Sizing Worksheet - INF-7 Bioinfiltration

Designer: Project Proponent: Date: Project: Location:		
Type of Vegetation:		
Pretreatment Feature:		
Outflow Collection:		
Step 1: Calculate Design Volume		
1-1. Enter Project area (acres), $A_{project}$ If this BMP captures runoff from a portion of the project area, enter the tributary area	$A_{project}$ =	acres
1-2. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	
1-3. Determine pervious runoff coefficient using Table C-1, C_p	C_p =	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-5. Enter design rainfall depth of the storm (in), P_i	P_i =	in
1-6. Calculate rainfall depth (ft), $P = P_i/12$	P =	ft
1-7. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{project}$	SQDV=	ft^3
Step 2: Determine the design percolation rate		
2-1. Enter measured soil infiltration rate (in/hr, 0.3 in/hr min.), $P_{measured}$	$P_{measured}$ =	in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Appendix C.2)	S_A =	
2-3. Determine percolation rate correction factor, S_B based on design (see Appendix C.2)	S_b =	
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =	
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} =	in/hr
Step 3: Calculate the Surface Area		

3-1. Determine the maximum depth of surface ponding water $d_{\max} = \frac{P_{design} \times t_{ponding}}{12 \frac{in}{ft}}$ The required drain time of surface ponding $t_{ponding}$ is 72 hours.	d_{max}	ft
3-2. Choose surface ponding depth (d_p) such that: $d_p \leq d_{\max}$	d_p	ft
3-3. Choose thickness(es) of amended media and aggregate layer(s) and calculate total effective storage depth of bioinfiltration area Thickness(es) of amended media Available porosity of amended soil media (approximately 0.25 ft/ft) Choose thickness(es) of aggregate layer(s) Available porosity of gravel layer (approximately 0.40 ft/ft) $d_{effective} \leq (d_p + n^*_{media} l_{media} + n_{gravel} l_{gravel})$	l_{media} n^*_{media} l_{gravel} n_{gravel} $d_{effective}$	ft ft/ft ft ft/ft ft
3-4. Check entire effective depth infiltrates in less than 72 hrs $t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 72\ hrs$	t_{total}	hrs
3-5. Calculate required infiltration surface area $A_{req} = \frac{SQDV}{d_{effective}}$	A_{req}	ft^2
Step 4: Calculate Bioinfiltration Area Total Footprint		
4-1. Calculate the total footprint by including the buffer for side slopes	A_{total}	ft^2
Step 5: Provide conveyance capacity for clogging		
5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event it becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.		