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TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON MAY 5 2015**
FROM:	**JOHN BRAAM, P. ENG. MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER**
SUBJECT:	**PILOT PROJECT TO RESOLVE SURFACE ICING RESULTING FROM SUMP PUMP DISCHARGE**

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental & Engineering Services & City Engineer, the Civic Administration **BE AUTHORIZED** to undertake a pilot voluntary storm PDC extension project on a part of Guildwood Boulevard, subject to receiving 100% participation from homeowners within the study area; it being noted that this pilot project would be completely funded by the City of London.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

None.

BACKGROUND

Purpose:

The purpose of this report is to recommend a pilot project to evaluate public response, technical methods and costs associated with resolving surface icing on City Right-Of-Way (ROW) resulting from sump pump discharge to ground surfaces.

Context:

Prior to 1985, house weeping tile, or foundation drains, were generally connected directly to the sanitary sewer private drain connection (PDC). In 1985, City of London by-law changes resulted in the prohibition of weeping tile flows into the sanitary sewer for new construction. As a result, weeping tiles were required to be connected to a sump pit in the basement, where a sump pump would pump excess water collected in the sump pit from the weeping tile out to the ground surface. In the intervening years, sump pump discharge icing became problematic in certain areas of the City, especially where sump pumps were active due to high ground water table and poor draining soils. Beginning in 1996, the City required that sump pump discharge be connected to a storm sewer PDC, eliminating the creation of additional surface icing issues.

However, sump pump surface icing issues continue to be problematic in subdivisions developed between 1985-1995.

Discussion:

Existing Sump Pump Grant Program:

The City currently has a Basement Flooding Grant Program which provides funding for 75% of the cost (to an upset limit of $6,000 per house) to install a storm PDC from the storm sewer main to the sump pump outlet at building face. If a storm PDC already exists on City ROW to property line, the grant funding provides 75% of the cost to an upset limit of $1,000 per house to extend the storm PDC to the sump pump outlet. Further details of the sump pump grant program can be found in Appendix ‘C’. Uptake in this program for storm PDC retrofit has been

very low as homeowners have traditionally been unwilling to invest in a storm PDC to resolve surface icing issues. Further complicating matters are situations where a neighbouring home is causing icing issues to an adjacent property. The City currently has no mechanism to force remedial action.

Proposed Pilot Project:

A pilot project is proposed which would see the City provide 100% funding for, and manage, the retrofit of storm PDCs to a defined group of 27 homes on Guildwood Boulevard to eliminate sump pump surface discharge and thus remove the risk of surface icing in winter months. In order to be effective, every home within the selected area will have to agree to have their sump pump discharge redirected into a newly constructed storm PDC, which will require work on their private property. Inspections will also be required in each basement to confirm that sump pump discharge piping is not interconnected with sanitary plumbing. This pilot project has a similarity to the Blanchard Crescent weeping tile disconnect pilot project, in that the City is proposing to undertake work on private property. Appendix 'A' contains pictures of storm PDC retrofit construction from Blanchard Crescent along with diagrams showing layout of sump pump discharge and storm PDC. The same configuration would be required on Guildwood Boulevard.

Target Area:

The proposed pilot project is focused on Guildwood Boulevard, as shown in Appendix 'B'. This area was chosen for the following reasons:

- Historical sump pump surface icing issues;
- Guildwood Boulevard, classified as a Secondary Collector with sidewalks on both sides of the street, is considered to have higher pedestrian movements than other Local streets;
- A storm sewer is available to connect storm PDCs.

Additionally, this area has been specifically targeted with the City Basement Flooding Grant Program in the past. In August and November of 2013, letters were sent to the 27 target homes to advise homeowners of the sump pump icing problem on their street and the availability of a grant program to help pay for costs to install a storm PDC. It is noted that the City did not receive any grant applications for storm PDC installation at that time.

These factors combine to make Guildwood Boulevard a good candidate for the pilot project.

Why 100% Participation?

The pilot requires 100% homeowner participation within the area. The reason for this lies with the fact that the source of the surface icing is coming from each individual house sump pump discharge pipe. If even a small percentage of homes do not participate, this pilot area will continue to have surface icing problems, making the pilot a poor investment.

Next Steps and Cost:

If 100% participation is received from homeowners, then the City will move forward with a public tender to hire a contractor to install storm PDCs from the storm sewer main to the sump pump discharge pipe exiting the house. These PDCs will likely be installed by horizontal directional drilling to minimize surface impact. Although this method is less intrusive than digging an open trench, two pits are still required. A sending pit will be dug in the road at the storm main connection point and a receiving pit will be dug at the house sump pump discharge location. Inspections in each basement will also be required to confirm sump pump discharge piping is not directed to sanitary plumbing. Cost is currently estimated at approximately $10,000 per house. This figure includes storm PDC installation, restoration, and road asphalt resurfacing within the project limits which will be required due to the number of road cuts necessary to construct and connect new storm PDCs. It is noted that a dedicated capital account entitled 'Problematic Sump Pump Discharge Program' (ES2468) was set up in 2014 and currently has $400,000 available. This account was created to address sump pump surface icing.

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If 100% participation is not received, then staff will report back with an evaluation on the pilot project, contributing factors and viability of the approach.

Summary:

In certain locations, a sump pump discharge icing issue can exist in subdivisions generally built between 1985-1995. The City is proposing to offer a small scale pilot project to connect sump pump discharge to new storm PDCs to 27 homes on Guildwood Boulevard. 100% participation from the homes within the selected area is required to move forward with the pilot project. In-house inspections will also be required to confirm that sump pump discharge piping in the basement is not interconnected with sanitary plumbing. If homeowner participation is confirmed, this project will be 100% funded and managed by the City.

Acknowledgements:

This report was prepared within the Wastewater and Drainage Engineering Division by Kyle Chambers, P.Eng., Environmental Service Engineer.

PREPARED BY:	**REVIEWED AND CONCURRED BY:**
TOM COPELAND, P. ENG. **DIVISION MANAGER, WASTEWATER AND DRAINAGE ENGINEERING**	**JOHN LUCAS, P. ENG.** **DIRECTOR, WATER AND WASTEWATER**
RECOMMENDED BY:	
JOHN BRAAM, P.ENG. **MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER**	

April 28, 2015

/kjc

Attach: Appendix “A” – Sump Pump, Storm PDC Diagrams, photos of Storm PDC Installation
Appendix “B” – Map of Guildwood Boulevard Target Area
Appendix “C” – Sump Pump Grant Information, Basement Flooding Guide Pamphlet

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Appendix ‘A’

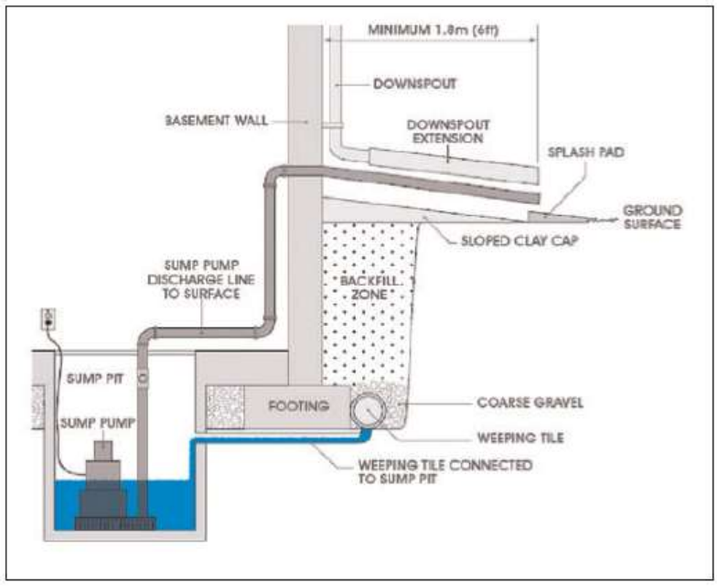

Figure 1: Schematic of existing sump pump collection and discharge. Diagram courtesy of Institute for Catastrophic Loss Reduction

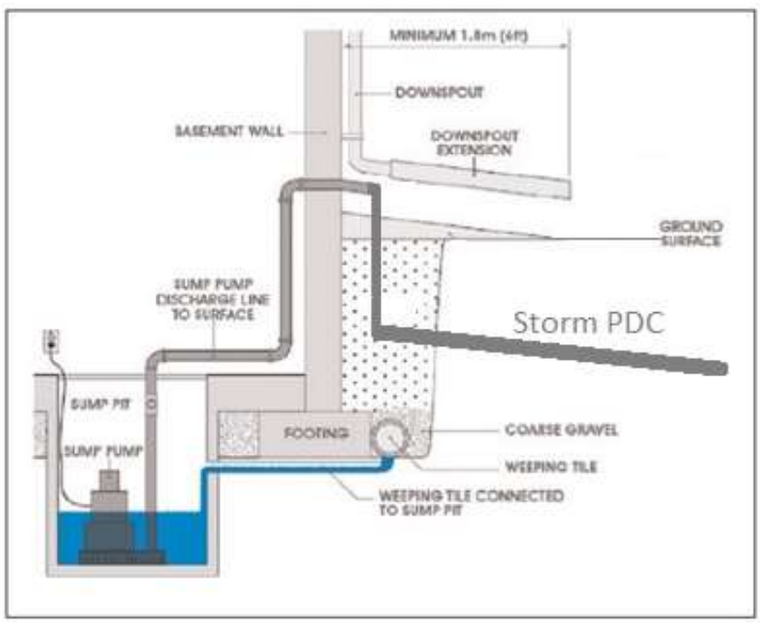

Figure 2: Profile drawing of proposed storm PDC (typical)

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Figure 3: access to receiving pit for installation of storm PDC with lawn protection

Figure 4: receiving pit to retrive storm PDC to connect to sump pump discharge pipe

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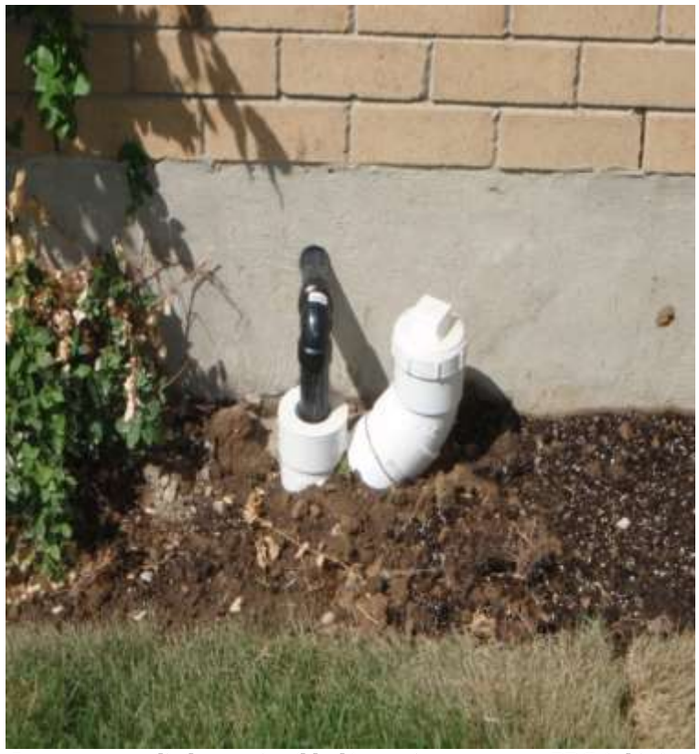

Figure 5: sump pump discharge pipe (black) entering new storm PDC (white)

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Appendix ‘B’

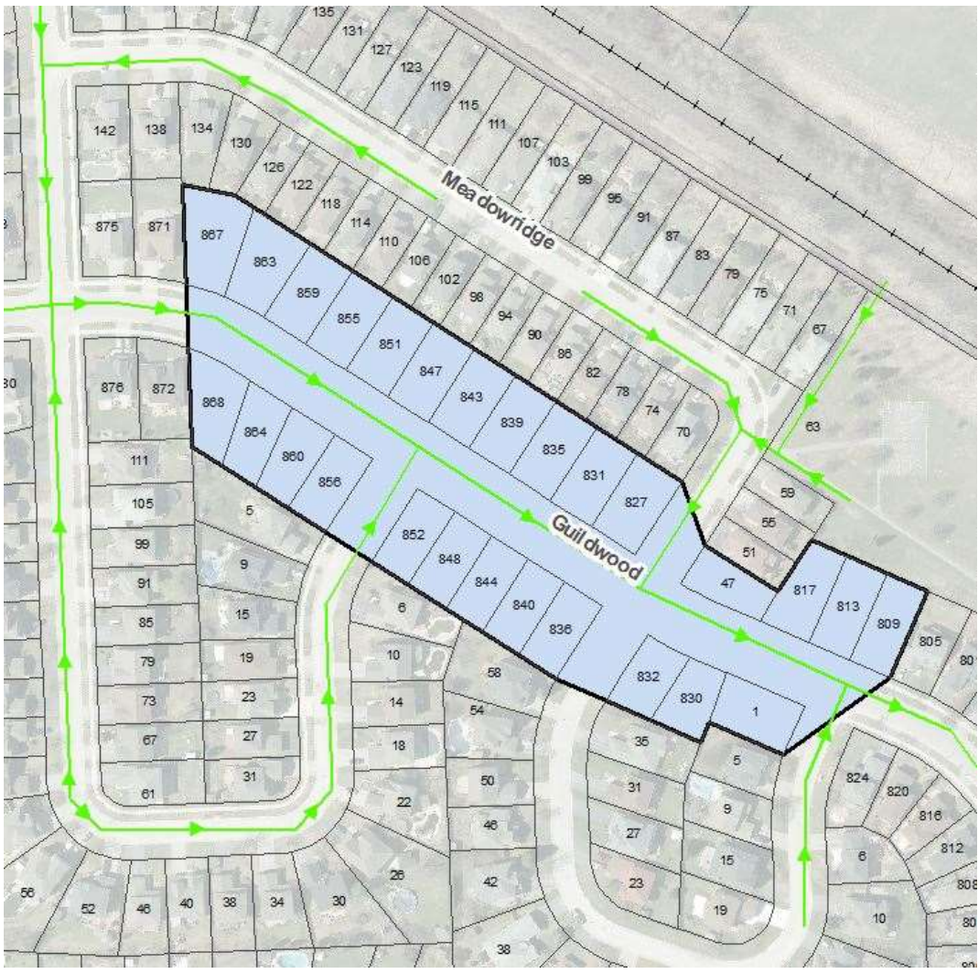

Figure 6: Map of pilot project area

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Appendix ‘C’

The Application Process

1. **Contact a licensed plumber** to assess the appropriate remedial measure(s) for your property and obtain a cost estimate.
2. **Obtain an information package**. Contact Wastewater & Drainage Engineering at 519 661-2500 ext. 5489, or visit the 9th floor of City Hall.
3. **Fill out the application**
4. **Allow two to four weeks for the City to review your application** and approve the amount of your grant in writing. The amount of grant will depend on assessment of the work completed.
5. **When approved, hire a plumber** to do the work and obtain a Plumbing Permit from Building Control, City Hall, 7th floor.
6. **Contact Building Control to inspect the work** and sign off on the installation (as per the Plumbing Permit requirements). Also notify the Wastewater & Drainage Division (ext. 5489) to verify if further inspection is required.
7. **Provide** both the inspection form signed by the City's plumbing inspector and a paid, itemized invoice detailing all the work that was completed to:

   Wastewater & Drainage Engineering Division
   9th Floor, 300 Dufferin Avenue
   P.O. Box 5035
   London Ontario
   N6A 4L9
   Attention: Basement Flooding Grant Program
8. Subject to approval of the submission, **the City will issue a cheque for the grant** within four to six weeks.

Environmental & Engineering Services Department

London CANADA

Protect Your Basement

Basement Flooding Grant Program

to help homeowners reduce the likelihood of basement flooding

London CANADA

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Basement Flooding Grant Programs

Eligibility Criteria

You may be eligible for the City's grant program if basement flooding is happening due to:

- Weeping (footing) tiles directly connected to the sanitary or storm sewer
- Sanitary or storm sewer surcharging in your basement
- Your property being in an area identified by the City as prone to basement flooding
- Evident erosion or icing problems

The Program – An Overview

Residential homes (Single detached, semi-detached, duplex dwellings):

Remedial measure	Grant: 75% of total cost to a maximum of
Full port-type backwater valve[1]	$825
Sewage ejector installed with a sump pump[2]	$1,525
Sump pumps: with weeping tiles disconnected *inside* the basement	$1,950
Sump pumps: with weeping tiles disconnected *outside* the basement	$2,650
Storm Private Drain Connection (PDC) for work from the City sewer in the road allowance to the dwelling unit	$6,000
Storm building sewer on private property from an existing PDC on the City road allowance or within a City easement	$1,000

[1] Where a sump pump already exists. [2] Instead of a full port-type backwater valve.

Condominium Corporations, Non-profit Housing Co-operatives :

Remedial measure	Grant: 75% of total cost to a maximum of
Engineering report	$2,000
Lot grading, sump pump systems, backflow prevention systems, and certification	$900 per unit

For more information about the remedial measures, or to obtain a copy of the City's ***Basement Flooding Guide***:

- Phone 519 661-2500 ext. 5489;
- Visit City Hall, 9th Floor, 300 Dufferin Avenue, London; or
- View our website, **www.london.ca** and enter "**Basement Flooding Grant Program**" into the *Search* field.

Why isn't the City fixing my drainage problem?

Drainage standards have changed over the years. On private property, renovating to meet current drainage standards is the responsibility of the homeowner, similar to bringing a home's electrical and plumbing systems up-to-date. Where large-scale neighbourhood flooding problems exist, the City has undertaken multi-million dollar projects to reduce the severity of basement floodings.

In many circumstances, only improvements completed on private property will reduce the chance of flooding. These types of improvements must be undertaken privately by the homeowner.

How much is this going to cost?

Each situation will be different. You should contact a licensed plumber to assess the potential cause of flooding and provide a cost estimate. While repairs on private property are the responsibility of the homeowner, the City of London offers a grant to qualifying homeowners to improve home drainage systems. Please refer to the City's *Basement Flooding Grant Program* pamphlet for more details.

For more information, or to obtain a copy of the ***Basement Flooding Grant Program*** pamphlet:

- Phone 519-661-2500 ext. 5489;
- Visit City Hall, 9th Floor, 300 Dufferin Avenue, London; or
- View our website, **www.london.ca**, and enter "Basement Flooding Grant Program" into the *Search* field.

Environmental & Engineering Services Department

London CANADA

BasementFlood_BrochureSept08.indd 1

Protect Your Basement

Basement Flooding Guide

to help homeowners identify causes of basement flooding and improve drainage conditions.

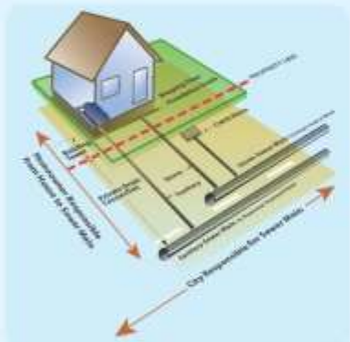
Environmental & Engineering Services Department

London CANADA

Protect your home and possessions by understanding what causes basement flooding.

Basement flooding is a serious problem that affects residents in many municipalities, including the city of London. Basement floodings generally occur during snow melts and heavy rainfall and can cause serious damage and inconvenience. There are two systems involved in basement flooding:

1. Overloaded home drainage systems
2. Overloaded City sewer systems



Working together – Home drainage and City sewer systems

No municipal drainage system can guarantee every house complete protection against basement floods. Working together, we can help prevent flooding and reduce costly upgrades to City systems.

City sewer systems:

Sanitary (wastewater) sewer – The sanitary sewer receives wastewater from toilets, bathtubs, sinks, and laundry machines through your home pipes. The sanitary sewer is located under the street and is connected to the nearest sewage treatment plant.

Storm (rainwater) sewer – The storm sewer is located under the street and carries surface water from lawns and streets, and groundwater from weeping tiles and foundation drains, through pipes to local streams.

Home drainage system:

Footing tiles/weeping tiles/foundation drains – Weeping tiles are pipes with drainage holes located underground around the basement foundation to prevent groundwater from entering the basement. Weeping tiles should be connected to the sump pit, however, in older homes they may be connected to the sanitary sewer or storm sewer.

Downspouts – Typically, downspouts carry rainwater from your roof directly onto the ground surface. In older homes, downspouts may be connected to your weeping tiles or directly to the storm sewer.

Sump pit/pump – A sump pit is dug into your basement floor and collects natural groundwater from the weeping tiles. The sump pump moves the water from the sump pit to the ground surface or to the storm sewer.

Full-Port type Backwater Valve – A backwater valve is a device that prevents sewage from backing up into your basement from the City's sanitary sewer. The backwater valve automatically closes if sewage backs up from the sanitary sewer. Regular cleaning of the backwater valve is the responsibility of the homeowner.

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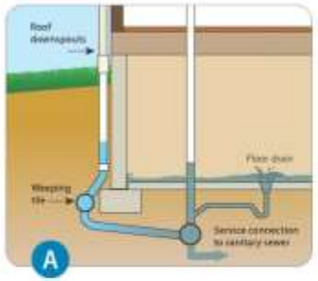
What is causing my flooding?

There are a variety of causes of basement flooding.
The following cases describe a number of common flooding situations that can occur in London homes.



A

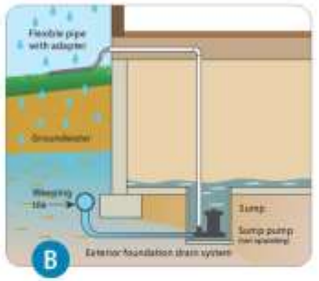
Weeping Tiles and/or Downspouts Connected to the Sanitary Sewer

During heavy rainfall, the water entering the downspouts may cause the weeping tiles to overflow. If your weeping tiles are connected to the sanitary pipes, this may cause rainwater or sewage to back up into your home.

Solution

Disconnect weeping tiles and downspouts from the sanitary sewer system

Rainwater should not be entering the sanitary (wastewater) sewer system. Have a qualified plumber disconnect your weeping tiles and downspouts from the sanitary sewer system. Install a sump pump and backwater valve to send the rainwater to the ground surface or to the storm (rainwater) sewer system.



B

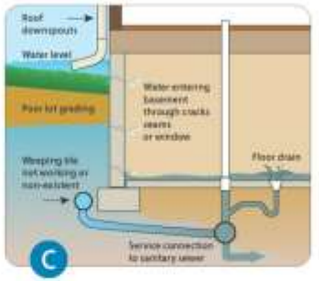
Malfunctioning Sump Pump

If your home is equipped with a sump pump, it may have malfunctioned – causing your basement to flood.

Solution

Replace your sump pump

Ensure that your sump pump is properly maintained. If your sump pump has malfunctioned in the past, consider contacting a qualified plumber and having it replaced.



C

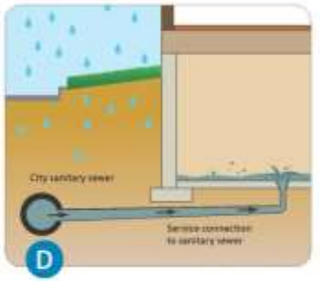
Surface Water Causing Basement Flooding

Basement flooding can occur when there is water ponding around your foundation walls and/or your weeping tiles are not working or are not existent.

Solution

Smart landscaping

Check that the ground around your house is sloping away from your foundation wall. This reduces the possibility of water entering through cracks in your foundation or overloading the weeping tiles. Direct your downspouts where water can be easily absorbed, such as your lawn or flower bed.



D

City Sanitary Sewer Pipe Full

If the City's sanitary sewer pipe is full due to large amounts of rainwater from various sources – such as private weeping tiles or from neighbour's homes – then sewage can back up into the basement.

Solution

Flood-proofing devices

Homes prone to flooding should have sump pumps and backwater valves to prevent rainwater or sewage from backing up into the basement. Talk to a qualified plumber about the best way to flood-proof your basement before any device is installed. Each installation is different and some devices require a plumbing permit. Be sure to get at least three estimates before hiring a plumber.

Check your local Yellow Pages or Better Business Bureau for a list of suppliers and contractors. Hardware, home improvement, plumbing outlets and suppliers offer information and equipment for do-it-yourself installations.