

Vapor Pin®

Standard Operating Procedure

Vapor Pin® Capsule

Scope & Purpose

Scope

This standard operating procedure describes the installation and extraction of the Vapor Pin® Capsule for sub-slab passive soil-gas sampling via the Waterloo Membrane Sampler-VP (WMS-VP).

Purpose

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Vapor Pin® Capsule and WMS-VP.

Equipment Needed

- Vapor Pin® Sampling Device
- Vapor Pin® Sleeve
- Vapor Pin® Cap
- Vapor Pin® Capsule
- Waterloo Membrane Sampler (WMS-VP) Kit
- Installation/Extraction Tool
- Rotary Hammer Drill
 - 5/8 - Inch (16mm) diameter hammer bit
 - 1½ - Inch (38mm) diameter hammer bit for flush mount applications
- ¾- Inch (19mm) diameter bottle brush
- Wet/Dry Vacuum with HEPA filter (optional)
- Dead Blow Hammer
- ¾" diameter closed cell foam rod to seal the hole prior to applying patching material
- VOC-free hole patching material (hydraulic cement) and a putty knife or trowel
 - This is for repairing the hole following the extraction of the Vapor Pin® Sampling Device

Quick Set Up

For More Details, Please Read Extended Steps

1. To install the Vapor Pin® Capsule, simply prepare your Vapor Pin® sampling device (Figure 1), then screw the Capsule into the bottom of the Vapor Pin® sampling device (Figures 2 and 3).
2. Open your Waterloo Membrane Sampler Kit, remove the WMS-VP sampler from the glass container and place it inside of the Vapor Pin® Capsule with the membrane facing the open end of the Capsule. Screw the knurled base onto the Capsule and install the Vapor Pin® assembly into the slab.
3. Once the pre-determined deployment time is complete, extract your Vapor Pin® assembly using the Installation Extraction Tool. Remove WMS-VP from the Capsule, place it in the glass container and seal with the provided tape, place the sealed container in the bubble wrap and foil bag, then ship it to the lab.

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Assembly & Installation Procedure (Extended)

1. Check for buried obstacles (pipes, electrical lines, etc.) using ground penetrating radar or utility maps prior to proceeding.
2. Set up wet/dry vacuum equipped with a dust bag or HEPA filter to collect drill cuttings.
3. For a flush mount installation, drill a 1½-inch (38mm) diameter hole at least 1¾-inches (45mm) into the slab. Check the depth of the hole with the Stainless-Steel Drilling Guide. If the collar on the of the drilling guide lies on the surface of the slab, proceed to drill a ⅝-inch (16mm) diameter hole through the slab and into the underlying soil to form a void deep enough to freely accommodate the Capsule beneath the base of the slab.
 - For a temporary installation, drill a ⅝-inch (16mm) diameter hole through the slab and into the underlying soil to form a void deep enough to freely accommodate the Capsule beneath the base of the slab.
4. Remove the drill bit, brush the hole with the bottle brush and remove the loose cuttings with the vacuum.
5. Assemble the Vapor Pin® sampling device and Vapor Pin® Sleeve (Figure 1).
6. Attach the threaded Vapor Pin® Capsule to the base of the Vapor Pin® sampling device (Figures 2 and 3).
 - NOTE: If extensions are required per sampling plan/slab thickness/state or local guidance, thread extension onto Vapor Pin® sampling device prior to threading on the Vapor Pin® Capsule. You may need to confirm that the depth being drilled is appropriate for the length of the sampler setup with extensions in this case.
7. Open the WMS-VP foil bag by removing/tearing off the top at the indicated (perforated) line, just above the sealing portion of the foil sample pack bag (Figure 4).
8. Confirm contents to include: 1) a small bubble wrap bag containing a glass storage vial wrapped in aluminum foil, and 2) a piece of tape for resealing the vial (Figure 5).
9. Open bubble wrap bag (containing glass storage vial wrapped in aluminum foil) and remove aluminum foil from the storage vial (the foil may be discarded after removal) (Figures 6 and 7).
10. Confirm that laboratory provided “Sampler ID” on the glass storage vial matches the same ID on the outside of the foil sampler bag pack.
11. Unthread the base of the Vapor Pin® Capsule (knurled portion with holes) to provide access to the inside of the Capsule (Figure 8).
12. Inspect interior of the Capsule for potential blockages (Figure 9).
13. Open glass storage vial containing the WMS-VP (Figure 10).
14. Remove WMS-VP and confirm that sampler ID matches glass storage vial and foil sample bag (Figure 11).
15. Remove the absorption packet (white square) from the glass storage vial and discard (Figure 12).
16. Place the WMS-VP vial into the Capsule with the membrane end facing the open end of the Capsule (Figures 13 and 14).
17. Re-thread the Vapor Pin® Capsule cap all the way (hand tighten only, Figure 15).
18. Insert the assembled Vapor Pin® sampling device and Vapor Pin® Capsule into the drilled hole and install using the installation/extraction tool and dead blow hammer (Figures 16 through 18).
19. Place the Vapor Pin® Cap onto the installed Vapor Pin® sampling device (Figure 19).

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- 20.** For flush-mount installations, use a Vapor Pin® Cover, or Vapor Pin® Secure Cover over the exposed sampling device (Figure 20). For temporary installations (stickup orientation), cover the exposed sampling device with a cone to avoid trip hazards.
- 21.** Note sampler information (Sampler ID, location name, date, etc.) on applicable field forms along with time of installation
- 22.** Retain the WMS-VP foil bag, glass storage vial, bubble wrap bag, and sealing tape for post-sampling purposes. Note the start time and date on the foil bag.
- 23.** Return at the end of the prescribed sampling period to extract the WMS-VP.
- 24.** Use Installation/Extraction Tool to remove the Vapor Pin® Sampling Device assembly (Figure 21). Then remove the WMS-VP from the Vapor Pin® Capsule (Figure 22).
 - NOTE: If the WMS-VP does not easily come out of the chamber, a pin flag, or other small diameter object can be gently pushed through the top (barbed) side of the Vapor Pin® sampling device to dislodge it.
- 25.** Return the WMS-VP to the glass storage vial with the matching laboratory provided Sample ID and cap (Figures 23 and 24).
- 26.** Apply laboratory provided sealing tape to the cap/glass storage vial to seal (Figure 25), and place glass storage vial into bubble wrap bag (Figure 26).
- 27.** Return bubble wrap bag (containing the WMS-VP and sealed glass storage vial) to foil sampler pack bag and seal (Photo 27).
- 28.** Fill out sample label with end date and time, and complete laboratory provided chain-of-custody with required sample information. Your sample is now ready to be shipped to the laboratory, no ice required!

Standard Operating Procedure

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Pictures



Figure 1



Figure 2



Figure 3

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Figure 4



Figure 5



Figure 6



Figure 7

Standard Operating Procedure

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Figure 8

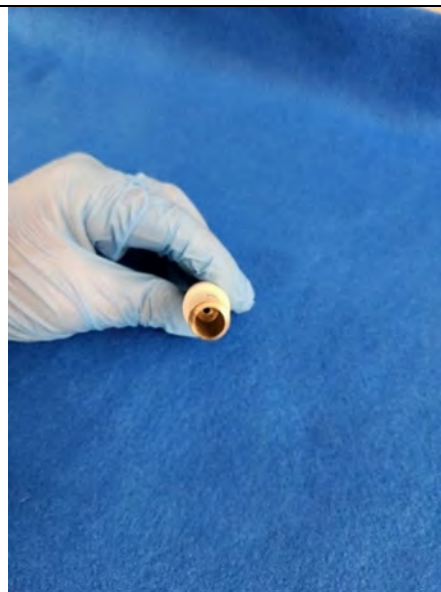


Figure 9



Figure 10



Figure 11



Figure 12

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Figure 13



Figure 14



Figure 15



Figure 16



Figure 17



Figure 18

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Figure 19



Figure 20



Figure 21

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Figure 22



Figure 23



Figure 24



Figure 25

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Figure 26



Figure 27