



SINGLE FAMILY RESIDENTIAL

Infiltration Trench System Design Application Worksheet

Review and follow the [Infiltration Trench System Design and Maintenance Guide](#) before using this worksheet. Submit this worksheet for your development project review.

Description of Project:

DESIGN

Step A. Calculate the total hard surface areas (in square feet [sq. ft.]) to be routed to the trench:

- Roof area w/overhangs _____ sq. ft.
- Driveway _____ sq. ft.
- Others (sidewalks, patios, etc.) _____ sq. ft.
- Total hard surface area _____ sq. ft.

Total hard surface area must be less than 5,000 sq. ft. to use this worksheet.

Step B. Choose the infiltration rate that applies to your site based on the Soils Professional's site evaluation and Soil Evaluation Report results. If the measured infiltration rate falls between the rates in the table in the Worksheet, select the closest lower infiltration rate. Calculate the total hard surface areas (in square feet [sq. ft.]) to be routed to the trench:

Select the closest lower value from the measured infiltration rate:

- ☐ 30 inches/hour
- ☐ 12 inches/hour
- ☐ 4 inches/hour
- ☐ 2 inches/hour
- ☐ 1 inch/hour
- ☐ Less than 1 inch/hour – A professional engineer must design the stormwater system

Step C. Select a trench depth between 2 and 5 feet. If the trench is deeper, it will be shorter in length. The total depth of the trench must include the depth of topsoil. At least 6 inches of topsoil is needed over the top of the trench. A Soils Professional can help with the trench depth selection.

- Trench depth = _____ feet

Step D. Select the trench bottom multiplier using the Sizing Table on the next page of this worksheet.

- Trench multiplier = _____

Step E. Select a trench width. Typical width ranges between 2 feet to 6 feet.

- Trench width = _____ feet (2 feet minimum – 10 feet maximum)

Step F. Calculate the trench length using the information gathered above (Step A, Step D and Step E). The maximum length is 100 feet from the starting point where the water enters the trench.

- Trench width = _____ feet (2 feet minimum – 10 feet maximum)

$$\text{Trench length} = \frac{\text{Total Surface Area} * \text{Trench Bottom Multiplier}}{\text{Trench Width}}$$

- (Step A) _____ sq. ft. x (Step D) _____ (trench bottom multiplier) / (Step E) _____ ft. (width) = _____ ft.

Step G. Summarize the trench dimensions:

- Trench _____ ft. deep x _____ ft. wide x _____ ft. long

The above design meets Minimum Requirement #5 – Onsite Stormwater Management LID Performance Standard, in accordance with 2021 Pierce County Stormwater Management and Site Development Manual.

Designer/Owners/Contractor Name (Printed)

Date

Signature

Registration No. (if applicable)

Sign, date, and stamp (if applicable)

Infiltration Trench Sizing Table

Initial Infiltration Rate	Depth (feet)	Trench Bottom Multiplier
30 inches/hour	2	0.024
	2.5	0.022
	3	0.019
	3.5	0.018
	4	0.017
	4.5	0.016
	5	0.015
12 inches/hour	2	0.058
	2.5	0.052
	3	0.046
	3.5	0.044
	4	0.040
	4.5	0.038
	5	0.036
4 inches/hour	2	0.101
	2.5	0.090
	3	0.080
	3.5	0.076
	4	0.072
	4.5	0.066
	5	0.063
2 inches/hour	2	0.144
	2.5	0.130
	3	0.114
	3.5	0.108
	4	0.102
	4.5	0.094
	5	0.090
1 inch/hour	2	0.206
	2.5	0.184
	3	0.163
	3.5	0.153
	4	0.146
	4.5	0.135
	5	0.129

The infiltration trench sizes in this sizing table have been verified in WWHM2012 with the following assumptions:

- The porosity of the gravel layer was assumed as 30 percent.
- The additional void volume of perforated pipe was neglected.
- A correction factor of 0.5 was applied to the infiltration rate to calculate the design infiltration rate.
- Predeveloped condition was set as moderate slope forest.
- All of runoff is delivered to the infiltration trench by a minimum 4-inch diameter perforated pipe.

EXAMPLE

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