

Principles of Surface Water Management

It is important to have a surface water management plan. Your plan should include:

- Maintaining positive lot drainage.
- Maintaining drainage swales as originally established.
- Ensuring downspout extensions are in the lowered position.
- Ensuring splash pads are placed at downspout and sump pump discharge locations.
- Ensuring the sump pump discharge is positioned to drain away from the home.
- Making certain that the area under decks and stairs is filled with clay and sloped away from the home.
- Properly designing flower beds that are located next to the foundation wall.
- Using caution when watering directly against the foundation wall and when using irrigation systems.

Other References:

- Your local municipality office
- Canada Mortgage and Housing Corporation
- Professional Landscapers



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Surface Water Management

Settlement • Window Wells
Eavestrough & Downspouts
Weeping Tile • Sump System
Lot Grading • Swales
Landscaping



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Surface Water Management

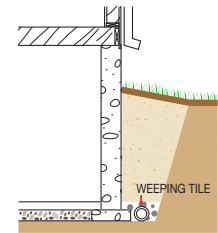
- Uncontrolled water has the ability to cause significant damage to your home beyond the inconvenience caused from a wet basement. Your attention to keeping water away from your home, by maintaining a proper Surface Water Management Plan will prove to be worth your time and effort.
- A proper Surface Water Management Plan assures that surface water (rain water, snow melt or sump discharge) is properly directed away from the home and off your property and does not become subsurface water that can adversely impact your home. The building grade plan for your home defines the approved Surface Water Management Plan for your lot and home.
- It is important to maintain the plan to keep water away from your home.

How Much Water?

- Annually, Alberta receives approximately 14 inches (355 mm) of rain between the months of May to October. On a typical 40' x 110' lot this would produce approximately 31,900 gallons (144,800 litres) of water!
- A 1/4 inch (6 mm) of rainfall onto a typical 40' x 110' lot would produce 571 gallons (2596 litres) of water.
- Annually the 14 inches of rainfall on the roof of a 2000 sq. ft. home would produce over 14,560 gallons (67,200 litres) of water which must be directed away from the foundation of the home.
- A 1/4 inch (6 mm) of rainfall onto the same home would produce 260 gallons (1,200 litres) of water which must be carried away by the downspouts.
- In addition you must consider the annual spring snow melt, plus your lawn and flower bed irrigation. In short, there is a lot of water!

Settlement

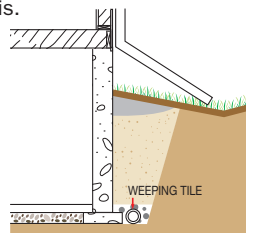
- When the clay backfill material installed around the perimeter of your home settles, it results in the soil sloping toward the foundation, which in turn causes water to drain toward your home, possibly leaking into the basement.
- Typically during construction the excavation for your basement extends 3 to 4 feet past the foundation walls to allow the Builder to install foundation form work and if required install the weeping tile and crushed rock before it is backfilled. The backfill is not as compact as the dense surrounding undisturbed soil which may trap the water in the excavated area next to your foundation.



- It is necessary to properly fill depressions after the soil has settled. Begin by removing the topsoil and filling the depression with compacted clay ensuring it slopes away from the foundation. Then replace the topsoil. Don't fill the settlement with topsoil as topsoil acts like a sponge and holds the water.
- It is the homeowners' responsibility to minimize the amount of water being potentially trapped near the foundation by:

1) Ensuring downspout extensions are down and clear of debris. This moves the roof water over the excavated area.

2) Filling settlement areas with clay (not topsoil) and ensuring a positive slope away from the foundation – 10% is recommend.





Surface Water Management

Window Wells

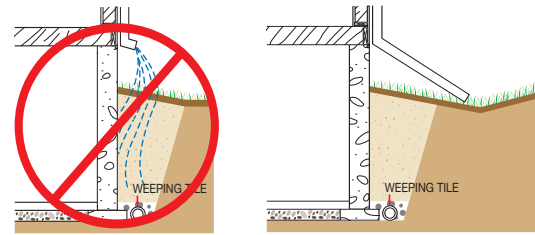
- Window wells are installed to accommodate the designed grade elevation which ensures positive drainage around the home. Positive drainage is the best defense against basement leaks.
- If your home has window wells it is imperative that they be kept free of leaves and other debris which may interfere with the proper flow of water through the drain tile to the weeping tile system.
- Window wells should extend higher than the finished grade level.
- Ensure that the grade around the window well is directing water away from the foundation.

Eavestrough & Downspouts

- The purpose of eavestroughing and downspouts is to channel the flow of water off the roof away from the foundation area and into the designed drainage swales which direct the water off the lot.
- Ensure that the eavestroughs are not clogged with leaves, paper or debris which can cause the eavestrough to overflow into the backfilled area, trapping water next to your foundation.
- If the downspout extension is not positioned to direct the water away from the home, water may collect adjacent to the foundation wall.
- Downspouts are a main source of water and should be positioned to drain into a property line swale or toward the street or back lane not towards the neighbouring home. Downspout extensions should extend beyond the backfilled area (a minimum of 4 feet).
- Keep downspout extensions extended year round. Water allowed to collect in the soil adjacent to foundation walls increases the potential of water

penetration into the basement. In winter when the water freezes, frost heave occurs which will lift decks, driveways and sidewalks and may cause foundation problems.

- Extending the downspout into a drain that is buried in the soil is not recommended (especially perforated drain tile).



Weeping Tile

- Weeping tile installed at the footing is designed to manage [subsurface](#) ground water.
- Not all Municipalities require weeping tile systems to be installed to control the subsurface water. Requirements depend upon soil composition and underground water table.
- Weeping tile is [not](#) designed as a primary defense to control [surface](#) water but it assists with the removal of water at the base of the foundation especially during heavy spring thaws and prolonged rainfalls.
- Weeping tile reduces the hydrostatic forces exerted by water standing against the foundation walls.
- Weeping tile drains to a sump pit, storm sewer or to daylight.

Sump System

- Some new homes constructed today employ a sump system consisting of a sump pump and pit in the basement area to remove water that accumulates under the basement floor slab.

- As part of your regular maintenance program, check to ensure that the sump pump is working.
- If the pump is continuously running, the water being pumped out could be seeping back down against the foundation wall again, and it is being re-circulated by the pump. Ensure that there is proper surface grade at the sump discharge directing water away from the foundation area.

- Installing a discharge hose during spring and summer months will move the water collected in your sump pit further away from your home.

Lot Grading

- Generally in residential construction, your Builder Member is responsible for bringing the lot to the required rough grade elevation. This meets developer requirements in accordance with an approved plot or grade plan. The plot or grade plan details the [surface water drainage patterns](#) and swales.
- In certain municipalities there is a requirement to obtain an approved lot grading certificate. This verifies that the proper grading elevations and drainage patterns have been established. The final grade should be 6" below all wood surfaces.
- Your final topsoil application should not exceed depths of 4 to 6 inches.

Swales

- Swales are shallow depressions in the rough grade that are designed to direct surface water runoff away from the home.
- Swale drainage should be directed to the nearest street, lane, or storm water management lake not to your neighbor's yard or to the backfilled areas.
- Each lot must conform and drain its own surface water. Lot to lot drainage is not permitted.
- Swales are usually located along the side property lines and occasionally at the rear of the lot.
- Depending on the general slope of the lot, additional drainage swales may be required.

- The slope of a swale must be maintained to ensure water movement away from your foundation in conformance of the overall design.
- Ensure the swale slopes. Alteration of the swale could cause flooding of your lot increasing the potential of water damage to your home.

Landscaping

- Final landscaping must maintain the total surface water management plan.
- In the process of final landscaping [do not](#) alter the rough grade of the property.
- Typically, the rough grade is designed to allow for approximately 4 inches (100 mm) of topsoil and sod.
- Maintaining the functionality of the swale as designed is a necessity.
- It is not recommended to place flowerbeds immediately adjacent to the foundation as watering can overload the drainage system. Careful placement should be considered if flowerbeds are placed next to the foundation wall. Attention must be given to ensure that there is a 1 foot (300 mm) clay cap (layer) directing water away from the foundation.
- Watering flower beds must be done with caution so as to minimize the hydrostatic load next to your foundation.
- Careful attention is required in the design, installation and maintenance of your irrigation system.
- The clay cap and flower bed must slope away from the foundation wall to ensure positive water drainage.
- Maintain the surface drainage patterns yearly by filling depressions and settlement as they occur. (Refer to details described under the settlement section of this brochure.)