

# Good Home Drainage Guide

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# Acknowledgments

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*Photo: Even during the winter season, storm systems are active.*

# Introduction

Every year, millions of litres of water from rain, snow melt, and sump pump discharge makes its way into the City's storm drains, pipes, detention ponds and channels. Most people don't think about how this water is collected or where it goes. However, when an intense prairie storm or quick snow melt occurs, it's top of mind when the system falters and there's water in your home.

Regina mainly has flat topography and clay soils which makes the city susceptible to flooding. Water damage from flooding costs time and money and is a major inconvenience. Fortunately, there are many things you can do to reduce your risk. Prevention and maintenance are the key to managing your risk. Looking at your home now and fixing any problem areas before the next major rainstorm can save you a lot of grief.

This guide contains information that can help you identify potential drainage problems around your home and address them, so they are no longer an issue.



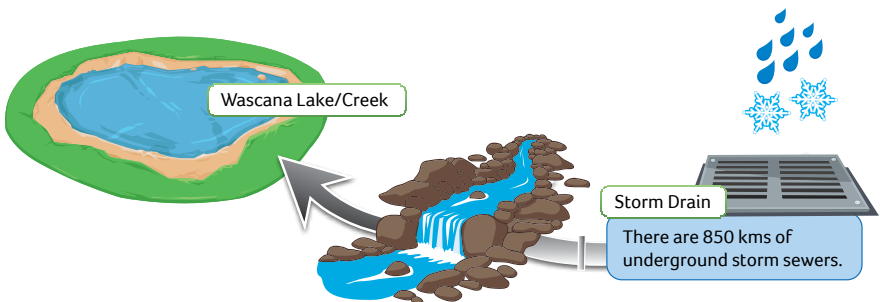
# Public Drainage System 101

The City maintains a system of storm drains, pipes, culverts, berms, dikes, swales, ditches, channels, and retention ponds to collect and convey rain and snowmelt to achieve good drainage and to protect against flooding. This system is collectively known as the public drainage system.



*Photo: Storm culverts allow for water to cross roadways and other obstacles.*

The system is large, boasting approximately 850 kilometres of underground pipe and over 22,000 storm drains. Ultimately, this system takes the water to the Wascana Creek and the Upper Qu'Appelle River system.



## Drainage Channels

A drainage channel is an overland system that is responsible for conveying large amounts of meltwater and stormwater away from the City into the natural system. In Regina, you can think of them as engineered “creeks” that empty their water into the Wascana System.



*Photo: The public drainage system sends rain water and snow melt into the natural creeks and rivers.*



*Photo: Entry points to the Public Drainage System are called Storm Drains.*



*Photo: Drainage channels are part of the City's open space system.*





*Photo: Drainage channels allow for large amounts of storm and melt water to be carried away into the natural system.*



*Photo: Drainage channels provide homes for urban wildlife.*

## Wet Ponds (Retention Ponds)

Wet retention ponds are stormwater control structures designed to hold and filter the stormwater runoff. These ponds in Regina are designed to always hold a permanent amount of water but have extra room that can be used during spring melt or a storm event. They typically appear as a “lake” feature in a neighbourhood.



*Photo: Wet ponds have water in them and often attract wetland wildlife.*

## Dry Ponds (Detention Ponds)

Dry ponds are constructed basins that have been designed to hold stormwater runoff for a period, typically 24 hours, to allow the for the drainage system to catch up during storm events. Unlike wet ponds, these facilities do not have permanent water. In Regina, many of these are “in disguise” as soccer pitches or other multi-purpose fields.



*Photo: Dry ponds are often difficult to spot as they often pose as multipurpose sports fields.*



*Photo: Dry ponds may contain small amounts of water during a rainy day.*



*Photo: Dry ponds are designed to fill quickly during a heavy rain or quick spring melt.*

The public drainage system is different from the wastewater system. The wastewater system is a system designed to direct all wastewater from bathrooms, sinks, laundry facilities, and kitchens to wastewater treatment plants for treatment before being considered safe enough to release. In contrast, stormwater is water from natural sources, which can be safely released into streams, rivers or other natural locations with no treatment required.

Stormwater can enter the wastewater collection system through a variety of ways, collectively known as inflow and infiltration (i&i). When it rains or snows, stormwater runoff can enter wastewater pipes through maintenance holes, joints, and direct connections to the wastewater collection system. This can result in basement flooding or in extreme situations, bypasses to the receiving waters.

The public drainage system is important to maintain and protect. There are things that you, as a homeowner, can do to help:

- You can help by giving your neighbourhood storm drains a little tender loving care by adopting them! Adopting a storm drain is easy and a great opportunity to give back to your community. To adopt a storm drain, visit [Regina.ca/stormdrain](https://regina.ca/stormdrain)
- To report a blocked storm drain or an area with poor drainage to be inspected, provide the location by street address or nearest intersection through an [online service request](#) or call 306-777-7000 on weekdays between 8 a.m. and 4:45 p.m.
- Adopt the use of a Rain Barrel system at your home. The University of Saskatchewan has developed a [useful guide](#) to get you started.



*Photo: Stormwater ends up in the natural system with no treatment.*



*Photo: Adopt a storm drain in your neighbourhood to help rain or melt water get to the creek.*



*Photo: Rain barrels are an environmentally friendly way to keep your gardens and flowers watered.*

# Why Homes Flood

Regina gets about 390 millimetres of precipitation in the form of rain and snow every year. Most of this comes in the form of thundershowers or summer storms, any one of which can drop a large amount of water in a concentrated area in a short period of time. When a major rainstorm hits, the huge volume of water that occurs can overwhelm drainage systems and cause flooding. Snow poses a similar threat in the spring if there is a rapid snowmelt.



*Photo: Storm channels are dangerous during a large rain and should be avoided.*



*Photo: During very heavy rains or quick spring melt, the storm system can exceed its capacity.*



In Regina, the underground drainage system design standard uses a storm event of 1 in 5 years. This means that the system can handle any typical rainstorm, but could have its capacity exceeded, on average, once every five years. This design approach is based on historical weather patterns.

The City has measures in place to reduce flooding in known problem areas throughout our community. Detention and retention ponds, as well as dikes and berms, direct as much runoff as possible away from roads and sewers. Dikes and berms act as barriers to help keep the water away, helping to prevent flooding in basements of homes and businesses. Storm ponds will fill with water until the underground drainage system is able to manage, or the storm channels and creek levels start to recede.

During a heavy rain event or spring melt, there are things homeowners can do to limit water damage and flooding:

- Limit the use of water as any additional wastewater added to the system at this point could contribute to sewer backups.
- Keep an eye on your basement. Ensure your sewer cap is on.
- Make sure your downspouts are moving water away from your foundation.
- Consider having a sump pump and backflow prevention valves installed in your home.
- Shovel or remove snow at least 2.0 metres from your foundation and move it to a position where melt water will drain.
- Remove any debris or snow from any window wells.
- Clear neighbourhood storm drains or [adopt a storm drain](#) to help water drain.

If your home has been impacted by flooding, The Ministry of Health has a [Flood Clean Up Guide](#) that includes helpful tips on how property owners can begin the recovery process following a major flood.

# Eavestroughs and Downspouts

On any property, the first line of defense in dealing effectively with rapid snowmelt or a rainstorm is the eavestroughs and downspouts. Catching water from the roof and directing it away from the foundation of the house is a critical factor in preventing water damage and keeping your basement dry.



*Photo: Your first line of defense against the rain and snow is the roof and eavestrough system. Make sure these are in good repair.*

Eavestroughs are located directly below the roofline of your home. Eavestroughs catch roof runoff and channel it to downspouts. These downspouts then carry rainwater and melting snow from eavestroughs on your roof and direct it onto your property or the nearest storm drain. Protect your home by ensuring to check your roof, eavestroughs and downspouts for the following:

- Shingles that are buckling, curling, or blistering.
- Cracked caulking or rust on roof flashing.
- Cracked or leaking eavestrough or downspouts.
- Ensure your eavestroughs are clean from debris, leaves, branches, or other obstructions.
- Make sure downspouts are directed a minimum of 1.0 metre away from the foundation.
- Make sure downspouts are at least 2.0 metres inset from your rear property line.
- Ensure that downspouts are not directed onto a neighbouring property.
- Use a splash pad to protect from erosion and direct the water where a long downspout extension cannot be used.
- Direct downspouts and splash pads to gardens or lawns if possible.
- Consider using a rain barrel downspout converter to capture water and prevent overflow.

Contact a qualified professional to further assess and repair any visible damage to the shingles or roofing material. Plan for a quick and timely repair as damage to the roofing material can cause other issues and damage to the home.

Eavestrough leaks typically occur at joints. Fortunately, they can be repaired quickly and easily with silicone. Silicone comes in a tube and is usually clear or white. Once dry, it is water resistant and stands up well to extreme temperatures. When repairing a leak, do it from the inside of the eavestrough. Make sure the surface is clean and dry before applying the silicone.



*Photo: It is important to clean your eavestroughs every year.*

You can test the effectiveness of your eavestroughs by pouring water at the end furthest away from the downspout. If water leaks out or pools at any point you need to clean, repair, or replace it.



*Photo: Downspout extensions should direct the water away from your home, but not into your neighbour's property.*



*Photo: Splashpads help your yard absorb the water from your roof and protect against soil erosion.*



*Photo: Your house may have many downspouts depending on your roof design.*

# Improving Lot Grading

Proper lot grading is one of the most important things you can do to prevent water from getting into your home. Since 1974, the City has required a Rear of Lot Elevation Certificate prepared by a Legal Surveyor. In 2022, the City added further requirements to this grading certificate to allow for lot grading to be monitored on side yard and rear yard. This certificate verifies that, upon grading completion, the lot grades are correct to design.

Good lot grading directs stormwater runoff away from and off permanent structures (homes and garages) to public roadways, landscaped areas, or drainage swales where runoff can ultimately find its way into the public drainage system.



*Photo: Good lot grading makes for good neighbours, talk to your neighbour about solutions to home drainage.*



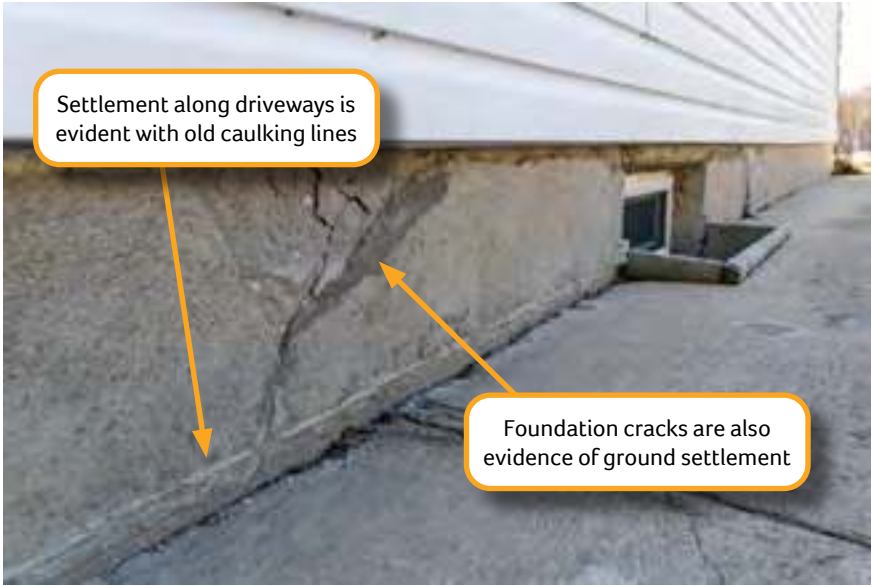
*Photo: Ensure that sheds and items stored along the fence are a minimum 0.5 metres (20 inches) away.*

Property owners should keep themselves informed of their lots' intended grading plan by contacting the City to request it. A properly graded lot helps avoid potential flooding problems and damage to neighboring properties. Improper lot grading can result in ponding, basement dampness and/or flooding to the homeowner or adjacent neighbours.

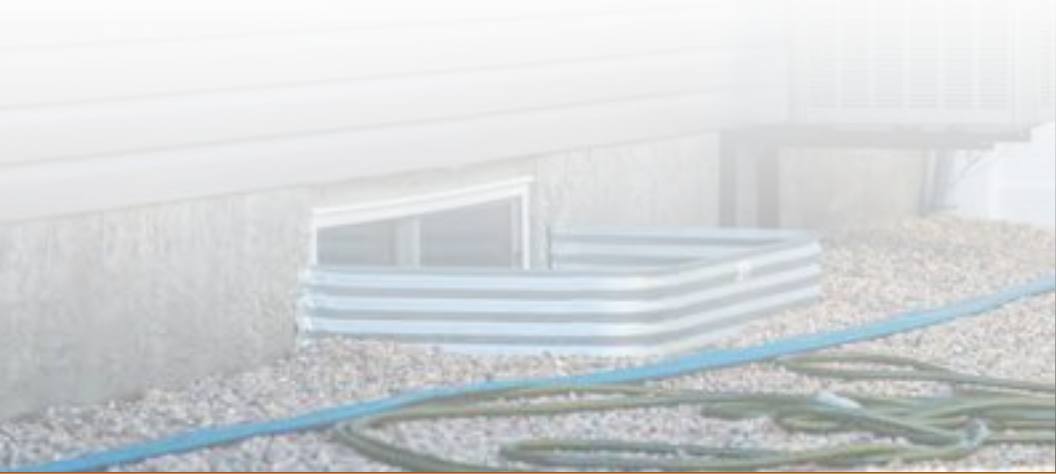
Lot grading starts at your basement wall. Good eavestroughs, downspouts and extensions help make your outdoor drainage system better, but it can't make up for poor lot grading. Walk around your home and ensure there is a minimum slope from the foundation wall. This includes under stairs, steps, and decks. The dirt or sod should slope down from the wall at a continuous angle for at least 1.5 to 2 metres (5 to 6 feet). If the surface is decorative rock, bark, or another porous material that lets water through easily, take the measurement from where the underlying dirt begins.

Due to Regina's relatively flat topography and clay soil types, the ground settles and moves over time, particularly near basement walls. You should check your grade every year and add soil where necessary.

If your house has a basement with a window that is at or near ground level, ensure that a widow well is installed. A widow well is a U-shaped, ribbed, light metal product that can be purchased in most hardware stores. They come in various widths and heights, so measure your window before purchase. They not only allow for proper grading, but they also prevent dirt and moisture from rotting window sills.



*Photo: Regina clay soil is notorious for causing the ground to shift or settle.*







*Photo: Proper window well installation prevents water from entering your basement.*

Proper installation of window wells is important for it to function properly. The outer edges of the window well should surround the window and be tight against the basement wall.

The bottom of the window well should be at least 300 millimetres (one foot) below the bottom of the windowsill. The area inside the window well should be cleared of dirt and backfilled with loose gravel or rock. This process should be done from the bottom of the well to 75 to 150 millimetres (three to six inches) below the bottom of the windowsill allowing water to easily drain and filter down to the foundation weeping tile. The dirt or sod on the outside of the windowsill should be graded in the same manner as the remainder of the house.

# Backwater Valves, Weeping Tile and Sump Pumps

Water that soaks into the ground is typically collected by weeping tile and then discharged by a sump pump, collectively known as the foundation drain discharge collection system. Found in newer homes, the foundation drain collects and discharges subsurface water with a sump pump to the surface of the property. In older homes, this system may be connected directly to the sanitary sewer system.

Homes located in areas of the City that are experiencing high underground water tables or high underground water pressure (artesian) will produce a discharge from their collection system many days after a rainfall. When the City receives several seasons of above average rainfall or snowmelt, the groundwater table will elevate to a greater extent causing the discharge system to run for a prolonged period. It is important for homeowners that have properties that are subjected to these conditions to ensure that sump pump and discharge system is inspected and maintained on a regular basis.

## Weeping Tile

Weeping tile is a perforated plastic pipe that surrounds the foundation of a home. It sits in a bed of gravel, allowing excess groundwater to seep into it. This water is channeled to a sump pump, or the sanitary sewer system, the stormwater sewer system, depending on the age of the home.

Installing or repairing weeping tile is expensive, but necessary in some cases. For example, weeping tile that is collapsed or clogged by debris should be repaired to prevent damage to the foundation and basement walls. You should seek professional advice from a plumber or qualified contractor before making any decisions.



*Photo: Weeping tile systems protect your basement and home from ground water. (Image Courtesy City of Edmonton)*

## Sump Pumps

A sump pump keeps your basement dry by redirecting water away from your home's foundation. In most cases, it is installed below the floor of your basement and may be connected to the weeping tile system surrounding your house, channeling groundwater out and away from the home.

If your home has a sump pump, you should be aware of the condition of your pump and whether it needs replacing. A good quality pump should last around 10 years, depending on how often it is working and the acidity and dirtiness of the water.

Each spring, follow these sump pump maintenance tips to ensure yours works properly.

- Remove the cover. Check the tank for debris, such as mud, rocks, or gravel.
- Flush the system. Ensure proper pump operation by flushing out the system with water from a hose or bucket. When the pump turns on, listen for strange sounds. The pump should run smooth. If it doesn't that could signal worn or damaged parts.
- Inspect the float. As water fills the tank, make sure the float travels freely on the float rod.
- Inspect the discharge pipe. Before a major rain, make sure the discharge hose is free from debris, such as mulch, mud, stones, or rodent nests. Ensure that the discharged water is a minimum 1.0 metre from your foundation.



*Photo: A newly installed sump pump system.*

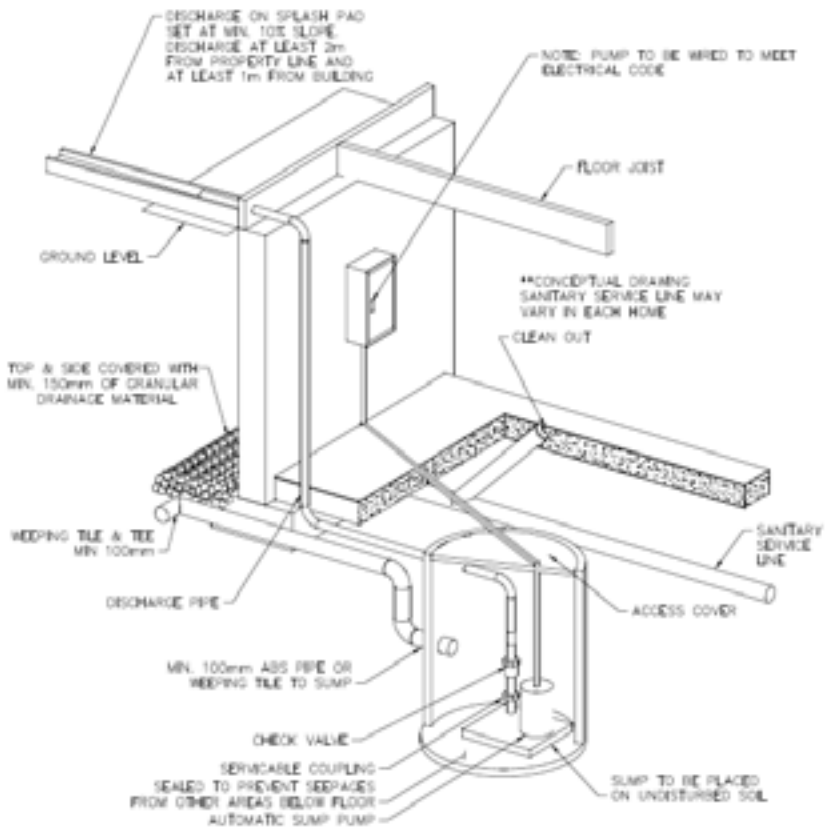


Photo: A sump pump system prior to installation in the sump pit.

Depending on the problems you encounter, you may want to consider getting your sump pump serviced or replaced. Maintenance should be completed by a qualified professional. It is also important to consider what time of year your system is discharging. You may have to consider disconnecting any outside hoses if your pump is operating during freezing temperatures to prevent damage from a line blockage. You should also ensure that the discharged water is a minimum 1.0 metre from the foundation and has good lot grading to remove the water from the property. If water from your discharge pipe is too close to your foundation, the water may recycle and end up back in your system, possibly endangering your foundation.



*Photo: A properly installed sump pump system.*

## Backwater Valves

A backwater valve is located on the home's connection to the main sanitary sewer line. Its job is to prevent sewage from returning up a sanitary sewer line and entering the basement. It is an effective last line of defense and is required on all new homes in Regina.

During a rainstorm, wastewater trying to flow back into a home causes the backwater valve to close its flap. This action prevents sewage from reentering the home, but it also means water from inside your home can't get out until the valve reopens.

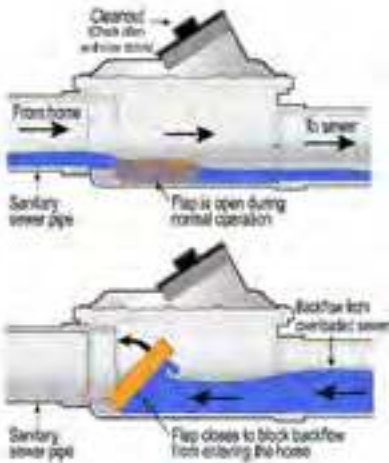


Image Courtesy of the City of Toronto



Photo: A backwater valve in a home.

There are two types of backwater valves. Both work well, but it is important to install the right one according to code. The sanitary sewer line entering a home needs a normally open backwater valve. Branch lines coming off the main line need a normally closed backwater valve. You may need more than one valve depending on your home's internal plumbing. A qualified plumber can test your system and recommend the correct installation.



Photo: A backwater valve located in the basement of a home.



Photo: A backwater valve location with the floor cover over it.

### Typical household backwater valve installations

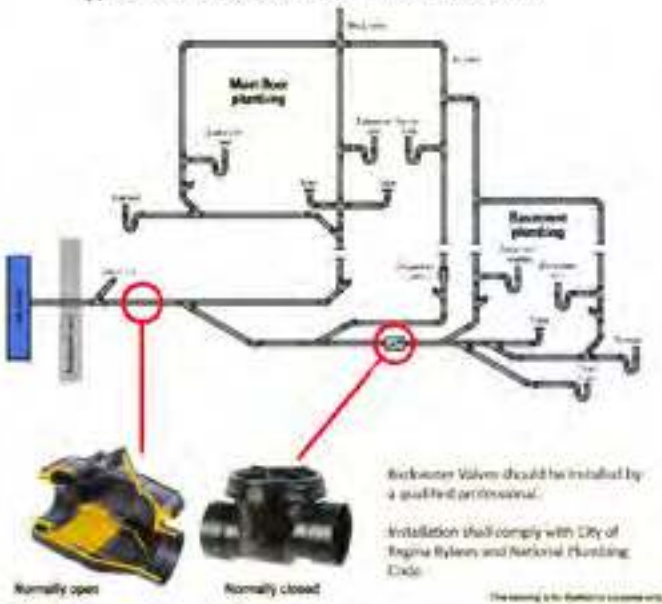


Image Courtesy of the City of Winnipeg

Backwater valves need to be cleaned and maintained to work properly. Older backwater valves have metal flaps (brass and cast iron). Cast iron flappers can corrode over time, which can cause them to stick. Once this occurs, they should be replaced with a valve that has a plastic flap. Every spring you should plan to inspect the normally open backwater valve going from the sewer connection to the house. Open the top and clean out any debris and check the flapper to make sure it's moving freely.

Please note that these Guidelines have been prepared for informational purposes only. Homebuilders and homeowners are encouraged to seek the assistance of a professional engineer, surveyor landscape architect or contractor as required.

**For any questions on content related to these guidelines,  
please contact the City of Regina.**

**Phone: 306.777.7000**

