

# Storm Water and Groundwater Basement Drainage Causes and Solutions

## Basement Moisture Sources

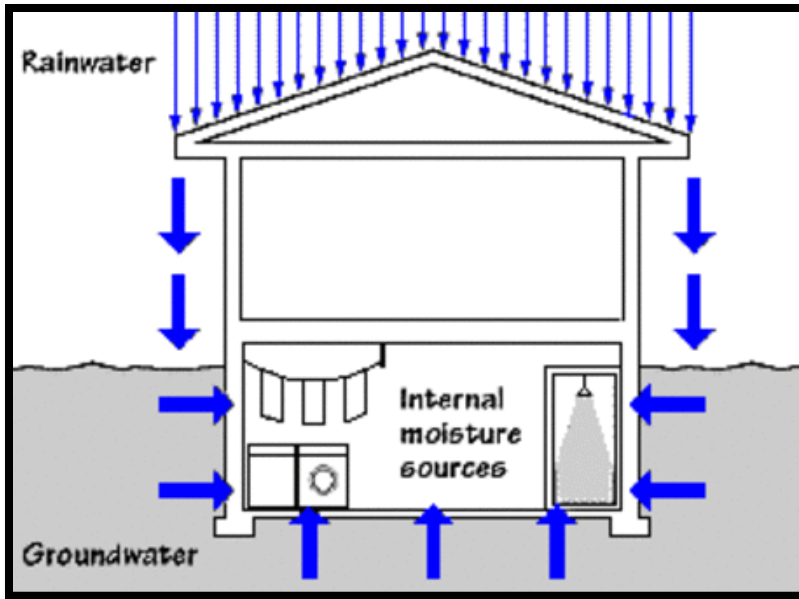


Image from UMN Extension

## Rain and groundwater

In a 1-inch rain, 935 gallons of water fall on the roof of a 1,500-square-foot house. This water can flow into the basement without proper grading, gutters and downspouts to shed the water away from the house. Also, the water table can also rise due to flooding or seasonal wet weather conditions. Drain tile systems are recommended around basement walls, even in sandy or gravel soils, to gather any water that does come toward the basement, capture it and transport it away from the house.

## Typical causes of basement moisture problems and solutions

### Inadequate grading

**Problem:** ground around the house is flat or sloping toward the house

**Solution:** add soil around the house to slope the ground away. Recommended sloping is 1 inch per foot for at least 6 feet.

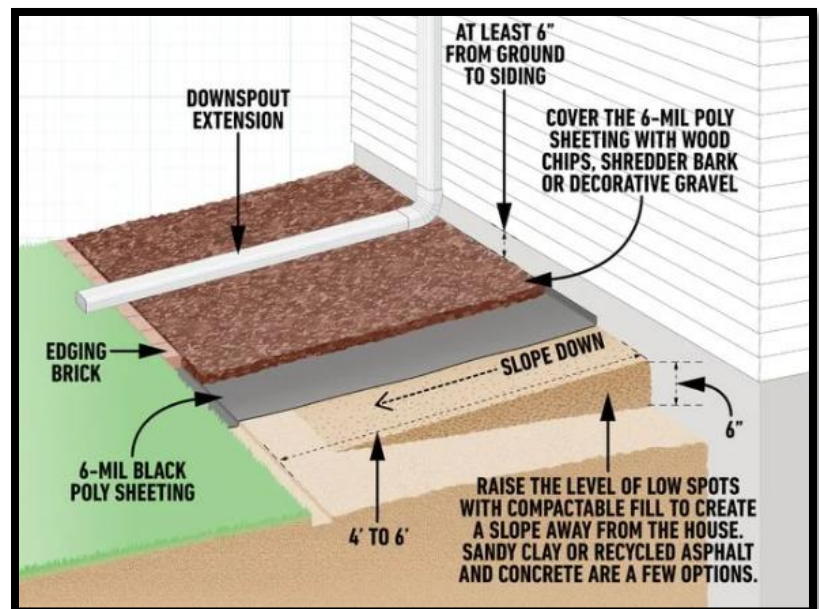


Image from Family Handyman

## Defective or missing gutters and downspouts

**Problem:** gutters without a downspout could be worse than no gutters at all as large volumes of water are being collected and deposited directly at the ground below the eave.

**Solution:** having enough downspouts (1 per 50 lf of roof eave and having a discharge 4+ feet from the wall will make sure that the downspouts are conveying all the water safely away from the basement.



Image from Hershey Exteriors



Image from Quality Seamless Gutters

## Improperly Designed Window Wells

**Problem:** Window wells can act like a drain directly next to the basement wall especially if they are not build to direct water away from the wall.

**Solution:** well-draining coarse aggregate should be installed below the window well and connected to the gravel surrounding the basement footing. Also, supplementing that with a drain tile extension will make sure water gets collected and directed away from the basement.

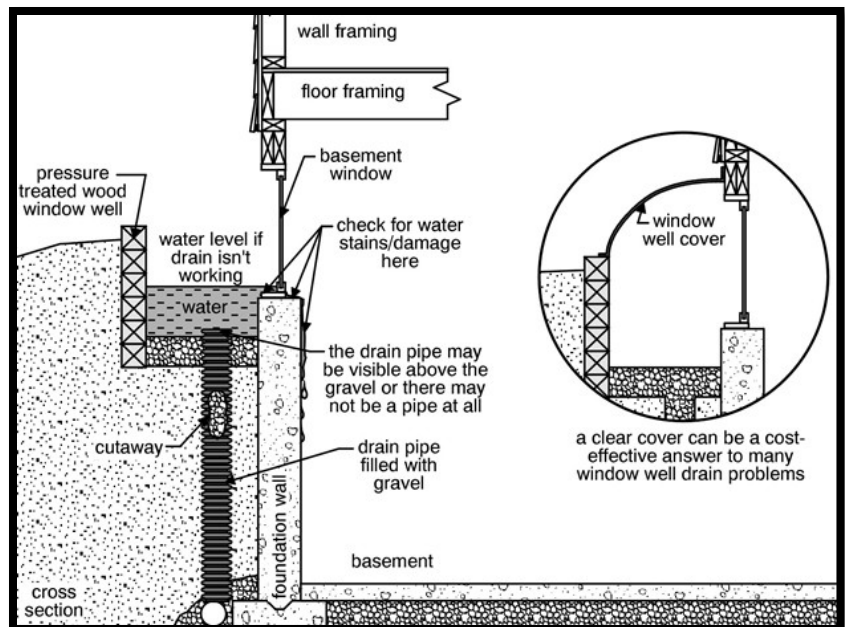
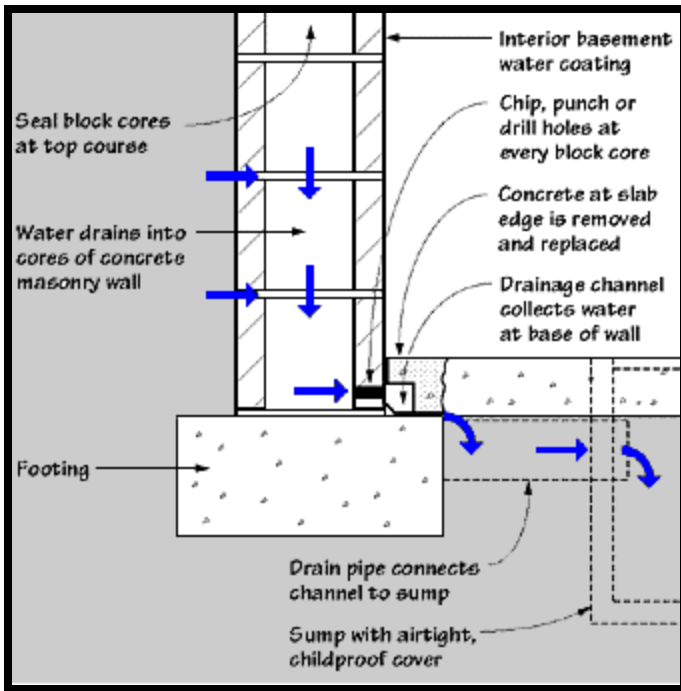


Image from InterNACHI Forum

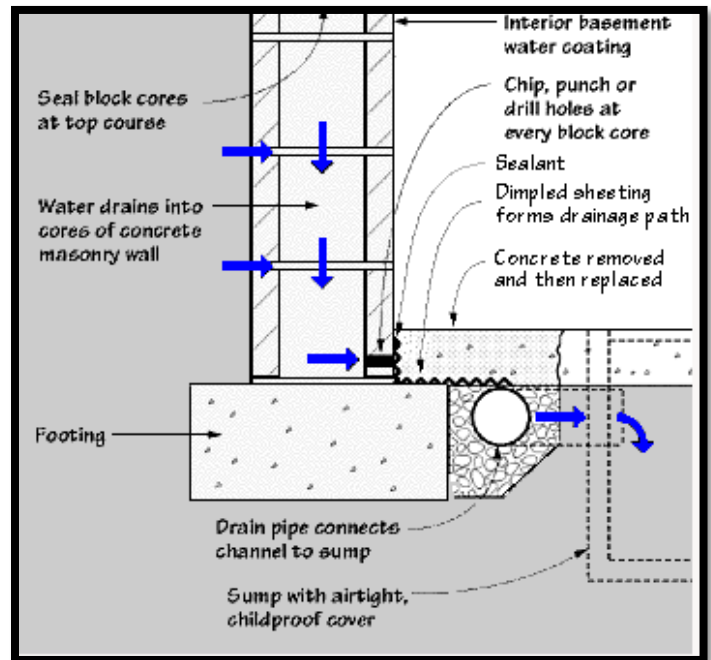
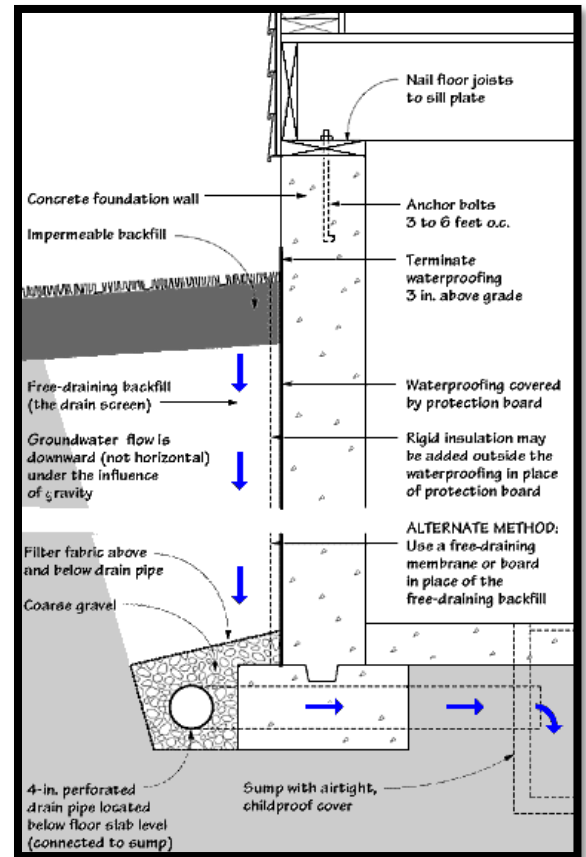
## Ineffective (or non-existent) drain tile and sump pumps

**Problem:** many homes don't have drain tile or sump pumps. In other cases the drain tile may have collapsed or become plugged with fine particles. Sump pumps and sump pump switches can fail causing water to accumulate.

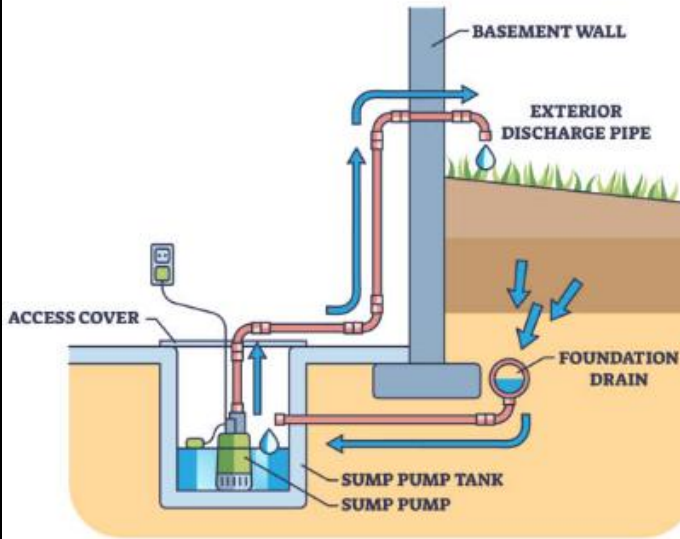
**Solution:** Installing drain tile and sump pump with an active monitoring system will be the most effective and assured method to control and manage water around the basement walls. They can be installed on the exterior or interior of the basement.



Images from UMN Extension



# SUMP PUMP

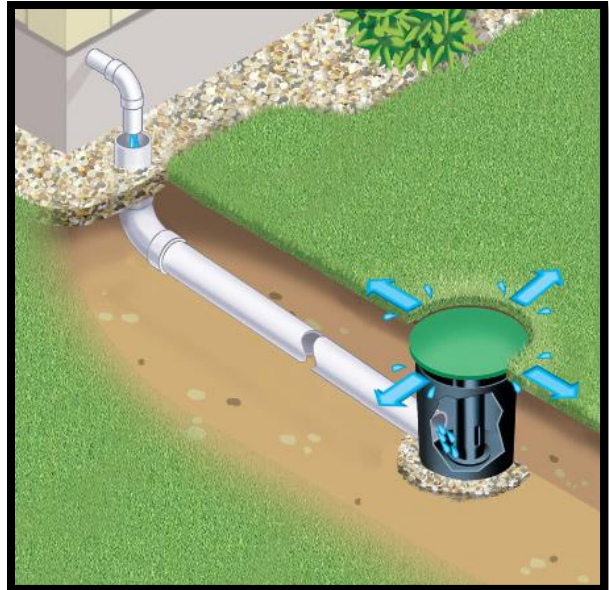
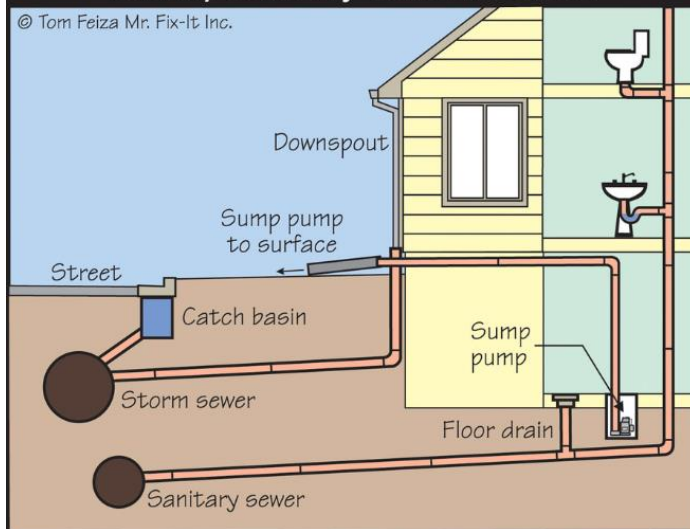


Sump pump discharges should be air gapped once they are outside of the basement walls, but then piping can be directed above ground or below ground to a convenient location away from the house. This could be the curb and gutter of the street, or connect to a catch basin in the roadway, storm lateral piping connected to municipal storm sewer, or in some cases back to the lawn to infiltrate. **Caution - since storm sewer systems are prone to surcharging due to heavy downpours, directly connecting piping without air gaps can be dangerous as water could surcharge from street flooding and storm sewer flooding back to your basement.**

*Image from istockphoto*

## Storm / Sanitary Sewer in Street

© Tom Feiza Mr. Fix-It Inc.



*Image from US waterproofing*



**It is recommended you discuss your particular situation with a qualified professional. Further questions can be directed to the City of Wisconsin Rapids' Engineering Department at [engineering@wirapids.org](mailto:engineering@wirapids.org) or 715-421-8205.**