

Calculation for Planter Storage Capacity

Project Name: _____
 Date Submitted: _____
 Property Address: _____
 Development/Property Name: _____
 GMP Number: _____
 Design Firm: _____
 Design Engineer: _____ Telephone: _____ Email: _____
 KY PE No.: _____

MSD Reviewer: _____
 WM No. _____

Step A. Site Planning Recommendation

Define goals and primary function of planters based on the Planters Step by Step Design Procedures beginning on page 18.5.12-5 and Table 18.5.12-A. Refer to this section as needed throughout the remainder of this calculation sheet.

Step B. Determine the Required Water Quality Volume Rain Event, RE_{WQV} in inches (Refer to Chapter 18.3; A minimum depth of 0.6 inches must be used):

_____ inches

Step C. Calculate the Required Water Quality Volume (WQV Required) of water to be removed by the Planters

1. A = Contributing drainage area to planters: _____ ft^2
2. RE_{WQV} = Required WQ_V Rain Event in inches: _____ inches
3. I = Impervious cover of the contribution drainage area in percent: _____ %
 - a. $R_v = 0.05 + 0.009 (I) =$ _____
4. WQ_V Required = $(A/12)(RE_{WQV})(R_v) =$ _____ ft^3

Step D. Determine minimum surface area of planters

1. Refer to table 18.5.2-A
2. WQ_V = required water quality volume: _____ ft^3
3. h = average height of water above the amended/in situ soils during WQ_V rain event _____ ft
4. d = depth of any amended soils _____ ft
5. P = porosity of any amended soils (% void): _____ 40 %
6. A = Surface area of the ponding area of the Planters = $(WQ_V) / [(d)(P) + h]$ _____ ft^2

Step E. Calculate the Provided Water Quality Volume (WQ_V Provided), or storage capacity of Planters

1. N = number of planters _____
2. W = width of planters _____ ft
3. L = length of planters _____ ft
4. A_1 = Area = $W \times L$ _____ ft^2
5. φ = porosity of media (% void): _____ 40 %
6. M = depth of amended soils _____ ft
7. P = ponding depth of water _____ ft
8. WQ_V Provided = $(A)(N)[\varphi(M) + P]$ _____ ft^3

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Step F. Compare the minimum calculated surface area of the planters to the input area of planters

1. Is the area in step E.4 greater than the minimum surface area calculated in step D.6? _____

Step G. Determine the Managed Water Quality Volume (MWQ_V)

1. Determine the GMP Management Capacity of the planters in percent (Refer to table 18.3-C for percent). Please attach model printouts or other documentation to verify retention times as required by Table 18.3-C. _____ %

2. $MWQ_V = (1/100)(\text{GMP Management Capacity in percent})(WQ_V \text{ Provided}) =$ _____ ft³

3. Is all of the WQ_V Required managed or treated (i.e. is MWQ_V greater than or equal to WQ_V Required)? _____

If No, adjust WQ_V Provided parameters to allow for greater storage capacity and/or proceed to Step H.

If Yes, proceed to step J.

Step H. Calculate the Required Remaining Water Quality Volume (RWQ_V)

1. $\text{Required RWQ}_V = 2(WQ_V \text{ Required} - MWQ_V) =$ _____ ft³

Step I. Select Alternate GMPs to Treat RWQ_V. Examples may include:

Check all that apply. Include additional calculation sheets as necessary.

- Green Wet Basin
- Green Dry Basin
- Catch Basin Inserts
- Proprietary Water Quality Units
- Other

1. How much additional WQ_V is removed by the Alternate GMPs? _____ ft³

2. Does the Alternate GMP remove all the Required RWQV? _____

3. If Yes, proceed to step J.

If No, alter existing GMPs or add new ones to provide adequate storage.

Step J. Complete O&M documentation.

Additional Calculations and Explanation (Required if design deviates from calculation sheet):
