Infiltration Test Worksheet

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Application #:

Date:

The intent of this worksheet is to provide a summary of stormwater Best Management Practices (BMP) for subsurface investigation and infiltration testing requirements. The worksheet is to test for infiltration trenches or raingarden design. All projects and associated plans are also subject to the minimum requirements outlined in the Department of Ecology Stormwater Manual. This worksheet does not preclude the use of professional judgment to evaluate and manage risk associated with design, construction, and operation of infiltration BMPs. If your project will infiltrate greater than 5,000 square feet of hard surface area, an alternate test method is required.

The following items will be needed for the infiltration testing:

- 5-gallon or larger buckets/water container
- Source of water. If no water is available on project site, bring at least 36 gallons for test from November to March; or 60 gallons for April through October.
- Ruler or tape measure (60" minimum length)
- Shovel(s) and a post hole digger
- Notebook/pen or pencil
- Camera

Part 1 Subsurface Investigation

1. Dig a hole using a post hole digger to the depth required per Table A below (2-feet below proposed facility in the wet season and 3-feet below the proposed facility in the dry season) and approximately 5-feet from the proposed infiltration facility. (See the footnote at the end of Table A – depth is measured from the bottom of the proposed infiltration facility.)

Table A. Minimum Investigation Depth and Vertical Separation Requirements (ALL BMPs)

Season	Minimum Investigation Depth (ft)	Minimum Vertical Separation, ft [a]	
		Groundwater	Hydraulically-Restrictive Layer
Wet Season (November – March)	2	1	1
Dry Season (April – October)	3	2	1

[a] The minimum investigation depth and vertical separation shall be measured from the bottom of the facility. The bottom of the facility is defined as the deepest portion of proposed facility where infiltrating water is expected to move into the underlying soil.

2. Record total depth of hole from surrounding ground surface: _____ feet
3. While digging the hole, did you:
   a. Hit hard pan? (i.e. hardened soil that is like concrete) Yes No
   b. Encounter standing water or seepage in the hole? Yes No
4. If you answered "yes" to either (13a) or (13b), *then infiltration is not feasible for this site.* No further testing is required. **Stop here.**

Part 2 Infiltration Test

The infiltration test shall be conducted within the footprint of the proposed infiltration facility. The total area to be infiltrated must be less than 5,000 square feet, for this test method.

1. Date and time of test(s): _____
2. If performed November through March, one test is required.
   If performed April through October, two tests are required.
   - *Tests must be in the same hole within 2 days.*
   - *The beginning of each test must be spaced 24 hours apart.*
3. Dig an infiltration test hole at least 2 feet deep, measured from the proposed finished grade, and 2 feet across.
4. Diameter of test hole (2-foot minimum): _____ feet
5. Depth of test hole (2-foot minimum): _____ feet
6. Describe soil type and texture (e.g., sand, clay, gravel.):_____
7. PRE-SOAK PERIOD (for estimating drawdown time and to determine which table to use)
   a) Add water to the 12-inch mark. (Measure depth using a ruler, scale, or tape measure).
   b) Stabilize water depth for a minimum of 30 minutes by adding water until the depth is maintained at a minimum of 12 inches, then move on to step c.
   c) Stop adding water, then record the number of inches the water has fallen in 1 hour: _____ inches
   d) Record the number of inches the water has fallen from hour 1 to hour 2:_____ inches
   e) What is the smaller of the two numbers in row 9c and 9d above? (check only one box below)
      - ☐ Greater than 3 inches (Use Table 1 below – 15-minute intervals.)
      - ☐ Between 1 inch and 3 inches (Use Table 2 below – 30-minute intervals.)
      - ☐ Less than 1 inch (Use Table 3 below – 60-minute intervals.)

Illustration of Infiltration Test Process (please provide photos of your own test)

1. Dig Hole

2. Fill Hole with Water

3. Measure Water Level

Photo credits to Julie Day at /www.todayshomeowner.com

8. TESTING PERIOD (based on the answer to 7e above, record the following data in INFILTRATION TEST RESULTS Table 1, 2, or 3)
   a) Refill the hole to the 12-inch mark.
   b) Immediately record the time and depth of water in the appropriate infiltration test results table.
   c) Based on your time interval (answer to 7e above):
      - Record the time and depth of water in the hole at the specified intervals.
      - Complete the table by recording six measurements (in addition to the starting depth).
      - If the hole empties prior to the six measurements, refill to the 12-inch mark and continue recording until you have completed the table.
   d) Using the depth of water recorded at each interval, calculate the infiltration rate and record the results:
      - Table 1: Infiltration Rate = Change in depth between each interval x 4
        - *For example: after 15 min, the depth of water is recorded as 10 inches, the change in depth is 12" -10" = 2 inches. The infiltration rate is 2 inches x 4 inches = 8 inches/hour*
      - Table 2: Infiltration Rate = Change in depth between each interval x 2
      - Table 3: Infiltration Rate = Change in depth between each interval x 1
   e) If performed April through October, repeat steps 9 and 10 in the same hole 24 hours after the beginning of the first infiltration test and record the results in the Infiltration Test #2 Result tables.

Infiltration Test Results

(Use table determined in 7e, above)

Test #1 Results

Table 1 (15-min)

Time (15-min)	Depth of Water (inches)	Infiltration Rate (in/hr)
	12	---

Table 2 (30-min)

Time (30-min)	Depth of Water (inches)	Infiltration Rate (in/hr)
	12	---

Table 3 (60-min)

Time (60-min)	Depth of Water (inches)	Infiltration Rate (in/hr)
	12	---

Test #2 Results (Required if performed April through October – see step 4 above)

Table 1 (15-min)

Time (15-min)	Depth of Water (inches)	Infiltration Rate (in/hr)
	12	---

Table 2 (30-min)

Time (30-min)	Depth of Water (inches)	Infiltration Rate (in/hr)
	12	---

Table 3 (60-min)

Time (60-min)	Depth of Water (inches)	Infiltration Rate (in/hr)
	12	---

The lowest infiltration rate from the tables above = _____in/hr (Measured infiltration rate)

NOTE: *If the lowest measured infiltration rate is less than the minimum rate associated with an infiltration Best Management Practice (see Table B below), that BMP cannot be used.*

Table B. Minimum Measured Infiltration Rates in Inches per Hour

Infiltration BMP	Minimum Measured Infiltration Rate for On-site List Approach (in/hr)
Infiltration Trenches (I-pit)	5
Drywells	5
Rain Gardens	0.3
Perforated Stub-out Connections	0.3
Infiltration Basins	Not applicable
Infiltration Chambers	Not applicable

SIGNATURES ARE REQUIRED

I certify that I have followed the procedures outlined in this document to determine the infiltration BMP feasibility and infiltration rate.

Test performed by: Print Name _____

Signature _____ Date_____

Please include the following two documents with this checklist:

☐ Site plan with test locations clearly marked
☐ Photos taken during your test similar to the ones in the photo illustration