

Public Works Department News

“BE THE WATER”

Part I

(Editor’s Note: This is Part I of a two-part series that looks at drainage issues.)

Drainage is an incredibly important facet of construction. Builders can be so immersed in the structural needs of their projects, that the specific drainage needs receive inadequate attention. If drainage needs are not addressed properly at the building stage, they are extremely difficult and expensive to fix later on. Sometimes, there is no reasonable way to resolve these construction-related drainage problems, causing endless frustration for the property owners, their neighbors, and their elected representatives.

To effectively address drainage, builders need to “be the water” and imagine, for each construction site, where the water comes from and where it goes. It is important to know the original, natural conditions of a site and how those conditions are modified by construction. Remember the saying “it’s not nice to fool with Mother Nature?” Here’s a new one: “it’s not smart to fool with approved grading plans”. Every independent construction project changes Mother Nature’s design – a design that took millennia to evolve. Grading plans are reviewed to help insure that the drainage changes proposed for one construction project will not flood someone else; that cumulative changes still follow Mother Nature’s grand drainage plan. After a grading plan is approved, in-field modifications can upset this delicate balance – sometimes in disastrous ways.

Water Issues

In Rochester, ground water issues are as common as surface water issues. It can be difficult to identify what water source is the root cause of a site condition or drainage problem. Here are the common situations seen in our geologic setting:

Groundwater

- Water table elevations vary dramatically with time – a site that would have a dry basement during a climactic drought period can have a perennial wet basement when the dry period reverses. The water table maximums can be identified for each site by studying the soils and historic water level records.
- Springs and seeps are locations where groundwater comes to the surface. Like ground water tables, their location and volume can change with the climate and with seasons. Groundwater discharges can’t be stopped, but they can be shifted from one site to another. This should never be attempted without knowing the consequences to other property owners.

Groundwater fed wetlands, known as fens, are protected by state law and cannot be drained, filled, replaced, or destroyed. Besides preserving the land the fen is on, the amount of water supplying the fen must be sustained. There must also be a way for the water to leave the fen and recharge our underground water supplies.

Surface Water

- Rain and snow melt must have a place to go. If the surface water cannot soak directly into the ground, it will travel across the land in order to reach streams and rivers. Ravines and drainage ways are natural storm water conveyance paths. Just like storm sewers, they have limited conveyance capacity. As vegetation is removed and hard surfaces like buildings, roads, and sidewalks are added, the amount and rate of runoff increases and the amount of pollution changes. Approved drainage designs address water quality, quantity, and conveyance. Surface water fed wetlands should also be protected, but state law allows alteration or loss under certain conditions if they are replaced at a higher ratio. The extent of surface water wetlands can also change with the climate, so never underestimate the size of the potentially wet areas.
- Natural waterways, whether wet or dry, have floodplains that must be allowed to fill with water during flood events. Constructing in floodplains is only allowed when certain conditions have been met. Even then, there is always a risk of future flood damage when constructing in floodplains.

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