

The Homeowner's Guide to Lot Grading and Drainage

How to Identify Problems and Maintain
Your Home's Drainage Systems

City of Edmonton



Edmonton



Flooding caused by heavy precipitation, melting snow, or runoff may pose problems for all kinds of properties. Older and newer houses may be at risk for flooding if proper precautions are not taken. The City encourages all builders and homeowners to take preventive measures to avoid flooding. This booklet contains information on:

- + Why homes flood
- + Protecting your home from flooding
- + Eavestroughs, downspouts, and weeping tile
- + Pipes, sump pumps, and backwater valves
- + Improving lot grading
- + Maintaining your home drainage system

Note: To clarify the corporate meaning and responsibility of the title "Drainage", the City of Edmonton agrees that EPCOR Drainage Services takes full responsibility for this word.

The Lot Grading Section of the City of Edmonton is the Local Approving Authority for regulating the control of stormwater surface flow on private property.

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INTRODUCTION

Every year, millions of litres of water flow into the municipal drainage system from residential rooftops and indoor plumbing. Most people don't think about how the water is collected or where it goes. However, it's a different matter when there is a torrential storm, the drainage system falters, and you get water in your basement.

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 keys. Looking at your home now and fixing any problem areas before the next major rainstorm can save you a lot of grief.

This Homeowner's Guide to Lot Grading and Drainage contains information that can help you identify problems and properly upgrade, repair, or maintain your home's lot grading and drainage system. This booklet is filled with practical drainage tips and projects that you can do yourself.

Details of various projects, relative costs, and degrees of difficulty are provided throughout. Even if you prefer to hire a professional, this booklet offers knowledge and insights that may help you make a more informed choice. It is recommended that you obtain three quotes and ask for references, particularly if you are unfamiliar with the company or individual.

Definitions of words or phrases highlighted in bold can be found in the Glossary of Terms in Chapter 8.

CHAPTER 1: UNDERSTANDING DRAINAGE

Home Drainage System

In any City, private and public drainage systems work together to channel and move sanitary and **stormwater** safely away from homes and neighbourhood streets. The private system is the responsibility of residential and commercial property owners. **As of September 1, 2017, the public system is owned and operated by EPCOR Drainage.** Various servicing scenarios exist in the city and each property has unique connection requirements based on the drainage system that is available in the area.

The **Sanitary Sewer Main** deals with all water disposed from inside the home. Water from showers, toilets, sinks, dishwashers, clothes washers, and floor drains is channelled to a pipe under your basement floor. This pipe is connected to a larger sanitary sewer pipe located under the street or the back lane.

The **Storm Sewer Main** deals with roof and surface water that comes from rainfall or snowmelt. Sloped lawns and driveways direct water from the roof and the ground to the street or the back lane, where catch basins are located. The **catch basins** are connected to large underground **stormwater** pipes (See Figure 2 and 3).

Water that seeps through the ground is collected by weeping tile located at the bottom of your home's foundation. **Weeping tile** is either connected to a **sump pump**, which sends excess water up to the surface or to a sewer pipe under your basement floor (See Figure 2 and 3).

Some properties in Edmonton have a separate storm service. In these homes, roof **downspouts** are connected to a stand pipe. This pipe goes into the ground and sends the water to a larger stormwater pipe located under the street or the back lane (See Figure 2).

The following three figures show common service connections at different stages in the City's development.

CHAPTER 1: UNDERSTANDING DRAINAGE (CONT.)

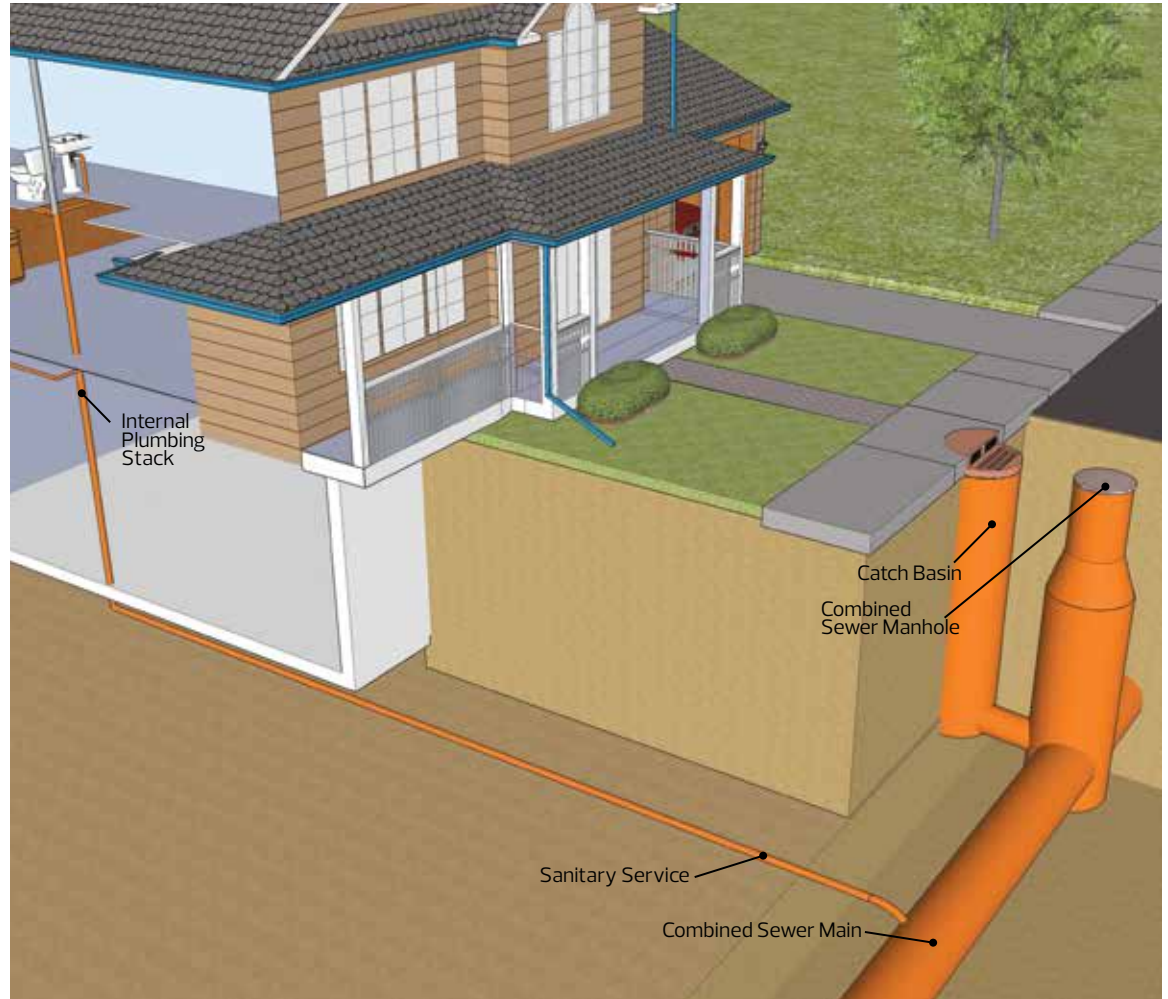


Figure 1: Typical service connection prior to 1960 – Combined Sewer Main

Note: Properties in this era may have weeping tile connection to the sanitary service and to a **Combined Sewer Main**. Downspouts may have been connected to a property's **Sanitary Service** pipe. However, this type of connection has not been allowed in the City of Edmonton since 1988.

Contact EPCOR Infill Water and Sewer Servicing at **780-496-5444** or email wass.drainage@epcor.com for connection requirements.

CHAPTER 1: UNDERSTANDING DRAINAGE (CONT.)

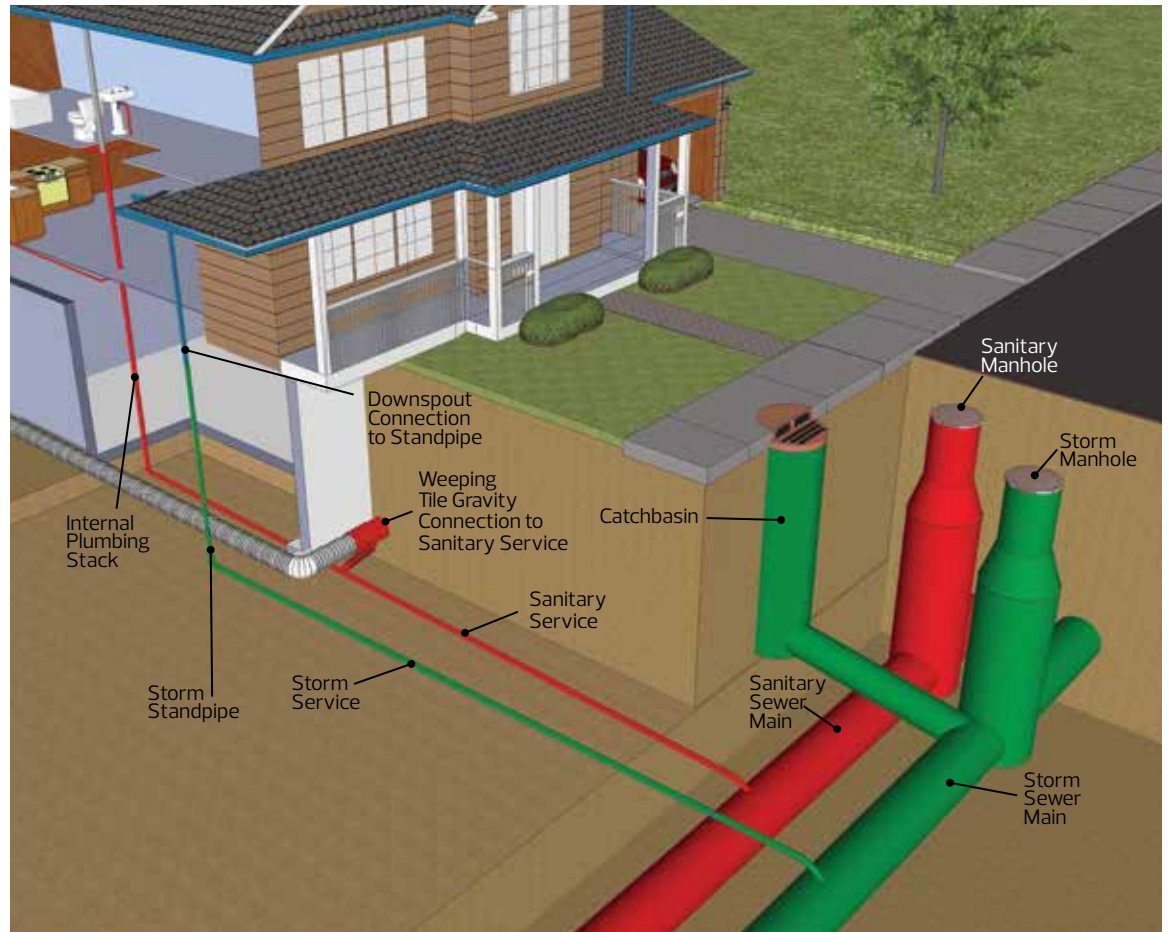


Figure 2: Typical Service Connection Between 1960 – 1988
Separate Storm Sewer Main and Separate Sanitary Sewer Main

Note: Some properties in this era did not have storm services constructed to the property line and roof water may spill to the surface.

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CHAPTER 1: UNDERSTANDING DRAINAGE (CONT.)

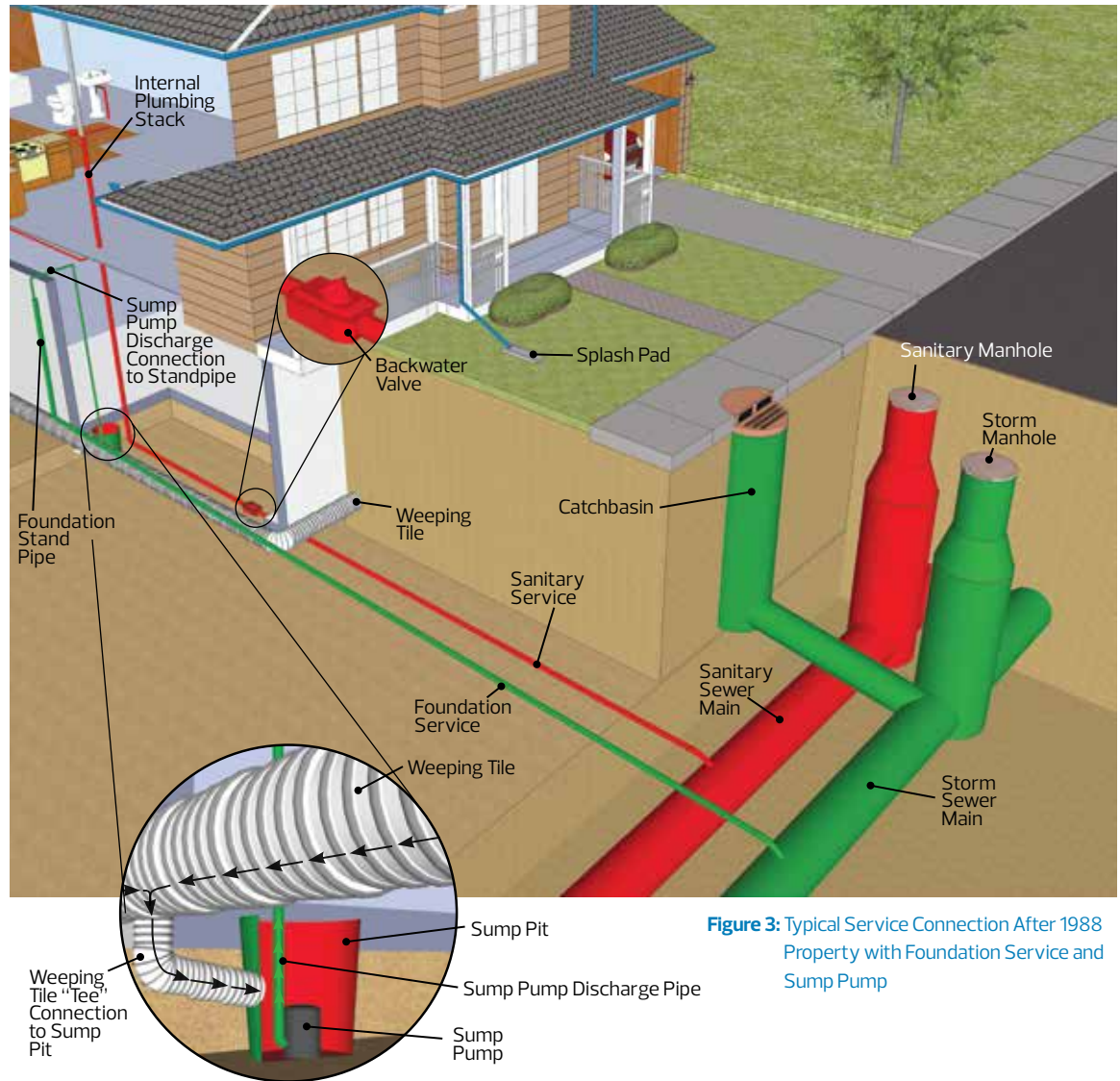


Figure 3: Typical Service Connection After 1988 Property with Foundation Service and Sump Pump

Note: Some properties in this era did not have foundation or storm services constructed to the property line and roof water/sump pump discharge may spill to the surface. In newer neighbourhoods developed after 2006, separate **foundation services** or storm services are provided for every property. These properties must connect the weeping tile discharge to the foundation service or **storm service** provided.

For all properties having a separate storm service, the weeping tile discharge as well as the roof water must drain to the separate storm service.

Contact EPCOR Infill Water and Sewer Servicing at **780-496-5444** or email wass.drainage@epcor.com for connection requirements.

CHAPTER 1: UNDERSTANDING DRAINAGE (CONT.)

Municipal Drainage System

The Municipal (Public) system is owned and operated by EPCOR Drainage as of September 1, 2017. The **sanitary sewer main** collects sewage and “**grey water**” and sends it to either the EPCOR Gold Bar Wastewater Treatment Plant or the Alberta Capital Region Wastewater Treatment Plant for processing. At the plants, the solid waste is removed and the water is cleaned before being released into the North Saskatchewan River.

The **stormwater** system collects rainwater and snowmelt and channels it via pipes or overland routes to **dry ponds, stormwater management lakes**, creeks, ravines, or directly into the North Saskatchewan River. Since about 1980, stormwater management lakes to service new Edmonton neighbourhoods have been mandatory.

A **combined sewer main** exists in Edmonton neighbourhoods built before the 1960s. The **combined sewer main** collects sanitary and stormwater in the same pipe and sends it to the EPCOR Gold Bar Wastewater Treatment Plant for processing.



Stormwater Management Lake



Dry pond



Outfall

CHAPTER 2: WHY HOMES FLOOD

Edmonton gets about 345 millimetres (14 inches) of rain each 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.



During a rainstorm, the pressure on your home drainage and the municipal drainage systems increases dramatically. The condition and capacity of these systems are equally important in managing wet weather. Blocked or broken pipes, poor **lot grading**, excess hail, and other factors can restrict the flow of water, which substantially increases the risk of flooding.

In Edmonton, the municipal **stormwater** drainage system design standard is one in five years, meaning the system can handle any typical rainstorm but could have its capacity exceeded, on average, once every five years. This design standard is based on historical weather patterns. The municipal sanitary system design is based on sewage flows, including an allowance for water that gets into the system during wet weather.

When the volume of stormwater exceeds the municipal system's capacity, surface pooling occurs. Some of this excess water also finds its way into the sanitary system and creates added pressure on sanitary pipes, including those exiting from homes. Since 1988, [Alberta Plumbing Code and Standards](#) and City of Edmonton bylaws have required that each new home have a backwater valve to protect against sewer backup. City of Edmonton bylaws have required that each new home have a **backwater valve** to protect against sewer backup.

Lot grading must have a positive **slope** of 10 to 15 cm (4 to 6 inches) for a minimum distance of 1.5 to 2 metres (5 to 6 feet) away from the home's foundation. Also note that grading near a common property line must not impact abutting lots. Also, **downspout extensions** or **splash pads**, **window wells** (where required), and weeping tile connected to a **sump pit** (in some cases) are recommended.



Water near a foundation.

CHAPTER 2: WHY HOMES FLOOD (CONT.)

Often, homes that flood are missing one or more of these components or the components are found to be in poor working order. The location of a home can also make a difference. For example, homes built in low lying areas or next to lakes have a greater flood risk, as surface and groundwater will naturally drain to these areas. Other flood risk factors include lot elevation, style of home, servicing elevation, surface conditions, and water drainage from neighbouring properties.

Homeowner behaviour during a storm can also increase the risk of flooding. For example, washing clothes, taking a shower, running the dishwasher, and flushing toilets adds water to a system that may already be overloaded. The water may have nowhere to go but up your floor drain and into your basement.

This is particularly true if you have a backwater valve. The valve is designed to close during extreme conditions and keep outside water from getting in. However, when the valve is closed, water from the inside also can't get out.

Many people forget to put their downspout extensions down before it rains. A long downspout extension is of no value when it's propped up against the side of the house. If you have a **sump pump**, double check to see that it is plugged in and the breaker is on during a storm. More than one homeowner has searched for the cause of a flooded basement only to discover the **sump pump** lacked the power to perform.



Flushing a toilet during a storm can increase flood risk



Downspout and grading problem.

CHAPTER 2: WHY HOMES FLOOD (CONT.)

Five Quick, Inexpensive Ways To Get You Started

An assessment of your home drainage system may have pointed out a number of deficiencies. So where do you start? Here are some quick, inexpensive actions you can take that will make a difference in reducing your flood risk.

- 1 **Plug the leaks.** A ladder, silicone, and time are all you need to seal holes or cracks in your eavestroughs, downspouts, downspout extensions, sidewalks, patio, and/or driveway.
- 2 **Repair or replace downspout extensions.** This action might be a matter of simply putting down the extension that's already there or putting back the **splash pad**. Purchasing and installing extensions or splash pads is inexpensive, but very important in getting water away from foundation walls. Do not direct the **downspout extensions** towards a neighbouring property.
- 3 **Clean your eavestroughs and downspouts.** The downspout extensions have little value if leaves and other debris are preventing water from getting down the **downspout**. A gloved hand (or garden spade), ladder, and garden hose are what you need to get the job done.
- 4 **Backfill under steps and decks.** These are often the weak spots in **lot grading**. Dirt and some shovel work is all it takes to fill the depression and get the ground sloping downhill away from the house again.
- 5 **Top up sunken areas around the foundation.** Ground around your basement settles over time. Raising that up with some dirt and shovel work will reestablish a positive **slope** (regrade at little or no cost). Consulting with abutting property owners is very important when regrading between properties.



CHAPTER 3: EAVESTROUGHS AND DOWNSPOUTS

On any property, the first point of defence in dealing effectively with rapid snowmelt or a rainstorm is the **eavestroughs** and **downspouts**. Just 10 mm (0.4 inches) of rain on the roof of an average sized bungalow generates 1,200 litres of runoff. Catching water from the roof and directing it away from the walls of the house are critical factors in keeping your basement dry. Eavestroughs, also known as **rain gutters**, are located directly below the roofline of your home. Eavestroughs catch roof runoff and channel it to downspouts that are normally located at the bottom corners of the roof.

The standard residential eavestrough or downspout is four or five inches wide. They are made of plastic or aluminium, but plastic is more commonly used because it is sturdier and easier to work with. They come in one standard length, but can be easily cut to the desired size. Elbows, end caps, Ts, and straight connectors are all precast so any roof size or shape can be accommodated.

Eavestroughs and downspouts should be cleaned regularly of leaves and debris so water flow is not blocked. Special hard mesh screens can be purchased to sit on top of eavestroughs to prevent leaves and large objects from entering. 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.

Eavestroughs should direct water on a gentle **slope** down towards the downspout. Use a level inside the **eavestrough** to check that the downhill grade is consistent from one end of the eavestrough to the **downspout**. Sometimes a sagging eavestrough can be repositioned to prevent pooling and reestablish the grade. If it cannot be repositioned, replace it.



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.

CHAPTER 3: EAVESTROUGHS AND DOWNSPOUTS (CONT.)

The eavestrough should be replaced if the leak is from a large hole or crack. When replacing an eavestrough or downspout, make sure to seal all connector joints and end caps with silicone.

Downspouts are hollow pipes that take water from the eavestrough and channel it to the ground. Ideally, the downspout should end in an elbow and extension that directs the water 1.5 to 2 metres (5 to 6 feet) away from the house and towards the street or back lane. The extension should be at a 30 degree or more angle in relation to the ground. In Edmonton, it must end at least 15 centimetres (six inches) inside your property line. Ensure the water is not directed onto your neighbour's property. You may be fined for discharging onto another property in a manner that causes nuisance or damage under provisions of the Drainage Bylaw 18093.

Professionals use downspout material for extensions because it is durable and very effective in channelling water away quickly. Leave the extension down all of the time or put it down whenever rain is forecast. An alternative to hard downspout material is a soft plastic extension. This type of extension rolls out when it rains and can be purchased at home improvement stores. Any extension should be checked regularly for leaks and to ensure that it is functioning properly.

Some side yards are too narrow to allow for a long downspout extension. In these cases, splash pads should be used. Standard splash pads are two feet long, are made of concrete or plastic, and slope away from the wall at 10% **slope**. The downspout ends within a few inches of the splash pad, which in turn directs the water away from the foundation of the house.



CHAPTER 3: EAVESTROUGHS AND DOWNSPOUTS (CONT.)

Downspout extensions or **splash pads** should never be removed. They protect you from a number of potential problems. Water along the basement walls of your house can seep through tiny cracks and cause a damp, clammy basement. Left unchecked, this seepage can eventually damage the foundation of your house.



Correct

Water that seeps down your basement walls and into your **weeping tile** can overload the sanitary sewer system, causing a sewer backup. It may create extra work for your sump pump, if you have one, and could cause pump failure under severe conditions.



Incorrect

An Exception to the Rule: *In many older Edmonton homes, roof downspouts are directly connected to an underground separate **Storm Service** pipe. In these cases, disconnecting a roof downspout from the pipe may not have much impact in reducing a flood risk. In fact, it may increase the risk if the lot is not properly graded to drain water away from the home, or it can create drainage issues or complaints from a neighbour. Some newer properties that have a Storm Service available must have the downspouts connected. For servicing information for your property please call EPCOR Water Services Inc., Infill Water and Sewer Servicing at **780-496-5444** or email wass.drainage@epcor.com*

CHAPTER 4: 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 1989, the City of Edmonton has had a bylaw that requires all homes in neighbourhoods to be graded in accordance to an approved **lot grading plan**.



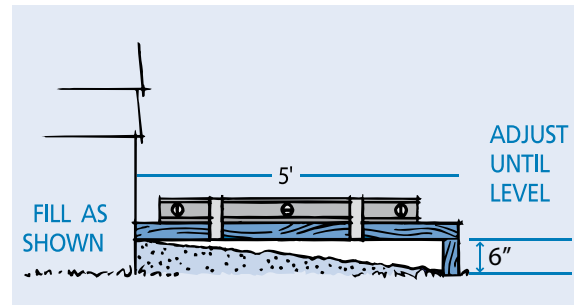
Lot grading starts at your basement wall. Good eavestroughs, downspouts and extensions help make your outdoor drainage system better, but it can't make up for poor **lot grading**. Walk around your home and ensure there is a minimum **slope** from the wall. This includes under stairs, steps, and decks. 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.



To have a proper slope, the soil at your basement wall should be higher than the ground several feet away. You should have a positive slope of 10 to 15 cm (4 to 6 inches) for a minimum distance of 1.5 to 2 metres (5 to 6 feet) away from your home's foundation. Use a slope gauge (see box) to see if the angle of the slope is adequate.

Homemade Slope Gauge

It's easy to make a slope gauge. Cut a 2x4 into one five foot length and one six inch length. Place the shorter piece vertically on end. Place the longer piece horizontally on top. Nail or screw the end of the horizontal piece onto the end of the shorter piece. Tie or place a level on top of the horizontal piece and you are ready to go!



Place the long end of your slope gauge against the basement wall and the shorter end on the ground. The horizontal board should be level. If it is not, add soil at the basement wall until level is achieved.

Once it is level, fill in the space underneath the slope gauge all the 6" way to the end. Use this process as a guide for backfilling all the way around your home. Pack down the soil with a shovel or your foot. Check every 1.5 to 2 metres (5 to 6 feet) with your slope gauge to make sure the angle is still right.

It's important to backfill underneath your stairs, steps, and decks as well. Use the same angle as around the rest of the house, even if the bottom stair or step is less than five feet from the basement wall.

CHAPTER 4: IMPROVING LOT GRADING (CONT.)

Remember: Ground settles over time, particularly near basement walls. You should check your grade every year and add soil where necessary.



Window wells should be used where the bottom of a basement window is at or near ground level. They not only allow for proper grading but they also prevent dirt from rotting window sills. A window 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.

The outer edges of the window well should surround the window and be tight against the basement wall.

Product Focus Window Wells

- + Various widths and heights. Measure your basement window before purchase.
- + Galvanized steel construction.
- + Easy to install.

The bottom of the window well should be at least one foot below the bottom of the window sill. 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 three to six inches below the bottom of the window sill allowing water to easily drain and filter down to the foundation **weeping tile**. The dirt or sod on the outside of the window sill should be graded in the same manner as the remainder of the house.

In some cases, houses may have existing window wells that don't drain properly. In extreme cases, a pipe may have to be inserted that runs directly from the bottom of your window well towards your weeping tile. Seek the advice of a professional before doing such work.

CHAPTER 4: IMPROVING LOT GRADING (CONT.)

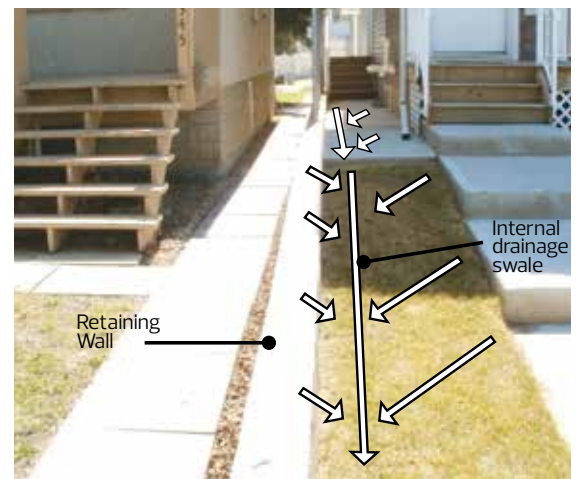
Be Kind to Your Neighbours

The sloping of your lot must follow the same rules as downspout extensions (see Chapter 3). Water should be directed to the back alley or the street and not into your neighbour's yard. This can be tricky when the space between houses is narrow. One solution is for you and your neighbour to create slope down towards a common property line. This creates a common **swale** that can then channel water towards the alley or the street.

Your property may not allow for this solution. (i.e. you may have a retaining wall or high ground at the property line). In such cases, you can create an **internal swale** (a slope from the house and a slope from the high ground meet in the middle of the yard) and channel water towards the alley or the street.

In some cases, a neighbour's property may have approved grading, but be lower than yours. A retaining wall along the property line is a good solution to this problem and can be done in front of an existing fence or other feature you don't want disturbed. The wall allows you to create an **internal swale** that can safely channel water away.

It is always best if neighbours can discuss and resolve **lot grading** issues together. You can also contact a restoration company, professional landscapers, grading companies/contractors, private home inspectors or foundation drainage/repair contractors experts for consultation and professional advice.



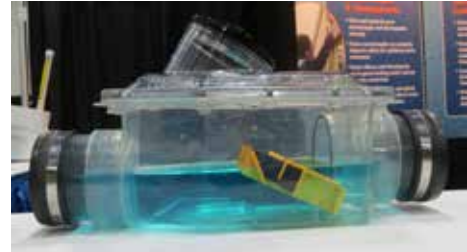
CHAPTER 5: BACKWATER VALVES, WEEPING TILE AND SUMP PUMPS

Flood prevention devices like **backwater valves** and **sump pumps** can be valuable home drainage assets, but not everyone needs one. Consider your entire home drainage system, what type of home you have, where you live, method of servicing, and your flooding history before rushing out to buy and install these devices.

Backwater Valves

A backwater valve sits inside a home's branch or 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 defence and is recommended for all homes that are at risk of flooding.

There are two types of backwater valves. Both work well, but it is important to install the right one. The **sanitary service** line entering a home needs a **vented** backwater valve. Branch lines coming off the main line need a **non-vented** 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.

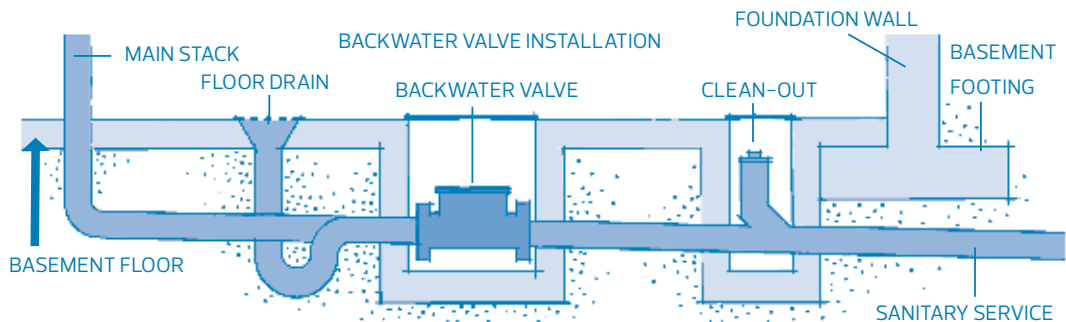


Example of a vented backwater valve

During a storm, sanitary 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.

Remember: When the valve closes the sewer line, you should not use the toilet, sink, shower, washer, dishwasher, or anything else that discharges wastewater. The wastewater will have nowhere to go except up the floor drain and into your basement.

Backwater valves need to be cleaned and maintained to work properly (Chapter 6). Also, 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.



*NOTE: FOR CONCEPTUAL PURPOSES ONLY. MAY VARY WITH EACH HOME.

CHAPTER 5: BACKWATER VALVES, WEeping TILE AND SUMP PUMPS (CONT.)

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 channelled to a **sump pump**, or the sanitary sewer system, the **stormwater** sewer system, depending on the age of the home.



Permits

Adding drainage components like a backwater valve and weeping tile requires a plumbing permit from the City of Edmonton. Call 311 for all permits.

For development prior to 1988, **weeping tile** flows were directed to the **sanitary sewer main** and **combined sewer main**. As of 1988, new development is required to direct weeping tile to the **foundation service** where available.

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.

Sump Pumps

Over 60,000 homes in the Edmonton region may need their sump pumps replaced in the next five years. Yours may be one of them.

The majority of homes built since 1988 have a sump pump. A working pump plays an important part in flood prevention, channelling groundwater out and away from the home. If your home was built after 1988, 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.



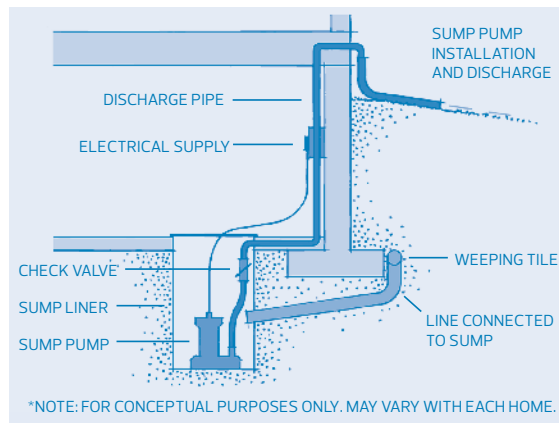
CHAPTER 5: BACKWATER VALVES, WEeping TILE AND SUMP PUMPS (CONT.)

How do you find out whether or not you need to replace your pump? If you need to replace it, what should you look for in a new pump?

Finding and Testing Your Sump Pump

Different manufacturers have different recommendations for testing and maintaining your pump. Some recommend running the pump every two to three months, while others recommend a yearly test. Follow any recommendations provided by the manufacturer. The pump should be located in a shallow pit or **sump** at the lowest point in your basement. Once you've located the pump, you can perform a simple three-step test to ensure the pump is working properly:

- 1 Check to make sure power is running to the pump circuit.
- 2 Pour enough water into the **sump** pit for the pump to begin working.
- 3 Check the outside pipe to ensure that water is flowing from the discharge line outside your home. In some cases, the pump may seem to run but not pump water.



If you test the pump and it is not working properly:

- + Check for debris blocking the suction intake.
- + Listen for strange noises coming from the motor.
- + Check for oil in the sump well (may indicate a failed pump seal).
- + If the activating switch for the pump works on a float, check that the float is not restricted.

Depending on the problems you encounter, you may want to consider getting your sump pump serviced or replaced.

Caution: Maintenance should be done by a qualified technician.

Other Factors

Freezing: If your pump is operating during freezing weather, there is a risk of freezing and line blockage. It is best to disconnect outside hoses prior to winter.



Recycling: If water from your **sump** hose discharges too close to your foundation, the water may recycle and end up back in your system, possibly endangering your foundation.



CHAPTER 5: BACKWATER VALVES, WEeping TILE AND SUMP PUMPS (CONT.)

What to Look for When Replacing Your Sump Pump

There are some basic criteria for choosing a pump: size or capacity, pump type, and horsepower. There are other factors specific to your home that may also influence your choice of pump, such as the volume of water your drainage system has to handle or the amount of grit in the water. In the end, you have to balance your needs with how much you want to pay. You can buy a cheaper pump, but don't expect it to perform as long or as well. A higher quality pump is built from top quality components.

Horsepower (hp)

- + Minimum 1/3 hp recommended.

Size/Capacity/Performance

- + Make sure to size your pump properly to ensure greatest efficiency.
- + Get information on the pump capacity (the amount of water pumped in gallons per minute) and the height and distance the water needs to travel (referred to as "head").
- + To avoid clogging, the pump should be able to pass stones of up to 10 millimetres through the pipes.
- + Pumping head should be a minimum of approximately 10 feet.
- + Discharge line should be 1 1/4 inch pipe.

Pump Type, Back-up Systems and Alarms

- + **Common types: submersible, pedestal, and water-powered.**
- + Submersible is most common.
- + Pedestal type may be better in highly corrosive areas.
- + Water-powered pumps are not as efficient as electric.
- + It is a good idea to have a back-up system (water powered or battery) or an alarm to warn you if your pump fails.
- + Back-up systems: water-powered or battery.

Quality

Pumps are tested against general standards and rated accordingly. Before purchasing a pump, check whether the pump meets CSA standards and displays a "CSA Approved" sticker.

Sump Pit Requirements

If your sump pit is incorrectly sized, it will affect the operation of the pump. The pump is most efficient when it is working at its optimal flow rate, based on the capacity of the pit. The City's building code sets out minimum requirements for sump pit size:

Pit depth: 750 mm

Pit area: 0.25 square meters (0.56 m diameter for circular sumps)

A sump pit cover is required, and should be child-proof.



CHAPTER 5: BACKWATER VALVES, WEEPING TILE AND SUMP PUMPS (CONT.)

Purchasing Checklist

(use to compare models you are considering for purchase)

| FEATURE | MINIMUM REQUIREMENT | MODEL: | MODEL: | MODEL: |
|-----------------------------------------------|-----------------------------------|--------|--------|--------|
| Horsepower (hp) | rated 1/3 hp | | | |
| Pump capacity (gallons per minute) | specific to each home | | | |
| Pump head (sump level to pipe exit from home) | approx. 10 to 12 ft. | | | |
| Solids handling | allows stones up to 10 mm to pass | | | |
| Discharge line size | 1 1/4 inch pipe | | | |
| Check valve | recommended | | | |
| Back-up system / alarm | recommended | | | |
| Warranty | generally 1-2 years | | | |
| Approved by Canadian Standards Association | recommended | | | |

CHAPTER 6: MAINTAINING YOUR HOME DRAINAGE SYSTEM

Regular maintenance of your home drainage system can often be the difference between staying dry or getting flooded. Once a year, it is a good idea to evaluate the condition of your system – inside and out. If you find a problem, make fixing it a priority.

Remember: *Most flooding on private property is caused by the failure of one or more home drainage components.*

This chapter provides a maintenance checklist you should review each year. If you are unsure of what to do, call a professional.

Outside

Eavestroughs and Downspouts

- + Clean leaves and debris from inside the eavestrough and downspouts.
- + Tighten elbows and other connections.
- + Caulk and seal any leaks.
- + Repair or replace sagging, badly dented, or cracked sections.



Poor repair of an eavestrough

Splash Pads and Extensions

- + Reconnect any loose pads or extensions.
- + Replace badly dented extensions.
- + Check soft plastic.
- + Roll out extensions to check for leaks and to ensure they work properly.

Lot Grading

- + Check the **slope** from the basement wall.
- + Check for settling, particularly under stairs and decks.
- + Raise any low spots.
- + Look for cracks or spaces on driveways, sidewalks, and patios that are next to the foundation wall. Caulk or waterproof where needed.



Inside

Foundation Walls

- + Check for moisture along the walls and the floor.
- + Fill and seal any visible cracks.



CHAPTER 6: MAINTAINING YOUR HOME DRAINAGE SYSTEM (CONT.)

Sump Pump

- + Check for power.
- + Test the pump by pouring water into the pump well.
- + Check the outside pipe to confirm water is flowing towards the street or back lane.
- + Check and repair any leaks in the sump pump pipe.
- + Disconnect sump pump discharge hose in winter conditions to avoid freezing in the line.

Backwater Valve

- + Open the top and clean out any debris.
- + Check the flapper. Make sure it is moving freely.

Plumbing Fixtures

- + Maintain proper water levels in traps in floor drains and toilets to minimize odours.

Fats, Oils, and Grease – Store it, don't pour it. (EPCOR)

Pouring fats, oils, and grease (FOG) down your drain can cause significant problems in your home sewer system as the FOG solidifies in your pipes and causes sewer back up. The result can be property damage and considerable expense and inconvenience to you and to the City.

Store your used fats and grease in a disposable container. When it is full, put it in the garbage. Used cooking oil should be cooled and put into a covered plastic bottle, labeled, and put out for garbage collection. If you need to dispose of more than one litre of used cooking oil, take it to an [Eco Station](#).



CHAPTER 7: RESOURCES THAT CAN HELP

There are a number of people and organizations that can help you if you are concerned, or need help with your home drainage system.

The City of Edmonton

311

+ Lot Grading General Information

EPCOR

Water Services Inc., Infill Water Sewer Servicing
780-496-5444

wass.drainage@epcor.com

Call this number for information regarding water and sewer service connection requirements.

Visit www.epcor.com to learn more about EPCOR's programs and strategies for Flooding and Flood Prevention.

EPCOR Drainage, Flood Prevention Home Checkup Program

780-944-7777

floodprevention@epcor.com

www.epcor.com/floodprevention

For information about EPCOR's programs and strategies for Flooding and Flood Prevention: During and After Flooding, Flood Prevention Homeowner Programs and Flood Prevention Homeowner Maintenance.

EPCOR Drainage

www.epcor.com/products-services/drainage

For information on EPCOR Drainage Products and Services: Flood Mitigation, Flooding and Flood Prevention, About Stormwater Facilities, Manhole Cover and Catch Basin Concerns.

EPCOR Drainage and Sewer Trouble

780-412-4500

<https://epcor.com>

Plumbers and Landscapers

If you would like professional help correcting a drainage problem, look to professional plumbers and landscapers for help. Lists of plumbers or landscapers can be found in the Yellow Pages or by contacting the Better Business Bureau of Central and Northern Alberta at 1-800-232-7298 or <https://www.bbb.org/>. The Better Business Bureau can provide you with company reports 24 hours a day. Regardless of whom you contact, it's a good idea to get three estimates and references before choosing a contractor.

Do-it-yourself Resources

If you plan on doing the work yourself, you can get a lot of support and information from hardware, home improvement, and plumbing supply stores. Many of the staff are trade professionals and are usually more than happy to share their knowledge and expertise with you.

Alberta Health Services

780-735-1800

www.albertahealthservices.ca/eph/eph.aspx

Leaky or flooded basements may become a health risk if clean-up is not done quickly and correctly. This environmental health services unit can provide information and advice in response to inquiries about potential health risks.

Environmental Public Health

10055 106 Street

Edmonton, Alberta T5J 2Y2

Telephone: 780-735-1800

(Call for inspector availability)

CHAPTER 8: GLOSSARY OF TERMS

BACKWATER VALVE

A backwater valve is located in a house's sanitary sewer line. The valve closes under pressure, preventing sewage from returning up the line and back into the home.

CATCH BASIN

A catch basin collects stormwater from the street through an open metal grate and channels it to an underground stormwater pipe. Below street level is a trap where sand, gravel, and other material is captured for removal.

COMBINED SEWER MAIN

A combined sewer main collects both stormwater and wastewater in the same pipe. Since about 1960, combined sewers are no longer built in Edmonton.

DOWNSPOUT

A downspout is a length of pipe that is connected to an eavestrough and runs vertically from the roof to the ground.

DOWNSPOUT EXTENSION

A downspout extension is a length of pipe that is connected to the bottom of the downspout and runs at a downward angle away from a building.

DRY POND

A dry pond is a man-made depression created to capture surface runoff during major rains.

EAVESTROUGH

An eavestrough is attached directly below the roofline. It collects stormwater from the roof and channels it to a downspout.

FOUNDATION SERVICE

An underground sewer pipe that connects a private foundation drainage system (weeping tile) to a storm sewer main. This type of service is designed to collect subsurface flows and groundwater only.

GREY WATER

Grey water is the relatively clean waste from baths, sinks, washing machines, and other kitchen appliances.

INTERNAL SWALE

A swale designed to handle surface water entirely within a property.

LOT GRADING

Lot grading is shaping and sloping the land to direct surface drainage away from buildings and towards a City right-of-way (lane or street). The purpose of Lot Grading is to direct surface runoff away from buildings for the benefit of property owners.

LOT GRADING PLANS

Lot grading plans are engineered drainage designs for neighbourhoods specifying design elevations, surface grades, lot types, swale locations, and other drainage related information required for lot grading.

RAIN GUTTER

A rain gutter is another name for eavestrough.

SANITARY SERVICE

An underground sewer pipe that connects a private sanitary drainage system to a sanitary sewer main. This type of service is designed to collect sewage and wastewater.

SANITARY SEWER MAIN

A sanitary sewer main collects sewage and grey water from homes and businesses and directs it to a plant for treatment.

CHAPTER 8: GLOSSARY OF TERMS (CONT.)

SLOPE

A slope is any inclined portion of ground or earth that directs water in a specific direction.

SPLASH PAD

A splash pad is a concrete or plastic channel that can be attached to the side of a building and sits at an angle under a downspout. It channels stormwater from the downspout away from the building.

STORM SERVICE

An underground sewer pipe that connects a private stormwater drainage system to a storm sewer main. This type of service is designed to collect surface and subsurface flows resulting from rainwater and snow melt.

STORM SEWER MAIN

The storm sewer main collects rainwater and snowmelt and channels it via pipes to creeks, ravines, dry ponds, stormwater lakes, wetlands, and the North Saskatchewan River.

STORMWATER

Stormwater means any surface runoff that is the result of natural precipitation.

STORMWATER MANAGEMENT LAKE

A stormwater management lake is a body of water that is designated to collect and contain stormwater from a surrounding area. The lake may be natural or man-made.

SUMP

A basement sump is a pit in the ground under the basement floor that collects excess groundwater from weeping tile or surrounding soil.

SUMP PUMP

A sump pump is a motorized mechanical device that keeps basements dry by pumping excess water from a sump to the surface.

SWALE

A swale is a shallow, sloped channel in the ground that conveys water in a specific direction.

WEEPING TILE

Weeping tile is a perforated pipe that surrounds the foundation of a home and collects excess groundwater. In some homes, this excess water is released to a sump pump, which carries it to the surface.

WINDOW WELL

A window well is a corrugated metal product that surrounds a basement window at or below ground level. Installation allows for proper lot grading around the basement window.