114354-1

(19)

Project Correspondence

1724

Wet Detention Calculations:

Given:

Basin Area =	2.286 ac	Grande Champion Pond B
Impervious Area =	0.826 ac	
Water Body Area =	0.41 ac	
Pervious Area =	1.05 ac	
% Impervious =	36 %	

Calculate Treatment Volumes:

Treatment Volume:

Volume = 1.0 inches x drainage basin or		0.1905 ac-ft	8,298 CF
2.5 inches x impervious area (excluding water bodies		0.1721 ac-ft	7,496 CF
Volume (Class I, II, III-shellfish, OFW) =	0.1905 ac-ft (max F15, F16)	0.28575 ac-ft	12,447 CF

Calculate Permanent Pool Volume:

PPV = (DA*C*R*RT) / (WS*CF) =	0.316647	ac-ft	=	13,793	CF	0.475 ac-ft
						20,690 CF
Non-littoral Zone =	0.474971	ac-ft	=	20,690	CF	0.712 ac-ft
						31,035 CF

DA = Drainage area to pond =	2.286	ac
C = Runoff coefficient =	0.606	
R = Wet season rainfall depth =	30	in
RT = Residence Time =	14	days
WS = Length of wet season = (June - October - 153 days)	153	days
CF = Conversion factor (12 in/ft)	12	in/ft

Runoff coeff	area	c	Cw
imp area	1.236	0.95	0.606
perv area	1.05	0.2	
perv area			
total area	2.286		

Calculate Orifice Diameter:

$A = Q/(C*(2*g*h)^{1/2})$	0.0260 sf	=	2.19 inches
	0.0306 sf	=	2.37 inches
C = Orifice coefficient =	0.6		(0.6 included in equation)
D = Orifice Diameter =	2.19 inches		
g = gravity =	32.2 ft/s		
h = Depth of water above the center of the orifice	0.33 ft		0.239 ft
Q = TV/2*t*CF =	0.072031 cfs		(Based on 24 hours
TV =	12447 cf		

Class I, II, III-shellfish, OFW criteria
second iteration for orifice sizing

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Max stage 115.99

El	Vol
113	23
115.99	x
116	34.02

$x = 33.07$

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