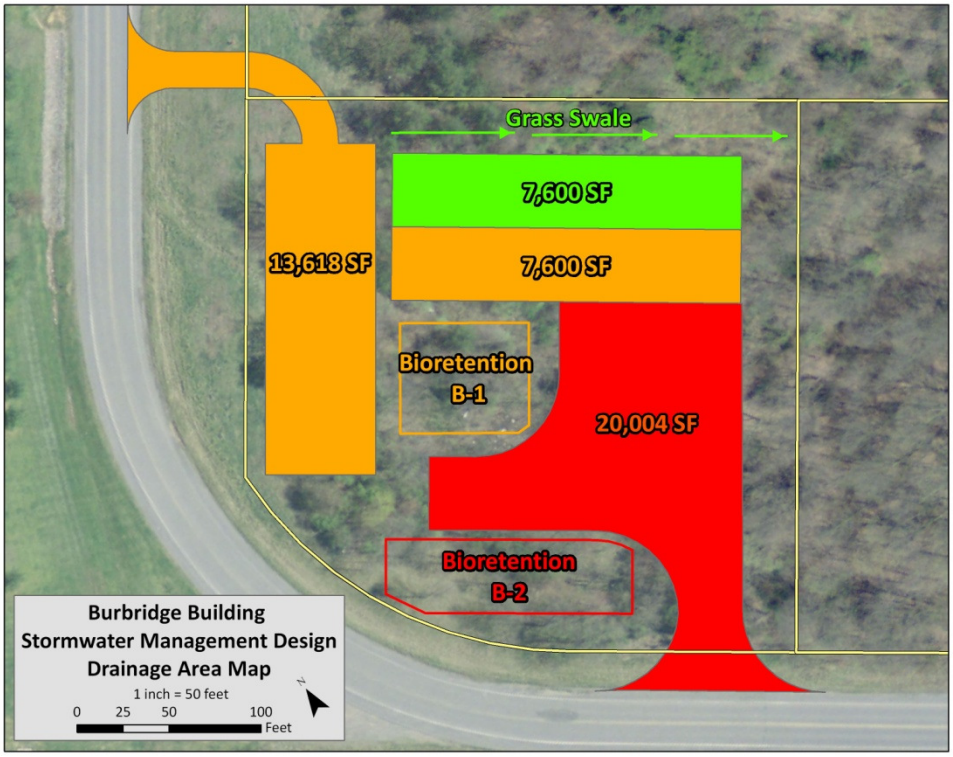
Design Example: **Allegany County Burbridge Building**

15,200 sf Industrial Building

2 Loading docks w/ truck entrance and turnaround and Employee Parking



Step 1: Determine Target Rainfall P_E for entire site w/in limits of disturbance:

For this project, DA = Drainage Area = Site Area = Limits of Disturbance Area = 2.0 acres

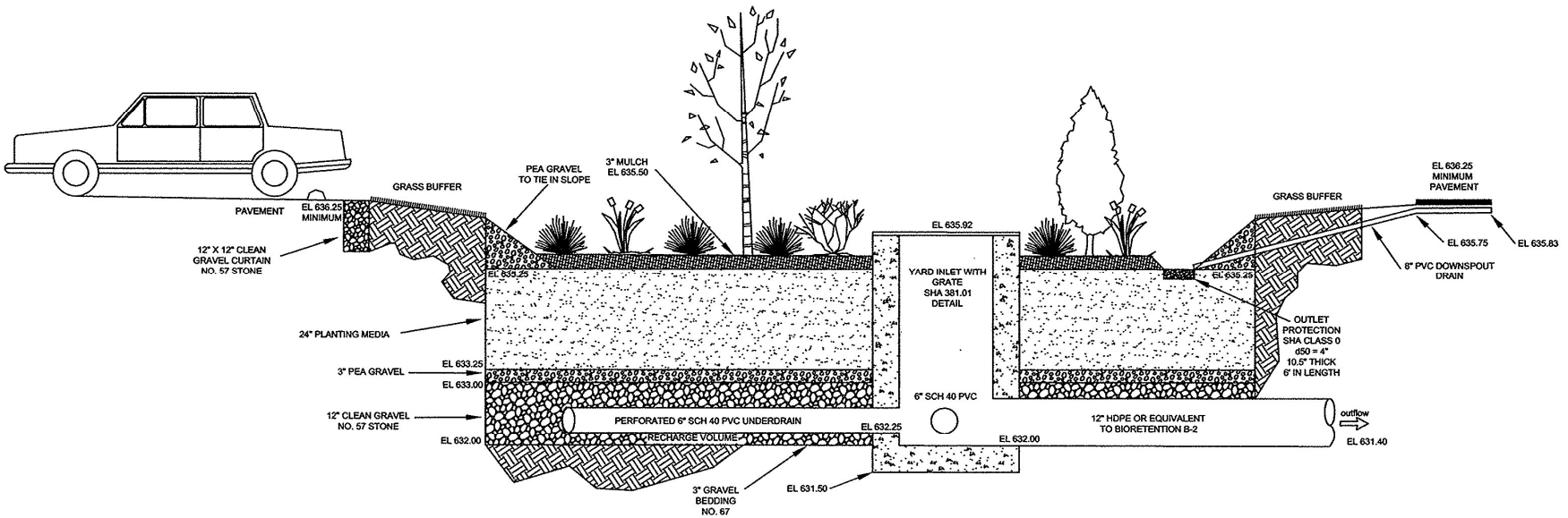
I = Percent Impervious Area = 1.12 acres / 2.0 acres = 0.56 = **56%**

Hydrologic Soil Group D										
%I	RCN*	P_E = 1"	1.2"	1.4"	1.6"	1.8"	2.0"	2.2"	2.4"	2.6"
0%	80									
5%	81									
10%	82									
15%	83									
20%	84	77								
25%	85	78								
30%	85	78	77	77						
35%	86	79	78	78						
40%	87	82	81	79	77					
45%	88	82	81	79	78					
50%	89	83	82	80	78					
55%	90	84	82	80	78					
60%	91	85	83	81	79					
65%	92	85	83	81	78					
70%	93	86	84	81	78					
75%	94	86	84	81	78					
80%	94	86	84	82	79					
85%	95	86	84	82	79					
90%	96	87	84	82	79	77				
95%	97	88	85	82	80	78				
100%	98	89	86	83	80	78	77			

Target Rainfall for entire site is 1.8 inches (**P_E=1.8"**)

Step 2: Calculate size of Micro-Bioretention for Sub-Area B-1

Approach A: Include green space	**Approach B: Exclude green space**
Impervious Area = 7,600 + 13,620 = 21,220 sf	Impervious Area = 7,600 + 13,620 = 21,220 sf
Green Area = 10,000 sf	Green Area = zero
DA = 21,220 sf + 10,000 sf = **31,220 sf**	DA = **21,220 sf**
I = 21,220 sf / 31,220 sf = 0.68 = **68%**	I = 21,220 sf / 21,220 sf = **100%**
P_E = 15"(A_f)/DA (Equation 5.2)	P_E = 15"(A_f)/DA (Equation 5.2)
Solve for A_f: $A_f = P_E(DA)/15 = 1.8(31,220)/15$ **A_f = 3,746 sf**	Solve for A_f: $A_f = P_E(DA)/15 = 1.8(21,220)/15$ **A_f = 2,546 sf**
Determine ESD Volume: $ESD_v = P_E(Rv)(A)/12$	**Determine ESD Volume:** $ESD_v = P_E(Rv)(A)/12$
Determine Runoff Coefficient, R_v: **R_v** = 0.05 + 0.009(I) = .05 + .009(68) = **0.662**	Determine Runoff Coefficient, R_v: **R_v** = 0.05 + 0.009(I) = .05 + .009(100) = **0.95**
ESDv = (1.8)(0.662)(31,220)/12 = **3,100 cf**	**ESDv** = (1.8)(0.95)(21,220)/12 = **3,024 cf**
*Micro-bioretention must capture and store at least **75%** of the ESDv:* (3,100 cf)(0.75) = **2,325 cf**	*Micro-bioretention must capture and store at least **75%** of the ESDv:* (3,024 cf)(0.75) = **2,268 cf**
Here is what NOT to do: Try A_f = 60 x 63 = 3,780 sf	**Here is what NOT to do:** Try A_f = 50 x 46 = 2,300 sf
Depth = 1.0 ft gravel underdrain (n=0.4) 2.0 ft min. filter bed thickness (n=0.4) 0.67 ft ponding depth	Depth = 1.0 ft gravel underdrain (n=0.4) 2.0 ft min. filter bed thickness (n=0.4) 0.67 ft ponding depth
Facility Volume = 3,780[(3 ft.)(0.4)+0.67 ft.] = **7,069 cf** **TOO BIG! (ESDv=2,325 cf)**	Facility Volume = 2,300[(3 ft.)(0.4)+0.67 ft.] = **4,301 cf** **TOO BIG! (ESDv=2,268 cf)**
Here is what TO do: Solve for A_f using ESDv = 2,325 cf	**Here is what TO do:** Solve for A_f using ESDv = 2,268 cf
2,325 cf = A_f [(3 ft.)(0.4)+0.67 ft.] **Af = 1,243 sf**	2,268 cf = A_f [(3 ft.)(0.4)+0.67 ft.] **Af = 1,213 sf**



BIORETENTION B-1

SECTION VIEW A - A'

NTS