

## Agenda Item # 4c

### Treated Impervious Surfaces (TIS) Summary Sheet

NR 115 allows for and Wis. Stats. 59.692 requires that a county establish impervious surface (IS) limits in shorelands and exclude impervious surfaces where stormwater best management practices (BMPs) are applied. These are often referred to as “treated impervious surfaces (TIS).”

Waukesha Co. proposes that specific standards be established in order to ensure that: 1.) proposed TIS be excluded from the IS coverage calculations, 2.) stormwater BMPs are constructed properly, and 3.) stormwater BMPs are properly maintained over time.

#### Stormwater Terms

**“Infiltration” (or infiltrate)** means the entry of precipitation or runoff into or through the soil.

**“Pervious surface”** means an area that releases as runoff a small portion of the precipitation that falls on it. Lawns, gardens, parks, forests and similar vegetated areas are examples of surfaces that typically are pervious.

**“Runoff”** means water from rain, snow or ice melt that moves over the land surface via sheet or channelized flow, and is also referred to as “stormwater”.

**“Stormwater”** has the same meaning as the term “runoff”.

**“Stormwater BMP”** means a structural best management practice that is designed to collect or manage the quantity or quality of stormwater for an indefinite time period, following adopted County or State technical standards. Some examples include, but are not limited to: pervious pavement, rain garden, infiltration trench or basin, green roof, bio-swale, filter strip, constructed wetland, bio-retention basin, wet detention basin, or any combination of these or other permanent stormwater management practices approved by the County.

### **Treated impervious surfaces exclusion standards**

#### **NR 115.05(1)(e)3m:**

A county may exclude from the IS calculation, any impervious surface where the property owner can show that runoff from the impervious surface is treated by devices such as stormwater ponds, constructed wetlands, infiltration basins, rain gardens, bio-swales, or other engineered systems, or that the runoff discharges to internally drained pervious area that retains the runoff on the parcel to allow infiltration into the soil.

#### **Wis. Stats 59.692(1k)5:**

A county shall not establish standards for impervious surfaces unless the standards provide that a surface is considered pervious if the runoff from the surface is treated by a device or system, or is discharged to an internally drained pervious area, that retains the runoff on or off the parcel to allow infiltration into the soil.

### **Proposed County performance standard**

The first ½ inch of runoff from the area of impervious surface to be excluded from the calculation must either infiltrate or be treated according to the above general standards.

The calculation of the runoff volume is simply the area of the IS to be excluded multiplied by the runoff depth (1/2 inch or 0.04 ft.). For example:

$$(1,000 \text{ sq. ft.})(0.04 \text{ ft.}) = 40 \text{ cubic feet}$$

The stormwater infiltration or treatment system shall comply with an adopted County or State post-construction stormwater management technical standard or guidance document.

### **Proposed County exclusion standard**

The County may exclude an impervious surface from the IS calculation provided the property owner can demonstrate that one or more of the following general standards apply, and that all applicable stormwater BMP technical standards are met:

1. One half inch of runoff from the impervious surface is treated by a stormwater BMP\* (defined); or
2. One half inch of runoff from the surface is discharged to an internally drained pervious area that retains the runoff on or off the parcel to allow infiltration into the soil.

### **Proposed County permitting standard**

A County Stormwater Permit shall be issued and all technical standards of the County Stormwater Management & Erosion Control Ordinance be met. This will include application materials, financial assurance, and recorded maintenance agreement.

\*The type of stormwater BMP proposed will determine whether a qualified professional needs to be hired to complete the work.



## First ½ Inch Stormwater Standard

### *Waukesha County Shoreland & Floodland Protection Ordinance*

Research shows that as impervious surfaces increase in the watershed of a lake or stream, water quality generally declines. Impervious surface limitations in shoreland zones aim to prevent this by requiring mitigation or treatment of runoff from new development that exceed the impervious surface standards. Research also shows that the first ½ inch of runoff from impervious surfaces generally carries the majority of associated pollutants.

For larger development sites, local stormwater codes generally require compliance with a series of stormwater performance standards related to peak flows, total suspended solids, runoff volumes and other related discharge standards. To demonstrate compliance, developers usually obtain the services of a professional engineer to conduct complex hydrologic modeling using tools such as SLAMM or a TR-55-based program, and to prepare detailed site grading plans. All of this is a time-consuming and expensive process.

For smaller sites, such as those usually associated with shoreland areas, hydrologic modeling is not necessary if the landowner simply infiltrates or treats the first ½ inch of runoff. A Waukesha County analysis of this method shows it will result in *exceedance* of the following stormwater discharge standards on most sites:

- Capture 80% of the total suspended solids (i.e. sediment/water quality standard);
- Infiltrate 90% of the predevelopment runoff volume (i.e. runoff volume standard).

The first ½ inch of runoff from the area of impervious surface to be excluded from the calculation must either infiltrate or be treated through a stormwater best management practice (BMP) following applicable State or County technical standards.

### Volume Calculation

The calculation of the runoff volume to treat or infiltrate is simply the area of the impervious surface (IS) to be excluded multiplied by the runoff depth (1/2 inch or 0.04 ft.). For example:

$$(1,000 \text{ sq. ft. IS}) \times (0.04 \text{ ft. runoff depth}) = 40 \text{ cubic feet (total volume to infiltrate/treat)}$$

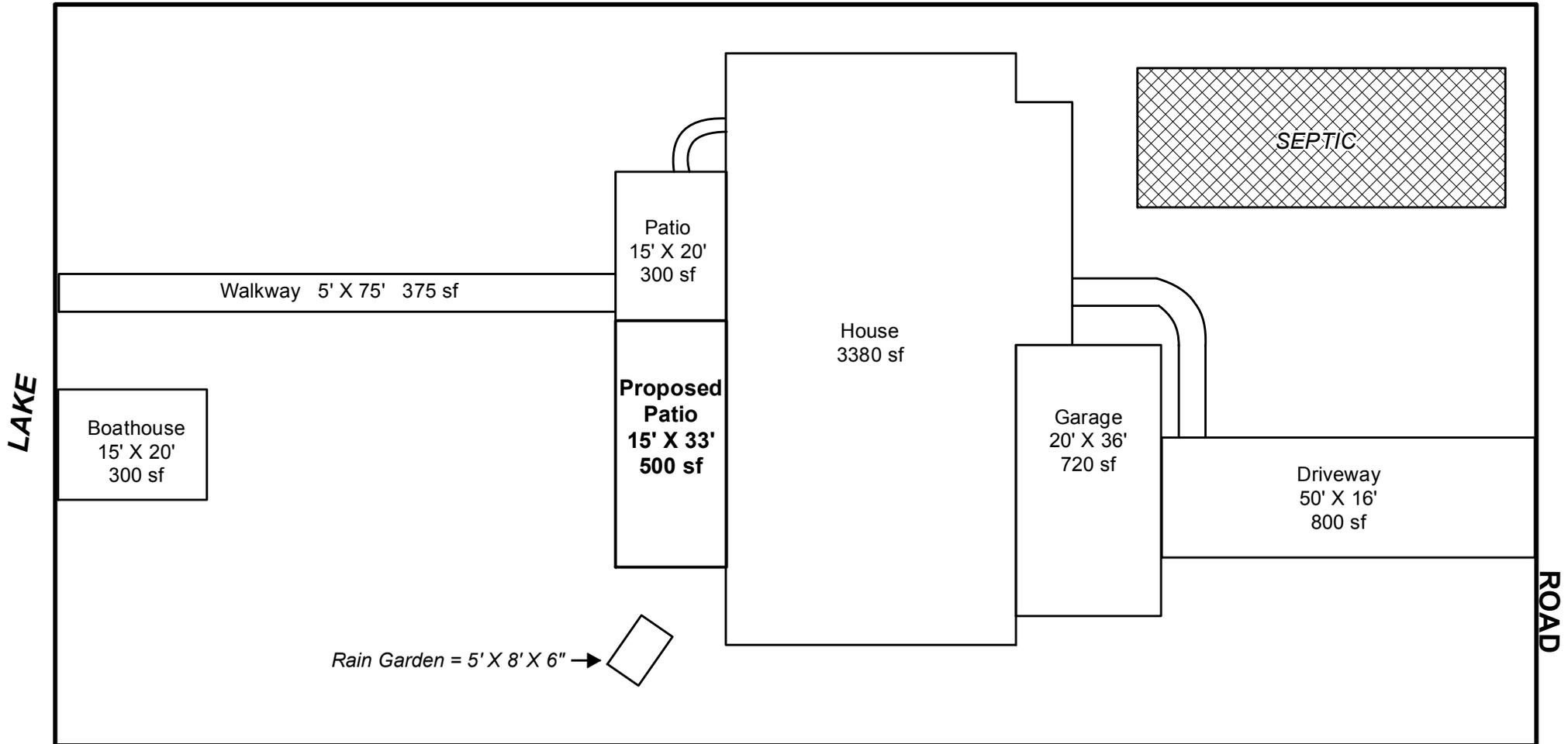
The stormwater infiltration or treatment system must be designed and built to comply with adopted County or State post-construction stormwater management BMP technical standards.

# SAMPLE LAKE LOT

200' X 100' = 20,000 sf

6000 sf of existing impervious surfaces (w/o proposed patio) = 30% IS coverage

1 inch = 20 feet



## Impervious Surface ("IS") Calculation

6,000 sf (existing IS) + 500 sf (proposed IS) = 6,500 sf

6,500 sf (existing & proposed IS) / 20,000 sf (lot size) X 100 = 32.5% (IS coverage)

The applicant must treat or mitigate 2.5% of the IS coverage assuming 30% is allowed by right.

## IS Treatment -- Rain Garden Sizing Calculation to Infiltrate the First 1/2" of Runoff from the Proposed Patio

Target Infiltration Volume = 500 sf X .04 feet (same as .5 inch) = 19.8 cubic feet

Rain Garden Size (assume 6 inches deep) = 5 feet wide X 8 feet long X .5 feet deep = 20 cubic feet