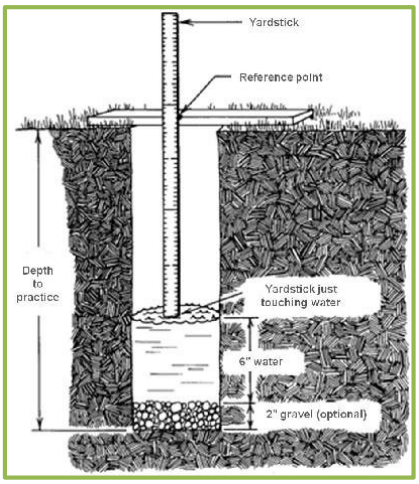
APPENDIX A

Site Infiltration Rate

Should you choose not to perform infiltration testing, your site infiltration rate will be 0.05 in/hr which excludes some BMP's as being applicable and others will require an underdrain. See Appendix D for details on constructing an underdrain. Field infiltration tests must **not** be conducted in the rain or within 24 hours of significant rainfall events (>0.5 inches), or when the temperature is below freezing. NOTE: Always call Missouri One Call to locate utility lines before you dig.

Testing Infiltration: the Simple Approach

It is assumed that an infiltration rate of 0.05 to 0.25 inches per hour exists on residential sites. The sizing criteria are set for this rate. However, if the soils have a higher infiltration rate the size of the features could be reduced.



Source: modified from www.ag.ndsu

If the following infiltration test is conducted, and if it returns a higher infiltration rate than 0.25 inches per hour, suitable reductions in the size of the infiltration-based facilities can be made. Any allowable reduction in BMP size requires that the infiltration test results be verified by a PE, geologist, or other qualified individual. See each BMP for the adjustment procedure.

1. Infiltration features (rain gardens, dry wells, permeable paver gravel layers) should reliably drain within the recommended time limit. Here is how to test if your soils can handle this type of feature.
2. Locate the approximate center of the area where you expect to build your feature.
3. Dig an access pit down to the bottom of the amended soils or gravel layer in the feature.
4. At that elevation dig a narrow test hole at least eight inches deep. You can optionally place 2" of coarse gravel in the bottom. The test hole can be excavated with small excavation equipment or by hand using a spade shovel or post-hole digger.
5. If you run into a hard layer that cannot be penetrated with a shovel or, you come across water in the hole, stop. Infiltration features should not be sited over impenetrable rock surfaces or over high water tables. If this occurs, your site is inappropriate for these improvement measures.
6. Place a flat board across the hole to serve as a measuring point (see figure).
7. Fill the hole with water to a depth of twelve inches. Measure from the flat board to the water surface. Record the exact time you stop filling the hole and the height of the water, in inches, in Table I for every 10 minutes for fast draining soils for a minimum of one hour, or In Table 2 every 30 minutes for slow draining soils for a minimum of two hours. Most sites within the City limits will fall under the slow draining soils category. If the soil on your site appears sandy, it will be categorized as fast draining.
8. Refill the hole again and repeat step 7 twice more. The third test will give you the best measure of how quickly your soil absorbs water when it is fully saturated.
9. If on the third test the water is dropping at least ½" per hour the soil will work for the infiltration features.

Source: www.learntogrow.com

INFILTRATION TESTING CHECKLIST

(IF REQUIRED)

Project Information:

Date of Test: _____ Time of Test: _____

This Infiltration Test Was Performed by: ☐ Homeowner ☐ Other (specify below)

Company Name: _____ Contact Name: _____

Phone Number: _____ Email Address: _____

The intent of this checklist is to provide a summary of stormwater Best Management Practices (BMP) subsurface investigation and infiltration requirements. All projects and associated plans are also subject to the minimum requirements outlined this guideline. This checklist does not preclude the use of professional judgment to evaluate and manage risk associated with design, construction, and operation of infiltration BMPs.

Part I. SUBSURFACE INVESTIGATION

1. Dig a hole using a post hole digger to a depth of 2-ft below proposed facility and approximate center of the proposed infiltration facility.
2. Record total depth of hole from surrounding ground surface: _____ feet
3. While digging the hole, did you:
    a. Encounter rock larger than gravel? □ YES □ NO
    b. Encounter standing water or seepage into the hole? □ YES □ NO
4. If you answered "yes" to either 3a or 3b, the infiltration is not feasible for this site. **No further testing is required. Stop Here.**

Part 2. INFILTRATION TEST

1. Is the infiltration test within the footprint of the proposed infiltration facility? □ YES □ NO
2. If "no," is testing being conducted within 50 feet of the proposed infiltration facility? □ YES □ NO
   Explain why: _____
3. ☐ Dig an infiltration test hole to the bottom of the BMP.
4. Describe soil type and texture (e.g., sand, clay, gravel.): _____
5. ☐ Place a flat board across the hole to serve as a measuring point.
6. ☐ Fill the hole with water to a depth of six inches. Measure from the flat board to the water surface. Record the exact time you stop filling the hole and height of the water, in inches, In Table I, every 10 minutes for fast draining soils for a minimum of one hour or in Table 2 (most soils in Kirkwood), every 30 minutes for slow draining soil for a minimum of 2 hours.
7. ☐ Repeat step 6 two more times. The third test will govern. Record results in the appropriate tables, below.

Table 1 (10-minute intervals)									
Time	Depth of water (in)	Difference in Water Depth (in)	Infiltration Rate (in/hr)	Depth of water (in)	Difference in Water Depth (in)	Infiltration Rate (in/hr)	Depth of water (in)	Difference in Water Depth (in)	Infiltration Rate (in/hr)
10		---	---		---	---		---	---
20									
30									
40									
50									
60									

The Difference in Water Depth is the difference between the depths of the current time minus the depth of the previous time. (i.e. $60\ minute\ depth - 30\ minutes\ depth$)

Table 2 (30-minute intervals)									
Time	Depth of water (in)	Difference in Water Depth (in)	Infiltration Rate (in/hr)	Depth of water (in)	Difference in Water Depth (in)	Infiltration Rate (in/hr)	Depth of water (in)	Difference in Water Depth (in)	Infiltration Rate (in/hr)
30		---	---		---	---		---	---
60									
90									
120									

The Difference in Water Depth is the difference between the depths of the current time minus the depth of the previous time. (i.e. $60\ minute\ depth - 30\ minutes\ depth$)

8. Record the **lowest** infiltration rate from the third test in the tables above = _____ in/hr

$$\text{(Infiltration rate} = \frac{\text{difference in water depth (inches)}}{\text{time (minutes)}} \times \frac{60 \text{ minutes}}{\text{hour}} = \text{in/hr)}$$

SIGNATURES ARE REQUIRED

I certify that I followed the procedures outlined in this document to determine the site infiltration rate.

Print Name: _____

Signature: _____ Date: _____

CITY OF KIRKWOOD PROPERTY ADDRESS: DATE:	ATTACH THIS TWO-PAGE SPECIFICATION TO SITE PLAN SUBMITTAL	INFILTRATION TESTING PAGE 1 OF 2

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