



**SURFACE WATER MANAGEMENT**

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## 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. That's enough to fill approximately 638 average-sized bathtubs!

A 1/4 inch (six mm) of rainfall on a typical 40' x 110' lot produces 571 gallons (2,596 litres) of water.

**A 1/4 inch (six mm) of rainfall on the roof of a 2,000 square foot home creates 260 gallons (1,200 litres) of water.**

In addition to the rain, you must consider the annual spring snow melt and the water used to maintain your lawn and flowerbeds. That's a lot of water to manage.

## SETTLEMENT

Low spots must be filled after the soil has settled. To fill a low spot, remove the topsoil and fill the low spot with compacted clay, ensuring it slopes away from the foundation. Do not use topsoil to fill a low spot. Once filled with clay, topsoil can be added again.

**When clay backfill installed around the perimeter of your home settles, the soil can slope towards the foundation and allow water to drain towards your home. This can cause leakage into the basement.**

During construction, the excavation for your basement typically extends three to four-feet past the foundation walls so the builder can install foundation form work and, if required, weeping tile and crushed rock before it is backfilled. Because the backfill is less compact than the undisturbed soil surrounding the foundation, water is easily trapped in the excavated area next to your foundation.

Homeowners can minimize the amount of water trapped near the foundation by:

- Ensuring downspout extensions are clear of debris
- Filling settlement areas with clay (not topsoil) with a positive slope away from the foundation (10 per cent is recommended).

## WINDOW WELLS

**Window wells must be kept free of leaves and other debris to ensure water can flow through the drain tile to the weeping tile system.**

Window wells should be installed in accordance with the Alberta Building Code. **The top of the window well should be a minimum of two inches (50 mm) above finished grade** and should not be more than six inches (150 mm), at the upper level, from finished grade.

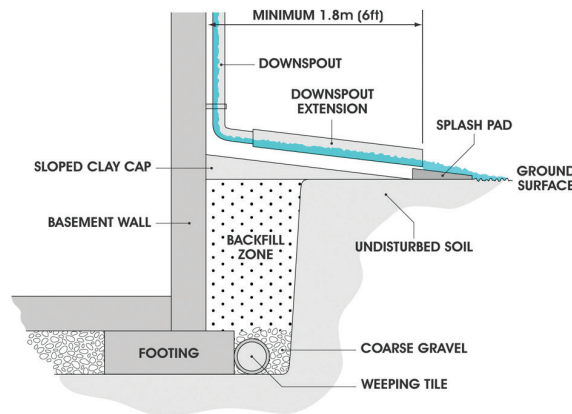
## EAVESTROUGH & DOWNSPOUTS

Eavestroughs and downspouts channel water off the roof and away from the foundation into designed drainage swales. These swales direct water off the lot.

**Eavestroughs clogged with debris can cause the water to overflow and become trapped next to your foundation.**

If a downspout extension does not direct water away from the foundation, water may collect adjacent to the foundation wall. Downspouts should be positioned to drain into a property line swale or toward the street or back lane. They should not be directed towards a neighbouring home. Downspout extensions should extend beyond the backfilled area (a minimum of four feet).

**Downspout extensions should be used year round. Water that collects in the soil adjacent to foundation walls increases the potential for water penetration into the basement.** When this water freezes, frost heave can occur and potentially lift decks, driveways and sidewalks. Frost heaves can also cause foundation problems. Extending the downspout into a drain buried in the soil is not recommended.



## WEEPING TILE

**Weeping tile installed at the footing is designed to manage subsurface ground water.** Some municipalities do not require the installation of weeping tile systems. Requirements depend on soil composition and the underground water table.

**Weeping tile is NOT a primary defense to control surface water.** Rather, 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 pressure exerted by water standing against the foundation walls and drains water to a sump or storm sewer.**

## SUMP SYSTEM

**Sump systems (sump pump and pit in the basement area) remove water that accumulates under the basement slab.**

As part of your maintenance program, ensure the sump pump is working.

If the sump pump runs continuously, it's possible the water being pumped out is seeping back down against the foundation wall and is simply being recirculated. To avoid this, ensure there is proper surface grade to direct water away from the foundation.

**Installing a discharge hose will also move the water collected in your sump pit farther away from your home.**

## LOT GRADING

In residential construction, a builder is generally responsible for bringing a lot to the required rough grade elevation outlined in the approved grading plan. This plan details the surface water drainage patterns and swales required for the lot.

Some municipalities require an approved lot grading certificate. This certificate verifies that proper grading elevations and drainage patterns have been established.

**The final grade (topsoil) should not exceed depths of four inches (or as required by the local lot grading bylaw). The final grade should be six inches below all wood surfaces.**

## SWALES

**Swales are shallow depressions in the rough grade 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 backfilled areas or a neighbour's yard.

Each lot must conform to the approved grading plan for directing surface water to municipal streets or swales. Lot-to-lot drainage is generally not permitted.

**Swales are usually located along 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 the foundation. Swale alteration could cause flooding.

## LANDSCAPING

Landscaping must maintain the Surface Water Management plan. **In the process of final landscaping, DO NOT alter the rough grade of the property. Maintaining the function of the swale is a necessity.**

The rough grade design typically allows for approximately four inches of topsoil and sod.

**Ideally, flowerbeds should not be placed immediately adjacent to the foundation. Watering may overload the drainage system.** Flowerbeds must be designed carefully if placed next to the foundation wall.

Prior to filling a flowerbed with soil, a clay cap (one-foot minimum) that slopes away from the foundation must be installed to ensure positive drainage away from the foundation.

Use caution when watering flowerbeds near the foundation to minimize water pressure next to the foundation.

**Careful attention is required in the design, installation and maintenance of your irrigation system. For example:**

- Sprinkler heads should not direct water against the foundation or cladding
- Sprinkler heads should not be placed within the backfill area near the foundation
- Rain sensors can be added to avoid overwatering
- Connections to the system should be secure
- The system should be serviced regularly to avoid damage to piping (e.g. splits from freezing).

You can maintain surface drainage patterns annually by filling depressions and settlement as they occur. (See Settlement section of brochure for more details).

## OTHER REFERENCES:

Your local municipality office

Canada Mortgage and Housing Corporation



## SURFACE WATER MANAGEMENT

CALGARY | 301, 30 Springborough Blvd SW Calgary, AB T3H 0N9  
EDMONTON | 204, 10464 Mayfield Road NW Edmonton, AB T5P 4P4

1 800 352 8240 | [anhwp.com](http://anhwp.com)