# Subject: Percent Impervious Cover Misused - CodeNEXT

**By Joseph Reynolds**

Commissioner,

Let me try again to convey how Staff is misusing “Percentage of Impervious Cover” when discussing localized flooding and CodeNEXT.

As I explained in previous documents, it is not the percentage of impervious cover that matters; it is the configuration, the shape and elevation of the surfaces, which is important. I’ll try to better illustrate that.

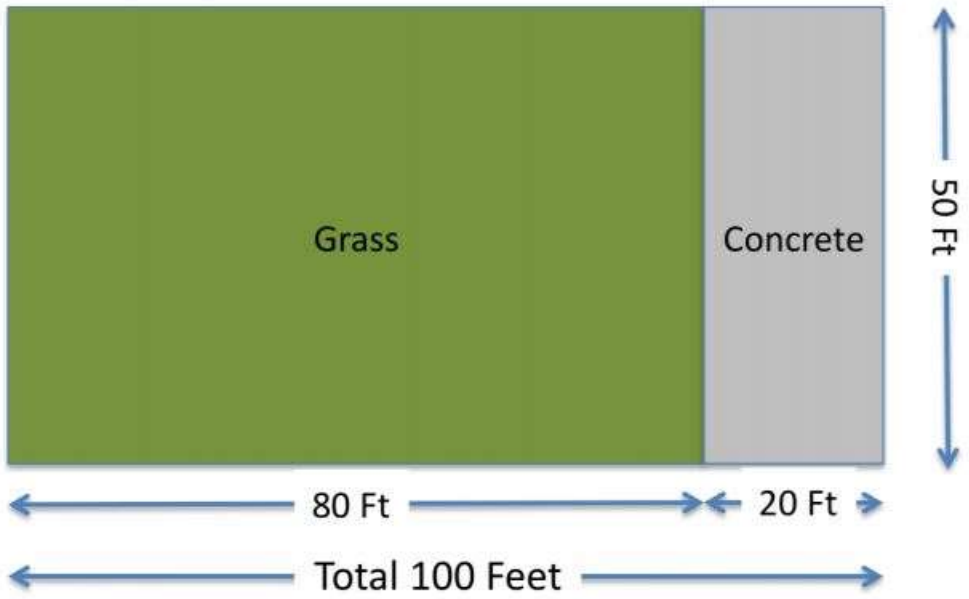
As I previously explained, because of the turbulence generated by water flowing fast past grass stems, the water is slowed as it flows across a lawn because energy is taken from the flow by the turbulence. Water is stored in the lawn until the rain stops. As a familiar example of the turbulence I mentioned wire whisks in the kitchen.

I explained that the time water takes to flow across a tract is important, because slowing water draining into a stream helps prevent flooding. Increasing the time between when rain falls and when it drains into a creek slows the charging of the stream, and if downstream flow is faster than the charge rate there can’t be flooding.

Areas of grass that are wider require a longer distance rain must travel, and thus a longer time for it to get to an impervious surface leading to the creek. Trips of longer distance take longer time to complete. The more time rain is held in grass, the slower the creek is charged.

So, let’s examine a series of similar tracts of land, all with only 20% impervious cover, and consider how each change of geometry, affects flooding.

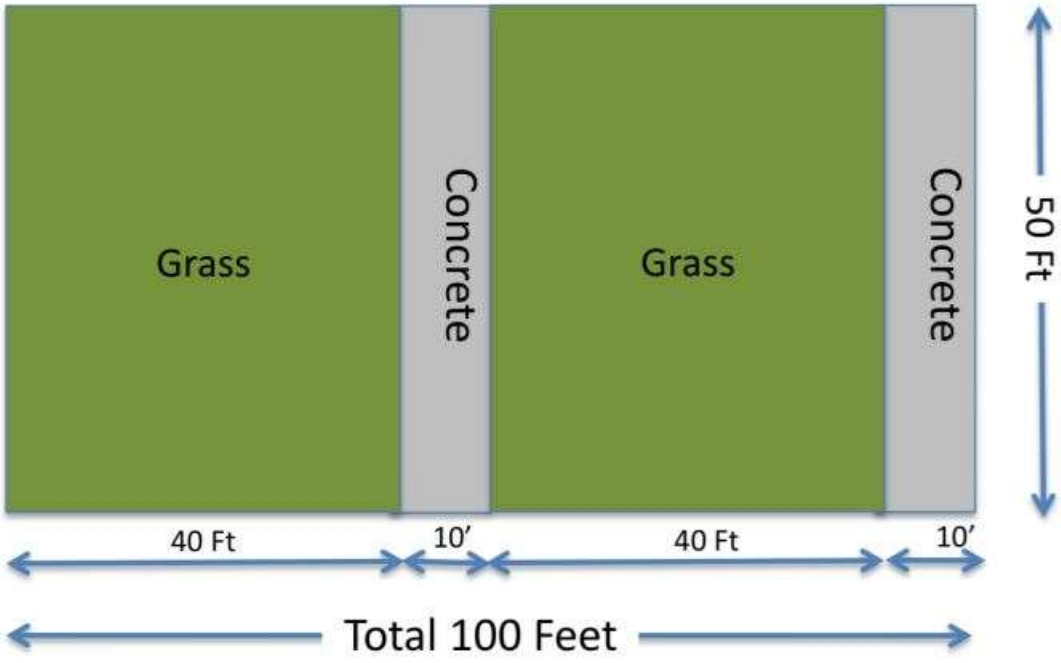
We’ll start with something similar to an Allandale Lot when the 45% Impervious Cover limit was enacted, lots of yard and a little concrete- only 20% impervious cover




This is a lot 100ft wide and 50ft deep. No exactly an Allandale lot, but good enough for an example. In this first case there is a grass area 80ft x 50ft and a 20ft x 50ft concrete strip – like a big front yard with a driveway. So, 80ft + 20ft = 100ft. And 20ft of concrete divided by 100ft total width = 20% concrete.

Rain falling on the grass could drain downward or toward the concrete driveway. If we think of some water starting in the middle of the yard it could run downward 25ft [to the street?] or sideways 40ft to the driveway.

But, what if the lot was split? Just duplicated with the dimensions of the strips half as wide.

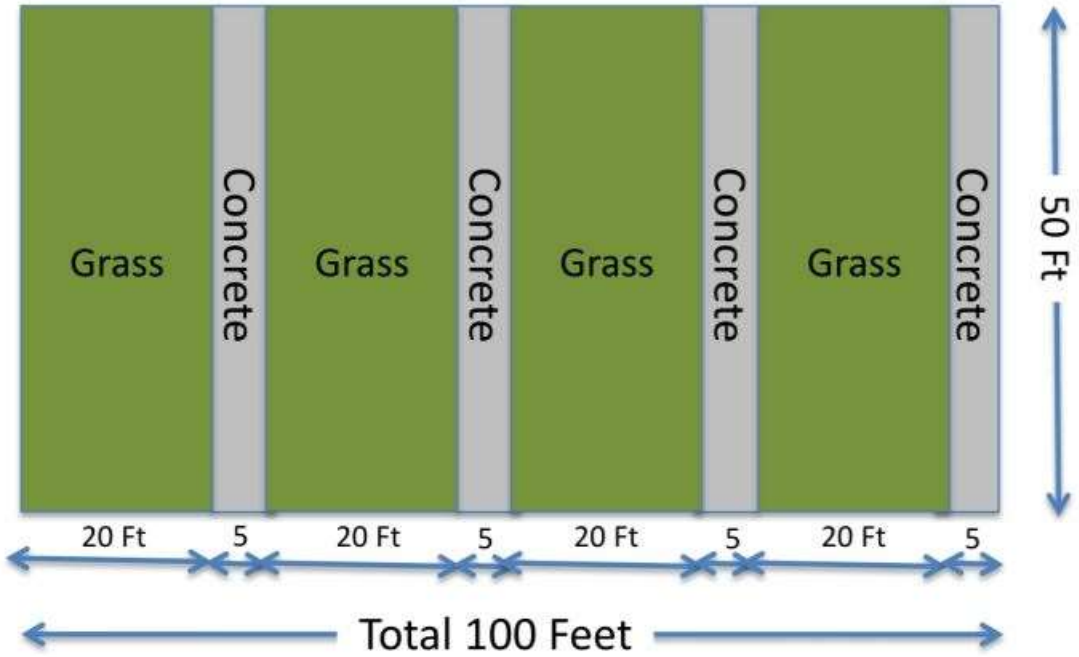


We still have just 20% concrete. The percentage of impervious cover hasn't changed. But, starting in the middle of the grass area the distances have changed. Now the water can get to concrete by flowing only 20ft to the driveway. Less distance to travel, less time to concrete, faster to the creek.

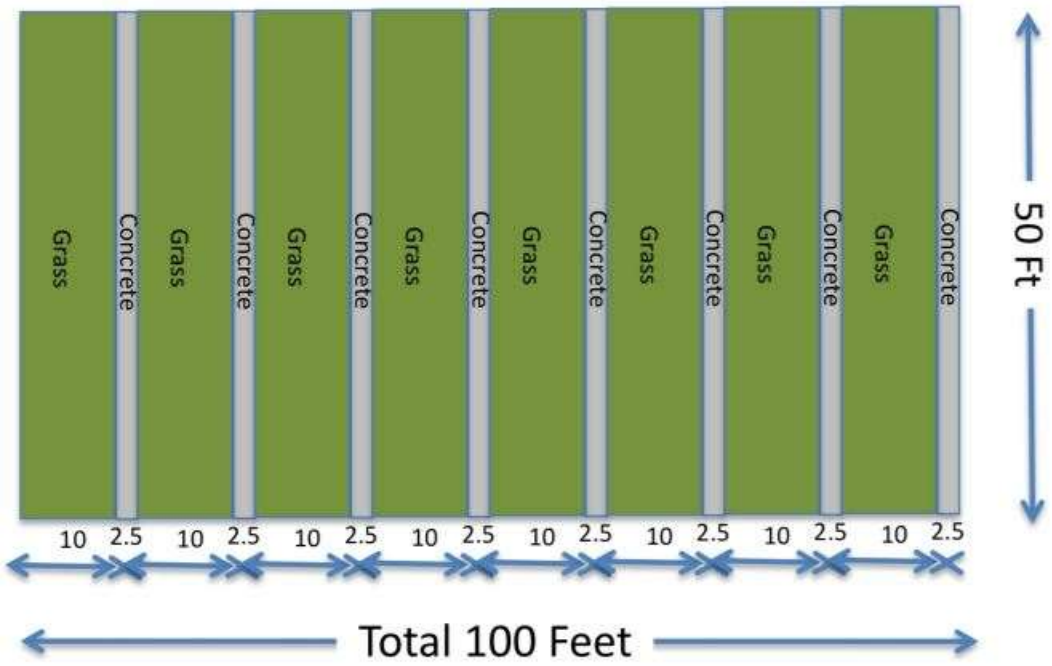
Ok, what if we go for smaller lots again; as before splitting everything in half.

Now we're into townhouse conditions. Each sub-lot is 25ft wide, with a 5ft paved strip to drag the garbage to the street.

The rain falling into the middle of the grass must now only flow 10ft to get to a fast track to the creek. At each stage in the example the time to start filling the storm drains drops by a factor of two. There's the same amount of grass and concrete. The water flows at the same rate in the lawn; the grass effect is the same, but the time is half. The percent Impervious Cover hasn't changed. The geometry has changed. CodeNext encourages these types of small lots and does nothing to manage the holding time of the yards.




Hey, we can do this again.




Now we have something like a bungalow. And, some grass with a sidewalk. Now the rain must only flow 5ft to get to a drain. The percentages aren't changed by making the lot shallower, say a 15ft instead of a 50ft or 25ft setback. That leaves almost no retention volume, and the percentage impervious cover hasn't changed.

This is a major problem when you consider flooding. Get it fixed. Stop the "handwave".