

## **RUNOFF POTENTIAL**

### **Runoff Potential**

In general, the amount of runoff generated from a particular property for a given amount of precipitation is largely based on the amount of impervious surface on that property - more impervious surface means more runoff. To a smaller degree, even pervious surfaces will contribute some runoff. Therefore, the runoff potential for a particular property is determined by both the amount of impervious area and pervious area. The impervious area is equated to the total area of the parcel minus the measured pervious area on that parcel. Runoff potential (RP) is measured in square feet, using the following formula:

$$RP = 0.15 \times [Total\ Area - Impervious\ Area] + 0.9 \times [Impervious\ Area]$$

### **Runoff Coefficients**

All surfaces will generate some amount of runoff during precipitation events, and can be assigned a runoff coefficient to represent the fraction of the precipitation that results in runoff. The Runoff Potential formula uses different runoff coefficients for the impervious area and pervious area to create a “weighted average” for that parcel. The runoff coefficient used for impervious surfaces is 0.9, which generally means that 90% of the precipitation on that surface will result in runoff. The runoff coefficient used for pervious surfaces is 0.15, which generally means that 15% of the precipitation on that surface will result in runoff.

### **Impervious Area**

An impervious area can be defined as a surface area that is resistant to permeation by surface water. Because precipitation cannot be absorbed by the impervious surface, runoff will be generated that must be managed by the sewer system. For the purpose of this apportionment, the following surfaces are considered to be impervious:

- Pavements – including sidewalks, private roads, parking lots, and patios made from concrete, asphalt, brick pavers and stone materials.
- Buildings
- Athletic courts and tracks
- Gravel (or dirt) driveways and parking areas used by vehicles
- Decks covered by a roof or having an impervious underlying surface (including plastic sheeting)

The Southeast Michigan Council of Governments (SEMCOG) conducted an aerial survey of the region in 2010 that was analyzed to determine the building footprints and impervious surface areas. The resulting data sets were provided to each community, and the building footprint and impervious surface area data sets were used to measure the impervious area for the properties in the City.

### **Pervious Area**

A pervious area will allow an amount of surface runoff to percolate into the soil naturally, to the extent possible based on the type of soil and degree of saturation. Note that large portions of the City have naturally occurring clayey (or loamy) soils near the surface that do not allow high rates of infiltration, so even undeveloped properties will generate some runoff for moderate amounts of rainfall. For the purpose of this apportionment, the following surfaces are considered to be pervious:

- Grass
- Gardens
- Landscape areas without impervious underlying membrane
- Open-slatted decks over an otherwise pervious surface
- Gravel (or dirt) paths used by pedestrians only
- Swimming pools (but not the paved surfaces around the pool)
- Pavers set in porous material specifically designed to be pervious
- Porous pavements specifically designed to be pervious