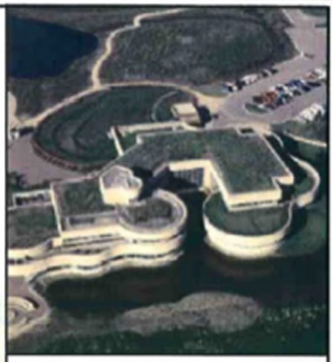
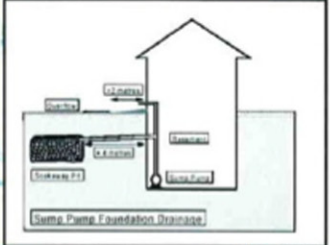
HALIFAX
REGIONAL MUNICIPALITY





Stormwater Management Guidelines

HALIFAX

Stormwater management guidelines

March 2006

DILLON CONSULTING

Source: Dillon Consulting Limited

THE TRIGGER

In 2000, Halifax's Regional Council recommended that the Municipality conduct a Water Resources Management Study to determine when and how new development should happen in Halifax Regional Municipality. This study also addressed "the importance the community places on the health of water systems and health issues such as preserving water quality and avoiding flood risk and damage." The report recommended that Halifax develop guidelines to protect the environment from adverse impacts of urban stormwater runoff.

THE APPROACH

The goal was to set general design criteria for stormwater quantity, quality, erosion and base flow control in new residential, industrial, commercial and institutional developments in Halifax. By presenting several Best Management Practices (BMPs), Halifax's objectives were to minimize the adverse effects of stormwater on and off development sites, to preserve a site's natural features and to develop a new stormwater system that could closely reproduce pre-development drainage and infiltration conditions. The guidelines were an additional tool towards appropriate stormwater management facilities. The Region found that design principles that are oriented toward the preservation of natural features on sites were a good way to reduce the lifecycle cost for stormwater management and minimize the need for costly capital improvements.

THE OUTCOME

The guidelines identifiy good stormwater management practices for developments that could provide the required environmental protection, function appropriately over time, were safe, were easy to operate and maintain, and had public acceptance. The guidelines were designed to be used by professionals from various sectors such as planning, design, review, operation and maintenance of stormwater facilities. The document provides BMPs that can be used individually or in combination to improve water quality while reducing flood risk. The guidelines do not act as a substitute for any pre-established standards, but rather as an additional tool to better manage stormwater. They provide details on stormwater management methods that can achieve adequate quantity and quality targets while achieving economic sustainability.

In order to identify which stormwater management practices were most appropriate for Halifax Region, the study reviewed the latest technical literature and past experiences in planning, design and construction of stormwater management facilities. Halifax then identified four broad categories of preferred alternatives: source controls, conveyance controls, end of pipe controls and miscellaneous controls.

Design criteria were set for the Region for both water quantity and quality. The objective behind quantity control is to manage flood hazards by preventing or reducing damages associated with extreme storm events. In terms of

BMP Alternatives	Applicability	Advantage	Disadvantage	Effectiveness	Operation/ Maintenance
source control					
Disconnection of Roof Leaders	• Mostly for detached or semi-detached homes • Suitable outlet and soil conditions required • Requires cooperation of owners in existing homes • By-law and/or public education required	• Decreased runoff quantity to receiving system • Increased infiltration • Runoff detainment • Potential for some water quality benefit	• Potential for home owner inconvenience (e.g. ponding water, clogging of pond outlet/soakway pit if implemented) • Difficult to implement in existing developments or in poor soil conditions	• Effective in reducing peak flow and volume of runoff in storm and combined sewers • If combined with ponding or soakway, it will impact homeowner's use of land	• Roof leader filter cleaning and replacement and trash removal • Where constructed with soakway pits or ponding areas, it requires regular inspection
Disconnection of Foundation Drains	• Requires a potential outlet-often not available unless a clearwater sewer • Requires cooperation of owners in existing homes • Provide sump pump to discharge to surface	• Decreased runoff quantity to receiving system • Increased infiltration	• May require sump pump • Difficult to implement in existing developments • If enforced may caused unwanted discharge to sanitary sewer	• Effective in reducing peak flow and volume of runoff in storm and combined sewers • Sump pumps not effective if high water tables exists	• Soakway pits and sump pump require regular maintenance
Porous Pavement	• New technology • Requires testing before applying	• Decreased runoff quantity to receiving system • Increased infiltration • Traffic noise reduction	• Potential for groundwater contamination • Potential for clogging	• Depends on maintenance to keep pores clean	• Require regular inspection and cleaning

Figure 11: *The table presented above shows some of the BMPs recommended in the Stormwater Management Guidelines. Each BMP is presented with its applicability, advantage, disadvantage, effectiveness and operation/maintenance to help users choose which method could be the most appropriate for their needs.*
(Source: Dillon Consulting Limited)

water quality, the main objective was to ensure that water quality pre- and post-development be similar.

The introduction of BMPs in the Municipality was done to minimize adverse stormwater effects on and off development sites. Although there are no practices that could suit every development, Halifax identified that the most efficient site design would happen when BMPs are selected in the following order: Water Quality Control, Runoff Peak Attenuation for Flood and Erosion Control, and Groundwater Recharge and Base Flow Maintenance.

The guidelines provide examples of best practices but also a four-step selection process to ensure that appropriate practices are chosen for a particular site. The first step of the design process is to establish the objectives of the practices and identify corresponding design criteria for the site. During the second step, the user chooses the most suitable practices for the site with the help of a screening tool that has been developed to compare the capabilities and limitations of each practice. The user then develops a refined list of alternatives derived from the initial assessment that would take into account the capability to remove pollutants, space requirements, environmental considerations and health and safety issues. The final step reviews and analyzes the list developed to make a final selection.

As soon as the Stormwater Management Guidelines were completed, the document was made available online to be used as a reference tool for developers, planners, designers and contractors.

A WORD FROM HALIFAX

When asked what advice he would give to other municipalities that are considering implementing stormwater management guidelines, Cameron Deacoff, Environmental Performance Officer for Halifax Regional Municipality Energy & Environment, responded that it is essential to be clear about your objectives and their scope. It is also important to fully assess the available approaches to determine which one is the most appropriate to meet a specific objective. Also, to make sure that the guidelines are appropriate for a specific municipality, Mr. Deacoff recommended thoroughly reviewing the basic assumptions and conditions affecting this locality. "Are your flood plain maps up to date? Do rainfall models (i.e. IDF curves) adequately account for expected changes in precipitation patterns?"

Finally, Mr. Deacoff highlighted the importance of reaching out to other members of the community. "Consult with professionals in your area for expert guidance [and] with members of your community to identify their concerns and their priorities. [Also], consider working with non-profit organizations in your area. They may be able to help to engage your residents and/or other stakeholders in a number of ways, including but not limited to surveys, direct-to-owner programs, workshops and demonstration projects."