

3/20/07 Version

**Facility Types: Detention Pond, Detention Tank, Infiltration Pond, Wetpond, Bioswale**

**All facilities designs assume only target impervious area drains to facility**

**All ponds have 1.0 ft freeboard. Dimensions are at design (max) water surface.**

**Pond side slopes are 3:1 interior and exterior, 6 ft minimum top width.**

**Note that all open facilities should be fenced to keep out livestock.**

**Detention Pond**

3:1 side slopes, 2:1 L:W, 3 ft depth, 12 in riser, 6 ft wide spillway, LA 1.0

Impervious Area	Facility Volume	Size and Height Orifice 1	Size and Height Orifice 2	Pond Bottom Area
10,000 ft <sup>2</sup>	4950 ft <sup>3</sup>	.5 inches at 0 feet	.5 inches at 1.8 feet	950 ft <sup>2</sup>
13000 ft <sup>2</sup>	6670 ft <sup>3</sup>	.5 inches at 0 feet	.5 inches at 1.63 feet	1400 ft <sup>2</sup>
16,000 ft <sup>2</sup>	8430 ft <sup>3</sup>	.5 inches at 0 feet	.5 inches at 1.69 feet	1875 ft <sup>2</sup>
20,000 ft <sup>2</sup>	9980 ft <sup>3</sup>	.5 inches at 0 feet	.8125 inches at 1.875 feet	2300 ft <sup>2</sup>

assumes 4 inch pipe diameter for orifice elbow

**Detention Tank**

36 in diameter tank, 12 in riser, LA 1.0

Impervious Area	Facility Volume	Size and Height Orifice 1	Size and Height Orifice 2	Tank Length
10,000 ft <sup>2</sup>	4950 ft <sup>3</sup>	.5 inches at 0 feet	.625 inches at 1.625 feet	700 ft
13000 ft <sup>2</sup>	6370 ft <sup>3</sup>	.5 inches at 0 feet	.625 inches at 1.5 feet	900 ft
16,000 ft <sup>2</sup>	8130 ft <sup>3</sup>	.5 inches at 0 feet	.75 inches at 1.45 feet	1150 ft
20,000 ft <sup>2</sup>	9720 ft <sup>3</sup>	.5625 inches at 0 feet	.9375 inches at 1.6875 feet	1375 ft

assumes 4 inch pipe diameter for orifice elbow

**Infiltration Pond**

3:1 side slopes, 2:1 L:W, 3 ft depth, 12 in riser, 6 ft wide spillway

Design infiltration rate = 1 in/hr, infiltrate all runoff

Impervious Area	Facility Volume	Pond Bottom Area	assumes permeable bottom and side slopes
10,000 ft <sup>2</sup>	2670 ft <sup>3</sup>	400 ft <sup>2</sup>	
13000 ft <sup>2</sup>	3500 ft <sup>3</sup>	600 ft <sup>2</sup>	
16,000 ft <sup>2</sup>	4350 ft <sup>3</sup>	800 ft <sup>2</sup>	
20,000 ft <sup>2</sup>	5450 ft <sup>3</sup>	1080 ft <sup>2</sup>	

**Infiltration Trench**

2 ft wide gravel trench with 6 in perf pipe, design infiltration rate = 1 in/hr, infiltrate all runoff

Impervious Area	Trench Length	assumes 2 foot deep trench
10,000 ft <sup>2</sup>	1100 ft	
13000 ft <sup>2</sup>	1430 ft	
16,000 ft <sup>2</sup>	1765 ft	
20,000 ft <sup>2</sup>	2195 ft	

3/20/07 Version

**Wet Pond**

3:1 side slopes\*, 3:1 flow path, 4 ft depth, single cell, 12 in inlet and outlet pipes, 6 ft wide spillway  
 Assumed mean annual storm 0.56 in,  $V_b/V_r = 3.0$  (multiply volume by 1.5 to get  $V_b/V_r = 4.5$ )

PGIS Area	Facility Volume	Water Surface Dimension	*Note: minimum size with 4 ft depth, 3:1 slopes and 3:1 flow path is 1942 ft <sup>3</sup> . Using 2:1 slopes reduces minimum pond size to 931 ft <sup>3</sup>
5,000 ft <sup>2</sup>	635 ft <sup>3</sup>	17x34 (2:1 side slopes)	
7,000 ft <sup>2</sup>	888 ft <sup>3</sup>	17x34 (2:1 side slopes)	
10,000 ft <sup>2</sup>	1269 ft <sup>3</sup>	18x40 (2:1 side slopes)	
13000 ft <sup>2</sup>	1650 ft <sup>3</sup>	20x42 (2:1 side slopes)	
16,000 ft <sup>2</sup>	2030 ft <sup>3</sup>	25x52 (3:1 side slopes)	
20,000 ft <sup>2</sup>	2538 ft <sup>3</sup>	27x55 (3:1 side slopes)	

**Bioswale**

Width 2 ft, slope 2%, LA 1.0, 60% of 2-yr 15-min undetained flow = 0.193 cfs, rural 4-in grass, n = 0.030  
 Using 3:1 side slopes 100-year flow depth = 0.20 ft, velocity = 2.1 fps for largest area  
 Note that 100 ft is minimum length allowed, 2 ft is minimum width allowed

PGIS Area	Length
5,000 ft <sup>2</sup>	100 ft
7,000 ft <sup>2</sup>	100 ft
10,000 ft <sup>2</sup>	100 ft
13000 ft <sup>2</sup>	100 ft
16,000 ft <sup>2</sup>	100 ft
20,000 ft <sup>2</sup>	109 ft

**Stormwater Wetland**

Width = 17 ft, 2:1 side slopes, 1st cell depth = 4 ft, wetland cell depth = 1.5 ft average

PGIS Area	1st Cell Length	Wetland Cell Length	Total Length
5,000 ft <sup>2</sup>	14 ft	9 ft	23 ft
7,000 ft <sup>2</sup>	14 ft	12 ft	26 ft
10,000 ft <sup>2</sup>	14 ft	17 ft	31 ft
13000 ft <sup>2</sup>	14 ft	22 ft	36 ft
16,000 ft <sup>2</sup>	14 ft	27 ft	41 ft
20,000 ft <sup>2</sup>	14 ft	34 ft	48 ft