

**FORMER BARRETT MANUFACTURING AND MICA ROOFING SITES
NYSDEC SITES 224196 and 224197
WORK PLAN ADDENDUM
VAPOR INTRUSION INVESTIGATION – 182 SIGOURNEY ST**

The “*Site Characterization Work Plan for the Former Barrett Manufacturing and Mica Roofing Site*” (Parsons 2016), including clarifications made by letter dated October 7, 2016, was approved by NYSDEC on October 31, 2016. The purpose of this work plan addendum is to define procedures to be used to conduct a vapor intrusion (VI) investigation at the buildings at 182 Sigourney St.

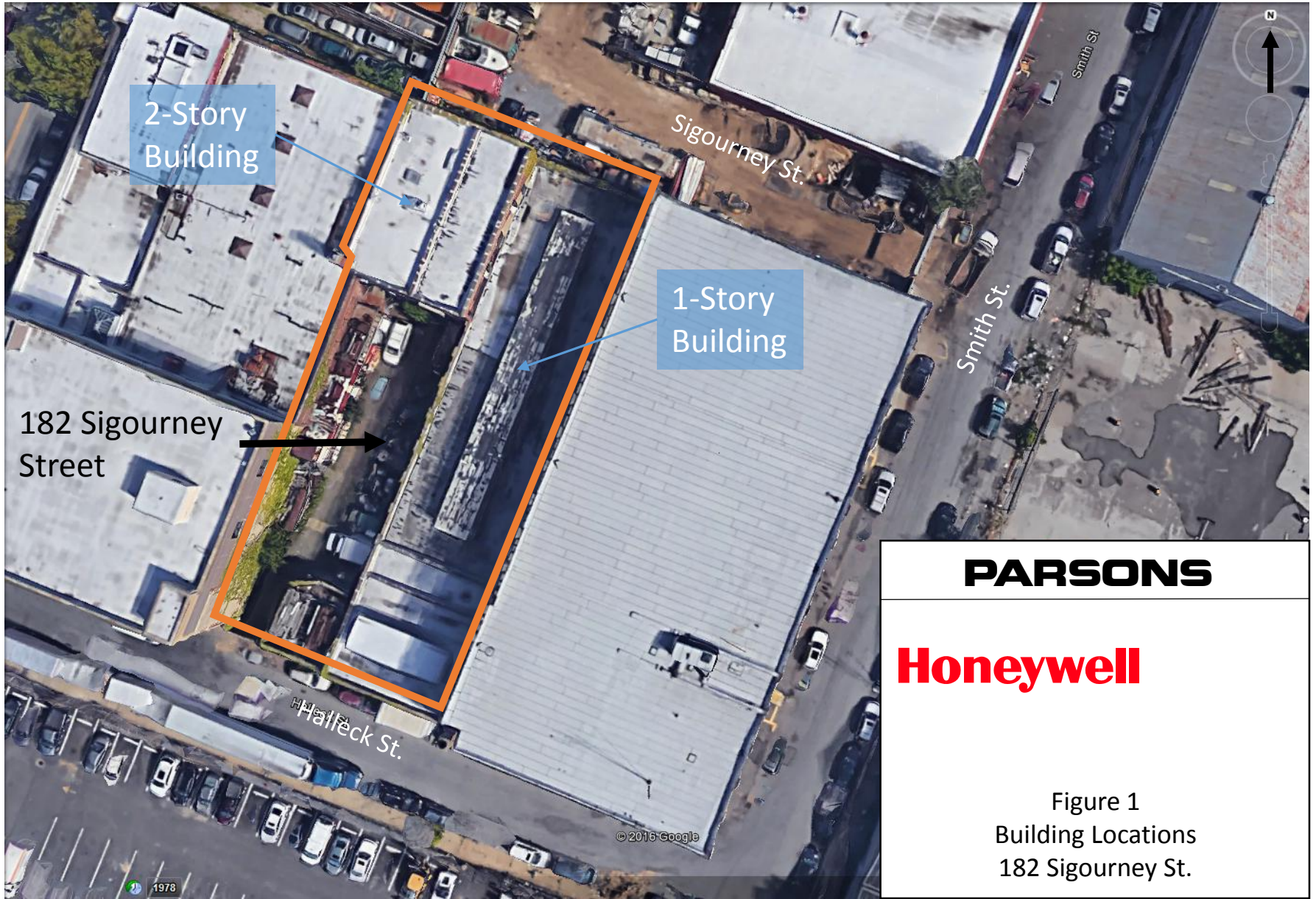
The VI investigation will be completed pursuant to the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006). The VI investigation will include collection of co-located indoor air and sub-slab vapor samples, and outdoor ambient air samples, for analysis for volatile organic compounds (VOCs).

As shown on Figure 1, there are two main buildings at 182 Sigourney Street: a two-story brick building (approximately 40 by 60 feet) at the north end of the property, and a second building (approximately 45 by 200 feet) that extends the entire length of the eastern side of the property. The VI investigation will begin with a walk-through of the buildings prior to sampling, to identify conditions that may affect the proposed investigation, including potential indoor air sources of VOCs (e.g., consumer and industrial products) and other influencing factors. A representative of 182 Sigourney Street will be asked to respond to a questionnaire to obtain basic information about the structure (e.g., heating and ventilation systems) and potential sources of VOCs within the structure. An “Indoor Air Quality Questionnaire and Building Inventory” form (NYSDOH 2006) will be completed, using visual observations and information obtained from the representative. A copy of the “Indoor Air Quality Questionnaire and Building Inventory” form is included as Attachment 1.

The number and locations for air sampling will be selected during the building walkthrough; it is anticipated that three co-located indoor air and sub-slab air samples will be collected over a 24-hour period. This number may be modified based on conditions observed. Sub-slab samples will be obtained using the equipment and Standard Operating Procedures (SOPs) for the Vapor Pin® method (Attachment 2)¹. Sample point locations will be selected to be away from cracks or openings in the floor and away from sub-slab utilities. Indoor air sample locations will be in the same rooms as the sub-slab samples. To the extent possible, the inlet of the canisters for the collection of indoor air will be positioned at approximately 3 to 5 feet above the floor (breathing zone). One duplicate sample (indoor air) will be collected as part of the sampling. In addition, two outdoor ambient air samples will be collected from locations selected based on wind direction conditions at the time of sampling.

Sub-slab, indoor, and ambient air samples will be analyzed for the list of VOCs identified in Compendium Method TO-15 (USEPA January 1999). All samples that will be used to make decisions on appropriate actions to address exposures and environmental contamination will be analyzed by SGS-Accutest labs, an ELAP-certified laboratory (NY# 10983). Analytical results will be evaluated to assess the potential for vapor intrusion using a multiple lines of evidence approach, taking into consideration constituents detected in groundwater, sub-slab air, and ambient air, and typical background concentrations of constituents in indoor air.

¹ Temporary sub-slab sampling points will be installed using a hammer drill to penetrate the concrete slab of the first floor. The drill will create an approximately 5/8-inch diameter hole and a temporary sampling point (i.e., Vapor Pin®) will be installed. A helium tracer gas will be used to verify the integrity of the vapor point seal. After sampling, the sampling point will be removed and the hole will be permanently sealed with hydraulic cement and allowed to cure.



PARSONS

Honeywell

Figure 1
Building Locations
182 Sigourney St.

**NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH**

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No. _____

Purpose of Investigation _____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential
Industrial

School
Church

Commercial/Multi-use
Other: _____

If the property is residential, type? (Circle appropriate response)

- | | | |
|--------------|-----------------|-------------------|
| Ranch | 2-Family | 3-Family |
| Raised Ranch | Split Level | Colonial |
| Cape Cod | Contemporary | Mobile Home |
| Duplex | Apartment House | Townhouses/Condos |
| Modular | Log Home | Other: _____ |

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors _____ Building age _____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

Airflow near source

Outdoor air infiltration

Infiltration into air ducts

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

- a. Above grade construction: wood frame concrete stone brick
- b. Basement type: full crawlspace slab other _____
- c. Basement floor: concrete dirt stone other _____
- d. Basement floor: uncovered covered covered with _____
- e. Concrete floor: unsealed sealed sealed with _____
- f. Foundation walls: poured block stone other _____
- g. Foundation walls: unsealed sealed sealed with _____
- h. The basement is: wet damp dry moldy
- i. The basement is: finished unfinished partially finished
- j. Sump present? Y / N
- k. Water in sump? Y / N / not applicable

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

- Hot air circulation
- Space Heaters
- Electric baseboard
- Heat pump
- Stream radiation
- Wood stove
- Hot water baseboard
- Radiant floor
- Outdoor wood boiler
- Other _____

The primary type of fuel used is:

- Natural Gas
- Electric
- Wood
- Fuel Oil
- Propane
- Coal
- Kerosene
- Solar

Domestic hot water tank fueled by: _____

Boiler/furnace located in: Basement Outdoors Main Floor Other _____

Air conditioning: Central Air Window units Open Windows None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level **General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**

Basement	_____
1 st Floor	_____
2 nd Floor	_____
3 rd Floor	_____
4 th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

- a. Is there an attached garage? Y / N
- b. Does the garage have a separate heating unit? Y / N / NA
- c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA
Please specify _____
- d. Has the building ever had a fire? Y / N When? _____
- e. Is a kerosene or unvented gas space heater present? Y / N Where? _____
- f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____
- g. Is there smoking in the building? Y / N How frequently? _____
- h. Have cleaning products been used recently? Y / N When & Type? _____
- i. Have cosmetic products been used recently? Y / N When & Type? _____

- j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____
- k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____
- l. Have air fresheners been used recently? Y / N When & Type? _____
- m. Is there a kitchen exhaust fan? Y / N If yes, where vented? _____
- n. Is there a bathroom exhaust fan? Y / N If yes, where vented? _____
- o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N
- p. Has there been a pesticide application? Y / N When & Type? _____

Are there odors in the building? Y / N
 If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
 (e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist)

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

- Yes, use dry-cleaning regularly (weekly) No
- Yes, use dry-cleaning infrequently (monthly or less) Unknown
- Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply: Public Water Drilled Well Driven Well Dug Well Other: _____
Sewage Disposal: Public Sewer Septic Tank Leach Field Dry Well Other: _____

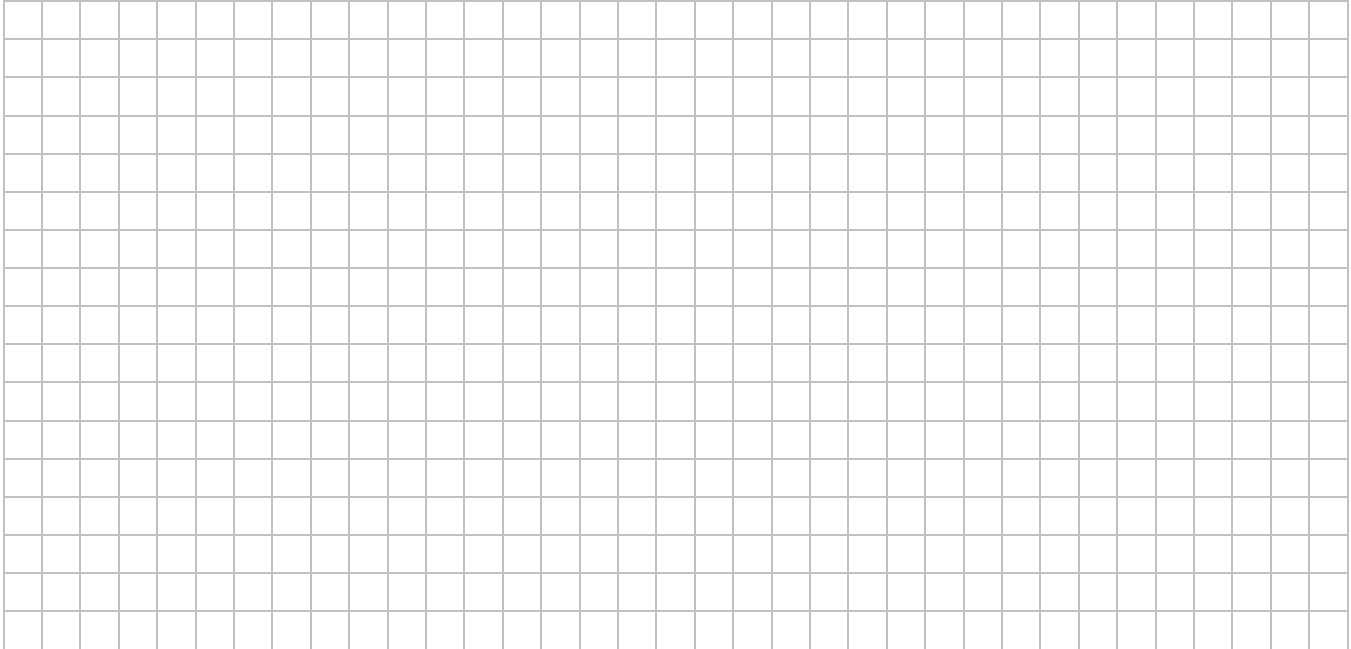
10. RELOCATION INFORMATION (for oil spill residential emergency)

- a. Provide reasons why relocation is recommended: _____
- b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel
- c. Responsibility for costs associated with reimbursement explained? Y / N
- d. Relocation package provided and explained to residents? Y / N

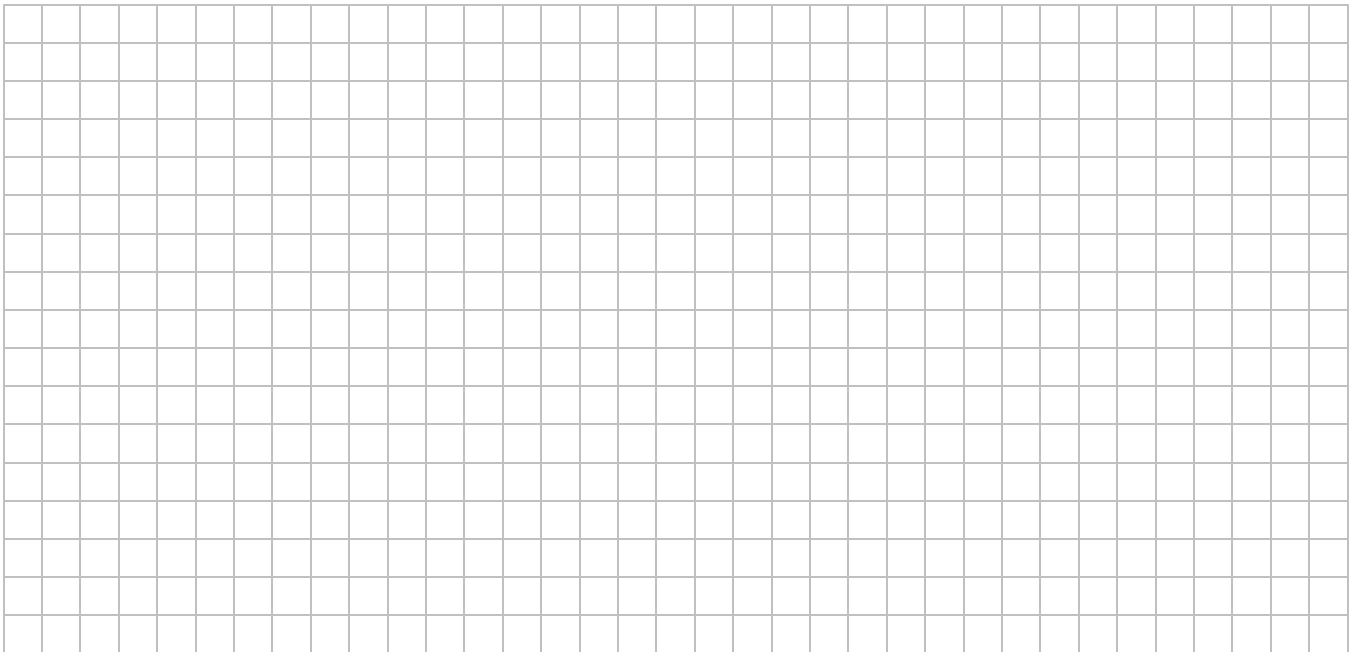
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



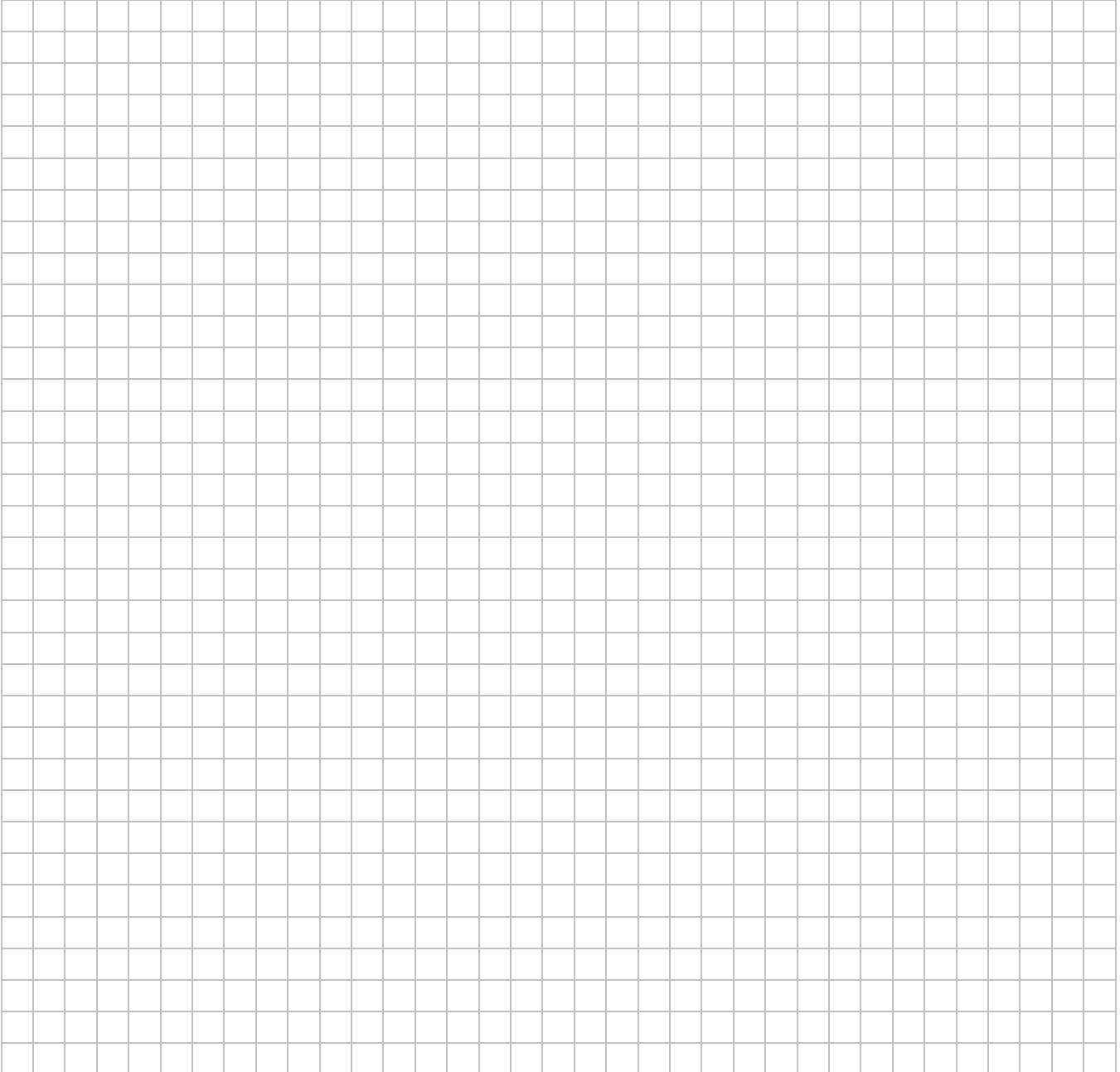
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition *	Chemical Ingredients	Field Instrument Reading (units)	Photo ** <u>Y/N</u>

* Describe the condition of the product containers as **Unopened (UO)**, **Used (U)**, or **Deteriorated (D)**
 ** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.



Standard Operating Procedure Installation and Extraction of the FLX-VP VAPOR PIN®

Updated March 28, 2016

Scope:

This standard operating procedure describes the installation, use, and extraction of the FLX-VP 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 FLX-VP for the collection of sub-slab soil-gas samples or pressure readings.

Equipment Needed:

- Assembled FLX-VP [FLX-VP barb fitting with O-ring, FLX-VP base, and silicone sleeve (Figure 1)]; Because of sharp edges, gloves are recommended for sleeve installation;
- Hammer drill;
- 5/8-inch (16mm) diameter hammer bit (hole must be 5/8-inch (16mm) diameter to ensure seal. It is recommended that you use the drill guide). (Hilti™ TE-YX 5/8" x 22" (400 mm) #00206514 or equivalent);
- 1½-inch (38mm) diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch (19mm) diameter bottle brush;
- Wet/Dry vacuum with HEPA filter (optional);
- VAPOR PIN® installation/extraction tool;
- Dead blow hammer;

- VAPOR PIN® flush mount cover, if desired;
- VAPOR PIN® drilling guide, if desired;
- VAPOR PIN® protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel for repairing the hole following the extraction of the FLX-VP.



Figure 1. Assembled FLX-VP

Installation Procedure:

- 1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.
- 2) Set up wet/dry vacuum to collect drill cuttings.

VAPOR PIN® protected under US Patent # 8,220,347 B2

- 3) If a flush mount installation is required, drill a 1½-inch (38mm) diameter hole at least 1¾-inches (45mm) into the slab. Use of a VAPOR PIN® drilling guide is recommended.
- 4) 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 seal. It is recommended that you use the drill guide.
- 5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.
- 6) Place the lower end of the assembled FLX-VP into the drilled hole. Place the small hole located in the handle of the installation/extraction tool over the barb fitting, and tap the FLX-VP into place using a dead blow hammer (Figure 2). Make sure the installation/extraction tool is aligned parallel to the FLX-VP to avoid damaging the barb fitting.



Figure 2. Installing the FLX-VP

During installation, the silicone sleeve will form a slight bulge between the slab and the FLX-VP shoulder. Place the protective cap on FLX-VP to prevent vapor loss prior to sampling (Figure 3).



Figure 3. Installed FLX-VP

- 7) For flush mount installations, cover the FLX-VP with a flush mount cover, using either the plastic cover or the optional stainless-steel Secure Cover (Figure 4).



Figure 4. Secure Cover Installed

- 8) Allow 20 minutes or more (consult applicable guidance for your situation)

for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.

- 9) Remove protective cap and connect sample tubing to the barb fitting of the FLX-VP. This connection can be made using a short piece of Tygon™ tubing to join the FLX-VP with the Nylaflow tubing (Figure 5). Put the Nylaflow tubing as close to the FLX-VP as possible to minimize contact between soil gas and Tygon™ tubing.

If you wish to directly connect to FLX-VP accessory (e.g. Swagelok fitting, TO-17 tube, or quick connect) unscrew the barb fitting and replace with accessory (Figures 6 and 7).



Figure 5. FLX-VP sample connection



Figure 6. FLX-VP with Swagelok® connection



Figure 7. FLX-VP with TO-17 Sorbent tube connection

10) 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 8). For flush-mount installations, distilled water can be poured directly into the 1 1/2 inch (38mm) hole.



Figure 8. Water dam used for leak detection

11) Collect sub-slab soil gas sample or pressure reading. When finished, replace the barb fitting and protective cap and flush mount cover until the next event. If the sampling is complete, extract the FLX-VP.

Extraction Procedure:

- 1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the FLX-VP (Figure 9). Continue turning the tool clockwise to pull the FLX-VP from the hole into the installation/extraction tool.
- 2) Fill the void with hydraulic cement and smooth with a trowel or putty knife.



Figure 9. Removing the FLX-VP

- 3) Prior to reuse, remove the silicone sleeve and protective cap and discard. Decontaminate the FLX-VP in a hot water and Alconox® wash, then heat in an oven to a temperature of 265° F (130° C) for 15 to 30 minutes.

The FLX-VP is designed to be used repeatedly, however, accessories, replacement parts and supplies will be required periodically. These parts are available on-line at VaporPin.CoxColvin.com