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Operating Procedures: Ring Infiltrrometer

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Works for me

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PDI Test

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ABSTRACT

Operating procedure for using the ring infiltrrometer.

PROTOCOL CITATION

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KEYWORDS

operating, procedure, ring, infiltrrometer

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MATERIALS TEXT

Required Equipment:

- Scale: ADAM DU CPWPlus (2 parts)
- Laptop with ADAM DU software installed
- Flat surface to place scale on (e.g. thin piece of plywood with large enough area)
- Connection cable for scale to computer
- Mariotte device
- Ring Infiltrrometer
- Containers to hold water- about 100 liters
- Shovel
- C-clamp
- Filter material
- Meter stick
- Sledgehammer
- Durable piece of wood
- Level

- 1 Fill up your containers with water. Make sure that the water that will be going into the mariotte device has as little dissolved gas in it as possible. Well water is often supersaturated with CO₂, and when the gas bubbles come out of solution they can interfere with flow from the Mariotte to the infiltrrometer ring. (St. Paul tap water worked well for us).

- 2 Bring all of the equipment to the infiltration site.
- 3 Place the ring over the infiltration site. Clear obstructions from beneath it.
- 4 Place the durable wood on top of the ring, and use the sledgehammer to drive the ring into the ground (by hitting the wood). Every so often, check to make sure that the ring is level.
- 5 When the ring has been inserted about 2.5-5cm into the ground, stop.
 - If the test involves bare soil, place the filter material inside the ring.
- 6 Using the shovel, clear a level surface to place the scale on.
- 7 Place the scale (on the flat plywood) on the now level surface and hook it up to the computer. You will need to connect the two scale parts as well.
- 8 Set the shovel on the ground with the head resting in the ring.
- 9 Begin pouring water gently into the ring, using the head of the shovel to disperse the flow. For this part you can use well water.
- 10 When the ring is almost full, stop. Determine how quickly the water is draining. The goal is to achieve a near steady-state in the ring where the water level decreases very slowly. Add more water as necessary.
 - It may be necessary to fill up more water containers depending on the soil.
- 11 When the water level seems relatively stable, fill the mariotte device with tap water.
- 12 Turn on the scale and zero it.
- 13 Start up the ADAM DU software following its operating procedures.
 - Note, the operating procedures assume that two scales are running. If only one is being used, only start one data session.
- 14 Place the mariotte device on the scale.
- 15 Take the rubber top off the device and open the valve at the base. Water should begin to flow out of the tubing rapidly.

- 16 Reinsert the rubber top.
- 17 Put one finger on the end of the tubing, blocking the flow.
- 18 Place the end of the tubing under water in the ring and remove your finger.
- 19 Attach the c-clamp over the rim of the ring, to help hold the tubing in place.
- 20 Inspect the tubing for bubbles.
 - If bubbles occur, take the tubing out and repeat steps 15-20.
- 21 Make sure the ADAM DU software is collecting data.
- 22 Wait until the weight loss of the Mariotte becomes linear, and confirm that the water level in the ring is steady.
- 23 Use the meter stick to find the head height of the water in the ring. A good way to do this is to measure the height of the water from one side, the middle, and the other side, then calculate the mean height.
- 24 In a notebook, record the height of water in the ring and the depth of insertion of the ring.
- 25 Stop the data collection.
- 26 Clean up.