Calculation for Infiltration Drain 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 infiltration practice based on the Infiltration Practice Step by Step Design Procedures beginning on page 18.5.20-8 as well as Table 18.5.20-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 Infiltration Practice

1. A = Contributing drainage area to infiltration practice: _____ 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 Infiltration Practice

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 infiltration drain during WQ_V rain event _____ ft
4. d=depth of infiltration drain _____ ft
5. P=porosity of media (% void): 40 %
6. A=Surface area of the ponding area of the infiltration drain=(WQv)/[(d)(P)+h] _____ ft^2

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

1. PD=Volume of Pretreatment Device (Optional, see Table 18.5.20-A for design of pretreatment device) _____ ft^3
2. A = Area of infiltration drain: _____ ft^2
3. φ = porosity of media (% void): 40 %
4. M = depth of infiltration drain _____ ft
5. P = ponding depth of water _____ ft
6. WQ_V Provided = $(A)[\varphi(M) + P]+PD$ _____ ft^3

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

1. Is the area in step E.2 greater than or equal to the minimum surface area in step D.6? _____

Calculation for Infiltration Drain Storage Capacity

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

1. Determine the management capacity of the infiltration practice in percent (Refer to Table 18.3-C for percent) _____ %
2. MWQ_V = (1/100)(GMP Management Capacity in percent)(WQ_V Provided) = _____ ft^3
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 using a GMP with less runoff capacity).

   If Yes, proceed to step J.

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

1. Required RWQ_V = 2(WQ_V Required - MWQ_V) = _____ ft^3

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? _____ ft^3
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):

_____
_____
_____
_____