 20 labour hours. The estimated median impact per firm is in the $5,000 range.

The Nova Scotia Road Builders Association (NSRBA) has indicated that restricting the hauling and disposal of surplus material at commercial fill sites will result in higher construction costs. NSRBA stated that fill sites in close proximity to large scale projects are required for better project effficiency, minimizing the number of trucks on the road, and keeping fuel costs low. Staff advise that any cost increases will either be passed on to the customer (developers or the general public) or absorbed by the contractor in a competitive market. Whether or not this by-law has an impact on the project cost will depend on the location and nature of the project.

FINANCIAL IMPLICATIONS

The administration of the proposed Grade Alteration By-law and Stormwater Management Standards can be carried out within the approved 2020/21 operating budget for Planning and Development. Additional permit revenue is estimated to be approximately $58,000 annually assuming an average of 290 permits per year at $200 per permit fee. This is only an estimate made using data from the last 5 years as the actual number or permits cannot predicted accurately.

RISK CONSIDERATION

There are no significant risks associated with the recommendations in this report. The risks considered rate low. To reach this conclusion, consideration was given to financial, legal and compliance, and service delivery risks.

COMMUNITY ENGAGEMENT

Consultation with the public and development industry stakeholders was held from late 2018 through July 2020. The consultation program included information sharing and consultation through:

- An online survey on HRM's website;
- Focused discussions with the Development Liaison Group;
- Review from relevant Nova Scotia Environment staff;
- Review from Halifax Water staff; and,
- Presentations on proposed stormwater management standards to:
    - Regional Watershed Advisory Board (2018)
    - Dalhousie Urban Forest Group (2018)
    - Dalhousie Green Engineering Conference (2019)
    - Dalhousie College of Sustainability (2019)
    - Sackville Rivers Association (2019)

Based on the feedback from the public and industry stakeholders, staff made changes to the proposed stormwater management standards. Feedback received from the public was in favour of implementing stormwater management strategies that focus on green infrastructure and BMPs.

At the time of writing this report the online survey was still under way. The launching of the survey was delayed due to the COVID-19 pandemic which impacted the public consultation process and in-person meetings. Staff are not expecting that the online pubic engagement will generate new concerns that have not already been brought forward to staff and Council. The clarifications to the proposed Grade Alteration By-law noted above are a direct result of working through nuisance and private property drainage issues in the past.

ENVIRONMENTAL IMPLICATIONS

Adopting a regional Grade Alteration By-law and Stormwater Management Standards for development activities will reduce drainage complaints, nuisance impacts, provide better environmental management and site design, improved onsite stormwater management on private property and improve the overall stormwater quality and quantity management.

ALTERNATIVES

Regional Council could choose not to approve the recommendations in this report and continue to administer the existing by-laws. This is not recommended for the reasons discussed in this report.

Regional Council could direct staff to return to Council at a later date with a draft by-law that does not contain the 1-year limit on grade alteration activities. This is not recommended as it would not address nuisances, and therefore would not be responsive to the June 2014 motion.

ATTACHMENTS

Attachment A Grade Alteration By-law G-200

Attachment B Administrative Order 2020-010-OP Stormwater Management Standards for Development Activities

Attachment C Showing Proposed Changes to By-law L-400, the Lot Grading By-law

Attachment D Amending By-law L-402

AttachmentE Showing Proposed Changes to By-law S-700, the Swimming Pool By-law

Attachment F Amending By-law S-701

Attachment G Amending Administrative Order

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

Report Prepared by: Shannon O'Connell, Program Engineer, Infrastructure Planning, Planning & Development, 902.476.2917

Ashley Blissett, Development Engineering Program Manager, Infrastructure Planning, Planning & Development, 902.476.7210

HALIFAX REGIONAL MUNICIPALITY
BY-LAW NUMBER G-200

RESPECTING GRADE ALTERATION AND STORMWATER MANAGEMENT ASSOCIATED WITH LAND DEVELOPMENT

Short Title

1. This By-law shall be known as By-law G- 200 and may be cited as the *Grade Alteration By-law*.

Interpretation

2. In this By-law:

(a) “Approved Subdivision Grading Plan” means a Grading Plan in a form acceptable to the Engineer, 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) "Certificate of Compliance" means a plan or report, in a form acceptable to the Engineer, depicting the recorded grading and drainage works on a lot of land as proposed on the approved Stormwater Management Plan and report;

(c) “Committee” means the Appeals Committee established pursuant to By-law A-100, *the Appeals Committee By-law*;

(d) “Council” means the Regional Council of the Municipality;

(e) "Deficiency Report" means a report prepared by a professional engineer describing the uncompleted construction requirements, as related to the grading and drainage works shown on the Stormwater Management Plan;

(f) "Development" means the definition found in the Halifax Regional Municipality Charter as amended from time to time;

(g) "Engineer" means the Engineer of the Municipality and includes a person acting under the supervision and direction of the Engineer;

(h) “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 localized depressions for vehicle or pedestrian entrances;

(i) "grading" means the alteration of land levels, including the addition or removal of topsoil, or other material of any kind, and includes a change in land that alters the permeability of the soil;

(j) "Grade Alteration Permit" means a permit issued under the provisions of this By-law;

(k) “Halifax Stormwater Management Standards” means the latest edition of the standards found in Administrative Order 2020-010-OP;

(l) "Municipality" means Halifax Regional Municipality;

(m) “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;

(n) “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;

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

(p) “retaining wall” means a rigid wall that is structurally designed and constructed to support fill materials between areas of land of different elevations.

(q) “Stormwater Management Plan" means a plan showing the final grading of land for a property subject to a Grade Alteration Permit, prepared in accordance with the Halifax Stormwater Management Standards, and includes stormwater management and erosion and sedimentation control features.

(r) “Stormwater Management Report” means a report prepared by a professional engineer stormwater management design rational, as related to the Stormwater Management Standards;

(s) "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;

(t) “Subdivision Agreement” means the agreement attached as Appendix 1 to the Regional Subdivision By-law as amended from time to time.

Application and Administration

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

(a) grading associated with:

(i) the change in elevation or contour of a parcel of land greater than 0.5 hectares

(5,000 square metres) in area;

(ii) the construction or reconstruction of parking lots; or

(iii) the construction of retaining walls over 1 metre in height;

(b) a Multi-Unit Residential, Institutional, Commercial, and Industrial (MICI) project including:

(i) a renovation or addition of an existing MICI use that involves changes to the building footprint or changes to the grading of the property and drainage patterns; or

(ii) the construction of accessories to MICI uses use that involves changes to the building footprint or changes to the grading of the property and drainage patterns;

(c) development of land associated with a Subdivision Agreement.

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

(a) construction regulated under the Lot Grading By-Law L-400;

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

(c) cultivation of garden beds or top dressing of lawns;

(d) bona fide agricultural, forestry, mining, or fishery related uses;

(e) gravel pits or quarries for which an Approval is required by the Province; or

(f) water lot infilling for which approval is required by the Federal Government through the Halifax Port Authority and Transport Canada (Navigable Waters).

5. For greater certainty this By-law applies to grade alteration being carried out pursuant to a Subdivision Agreement.

General Requirements

6. 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.

7. 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.

Grade Alteration Permit Application Procedure

8. Subject to section 3, no property shall be altered unless a Grade Alteration Permit has been issued by the Municipality.

9. An application for a Grade Alteration Permit shall be made at the time of application for a construction permit for works as set out in Section 3.

10. An application for a Grade Alteration Permit shall include:

(a) contact information of,

(i) the owner of the land(s) where grading is to take place,

(ii) the applicant, if different than the owner,

(iii) the contractor, and

(iv) the consulting engineer;

(b) a description of the proposed works;

(c) a schedule for the proposed works, including the start and completion dates and the duration of the construction period; and

(d) a Stormwater Management Plan and Report prepared by a professional engineer in accordance with the Halifax Stormwater Management Standards and shall identify abutting land uses.

11. Where the grading activity is included in an area subject to an Approved Subdivision Grading Plan, the Stormwater Management Plan shall be consistent with the Approved Subdivision Grading Plan, subject to variations approved by the Municipality.

12. A Stormwater Management Plan is deemed to be approved when it meets the requirements of this By-law and the Halifax Stormwater Standards, and a Grade Alteration Permit has been issued by the Municipality.

Certificate of Compliance

13. Final inspection for work and structures as set out in clause 3(a) shall not be completed unless a Completion Certificate and a Final Stormwater Management Plan and Report prepared by a professional engineer has been submitted to the Municipality, confirming that the grading has been carried out in accordance with the Stormwater Management Plan and Grade Alteration Permit.

14. No Person shall occupy a building as set out in clause 3(b) unless a Completion Certificate and a Final Stormwater Management Plan and Report prepared by a professional engineer has been submitted to the Municipality, confirming that the grading has been carried out in accordance with the Stormwater Management Plan and Grade Alteration Permit.

15. Where variations on the Stormwater Management Plan exist the Stormwater Management Plan shall be subject to review and approval by the Municipality.

16. Notwithstanding section 14, a building as set out in clause 3(b) may be occupied prior to receipt of a Completion Certificate if the following is filed with the Municipality:

(a) a Deficiency Report, prepared by a professional engineer, in a form acceptable to the Engineer, setting forth details and cost of the work to be completed;

(b) a performance security in a form acceptable to the Engineer for 110% of the cost of the work; and,

(c) a letter of undertaking by the owner stating that:

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

(ii) the Completion Certificate shall be submitted within a period of nine (9) months.

Terms and Conditions

17. A Grade Alteration Permit shall be valid for a period of one (1) year from the date of issuance by the Engineer.

18. (1) The Engineer may impose conditions on a permit that the Engineer deems necessary for the protection of health, lives and the environment, or to protect the public from nuisances that arise from the grading.

(2) Subject to subsection (1) conditions may include, but are not limited to:

(i) the months, days and hours of operation;

(ii) the number of trucks hauling within a residential or school area;

(iii) noise mitigation measures;

(iv) dust control measures; and

(v) additional environmental controls.

19. (1) Notwithstanding section 17, grading activities of a period longer than one (1) year from commencement or renewal of Grade Alteration Permit must be authorized by Council.

(2) Council may direct the Engineer to include such conditions that are deemed by Council to be reasonable and necessary to address issues considered by Council to be in the public interest.

(3) Council may refuse to authorize the Engineer to issue a permit for grading activities that last longer than one (1) year if such refusal is deemed by Council to be in the public Interest.

Permit Fees

20. An application for a Grade Alteration Permit shall be accompanied by a payment of the prescribed fee as set out in Administrative Order 15.

21. Notwithstanding section 20, no Grade Alteration Permit fee shall be required where the Grade Alteration Permit is for lands owned by the Municipality.

Securities

22. (1) Prior to the issuance of a Grade Alteration Permit, the applicant or owner shall provide a security deposit in the form of cash, certified cheque or an irrevocable letter of credit acceptable to the Municipality; which security may be drawn upon by the Municipality as its sole discretion to remedy any deficiency in any work.

(2) Upon written application by the applicant or owner, and upon the satisfaction of the Municipality that all conditions and requirements of the Grade Alteration Permit have been

fulfilled, the Municipality shall return said security deposit or the remaining amount of any reduced security deposit.

(3) The amount of security deposit:

(a) shall be valued as set out in Administrative Order 15 for each hectare of land, or part thereof, to which the Grade Alteration Permit will apply; and

(b) may be reduced, at the discretion of the Municipality, by an amount equal to the value of any work completed to the date of the reduction request, provided that the value of the work completed is certified by a professional engineer and meets the requirements of the Grade Alteration Permit.

Orders by the Engineer

23. 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 grading into compliance with the By-law.

24. An Order issued pursuant to section 23 shall specify the date on which the grading is to be brought into compliance.

25. An owner may, within fourteen (14) calendar days of being served with an Order that was issued pursuant to section 23, appeal the Order of the Engineer to the Committee.

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

27. 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.

28. An appeal pursuant to section 25 shall be commenced by filing a written notice with the Municipal Clerk which clearly states the grounds for the appeal.

29. 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.

30. After hearing an appeal pursuant to section 25 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.

31. The Engineer may cause the property 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.

32. 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.

Offence and Penalty
33. A person who

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

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

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

is guilty of an offence.

34. 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.

35. Every day during which an offence pursuant to section 33 continues is a separate offence.

36. 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.

37. 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.

Transition
38. Any permit issued under

(a) the former Town of Bedford By-law 23290, *Respecting the Movement of Topsoil, the Movement of Earth and the Alteration of the Grade of Land*; or

(b) the former Municipality of the County of Halifax By-law 40, *Respecting the Regulations and Controls of the Removal and Movement of Topsoil and Earth and the Alteration of the Grade of the Land*;

prior to the coming into force of this By-law shall remain valid and subject to any terms and conditions under which the permit was issued.

Repeal of By-Laws
39. The following By-laws are hereby repealed:

(a) Town of Bedford By-law 23290, *Respecting the Movement of Topsoil, the Movement of Earth and the Alteration of the Grade of Land*;

(b) Halifax County Municipality By-law 40, *Respecting the Regulations and Controls of the Removal and Movement of Topsoil and Earth and the Alteration of the Grade of the Land*; and

(c) Halifax County Municipality By-law 41, *Respecting Gravel Pits and Excavations*.

Done and passed in Council this day of 2020.

_____
Mayor

_____
Municipal Clerk

I, Sherryll Murphy, 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 , 2020.

_____
Sherryll Murphy, Municipal Clerk

Attachment B

ADMINISTRATIVE ORDER NUMBER 2020-010-OP
Respecting Stormwater Management Standards for Development Activities

WHEREAS the Council of the Halifax Regional Municipality recognizes that that urban development and the hardening of natural land surfaces can have a negative impact on the quality of water bodies, and increased demand of the stormwater sewer system;

AND WHEREAS the Council of the Halifax Regional Municipality recognizes that using stormwater management best practices which consider retention and stormwater quality can reduce localized flooding and improve the quality of stormwater reaching waterbodies;

AND WHEREAS the Council of the Halifax Regional Municipality wants to minimize the potential negative impacts development may have on surrounding properties as well as the quality of water bodies within the Halifax Regional Municipality through best management practices;

BE IT RESOLVED AS AN ADMINISTRATIVE ORDER of the Council of the Halifax Regional Municipality under the authority of the *Halifax Regional Municipality Charter,* as follows:

Short Title

1. This Administrative Order may be known as the *Administrative Order on Stormwater Management.*

Interpretation

2. In this Administrative Order,

(a) "Engineer" means the Engineer of the Municipality and includes a person acting under the supervision and direction of the Engineer;

(b) “Municipality” means Halifax Regional Municipality;

(c) “stormwater best management practices (BMPs)” means state of the art methods or techniques used to manage the quantity and improve the quality of wet weather flow;

(d) “Stormwater Management Plan” means a combination of diagrams, documents, drawings, and specifications, prepared by a Professional Engineer licensed to practice in the Province of Nova Scotia, that clearly demonstrate how stormwater will be managed within the site;

Purpose

3. The purpose of this Administrative Order is to adopt the Halifax Stormwater Management Standards for Development Activities as set out in Appendix A, to provide direction to reduce the quantity and improve the quality of stormwater leaving a developed site by setting minimum standards for on-site stormwater management infrastructure.

Application

4. This policy applies to private properties being altered for the development of land, whether associated with a building permit, development permit, or no permit but intended for future development use in accordance with By-law G-200 *Respecting Grade Alteration and*

Stormwater Management Associated with Land Development, as described in the Halifax Stormwater Management Standards for Development Activities.

5. For greater certainty, this Administrative Order does not apply to development or alteration of:

(a) lots regulated under By-law L-400 *Respecting Lot Grading*, or

(b) individual low-density residential lots.

6. (1) Without limiting the generality of the foregoing, the latest editions of the following regulations shall be considered in the preparation of a Stormwater Management Plan:

(a) the Halifax Stormwater Management Standards for Development Activities

(b) the Halifax Water Design Specifications, as adopted by the Halifax Regional Water Commission;

(c) the Halifax Regional Subdivision By-law;

(d) the Nova Scotia Environment Erosion and Sediment Control Handbook for Construction Sites; and

(e) By-law T-600, the Trees By-law.

(2) In the case of a conflict with any of these documents, the more stringent standard for the item in question shall apply.

Permit Requirements

7. In addition to submission requirements as part of the applicable permit, applications must be accompanied by:

(a) applicable fees;

(b) detailed Stormwater Management Site Plan(s) as described in the Halifax Stormwater Management Standards for Development Activities; and

(c) Stormwater Management Report as described in the Halifax Stormwater Management Standards.

8. Detailed Stormwater Management Site Plans must be submitted in advance of anticipated construction and will be evaluated by the Municipality as part of the review process for a building permit, a development permit, or a grade alteration permit.

Done and passed in Council this , 2020.

_____

MAYOR

MUNICIPAL CLERK

I, Sherryll Murphy, Municipal Clerk of the Halifax Regional Municipality, hereby certify that the above noted Administrative Order was passed at a meeting of Halifax Regional Council held on 2020.

Sherryll Murphy, Municipal Clerk

APPENDIX A

Halifax Stormwater Management Standards

For development activities

Halifax Regional Municipality

and Halifax Water

July 2020

HALIFAX

Table of Contents

1.0 Introduction

1.1 Stormwater Definition and Problem Statement

Stormwater is water from groundwater discharge, surface water, precipitation or melting snow and ice that flows across the landscape. Stormwater flows across a property (from rooftops, paved areas, graveled areas, bare soil, lawns, etc.) and gathers along streets, drains, open channels, and sewers in increasingly large amounts, until it eventually discharges into waterbodies. In areas served by combined sewer systems, stormwater flows with wastewater to a wastewater treatment facility, where it may lead to a combined sewer overflow.

As areas continue to urbanize, stormwater management is especially important due to decreases in natural surfaces and the increases of impervious surfaces like rooftops, sidewalks and asphalt. These surfaces compound the issues with stormwater because they change the permeability of the landscape, preventing stormwater from infiltrating into the ground.

Stormwater can pick up and carry pollutants (oil, grease, chemicals, dirt, sediment, nutrients, and pathogens). Without treatment, these pollutants can have a significant impact on downstream watersheds. Stormwater pollution can be significantly reduced with the use of applicable best management practices.

A properly designed and functioning stormwater system conveys the stormwater without damage to property, harm to personal health, significant inconvenience to the public, or detrimental environmental effects. However, some recent and historical storm events have caused damage and inconvenience to both public and private property. These storm events have caused problems that generally fall into the following categories:

- Private property flooding;
- Flooding and icing in the public right-of-way;
- Sewer system backups;
- Excessive stormwater in the wastewater system; and,
- Degradation in receiving water quality.

Scientific evidence indicates that climate change has already contributed to an increase in the severity and frequency of storm events, and will continue to do so. There is growing evidence to suggest that regulating site design features to promote control of stormwater at the source is more effective than public infrastructure at lessening effects.

1.2 Stormwater Legislation in Halifax

The Halifax Regional Municipality (HRM, Halifax) spans a geographic area of 5,600 square kilometres and has a population of approximately 400,000. Halifax was formed in 1996 through the amalgamation of four pre-existing municipalities. The amalgamation resulted in the inheritance of various policies and procedures relating to stormwater management (SWM).

In 2007 HRM conveyed the municipal wastewater and stormwater sewer systems, including ditches inside the service boundary, to the Halifax Regional Water Commission (Halifax Water). Since this time, there has been an increased awareness of the benefits of improving stormwater quality.

Before the adoption of this document, the stormwater management design requirement, adopted in 2002, was to balance pre-development flow with post-development flow over a development site. This requirement is based on the quantity, by limiting the stormwater flow rate leaving an overall site during prescribed precipitation events. However, it does not consider water quality impacts, nor does it manage stormwater throughout the site itself, but focuses on the ultimate outlet of the site.

Many major municipalities in North America have adopted stormwater management requirements that include stormwater runoff source control practices that aim to mimic the natural hydrology of the watershed, providing water quality benefits. This approach to stormwater management is commonly referred to as Low Impact Development (LID) practices, Stormwater Best Management Practices (BMPs), or Green Stormwater Infrastructure (GI). This document will refer to BMPs.

1.3 Purpose of Document

The Integrated Stormwater Management Policy Framework (ISMPF) was developed between HRM and Halifax Water and adopted by HRM Regional Council and the Halifax Water Board in January 2018. This document was developed between HRM and Halifax Water to support and implement the ISMPF by providing direction for mitigating the long-term impacts of development on natural waterbodies and downstream properties.

The primary goal of this document is to identify standards for stormwater management that, when followed, will reduce the quantity and improve the quality of stormwater leaving a site. This document describes the technical requirements to manage on-site stormwater quantity and quality for new development projects, including infill and redevelopment, (except low density residential developments, which are addressed by by-law L-400.)

This document guides the design and implementation of stormwater management practices on-site using BMPs. It also provides direction on stormwater management practices and approval requirements to HRM and Halifax Water, development community and property owners.

While this document presents a general framework of HRM and Halifax Water's expectations of approval requirements on water quantity and water quality targets for on-site stormwater management, HRM and Halifax Water also recognize that unique site-specific conditions may require alternative methods. As a result, HRM and Halifax Water may consider innovative approaches if it can be demonstrated that performance objectives are met.

1.4 Applicability

This document shall apply to private properties being altered for the development of land, whether associated with a building permit, development permit, or no permit but intended for

future development use, in accordance with By-Law G-200 Respecting Grade Alteration and Stormwater Management Associated with Land Development.

Applies to:

- Multi-unit, Institutional, Commercial, and Industrial (MICI) developments outside the regional centre
- MICI developments within the regional centre with less than 80% lot coverage
- Clearing of land for future development use.

Does not apply to:

- Development or alteration of individual low-density residential lots, such as single family homes and duplexes (refer to by-law L-400)
- Development of major subdivisions that will have a master stormwater management plan in accordance with the Regional Subdivision By-law
- MICI developments in the regional centre with greater than 80% lot coverage (refer to Centre Plan)
- Infrastructure in the public ROW, as this is addressed in the HRM Municipal Design Guidelines.

Developments shall follow the requirements in this document, as well as all applicable regulations, established by the HRM Subdivision By-Law, HRM land use by-laws, HRM Municipal Design Guidelines, Halifax Water's Design Specifications & Supplementary Standard Specifications for Water, Wastewater & Stormwater Systems (Halifax Water Design Specifications), Halifax Water's Rules and Regulations, and any applicable Provincial and Federal regulations, regarding storm drainage for private properties. Where these standards differ, the stricter requirement shall govern.

2.0 Stormwater Management Requirements

The requirements described in this chapter are applicable as described in section 1.4 – Applicability. Private stormwater management facilities are to be contained within the property they service, apart from shared systems between private property owners. Any new direct connection to the Halifax Water stormwater system shall be in accordance with the latest edition of the Halifax Water Design Specifications. If an existing development wishes to comply with these standards, HRM and Halifax Water staff can provide direction on the process.

Each of the requirements is described in the following sections.

2.1 Stormwater Balance (Retention and Reuse)

The purpose of this requirement is to retain and manage stormwater on the development site to reduce stormwater runoff and erosion, enhance resiliency of infrastructure to extreme rainfall events, and to decrease localized flooding.

2.1.1 Stormwater Balance Requirements

(a) Retain on site stormwater runoff generated from the first 10 mm depth of a rainfall event.

Retaining stormwater onsite means that it does not leave the site. This requirement is not referring to “detention”, where stormwater is stored temporarily and later released. This requirement is for ideal conditions such as average temperatures. It is understood that some of the methods used may be less effective in winter.

A 10 mm depth typically represents a 10-minute design storm event with a 1:5-year return period (minor event), according to Environment Canada IDF curves for Halifax, without adjustment for climate change impacts. The result of this on-site retention is that stormwater runoff is actually reduced from pre-development flow rates.

(b) Stormwater runoff generated after the first 10 mm of an event is to be balanced to ensure matching of the pre and post-development stormwater runoff conditions for the 1:5-year return design storm and the 1:100-year return design storm.

This requirement may be achieved using detention, or the temporary storage of stormwater. Pre-development conditions can be considered the existing conditions before the project was initiated, or before the site was prepared for the project.

Consistent with the hierarchy approach (see section 3.2), new MICI development and re-development projects shall endeavour to apply BMP strategy and design techniques that are suitable and applicable to individual site conditions. Some of the HRM recommended BMPs for consideration are described in Section 5. Physical factors, such as soil infiltration rates, may suggest the use of some BMPs and preclude the use of others, or they may point to special design considerations.

2.1.2 Discharge Criteria to Halifax Water Infrastructure

The peak stormwater runoff rate to the stormwater system (minor system) from the development site during a 1:5-year return design storm event (in accordance with the HRM and Halifax Water Design Specifications) must not exceed the peak runoff rate from the site under pre-development conditions during the same storm event.

2.2 Stormwater Quality

The purpose of this requirement is to improve the quality of stormwater that leaves the development site, by decreasing pollutants from the stormwater runoff.

2.2.1 Stormwater Quality Requirements

Average removal of 80% of Total Suspended Solids (TSS) on an annual loading basis from all stormwater runoff leaving the development site based on the post-development level of imperviousness.

In addition to TSS, there are many other water quality parameters of concern, such as elevated concentrations of nutrients (total phosphorus, nitrates), metals (copper, zinc, lead) and toxic chemicals (pesticides), petroleum products, etc. TSS was selected as the indicative parameter because TSS is a common and easily measured water quality parameter, and many of these contaminants are included in measurements of TSS. It is acknowledged the percent reductions for some contaminants will not be 80%, and that TSS is used as a proxy parameter for this policy.

The use of an average removal (defined as %) is to account for the variability in characteristics of rainfall events. The efficiency of any proposed BMP should be judged by its long-term sustainability and on an annual basis, instead of on an event or seasonal basis. This requirement is for ideal conditions; It is understood that some of the methods used may be less effective in winter.

Some BMPs require pre-treatment (by other BMPs) to ensure proper operation and longevity. Pre-treatment is recommended for infiltration BMPs to reduce the potential for clogging and to avoid the deterioration of groundwater quality.

2.3 Erosion Control

2.3.1 Erosion Control Requirements

The applicant is required to submit a temporary erosion and sediment control plan to demonstrate the erosion control measures for the site during construction.

Erosion and sediment control plans and their implementation shall demonstrate a preventative approach rather than a reactive approach. This approach will prevent or minimize the initial sediment erosion and subsequent suspension in stormwater.

All erosion and sediment control BMPs shall be designed, constructed and maintained in all development sites at a minimum in accordance with the Nova Scotia Environment Erosion and Sediment Control Handbook for Construction Sites. NSE is in the process of updating the

Erosion and Sediment Control Handbook for Construction Sites. Therefore, if more modern BMPs are proposed that meet the intent of the NSE requirements, they will be considered by HRM.

3.0 Selection of Best Management Practices

3.1 Benefits of On-Site Stormwater Best Management Practices (BMPs)

Stormwater BMPs are measures used to mitigate impacts to quantity and quality of stormwater runoff resulting from development. BMPs with a focus on green infrastructure (GI) use vegetation, soils, and other elements to mimic the natural processes required to manage stormwater and create healthier urban environments. Conversely, “grey” stormwater infrastructure includes the traditional fabricated facilities, often made from concrete and other hard / manmade materials. On-site BMPs may include vegetation planting, green roofs, and other landscaping to increase infiltration and evapotranspiration from the site, and to increase the amount of permeable surface on-site.

Vegetation slows the flow of stormwater in several ways. It is a physical barrier, allowing some of the stormwater to evaporate, it also absorbs stormwater through leaves, bark and roots, using it for growth. Vegetation can capture and uptake nutrients from deposited sediments, which can include nutrients that degrade water quality such that it may not support fish and aquatic organisms, or may cause nuisance plant growth and algal blooms. Some forms of algae, especially blue-green algae (cyanobacteria) in freshwater environments, may produce toxins that are harmful to wildlife, domestic animals, pets, and humans. This can result in the use of lakes being prohibited for recreation as a safety precaution.

Vegetation die-off and decomposition will release nutrients back into the water column. Unless vegetation harvesting and removal occurs, vegetation uptake does not substantially reduce nutrient loads in stormwater systems. Maintenance of BMPs is importance to maintain designed performance and the intended results.

During a rain event, the initial stages of stormwater runoff generated by the first 25 mm of rain fall is sometimes called “the first flush”. This stormwater collects the most sediment from impervious surfaces (such as parking lots, driveways, walkways etc.), and carries them downstream, increasing the concentration of pollutants along the way. By retaining on-site an initial portion stormwater from a single rain event, the concentration of nutrients downstream is reduced, which can result in an improvement to downstream water quality. Retaining rainfall on-site also decreases the flow rate of stormwater leaving individual sites. This results in improved flood resilience for affected areas and reduces the demand on municipal infrastructure.

Section 5 of this document identifies effective BMPs for developments that:

- provide environmental protection through stormwater quality improvements;
- continue to function appropriately over time; and,
- require minimal operation and maintenance.

The BMPs recommended in this document are based on proven technology used across Canada. Generally, these are methods that attempt to replicate the natural characteristics and

infiltration components of an undeveloped system to the extent possible, to limit runoff quantity and to reduce or prevent water quality degradation caused by typical development.

There is no single BMP that suits every development, and a single BMP may not satisfy all stormwater control objectives. Therefore, a combination of BMPs may be required to achieve the objectives.

Figure 1 - Rain garden at NSCC Ivany campus in Dartmouth

3.2 Hierarchy Approach

The Hierarchy Approach was adopted as part of the guiding principles used in establishing the objectives for this document.

The applicant shall demonstrate that the Stormwater Management Plan for the proposed development implements the hierarchy approach within the private stormwater management of the development site, as described below:

a. **Source Control** practices retain stormwater where it reaches the site (*i.e*. retain rain where it falls). Source controls at the lot level are the preferred method for controlling the impacts of stormwater.

b. **Conveyance Control** such as private vegetation swales and/or infiltration systems, can limit the flow as it moves across the site.

c. **End-of-Pipe Control**, considered the last treatment opportunity prior to leaving the sites, shall be implemented if source and conveyance controls are unable to achieve the necessary level of stormwater quality and quantity control targets.

Engineered solutions such as “grey infrastructure” will be considered if the above methods are unable to achieve the targets alone. These practices often require more ongoing maintenance than BMPs, and do not have the added benefits that vegetated “green” infrastructure offers.

Implementing the hierarchy approach on private development sites improves the overall downstream stormwater quality above and beyond the traditional approach of an end-of-pipe stormwater management facility. The use of stormwater BMPs upstream will decrease the requirements for end-of-pipe facilities. In general, end-of-pipe facilities are the least preferred approach, because of the construction and maintenance costs, and the potential disruption of land features. For these reasons, stormwater BMPs typically result in better Return on Investment results.

4.0 Administration

4.1 Application Requirements for New MICI Construction

Stormwater balance and quality requirements are applicable as described in section 1.4. The application will be reviewed by both HRM and Halifax Water for completeness and acceptability prior to approval[1].

The following documentation is to be provided in accordance with By-Law G-200 Respecting Grade Alteration and Stormwater Management Associated with Land Development:

4.1.1 Stormwater Management Site Plan

A *stormwater management site plan(s)*, prepared and stamped by a professional engineer, of the private stormwater management system and design calculations, confirming the stormwater management system for the development:

(a) retains on-site stormwater runoff generated from the first 10 mm depth of a rainfall event.

(b) balances stormwater runoff generated after the first 10 mm of an event, to ensure matching of the pre and post-development stormwater runoff conditions, identified in a table on the plan.

This plan may be combined with erosion control, servicing or grading plans where reasonable based on the complexity of the site.

4.1.2 Stormwater Management Report

A Stormwater Management Report prepared by a professional engineer that shall:

a) Confirm the average removal of a minimum of 80% of TSS on an annual loading basis from stormwater runoff leaving the development site based on the post-development level of imperviousness.

b) Provide design rationale and identify hierarchy of stormwater principles used in the design of the private stormwater management system.

c) Provide information on operation and maintenance activities, if required, to ensure quantity and quality requirements continue to be met through the life of the infrastructure.

This may be expressed through a letter, memo, or on construction notes in combination with the requirements in section 4.1.1. Confirmation of removal of 80% TSS is not intended to be demonstrated through testing, but may be expressed using rationale provided through research associated with the prescribed methods.

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[1] An application made in accordance with these standards does not preclude the requirements for (an) additional application(s) for approval from provincial or federal agencies, nor does HRM of Halifax Water guarantee the granting of such approvals.

4.1.3 Soil Analysis

In circumstances where native soil is proposed for infiltration purposes, a *geotechnical soil analysis* may be necessary to ensure the soil is of sufficient permeability to allow the water to infiltrate at an acceptable rate. Alternatively, soil amendments may be used to ensure the design infiltration is achieved. If soil analysis cannot be completed, or if the soil is not suitable for infiltration, consider bioretention cells with underdrains.

4.1.4 Erosion and Sediment Control Plan

An Erosion and Sediment Control Plan, prepared and stamped by a professional engineer, shall be submitted and implemented during construction, in accordance with the requirements described in section 2.3.

4.2 Construction Certification Requirements

Upon completion of works, a professional engineer shall provide a certification of compliance with the approved Stormwater Management Plan and Report, as described above.

In cases where changes are required during construction, the Stormwater Management Plan and Report must be updated and re-submitted, to ensure compliance with approval conditions.

4.3 Maintenance Requirements

Monitoring of operating conditions and maintenance inspections are required for most stormwater management facilities (BMPs). The property owner is responsible to maintain the designed performance of the private stormwater management system.

It is important that BMP designers consider maintenance activities in their design and provide specific details in the Stormwater Management Plan and Report. There are many factors, which affect sedimentation rates and maintenance requirements including: types of BMP, land use, upstream development, and wildlife. Typically, sediment removal is the main maintenance requirement for wet or dry ponds and for infiltration facilities. Accumulated sediment at pre-treatment inlets or within the facilities must be removed. Other maintenance requirements include periodic removal of debris, control of vegetation (grass cutting, weed control, etc.) and revegetating, where necessary.

5.0 Descriptions of Recommended Best Management Practices

There are a wide range of BMPs for different site challenges and purposes. There are many considerations when deciding on best practices for a particular site or network of sites. Some of the most common considerations include: available space, existing infrastructure, proximity of the water table and bedrock to the surface, soil infiltration rates, hydrology, demand for water re-use, available materials and resources, pollution sources, maintenance requirements, land owner/developer preferences, and allowable limits for discharge of pollutants to the stormwater system.

The following are options recommended by HRM and Halifax Water for stormwater management, however other options may be accepted.

5.1 Source Control

5.1.1 Rain Barrels and Cisterns

Overview

As a means of source control, rainwater can be harvested in rain barrels or cisterns for later reuse. *Rain barrels* and *cisterns* are storage containers that collect runoff from rooftops during storm events and can either release or re-use the rainwater during dry periods[2].

The harvested runoff can be reused for multiple non-potable purposes such as watering gardens, flushing toilets, and washing cars. In addition to reducing stormwater runoff, rainwater harvesting can help to reduce domestic water consumption and reduce water bills and costs associated with electricity from pumping water.

Use

Rain barrels are typically attached to downspouts and range in size from 190 L to 400 L and industrial or commercial cisterns can range from 750 L to 40,000 L. The design components of cisterns can include a drainage system, pre-treatment filter, storage container, and delivery mechanism such as an outflow spout.

As part of the Stormwater Management Plan submitted, applicants will be asked to provide a description of how they will reuse the harvested rainwater.

Considerations

- Frequency and volume of water stored.
- Stored water should be used completely or drained before next storm if storage space is limited.

[2] The use of captured rainwater for reuse as potable water may require NSE approval for a public registered water system. Additionally, disinfection through chlorination, UV, ozone, etc. may be required if the intended use is potable water.

- The level of treatment required should be considered, such as filtering and sediment removal.
- The pathway of precipitation if the system is full, or if the opening is frozen or otherwise blocked.

5.1.2 Green Roofs

Overview

As a means of source control, a *green roof* is a roof surface that has been intentionally covered with layers of actively rooted, growing vegetation planted in a growing medium.

Green roofs help to store rain water and result in increased evapotranspiration. Additional benefits from green roofs include temperature regulation for the building resulting in reduced energy costs, habitat creation for butterflies and bees, noise reduction, and increased longevity of the roof structure.

Use

Green roofs typically include a waterproof membrane, drainage layer and conveyance system for overflow, growing medium (soil), and vegetation. There are two main types of green roofs:

a) extensive green roofs which use a shallow growing medium, are planted with mosses, grasses, low plants and shrubs, and can be added to existing buildings of varying roof slopes; and,

b) intensive green roofs often include a thicker growing medium with larger features such as trees and walkways.

Green roofs can be built with building roof slopes of up to 10%, with larger slopes requiring engineering techniques to reduce erosion.

A minimum of 150 mm of growing medium should be used, to optimize stormwater capture and ensure the long-term survival of plants on a roof in Halifax's climate. While 150 mm is the recommended minimum, deeper soil depths allow more stormwater to be retained, and provide more function in winter weather.

Plantings of grasses and forbs (or mixed species including grasses, forbs, and succulents) are recommended for Halifax. There is increased maintenance during the first 2 years while plants become established. It is recommended that a 2-year maintenance contract be established to ensure the success of the green roof system and to ensure all plants are thriving.

Designers should consider provisions for supplemental irrigation. It is recommended that one hose bib be provided for every 30 linear meters of green roof.

These considerations are necessary to ensure the long-term sustainability of green roofs. If green roofs are not adequately designed and maintained, they can fail (plants die).

Green roofs can be paired with subsurface retention systems such as cisterns to maximize benefits of keeping stormwater on site. Roof structural requirements must be incorporated into the building design to support the increased weight of the green roof system. In the case of renovations, the building should be assessed by a structural engineer to ensure the structure can support the added weight of the green roof system including vegetation, soil, and maximum retained water.

Considerations

- The structural capability of the roof system
- Slope of the roof and erosion prevention techniques.
- Plant types used.
- How the system will function in colder months.
- Soil depths to support vegetation.

Figure 2 - Green roof on Halifax Central Library

Figure 3 - Green Roof on Halifax Seaport Farmers Market

5.1.3 Bioretention

Overview

Bioretention cells are depressions that contain vegetation grown in an engineered soil mixture often placed above a gravel storage bed. They provide storage, infiltration, and evaporation of both direct rainfall and runoff captured from surrounding areas. Street planters, stormwater boulevards, and rain gardens are examples of bioretention cells.

Use

Bioretention cells include a combination of sand/gravel and well-drained soil layers and are typically planted with native plants that can endure both moist and dry conditions between rain events. Native perennials, shrubs, and trees are often selected to reduce maintenance costs and create habitat.

Rain gardens are a type of bioretention cell consisting of just the engineered soil layer with no gravel bed below it, and typically have no walls. Rain garden sizes usually range between 4 – 28 m^2 (50 - 300 ft^2). The ground is typically excavated to ensure a flat bottom and the garden

soil is level with the ground surface. Design should allow surface water to infiltrate within a 4-hour period after a 25mm (1”) rainfall.

Bioretention systems can capture sediments, while the plants absorb and use the nutrients. A bioretention system can reduce runoff by approximately 30% compared to a conventional lawn. These systems can be combined with other infiltration systems. A perforated pipe/underdrain or vegetated swale can help direct excess runoff downhill to a destination such as a catch basin.

Bioretention systems using ground infiltration should be built 3 m away from building foundations and 8 m away from any portion of a septic system. Planting under tree canopy should generally be avoided to minimize disturbance to tree roots and promote greater plant growth. It is recommended that they be built on slopes of less than 12% to avoid erosional challenges and deepening the bed more than necessary. Compared to other best practices, bioretention has relatively low cost of installation and maintenance, which mainly involves erosion control, weeding/thinning, and watering in the first 2 years.

Considerations

- Available space
- Soil permeability and soil infiltration rate
- Proximity of groundwater table
- How the system will function in colder months
- The pathway of precipitation if the storage is full or otherwise blocked

Figure 4 - A rain garden being constructed outside the George Dixon Center in Halifax, with the help of the Ecology Action Center

5.1.4 Trees for Stormwater Management

Overview

In addition to their immense social and aesthetic value, trees and urban forests provide quantifiable economic and ecological value to cities. Healthy trees can contribute significantly to stormwater management, with large capacity to transpire water, intercept rainfall, and treat

water quality. Trees play a key role in mitigating the effects of water on our landscape. It is estimated that for every 5% increase in overall canopy cover, total city run-off is reduced by 2%. In HRM, it is estimated that trees provide about $2.1 million in stormwater reduction services annually.

The preservation of trees, or *forested buffers* left on-site can absorb significant amounts of rainfall. *Tree canopy* can capture and slow rainfall. Trees can also absorb rainfall in leaves, bark and roots. Canopy coverage from mature trees are an effective practice of stormwater management.

Trees survive best in a natural system such as forests or even *tree lawns*. However, in hardscape areas where there is limited space, *soil cells* can be used as an effective method of bioretention. *Tree trenches* are a shared planting pit that accommodates several trees and their roots systems, that may have a subsurface system for distributing runoff among a series of trees.

Use

It is important that these tree systems have adequate soil volumes and drainage to grow to maturity. Tree species selected should be diverse, climate and region appropriate. Varying trees can provide food and habitat to different species of birds and wildlife and can increase resilience to different kinds of disease. Select tree species that provide adequate canopy for stormwater management and, if applicable, are tolerant of standing water and wet conditions.

For further guidance on tree planting in urbanized areas, designers can refer to the tree guidelines in the HRM Municipal Design Guidelines.

Considerations

- Available space
- Tree species
- Adequate drainage
- The pathway of precipitation if / once the opening is frozen or otherwise blocked

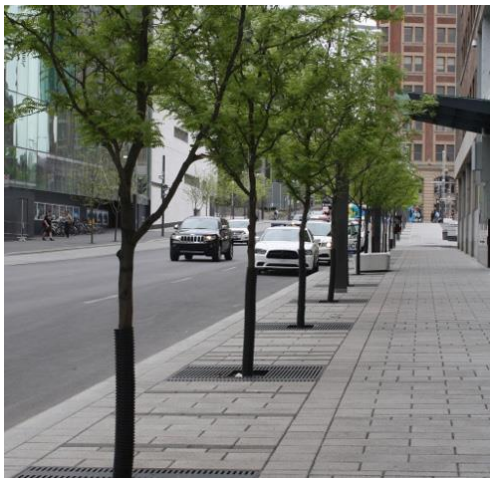


Figure 5 - Montreal - Soil cell

5.1.5 Permeable Pavement

Overview

In areas of new construction or where removal of pavement has occurred, permeable pavement can be installed to provide parking and walking areas which have higher permeability and infiltration capacity than conventional pavement. Permeable pavements typically include porous asphalt and concrete, vegetated grids, and inter-locking paving blocks, which sit above a storage layer. Rainfall passes through the pavement into the storage layer where it can infiltrate into the soil.

Permeable pavement can have higher cost than traditional pavement but are useful when other surface BMPs are not possible on the site. In the winter, they can reduce black ice, increase snow melt, and can be flexible enough to withstand minor heaving. These are suitable for private parking areas, and not suitable in the right-of-way or for heavy traffic.

In an Atlantic Canadian climate, important considerations for pavers include the ability of chosen materials to withstand freeze-thaw cycles and the impacts of de-icing strategies. Permeable pavements have been used successfully in Atlantic Canada through careful product selection and system design consideration.

Figure 6 - Permeable pavers in Dartmouth; water can infiltrate between the blocks to a gravel bed below.

Figure 7 – Porous asphalt in Halifax; water can infiltrate through the asphalt, but sediment may be trapped.

Use

Porous asphalt or *porous concrete* have a porous binder, while *inter-locking paving blocks* have built-in spacing and a cement or plastic grid with vegetation growing in a sandy soil medium between the gridlines. Permeable pavements are typically underlain with layers of sand and gravel to provide support for traffic and increase storage and filtration. An underdrain should be used where the ground has low infiltration capacity. These options provide a stable surface for vehicle and foot traffic while enabling greater water flow into the ground, reducing runoff quantity and providing some filtration.

Chloride de-icing salt is a potential contaminant that has been known to mobilize heavy metals in soils; therefore, pre-treatment prior to infiltration or avoidance of de-icing salt hot spots may be necessary where groundwater contamination is a risk. Filter strips or berms installed on the edge of the paved area can help to reduce surface water runoff and introduction of sediment to the permeable pavement. Permeable pavements are to be avoided for sites that have high potential for oil spills (e.g. gas stations).

Porous concrete and asphalt require maintenance in the form of regular vacuuming to remove sediment build up from the pavement pours. Lower maintenance BMPs are recommended over porous pavements in Halifax. However, if a maintenance plan is in place, porous paving may be considered.

Considerations

- Freeze-thaw cycles
- Location and proximity to salts and de-icing chemicals
- Depth of gravel bed below
- Ongoing maintenance

5.1.6 Disconnection and Removal of Impervious Area

Overview

Disconnection of impervious surfaces such as rooftops, walkways and parking lots, (typically connected to the municipal system by downspouts or catch basins), can reduce stormwater volume by redirecting water to rain barrels and/or vegetated areas and by promoting infiltration and evapotranspiration.

For new MICI developments, it is not permitted to connect roof leaders to the municipal stormwater system, and it is encouraged for existing developments to disconnect. It is recommended that roof leader disconnection be paired with other BMPs.

Use

All disconnected roof leaders should be discharged a minimum of 2 m away from building foundations. Disconnected roof leaders must not be directed to adjacent properties or the right-of-way.

Removal of pavement from unused parking lots can help to increase permeability of surfaces. The restored area can be made into an open space with soil amendments to increase permeability and can be combined with other BMPs and tree planting to increase stormwater infiltration and uptake.

Considerations

- Area of impervious material being removed
- Site grading, slopes and erosion control
- Combination with other BMPs

5.2 Conveyance Control

5.2.1 Biofiltration (Bioswales, Grass Swales, Vegetated Filter Strips)

Overview

While bioretention practices seek to hold water at the source for as long as possible, biofiltration practices filter the runoff while conveying it further downstream.

Grass Swales are typically shallow (0.5m) and are usually sodded with slopes around 1%, their purpose being to slow down water to allow infiltration. *Bioswales* are deeper and contain a variety of plants often selected for filtration and biodiversity and are typically used as a first stage treatment and infiltration. Bioswales may have gravel layers for added storage and infiltration. They can be used as pre-treatment of stormwater and direct water downhill to another BMP such as a rain garden, or permeable pavement area.

Vegetated filter strips are bands of dense vegetation through which runoff is directed. They are best for gently sloping areas, where channelized flow is not likely to form. Filter strips may treat runoff from roads, roof leaders, small parking lots and impervious surfaces, or can be used as pre-treatment. Vegetated filter strips should have slopes of not more than 10%, 1-5% is

considered ideal. *Forested buffers*, or undeveloped land strips can also be used as vegetated filters.

Figure 8 - Vegetated swale in Dartmouth

Use

Biofiltration practices should not be considered where the ground is not stabilized and should not be used where there are high sediment loads. They can be combined with an underdrain to increase drainage where the ground has low infiltration capacity.

Bioswales are typically excavated to a depth of 300 mm - 1 m (with thicker gravel layers enabling greater retention and infiltration of water. They are typically wider than grass swales, 4-6m. A slope of 5% or less is recommended to convey stormwater without eroding the channel. For slightly steeper slopes, check dams can be used to slow the water and promote sheet flow.

Maintenance of swales and infiltration trenches can include periodic trimming or mowing of vegetation, checking for clogging of the trench or underdrain, and replacing material lost through erosion.

Considerations

- Sediment loads
- Available area
- Slope and erosion control
- The pathway of precipitation if/once the conveyance system is full or entrance to the conveyance system is frozen or otherwise blocked.

5.2.2 Subsurface conveyance

Perforated Pipes and French Drains

Overview

Perforated pipes can be used to store excess stormwater, allowing the water to infiltrate slowly into the ground. They reduce surface water in undesirable locations by transmitting the excess water underground and downhill to a more suitable location such as a private catch basin. They can be used as an element in other BMPs, including bioswales, and rain gardens. They are useful for sites where infiltration conditions are poor.

French drains (or dry wells) are a specific BMP that includes *perforated pipes* as a design component. A French drain is a trench, lined with geotextile fabric, filled with clean gravel with a perforated pipe centered in the lower portion of the trench. The geotextile fabric and stone prevent particulate matter from clogging the holes in the pipe. French drains enable the infiltration and transmission of stormwater to lower lying areas and allow the ground surface to be free for other uses. The surface may be exposed gravel, or it may be topped with geotextile fabric, soil, and plant material.

Oversized piped sections, or subsurface detention chambers with orifice controls are also an acceptable method of temporarily storing and controlling the release of stormwater. These options can be placed below parking lots with no loss / consumption of land.

Use

Perforated pipe systems should include an observation well to enable regular maintenance and inspection and avoid blockage issues. It is recommended that these underdrain systems not be built on a slope greater than 15% and that the gravel bed have a slope of not more than 1% to promote infiltration. It is recommended that perforated pipes be installed after upstream construction has been completed and that pre-treatment be included to reduce particulates in stormwater outflows. Perforated pipes should be set back at least 4 meters from building foundations and must be below the local maximum frost penetration depth to avoid freezing during the winter.

Perforated pipes and French drains may not be connected directly to Halifax Water storm sewers. However oversized pipes with orifice control are typically acceptable. Refer to Halifax Water Design Specifications.

Considerations

- Soil material and infiltration rate
- Slope of ground and erosion control
- How the system will function in colder months.

5.3 End of Pipe

End-of-pipe solutions typically include naturalized stormwater ponds and constructed wetlands. End-of-pipe options are best used when upstream BMPs cannot achieve the requirements alone. Stormwater ponds can provide storage and can control the release of stormwater using

orifices or weirs. These systems may offer some quality benefits by allowing sediment to settle out. However there are regular maintenance requirements to remove built-up sediment.

An applicant may choose to use a privately owned and maintained stormwater management pond on site. However, publicly owned naturalized stormwater ponds and constructed wetlands require consultation with public entities such as NSE and are outside the scope of this document.

5.4 Other

When the requirements for water balance and quality cannot be met with the BMPs above, additional practices can be used in combination with BMPs, such as oil and grit separators, catch basin inlet control devices, parking lot storage, or underground storage tanks. Refer to the Halifax Water Design Specifications for more information prior to the design, selection and installation of these facilities.

Figure 9 - Green wall at NSCC Ivany campus in Dartmouth - an example of other innovative options

Attachment C
(Showing Proposed Changes)

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 in a form acceptable to the Engineer, 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;

(xa) “retaining wall” means a rigid wall that is structurally designed and constructed to support fill materials between areas of land of different elevations;

(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 located within an area where a sanitary sewage system is provided or is to be provided in the Municipality where the structure is:

(a) a residential building;

~~(b)~~(i) ~~less than~~ 600 square metres or less in building area; and

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

(b) a swimming pool;

(c) an accessory building associated with a residential use;

(d) ~~located within an area where a sanitary sewerage system is provided or is to be provided anywhere in the Municipality~~ a retaining wall over 1 metre in height.

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

(a) a ~~renovation~~ addition 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~~ construction permit for works as set out in section 3.

9. An application for a Lot Grading Permit shall include a Lot Grading Plan prepared in accordance with the Lot Grading and Drainage General Specification as follows:

(a) 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

(b) 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~~ clause 3(a) 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.

(3) Final inspection for:

(i) a pool as set out is clause 3(b), or

(ii) a structure as set out in clause 3(c),

shall not be completed unless a Lot Grading Certificate has been submitted to the Municipality.

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-Law

20. The following By-law is hereby repealed:

Halifax Regional Municipality By-law L-300

Done and passed in Council this 31st day of May, 2016.

_____
MAYOR

_____
MUNICIPAL CLERK

I, Kevin Arjoon, 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 May 31, 2016.

_____
Kevin Arjoon
Municipal Clerk

Notice of Motion:	August 4, 2015
First Reading:	April 26, 2016
Notice of Public Hearing Publication:	May 14, 2016
Second Reading:	May 31, 2016
Approval by Service Nova Scotia and Municipal Relations:	N/A
Effective Date:	July 2, 2016

Amendment # 1 – By-law L-401

Notice of Motion:	February 21, 2017
First Reading:	March 7, 2017
Notice of Public Hearing Publication:	March 11, 2017
Second Reading:	March 28, 2017
Approval by Service Nova Scotia and Municipal Relations:	N/A
Effective Date:	April 1, 2017

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, designed 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 within the developed area.

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 4.0.

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 4.0). 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 4.0 – 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

- The ground elevation adjacent to the foundation wall must be at least 150 mm below the top of the foundation wall.

- 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, 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.

2.3 **Repeal**

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. **Repeal**

3.3. 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.

3.4. 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.

3.5. 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

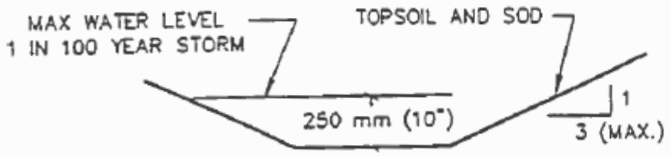


FIGURE 1b: SWALE AND UNDERDRAIN CROSS SECTION

N.T.S

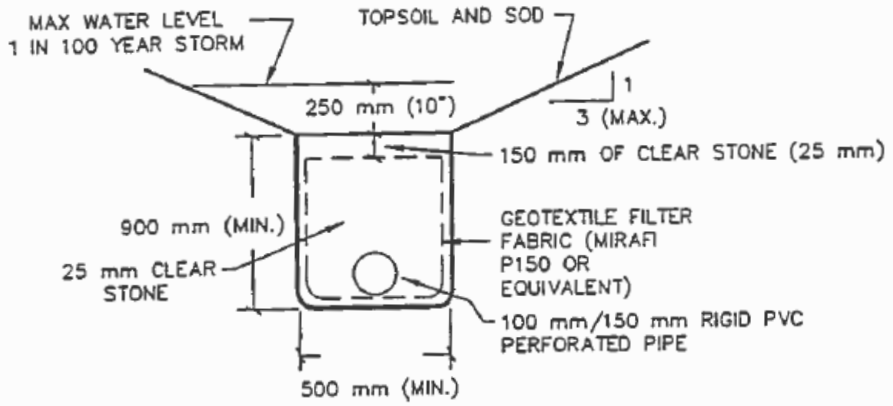


FIGURE 2

VICTORIA ESTATES – PHASE 2

LOT GRADING PLAN SHOWING PROPOSED DWELLING LOCATION ON

LOTS 224A and 224B

VICTORIA CRESCENT
TIMBERLEA , HALIFAX COUNTY
PROVINCE OF NOVA SCOTIA

SCALE : 1 INCH = 20 FEET
1998

123 PROJECT CONSULTANTS
SURVEY PLACE, SUITE 12
3347 WISE REVE
DARTMOUTH, NOVA SCOTIA
B6T 6Y3
PH: (902) 555-1234
FAX: (902) 555-4321

SIGNATURE
OCTOBER 5, 1998

STAMP

AGC BUILDER LTD.
1234 APPLE STREET
HALIFAX, NOVA SCOTIA
B6L 6X4
PH: (902) 555-8883

MUNICIPALITY USE ONLY:

APPLICANT: _____
TYPE: _____
BUILDING PERMIT # _____

DATE: _____

VICTORIA CRESCENT

12"ø WATERMAIN
8"ø SANITARY SEWER
36"ø STORM SEWER

SERVICE EASEMENT TYPICAL

LOT B | LOT A

2235

224A

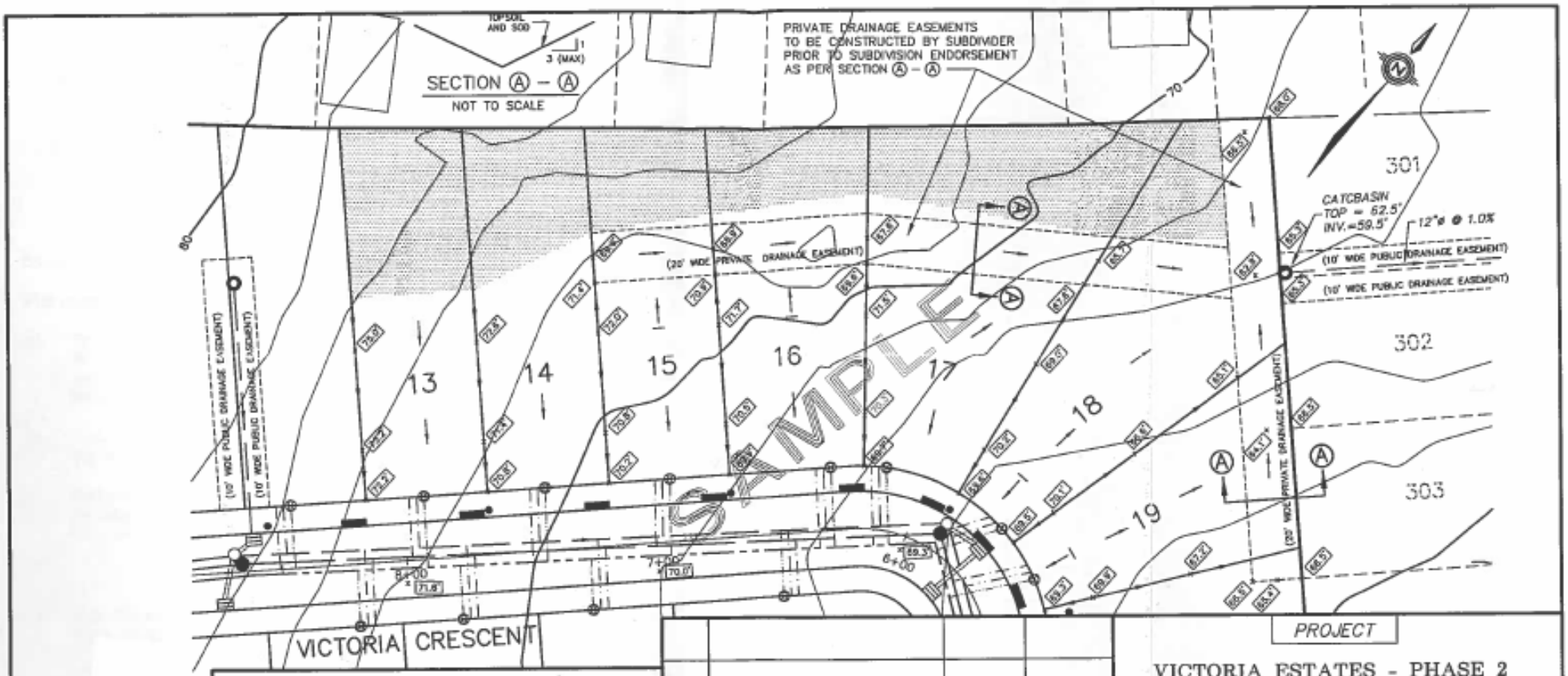
224B

2235A

PARK

HIGHWAY NO. 113

INVERT ELEVATIONS OF LATERALS AT PROPERTY LINE		
LATERAL	LOT 224A	LOT 224B
8"ø SANITARY	263.7'	263.7'
4"ø STORM	263.8'	263.8'



LEGEND

DESCRIPTION	SYMBOL
DRIVEWAY CUT (10'SNGL,16'DBL.)	
EXISTING GRADE CONTOUR	80
DIRECTION OF SURFACE DRAINAGE	
SWALE ON PROPERTY LINE	
EXISTING ELEV. , DESIGN ELEV.	× 70.2' ×70.2'
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 1289
2387 WYSE ROAD
DARTMOUTH, NOVA SCOTIA
B5T 6Y3
Ph: (902) 555-1234
FAX: (902) 555-4321

REGISTERED PROFESSIONAL ENGINEER
DATE
STAMP
PROVINCE OF NOVA SCOTIA

PROJECT

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

SHEET DESCRIPTION

SUBDIVISION GRADING PLAN
LOTS 11–19

DATE APRIL 28, 1996
HORIZ. 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 shall 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 D
(Amending By-law)

HALIFAX REGIONAL MUNICIPALITY
BY-LAW L-402
RESPECTING THE AMENDMENT OF BY-LAW L-400
THE LOT GRADING BY-LAW

BE IT ENACTED by the Council of Halifax Regional Municipality that By-Law L-400, the *Lot Grading By-law*, is amended as follows:

1. Amend section 2 by adding the following definition after the definition for “residential building” and immediately before the definition for “sanitary sewerage system”

> (xa) “retaining wall” means a rigid wall that is structurally designed and constructed to support fill materials between areas of land of different elevations;

2. Amending section 3 by:

(i) adding the words “located within an area where a sanitary sewage system is provided or is to be provided” after the word “lots” and before the words “in the” in section 3;

(ii) renumbering clauses (a) and (c) to subclauses (i) and (ii);

(iii) striking out the words “less than” at the beginning of the newly renumbered subclause (i);

(iv) adding the words “or less” after the word “metres” and before the words “in building” in the newly renumbered subclause (i);

(v) adding the word “and” at the end of the newly renumbered subclause (i);

(vi) striking out the word “and” at the end of the newly renumbered subclause (ii);

(vii) adding the following new clauses after the newly renumbered subclause 3(a)(ii) and before clause (d):

> (b) a swimming pool; or
>
> (c) an accessory building associated with a residential use;

(viii) striking out the words “located within an area where a sanitary sewerage system is provided or is to be provided anywhere in the Municipality” in clause (d); and

(ix) adding the words “a retaining wall over 1 metre in height” in clause (d).

2. Amend section 4 by:

(i) striking out the word “renovation” after the word “a” and before the words “of an” in clause (a); and

(ii) adding the word “addition” after the word “a” and before the words “of an” in clause (a).

3. Amend section 8 by:

(i) striking out the word “building” after the words “for a” and before the word “permit”;

(ii) adding the word “construction” after the words “for a” and before the word “permit”; and

(iii) adding the following words “for works as set out in section 3” after the word “permit” and before the period.

4. Amend section 12 by:

(i) striking out the word “Section” after the words “out in” and before the number “3” in subsection (1);

(ii) adding the word “clause” after the words “out in” and before the number “3” in subsection (1);

(iii) adding brackets and the letter “(a)” after the number “3” and before the word “unless” in subsection (1); and

(iv) adding the following subsection after subsection (2) and immediately before section 13:

(3) Final inspection for:

(i) a pool as set out is clause 3(b), or

(ii) a structure as set out in clause 3(c),

shall not be completed unless a Lot Grading Certificate has been submitted to the Municipality.

Done and passed by Council this day of , 2020.

_____
MAYOR

_____
MUNICIPAL CLERK

I, Sherryll Murphy, Municipal Clerk of the Halifax Regional Municipality, hereby certify that the above noted by-law was passed at a meeting of the Halifax Regional Council held on , 2020.

_____
Sherryll Murphy, Municipal Clerk

Attachment E
(Showing Proposed Changes)

HALIFAX REGIONAL MUNICIPALITY
BY-LAW NUMBER S-700

RESPECTING SWIMMING POOLS

BE IT ENACTED by the Council of the Halifax Regional Municipality, under the authority of Section 172(1) of the Municipal Government Act as follows:

SHORT TITLE

1. This By-law shall be known as By-law Number S-700 and may be cited as the "Swimming Pool By-law"

INTERPRETATION

2. In this By-law:

   (a) **"Council"** means the community council serving the area where the pool is to be constructed or, where there is no community council serving the area where the pool is to be constructed, Halifax Regional Municipality Council.

   (b) **"Inspector"** means the Building Inspector for Halifax Regional Municipality, and any By-law Enforcement Officers authorized by the Inspector to act in his or her stead to administer this By-law.

   (c) **"Swimming pool"** means an artificial body of water outside a building, excluding ponds, having more than 100 square feet of surface area that is designed or intended to be used for swimming purposes and contains or is capable of containing a water depth of more than 24 inches.

COMPLIANCE REQUIRED

3. It shall be unlawful to construct, maintain, install or enlarge any swimming pool in Halifax Regional Municipality except in compliance with all the provisions of this By-law.

PERMIT REQUIRED

4. It shall be unlawful to proceed with the construction, installation, enlargement or alternation of any private residential swimming pool and appurtenances within Halifax Regional Municipality unless a development permit, lot grading permit and building permit therefor has been obtained.

LOCATION

5. (1) No portion of a swimming pool, pumps, filters or pool water disinfection equipment installations shall be located closer than four feet from any side or rear property line.

(2) No portion of a swimming pool, pumps, filters or pool water disinfection equipment installations shall be located closer to any street line less than the distance applicable to the main building as set out in the land use by-law for the area in which the pool is located.

(3) No portion of a swimming pool, pumps, filters or pool water disinfection equipment installations shall be located closer to any watercourse than the distance applicable to a main building or accessory building, whichever is less, as set out in the land use by-law for the area in which the pool is located

VARIANCE

6. (1) A development officer may grant a variance to the requirements set out in Section 5.

(2) A variance may not be granted where the

(a) variance violates the intend of the land use by-law;
(b) difficulty experienced is general to properties in the area; or
(c) difficulty experienced results from an intentional disregard for the requirements of the land use by-law.

(3) Within seven days after granting a variance, the development officer shall give notice in writing of the variance granted to every assessed owner whose property is within 100 feet of the applicant's property.

(4) The notice shall

(a) describe the variance granted;
(b) identify the property where the variance is granted; and
(c) set out the right to appeal the decision of the development officer.

(5) Where a variance is granted, a property owner served a notice may appeal the decision to the council within fourteen days after receiving the notice.

(6) Where a variance is refused, the applicant may appeal the refusal to council within seven days after receiving notice of the refusal, by giving written notice to the clerk who shall notify the development office.

(7) Where an applicant appeals the refusal to grant a variance, the clerk or development officer shall give seven days written notice of the hearing to every assessed owner whose property is within 100 feet of the applicant's property.

(8) The notice shall

(a) describe the variance applied for and the reasons for its refusal;
(b) identify the property where the variance is applied for; and
(c) state the date, time and place when council will hear the appeal.

(9) Where a council hears an appeal from the granting or refusal of a variance, the council may make a decision that the development officer could have made.

(10) A development Office shall issue a development permit for any development for which a variance has been granted and which otherwise complies with a land-use by-law if

(a) the appeal period has elapsed and no appeal has been commenced; or
(b) all appeals have been abandoned or disposed of or the variance has been affirmed by the council.

(11) A council may be resolution provide that any person applying for a variance shall pay the municipality the cost of

(a) notifying affected land owners;
(b) posting a sign

PREVENTION OF UNAUTHORIZED ACCESS

7. (1) All swimming pools shall be completely separated from adjacent properties by an obstruction such as a fence, building, deck or similar structure.

(2) The enclosure shall be constructed to prevent unauthorized access by providing a vertical obstruction having a minimum height of five feet with no opening exceeding four inches in width or height and no member shall be constructed to facilitate climbing.

(3) For greater certainty, the sidewalls of an above ground pool shall not form part of the enclosure as required by clause (1).

(4) Except from within a building, all openings into a pool area enclosure shall be equipped with gates having self closing, self latching mechanisms.

CONFLICT WITH LAND USE BY-LAWS

8. In case of conflict between the provisions of this by-law and the provisions of any land use by-law, the provisions of this by-law shall prevail except where this by-law specifies that the provisions of the land use by-law apply.

PENALTY

9. (1) Every person who contravenes or fails to comply with any provision of this by-law shall for such offence be liable on conviction to a penalty of not less than One Hundred Dollars and not exceeding One Thousand Dollars, and in default of payment to imprisonment not exceeding two months and, in addition may be ordered by the Inspector to demolish and remove, alter or remedy any swimming pool constructed, altered or repaired contrary to the provisions of this by-law.

(2) In addition to any fine or imprisonment imposed pursuant to this section, the Court or judge may order the person convicted to pay all expenses incurred in correcting the contravention of the by-law or any damages associated with such contravention.

(3) Where any person is in contravention of any provision of this by-law, the Inspector may direct in writing that the contravention be remedied by that person in the manner and within the time specified in the written direction.

RELEAL OF BY-LAWS

10. The City of Dartmouth Swimming Pool By-law S-1600 and Halifax County Municipality Swimming Pool By-law # 52 as amended are hereby repealed.

Done and passed in Council this 22nd day of January, 2002.

_____
Mayor

_____
Municipal Clerk

I, Vi Carmichael, Municipal Clerk of the Halifax Regional Municipality, hereby certify that the Above-noted by-law was passed at a meeting of Halifax Regional Council held on January 22, 2002.

_____
Vi Carmichael, Municipal Clerk

Notice of Motion:	October 30, 2001
First Reading:	November 6, 2001
"Notice of Intent to Consider" Publication:	January 5, 2002
Second Reading:	January 22, 2002
Effective Date:	January 26, 2002

Amendment No 1 (V-100)
Addition to Section 9

Notice of Motion:	May 27, 2003
First Reading:	June 10, 2003
"Notice of Public Hearing" Publication	June 14, 2003
Second Reading:	July 8, 2003
Effective Date:	July 12, 2003

Attachment G
(Amending By-Law)

HALIFAX REGIONAL MUNICIPALITY
BY-LAW NUMBER S-701
RESPECTING THE AMENDMENT OF BY-LAW S-700
THE SWIMMING POOL BY-LAW

BE IT ENACTED by the Council of Halifax Regional Municipality that By-Law s-700, the *Swimming Pool By-law*, is amended by:

1. adding the words “lot grading permit” after the words and comma “development permit,” and before the words “and building” in section 4.

Done and passed by Council this day of , 2020.

_____
MAYOR

_____
MUNICIPAL CLERK

I, Sherryll Murphy, Municipal Clerk of the Halifax Regional Municipality, hereby certify that the above noted by-law was passed at a meeting of the Halifax Regional Council held on , 2020.

_____
Sherryll Murphy, Municipal Clerk

Attachment G
(Amending Administrative Order)

HALIFAX REGIONAL MUNICIPALITY
ADMINISTRATIVE ORDER NUMBER 15
Respecting License, Permit and Processing Fees

BE IT RESOLVED by the Council of the Halifax Regional Municipality that Administrative Order 15, the License, Permits and Processing Fees Administrative Order, is further amended as follows:

1. adding Table 26 immediately after Table 25:

26.

By-law G-200, Respecting Grade Alteration and Stormwater Management Associated with Land Development		
Fee Description	**By-law Section**	**Fee**
Performance Security	16(b)	110% of the cost of the work
Permit Fee	s. 20	$200
Security Deposit	ss. 22(1)	$2,500/0.5 hectare of land prorated, with a minimum fee of $1000

Done and passed in Council this day of 2020.

_____
Mayor

_____
Municipal Clerk

I, Sherryll Murphy, 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 , 2020.

_____
Sherryll Murphy, Municipal Clerk