



Hamilton

Development Requirements Groundwater Conditions

September 11, 2023

Objectives and Drivers

Constraints: *Hamilton has an aged infrastructure with significant wet-weather capacity constraints.*

Objective: *Limit groundwater discharge to the municipal system associated with foundations being advanced below the groundwater table.*

Drivers:

- 1) *To preserve stormwater conveyance capacity in the separated storm and combined sewer networks*
- 2) *To maintain a servicing strategy that enables sustainable growth and development*
- 3) *To mitigate risk of contaminant migration*
- 4) *To prevent impacts on residents associated with noise nuisance and premature failure due to sump pumps running frequently/continuously*

Infrastructure Planning Framework

1. City of Hamilton By-Law No. 14-090 (Sewer Use)

PART 4

DISCHARGES TO SEWER WORKS

- 4.1 No person shall, directly or indirectly, discharge or permit the discharge of matter into a sewer works or into a connection to a sewer works where to do so may result in:
- (a) a health or safety hazard to a person authorized by the General Manager to work on the sewer works, including but not limited to a person authorized to inspect, operate, maintain or repair the sewer works;
 - (b) an offence under any federal or provincial legislation, including but not limited to, the *Ontario Water Resources Act*, the *Environmental Protection Act*, the *Fisheries Act* or a regulation thereunder;
 - (c) failure of biosolids from a sewage treatment facility to meet the requirements set out in the *Nutrient Management Act, 2002* or a regulation thereunder;
 - (d) interference with the proper operation or maintenance of the sewer works;
 - (e) interference with any treatment process at a sewage treatment facility;

Infrastructure Planning Framework

1. City of Hamilton By-Law No. 14-090 (Sewer Use) - Continued

DISCHARGES TO SANITARY OR COMBINED SEWERS

4.5 No person shall, directly or indirectly, discharge or permit the discharge of matter into a sanitary sewer or a combined sewer or into a connection to a sanitary sewer or a combined sewer where the discharge contains:

- (a) a concentration, expressed in milligrams/litre, in excess of any one or more of the limits for any one or more of the parameters in Schedule B, except where:
 - (i) the discharge complies with a valid Sewer Discharge Permit; and
 - (ii) all fees required under the Sewer Discharge Permit are paid;
- (b) water originating from a source other than the City's potable water supply, except where:
 - (i) the discharge complies with a valid Sewer Discharge Permit; and
 - (ii) all fees required under the Sewer Discharge Permit are paid;
- (c) stormwater, water from drainage from roofs or land, water from a watercourse, groundwater or non-contact cooling water, except where:
 - (i) the discharge is from a premises that is connected to a combined sewer;
 - (ii) the non-contact cooling water originated from the City's potable water supply; or
 - (iii) the discharge complies with a valid Sewer Discharge Permit and all fees required under the Sewer Discharge Permit are paid.
- (d) water originating from Construction Dewatering, except where:
 - (i) the Discharge complies with a valid Sewer Discharge Permit; and;
 - (ii) all fees required under the Sewer Discharge Permit are paid. **(Added 22-103)**

Infrastructure Planning Framework

2. Ministry of the Environment, Conservation and Parks Stormwater Management Planning and Design Manual

Basement flooding

Each municipality will have criteria to prevent basement flooding for new urban development. The following are generic criteria:

- a. Minimum lot grades, i.e., 2%;
- b. Minimum 1% swale slopes at lot boundaries;
- c. Basement floor elevations above the 100 year hydraulic gradeline in the storm sewer system;
- d. Basement floor elevations above the backwater level in the minor system produced by the Regulatory Flood in the major system;
- e. Basement floor elevations above high groundwater levels;
- f. Building invert opening elevations above the maximum site ground elevation; and
- g. Foundation drain collectors not susceptible to backwater or surcharging, etc..

Infrastructure Planning Framework

Other legislation / guidelines to inform our planning framework:

- Ontario Building Codes (OBC) – Table 2.2.1.1 (Division A – Part 2)

5.	Resource Conservation	OR	An <i>objective</i> of this Code is to limit the probability that, as a result of the design or <i>construction</i> of a <i>building</i> , a resource will be exposed to an unacceptable risk of depletion or the capacity of the infrastructure supporting the use, treatment or disposal of the resource will be exposed to an unacceptable risk of being exceeded.
	Resource Conservation — Water and Energy Conservation	OR1	An <i>objective</i> of this Code is to limit the probability that, as a result of the design or <i>construction</i> of a <i>building</i> , a resource will be exposed to an unacceptable risk of depletion.
		OR1.1	An <i>objective</i> of this Code is to limit the probability that, as a result of the design or <i>construction</i> of a <i>building</i> , water resources will be exposed to an unacceptable risk of depletion due to the consumption of water.
		OR1.2	An <i>objective</i> of this Code is to limit the probability that, as a result of the design or <i>construction</i> of a <i>building</i> , a resource will be exposed to an unacceptable risk of depletion due to the consumption of energy.
	Resource Conservation — Infrastructure Capacity	OR2	An <i>objective</i> of this Code is to limit the probability that, as a result of the design or <i>construction</i> of a <i>building</i> , the capacity of the infrastructure supporting the use, treatment or disposal of a resource will be exposed to an unacceptable risk of being exceeded.
		OR2.1	An <i>objective</i> of this Code is to limit the probability that, as a result of the design or <i>construction</i> of a <i>building</i> , the capacity of the infrastructure supporting the use, treatment or disposal of a resource will be exposed to an unacceptable risk of being exceeded due to excessive demand on the infrastructure.

Infrastructure Planning Framework

Other legislation / guidelines to inform our planning framework (Continued):

National Research Council Canada (NRC) Publication – Practical Guidance for Private-Side Drainage System to Reduce Basement Flood Risks: Addressing Critical Information Gap

- S. 2.2.6 – Reducing the Load on Foundation Drainage Systems – Separation from Water Table
 - “Specifically separating building foundations and foundation drainage systems from high water table may be a method to reduce loads on foundation drainage systems”
 - “Foundation drainage systems should be high enough above the seasonal high water table level to be required only during “atypical” conditions, such as major storm events or unusually high groundwater conditions”
 - “Reflecting the need to limit reliance on sump pump systems to protect homes from seasonal high water tables, the Durham Standard (2018) recommends that foundation drainage systems not be relied upon to prevent flooding associated with continually or seasonally high water tables”
 - “Groundwater assessments should consider all site-specific factors that might affect the selection of an appropriate height of footings above the water table”

Examples – Practices in Other Municipalities

Table 2e: Examples of Requirements for the Height of Footings relative to the Groundwater Table¹⁹

Jurisdiction	Requirement
City of Cambridge, Ontario	Base of footings 0.75 m above the water table.
City of Barrie, Ontario	Foundation drains 0.5 m higher than water table, or as high as practical.
Town of Wasaga Beach, Ontario	Underside of the footing elevation minimum 0.3 m above seasonal high water table.
City of Ottawa, Ontario	Development where sump pumps are proposed shall ensure that each underside of footing is at least 0.3 m above the seasonal high water table. ¹³
Eau Claire County, Wisconsin	0.3 m separation between the basement and the seasonal high water table.

(NRC-CNRC, 2021)

Examples – Practices in Other Municipalities (Continued)

City of Toronto Foundation Drainage Policy (2021)

A *Qualified Professional* with a P.Eng. or P.Geo. has deemed³ that the lowest elevation of any proposed structure will be higher than the *Maximum Anticipated Groundwater Level*, in accordance with Groundwater monitoring requirements in the City's Foundation Drainage Guidelines.

City of Hamilton Initiative 19-H, Beach Boulevard Zoning By-Law No. 6593 Amendment

That **City Initiative 19-H**to further amend the “C/S-1436” (Urban Protected Residential, etc.) District and “G/S-1436” (Neighbourhood Shopping Centre, etc.) District, modified, of Zoning By-law NO. 6593, to increase the minimum ground floor elevation to 76.5 metres from 76.0 metres above mean sea level

Next Steps

1. Issue Urban Hydrogeological Study Terms of Reference
(status: pending Council approval)
2. Develop City of Hamilton Foundation Drainage Policy
and Guideline (status: in progress)

Thank you

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