



Filter Media Bed Size Calculations

1. Calculating Effective Area

$$AN = (Rv \times AP) + (Rv \times AL)$$

AN = Effective Area
Rv = Runoff Coefficient
AP = Pervious Area
AL = Impervious Area

2. Calculating Water Quality Volume

$$WQv = P \times An$$

WQv = Water Quality Volume
P = Depth of Rainfall to Treat
An = Effective Area

3. Calculating Surface Area of FocalPoint Biofiltration Bed

$$Af = WQv / [n(df) + H + (k*tf)]$$

Af = Surface Area of Bio retention bed
WQv = Water Quality Treatment Volume (cu.ft)
df = Planting Soil Bed Depth (ft)
k = Coefficient of Permeability of Soil Bed (ft / day)
H = Average Height of Water Above Bioretention bed (ft)
tf = Time Required For Water Quality Treatment
Volume to Filter through the Planting Soil Bed (Days)
n=Filter Media Porosity

Assume you have a 1 acre site, 50% of the site is impervious with a runoff coefficient of .95 and 50% of the site is landscaped with a runoff coefficient of .10. We will be utilizing a FocalPoint Biofiltration System to treat the first inch of rainfall. Our design will require 18" of media plus 6" of bridging stone and the system will be allowed to pond 12" before bypassing the system. The calculation would be as follows:

1. Calculating Effective Area $AN = (Rv \times AP) + (Rv \times AL)$

$$\begin{aligned} AN &= (21,780 \times .95) + (21,780 \times .10) \\ AN &= 20,691 + 2,178 \\ AN &= 22,869 \text{ SF} \end{aligned}$$

2. Calculating Water Quality Volume $WQv = P \times AN$

$$\begin{aligned} WQv &= .0833 \times 22,869 \\ WQv &= 1,905 \text{ CF} \end{aligned}$$

3. Calculating Surface Area of FocalPoint Biofiltration Bed $Af = WQv / [n(df) + H + (k*tf)]$

$$\begin{aligned} Af &= 1905 / [.4(2) + 1 + (200 \times .25)] \\ Af &= 36.8 \text{ SF of FocalPoint Biofiltration System} \end{aligned}$$