

Crossville Medical Office Building

Water Quality Calculations Area 1

Date Prepared: 2/1/2012

Area = 0.565 Acres
Area Impervious = 0.315 Acres
Area Pervious = 0.25 Acres

WATER QUALITY VOLUME ANALYSIS

$R_v = 0.05 + 0.009(I) = 0.55$
 $I = \% \text{ of Impervious Area} = 55.75\%$

$$WQ_v = \frac{1.2 R_v A}{12}$$

WQv = 1.2 0.552 0.57 12 0.03 Acre-Ft
1,358 Cubic Feet

BIORETENTION CALCULATIONS

WQv = design storage (cf) = 1,358
 d_f = filter bed depth (ft) = 4
 k = coefficient of permeability of filter media (ft/day) = 2
 h_f = average height of water above filter bed (ft) = 0.25
 t_d = design filter bed draining time (days) = 2
 A_f (sqft) = surface area of bioretention = $(WQ_v)(d_f)/[k(h_f+d_f)(t_d)]$
 A_f Basin A (sf) = 320
Provided Surface Area (sf) = 482

(from calculations above)
specified in detail

(from Georgia Erosion Control Manual for Madison Soil)
user input of 3" which is half the ponding depth
user input

calculated value
area from grading plan

Area 2

Date Prepared: 2/1/2012

Area = 1.152 Acres
Area Impervious = 0.69 Acres
Area Pervious = 0.462 Acres

WATER QUALITY VOLUME ANALYSIS

$R_v = 0.05 + 0.009(I) = 0.59$
 $I = \% \text{ of Impervious Area} = 59.90\%$

$$WQ_v = \frac{1.2 R_v A}{12}$$

WQv = 1.2 0.589 1.15 12 0.07 Acre-Ft
2,956 Cubic Feet

BIORETENTION CALCULATIONS

WQv = design storage (cf) = 2,956
 d_f = filter bed depth (ft) = 4
 k = coefficient of permeability of filter media (ft/day) = 2
 h_f = average height of water above filter bed (ft) = 0.25
 t_d = design filter bed draining time (days) = 2
 A_f (sqft) = surface area of bioretention = $(WQ_v)(d_f)/[k(h_f+d_f)(t_d)]$
 A_f Basin A (sf) = 696
Provided Surface Area (sf) = 778

(from calculations above)
specified in detail

(from Georgia Erosion Control Manual for Madison Soil)
user input of 3" which is half the ponding depth
user input

calculated value
area from grading plan

