Calculation for Tree Box

Project Name:_____
Date Submitted:_____
Property Address:_____
MSD Reviewer:_____
WM No._____
Development/Property Name:_____
GMP Number:_____
Design Firm:_____
Design Engineer:_____Telephone:_____Email:_____
KY PE No.:_____

Step A. Site Planning Recommendation

Define goals and primary function of Tree Boxes based on the Tree Box fact sheet in section 18.4.7. Refer to this section as needed throughout the remainder of this calculation sheet.

Note: Steps B and C provide options for sizing of tree boxes.

Step B. Calculate the Water Quality Volume Required (VR) of water to be removed by Tree Boxes

1. A = Contributing drainage area to tree boxes: _____ ft^2
2. RE = Required Water Quality Volume Rain Event in inches (minimum 0.6 in): _____ inches
3. I = Impervious cover of the contribution drainage area in percent: _____ %
4. VR = (1/12)(RE)(A)(0.05+(0.009)(I))= _____ ft^3

Step C. Determine minimum surface area of Tree Box

1. VR = required water quality volume: _____ ft^3
2. h = average height of water above the tree box bed during RE: _____ ft
3. d = depth of tree box: _____ ft
4. P = porosity of the soil mix in the tree box (% void): 40 %
5. A = Surface area of the ponding area of the tree box=(VR)/[(d)(P)+h] _____ ft^2

Step D. Calculate the Water Quality Volume Provided (VP), or storage capacity of Tree Boxes

1. A = Area of tree box: _____ ft^2
2. p = porosity of media (% void): 40 %
3. M = depth of media _____ ft
4. h = average height of water above the media during the RE rain event _____ ft
5. VP = (A)[(p)(M) + h] _____ ft^3

Note: This is a general formula, refer to manufacturer's guidelines.

Step E. Prepare exhibits A and B for long-term maintenance and operation agreement.

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