Scope:
This standard operating procedure describes the installation and use of the Mini Vapor Pin® for sub-slab soil-gas sampling.

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 Mini Vapor Pin® for the collection of sub-slab soil-gas samples or pressure readings.

Equipment Needed:
- Assembled Mini Vapor Pin® [FLX-VP™ barb fitting with O-ring, Mini Vapor Pin® base, and silicone sleeve (Figure 1)]. As shown on Figure 1, the silicone sleeve only extends onto the flat portion of the Mini Vapor Pin® for installation. It will slide onto the Mini Vapor Pin® as it is hammered into place;
- Hammer drill;
- 5/8-inch (16mm) diameter hammer bit (hole must be 5/8-inch (16mm) diameter to ensure seal. (Hilti™ TE-YX 5/8” x 22” (400 mm) #00206514 or equivalent);
- ¾-inch (19mm) diameter bottle brush;
- Wet/Dry vacuum with HEPA filter (optional);
- VAPOR PIN® installation/extraction tool;
- Dead blow hammer;
- Mini Vapor Pin® secure cover with O-ring;
- Mini Vapor Pin® drilling guide.

Installation Procedure:
1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.
2) Set up wet/dry vacuum to collect drill cuttings.
3) Drill a 5/8-inch (16mm) diameter hole through the slab and approximately 1-inch (25mm) into the underlying soil to form a void. Hole must be 5/8-inch (16mm) in diameter to ensure a seal. The drilled hole must be perpendicular to the slab for the mandatory Secure Cover to seat correctly. It is strongly recommended that the Mini-Vapor Pin® drilling guide be used for this purpose (Figure 2).
4) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.
5) Ensure the diameter of the hole will accommodate the Mini Vapor Pin® by inserting the top of the Mini Vapor Pin® into the hole. It should be easily inserted (Figure 3). If the Mini Vapor Pin® is tight, ream the hole with the bit and re-try.

6) Place the lower end of the assembled Mini Vapor Pin® into the drilled hole (Figure 4). Place the small hole located in the handle of the installation/extraction tool over the barb fitting and tap the Mini Vapor Pin® into place using a dead blow hammer (Figure 5) until the top of the Mini Vapor Pin® is flush with the slab (Figure 6).

Make sure the installation/extraction tool is aligned parallel to the Mini Vapor Pin® to avoid damaging the barb fitting. During installation, the silicone sleeve will slide onto the Mini Vapor Pin®.
8) Remove the Secure Cover, re-install the barb fitting and connect the Nylaflow® sample tubing to the barb and begin sampling. This connection can be made using a short piece of Tygon™ tubing to join the Nylaflow® tubing. Push the Nylaflow® tubing as close to the top of the barb fitting as possible to minimize contact between soil gas and Tygon™ tubing (Figure 8).

7) Remove the barb fitting and screw the Min Pin™ Secure Cover onto the Mini Pin™ (Figure 7). Allow 2 hours or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.
If you wish to directly connect to a Swagelok fitting, TO-17 tube, or quick connect, use those accessories instead of the barb fitting (Figure 9).

9) Conduct leak tests in accordance with applicable guidance. If the method of leak testing is not specified, an alternative can be the use of a water dam and vacuum pump, as described in SOP Leak Testing the FLX-VP™ via Mechanical Means (Figure 10).

10) Collect sub-slab soil gas sample or pressure reading. When finished, replace the barb fitting or accessory with the Mini Vapor Pin® Secure Cover until the next event (Figure 11).

The Mini Vapor Pin® is designed to be used repeatedly; however, accessories, replacement parts and supplies may be required periodically. These parts are available on-line at www.vaporpin.com.