Trench, Chamber, & Bed Design Worksheet - Draft

THE UNIVERSITY OF ARIZONA TUCSON ARIZONA

1. SYSTEM SIZING:

A. *Design Flow* : _____ GPD **B.** *Maximum Depth* : _____ inches

C. *Soil Absorption Rate (SAR):* _____ GPD/ft² (Choose the least value of lines 3.A, B, or C from Flow & Soil)

D. *Required Bottom Area: Design Flow (1.A) ÷ SAR (1.C) = Required Bottom Area*

_____ ÷ _____ = _____ ft²

E. Select *Dispersal Media* ☐ Rock ☐ Chambers ☐ Gravelless Pipe

☐ Other Approved Media _____

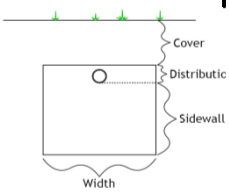
F. Select *Distribution Method* : ☐ Pressure (required for rapidly permeable soils)

☐ Gravity-Drop Box

☐ Gravity-Other _____

G. Select *Dispersal Type* : ☐ Trench ☐ Bed (<6% Slope) Seepage pit

2. TRENCH CONFIGURATION (Final report will use either E, F, or G):



A. Select *Sidewall Height* : _____ inches = _____ ft

6" minimum, 48" maximum

B. *Required Bottom Area (1.D)* : _____ ft²

C. Select *Trench Width* : _____ inches = _____ ft

12" minimum, 36" maximum

D. Select Depth of Cover over Distribution Pipe: _____ in = _____ ft

E. Trench Calculations:

1. Calculate *Trench Perimeter* : Height (2.A) + Width (2.C) + Height (2.A)

_____ ft + _____ ft + _____ ft = _____ ft

(4' maximum) (3' maximum) (4' maximum) (11' maximum)

2. Calculate *Total Required Trench Length: Bottom Area* (2.B) ÷ Trench perimeter (2.D)

_____ ft² ÷ _____ ft = _____ ft

3. Calculate *Number of Trenches* : Total Required Trench Length (2.D.2) ÷ 100 ft maximum length

_____ ft ÷ **100** ft = _____

F. Chamber Calculations:

1. Calculate *Chamber Effective Area:* [1.8 x B x L] + [2 x V x L]

B=exterior width of chamber bottom; V=vertical height of louvered sidewall; L=length of chamber

a. Choose chamber bottom width (B): _____ ft

b. Choose vertical height of louvered sidewall (V): _____ in = _____ ft

c. Choose length of chamber (L): _____ ft

(1.8 x _____ X _____)+(2 X _____ X _____) = _____

2. Calculate *Number of Chambers:* Required bottom area (2.B) ÷ Chamber effective area (2.E.1)

_____ ft² ÷ _____ ft² = _____ chambers

G. Gravelless Trench Calculations:

1. Choose *Gravelless Trench Effective Area Factor* (see Table A): _____

2. Calculate Gravelless Effective Area = [Required Bottom Area (2.B) * Gravelless Trench Effective Area Factor

_____ ft² x _____ = _____ ft²

3. *Length of Gravelless Trench:* Required bottom area ÷ Gravelless effective area

_____ ft² ÷ _____ ft² = _____

H. Select *Trench Spacing* **:** _____ ft (2 times effective depth or 5 ft, whichever is greate

I. Calculate Lawn Area: Trench Length (2.E.2 or 2.F.1 or 2.G.3) X Trench Spacing (2.H) = ft2 lawn area

_____ ft X _____ ft = _____ ft²

J. Calculate *Rock Volume* **:** (Sidewall Height (2.A) + Depth to Cover Pipe (2.H)) X Bottom Area (2.C) = cubic fe

[ ] + [ ] X [ ] = [ ] ft^3

To calculate cubic yards, divide ft^3 by 27 ft^3/yd^3:

[ ] ft^3 ÷ 27 ft^3/yd^3= [ ] yd^3

3. BED CONFIGURATION:(less than 6% slope)

A. Required *Bottom Area (1.D)* : _____ ft^2

B. Select *Bed Width* : _____ ft Min. = 10 ft; Max. = 12 ft (gravity)

C. Select *Sidewall depth* : _____ ft Min. = 0.5 ft; Max. = 3 ft (gravity)

D. Select Distribution pipe diameter: _____ in. = _____ ft (Min.= 3 in.; Max.= 4 in

E. Select depth of aggregate over pipe: _____ in. = _____ ft (Min. = 2 in.; Max. = 2 i

F. Select depth of aggregate under pipe: _____ in. = _____ ft (Min. = 12 in.; Max. = n

F. Bed absorption area: (sidewall depth 3.C) + bottom width (3.B) + sidewall depth (3.C)) ft X 1 linear ft

(_____ ft + _____ ft + _____ ft) x 1 linear ft = _____ ft^2

G. Calculate *Bed Length: Required Bottom Area* (3.A) ÷ *Bed Width* (3.B) = *Length*

_____ ft^2 ÷ _____ ft = _____ ft (100 ft maximum)

H. Total Rock Depth: depth of aggregate under pipe (3.F) + Pipe diameter (3.D) + depth of aggregate over pipe (3

_____ ft + _____ ft + _____ ft = _____ ft

I. Calculate *Rock Volume* : *Rock Depth (3.H)* X Bed Absorption *Area (3.F)* = ft^3

_____ ft X _____ **ft^2** **=** _____ ft^3

J. Calculate *Volume in cubic yards* : Rock volume in cubic feet (3.F) ÷ 27 = cubic yards

_____ ÷ 27 = _____ yd^3

4. ORGANIC LOADING: (if pretreatment is being used)

A. *Organic Loading* = *Design Flow (gpd)* X *Estimated BOD* (mg/L in effluent) X 8.35 ÷ 1,000,000

Select the Estimated BOD_5 in effluent, mg/L: _____ mg/L

_____ GPD X _____ mg/L X 8.35 ÷ 1,000,000 = _____ lbs BOD_5/day

B. Calculate *System Organic Loading: lbs. BOD* (4.A) ÷ *Bottom Area* (1.D) = lbs/day/ft^2

_____ lb BOD_5/day ÷ _____ ft^2 = _____ lbs/day/ft^2

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

(Designer) (Signature) (License #) (Date)