INFILTRATION TRENCH/DRY WELL CALCULATOR

These calculators size an infiltration trench or drywell to treat the Water Quality Volume (WQv), or calculate the volume of water treated given user e

Input cell =		User enters value
Default value =		User should only change value if able to provide explanation for adjustment
Calculation cell =		User should not change cell

CALCULATOR

Infiltration Trench/Dry Well Calculator - by Water Quality Volume

1	Water Quality Volume - WQv	1,500	cubic feet
2	Porosity - n	0.35	recommend 0.35 for coarse aggregate
3	Infiltration Rate - f	2	inches/hour (generally require f ≥0.5"/hr)
	Safety Factor	2	recommend 2
	Fill time - T	2	hours (1 to 2 hours, recommend 2)
	Max Drain Time - t	48	hours (recommend 48)
4	Depth to GW/Bedrock	8	feet

5	Max Allowable Depth - dmax	4.0	feet
	Design Trench Depth - d	4	feet (between 3 to 8 feet)
	Check Depth	**Okay**	

6	**Base Area Calculator**	**957**	square feet
7	Width of Trench	20	feet (should be less than 25 feet)

8	**Dimension Calculator**		
	Depth	**4.0**	feet
	Width	**20**	feet
	Length	**48**	feet
	Dry Well Diameter	**34.9**	feet

Infiltration Trench/Dry Well Calculator - by Available Dimensions

9	Available Length (or Diameter for Dry Well)	48	feet
10	Available Width	20	feet (should be less than 25 feet)
11	Porosity - n	0.35	recommend 0.35
12	Infiltration Rate - f	2	inches/hour (generally require f ≥0.5"/hr)
	Safety Factor	2	recommend 2
	Fill Time - T	2	hours (1 to 2 hours, recommend 2)
	Max Drain Time - t	48	hours (recommend 48)
13	Depth to GW/Bedrock	8	feet

14	Max Allowable Depth - dmax	4.0	feet
	Design Trench Depth - d	4	feet (between 3 to 8 feet)
	Check Depth	**Okay**	

15	**Treated Volume - Infiltration Trench**	**1,504**	cubic feet
	Treated Volume - Dry Well	**2,835**	cubic feet

INSTRUCTIONS

Use either steps 1 through 8 to determine the required size of your trench. Or use steps 9 through 15 to check what volume of water is treated given

To Determine The Required Size of the Infiltration Trench/Dry Well

Step	
1	Enter the Water Quality Volume (WQv) for the drainage management area (DMA). The WQv is calculated in Step 14 of the Water Quality V
2	Adjust the porosity of the trench/dry well backfill material if necessary. Recommend using a default value of 0.35. For a dry well without bac
3	Enter the infiltration rate of the underlying soils. This should be determined by geotechnical testing or, for conceptual studies, soil infiltration account for the inherent uncertainties in rate measurement and the decrease in infiltration rate over time. The default value for fill time is 2 h be changed unless explanation is provided by user.
4	Enter the lesser value of the depth to groundwater and depth to bedrock at the site. The bottom of the trench should be at least 4' from bedı
5	The maximum allowable depth of the trench/drywell is calculated here. In the next row, enter a design trench depth less than or equal to the
6	The trench/dry well surface area calculator determines the base surface area of the trench/dry well that is required to treat the design WQv.
7	To calculate actual trench dimensions, enter a desired width for the trench. Generally this will be between 3 and 8 feet, and not exceed 25 f
8	The required dimensions for your WQv trench or dry well are determined here.

To Determine the Volume of Water Treated by Available Dimensions

9	Enter the design length of your trench. For a Dry Well enter the design diameter, and skip Step 11.
10	Enter the design width of your trench.
11	Adjust the porosity of the trench backfill material if necessary. Recommend using a default value of 0.35. For a dry well without backfill use
12	Enter the infiltration rate of the underlying soils. This should be determined by geotechnical testing or, for conceptual studies, soil infiltration A safety factor of two will be applied in the calculations to account for the decrease in infiltration rate over time due to accumulation of solids The default value for fill time is 2 hours. The default drain time is 48 hours. These values should not be changed unless explanation is provi
13	Enter the lesser value of the depth to groundwater and depth to bedrock at the site. The bottom of the trench should be at least 4' from bedı
14	The maximum allowable depth of the trench/drywell is calculated here. In the next row, enter a design trench depth less than or equal to the
15	The volume of water treated by your trench or dry well design is shown here. If this volume is less than the required WQv then additional tre

DEFINITIONS

Water Quality Volume (WQv)	The runoff volume to be managed by the stormwater BMP such that treatment requirements Water Quality Flow Rate Calculator.
Porosity (n)	Volume of void space to total volume. This is expressed as a ratio, e.g. 0.35 means that one
Infiltration Rate (f)	The rate of water entry into the soil, generally expressed as inches/hour, and determined by hydraulic conductivity of the soil times the hydraulic gradient.
Fill Time (T)	The time taken for the trench/ dry well to fill with runoff. Use recommended values or calcula
Drain Time (t)	The time for the trench/dry well to drain the water quality volume.
Depth (d)	The depth of the trench/dry well from the surface of the gravel backfill material.
Length	The longitudinal length of the trench.
Width	The width of the trench.
Base Area	The area of the base of the trench or dry well.