March 28, 2016

Ms. Seth Kellog
Sr. Project Manager, CDM Smith
110 Field Crest Avenue
Edison, New Jersey 08837

Re: Soil Vapor Remedial Activities (Revised)
Boston Market
1465 Forest Avenue, Staten Island, NY
Staten Island, New York 10302
KES Project # 0455.11214.1

Dear Ms. Kellog:

Reference is made to our February 8, 2016 signed contract for the installation of three (3) Active Soil Depressurization (ASD) Systems at the former Paul Miller Dry Cleaning Site located at 1465 Forest Avenue, Staten Island, NY.

During the week of February 8, 2016, KES completed the installation of the soil vapor remediation systems. Please find the following revised project close out documentation regarding our ASD installations.

Appendix A - Mitigation system installation record for 1465 Forest Avenue
Appendix B - As-Built System Drawings
Appendix C - Contractor Daily Reports
Appendix D - Diagnostic / Final Testing Data Sheets and Diagrams
Appendix E – On-Site Photo Documentation
Appendix F – Fan Specifications / Warranty
Appendix G – System Operating Instructions

After reviewing our submittal information, please do not hesitate to contact our office with any questions. Thank you.

Sincerely,

Richard J. Tarnowski, CEP, CEI
Member/Director of Environmental Services

RJT/tms

# APPENDIX A

## Mitigation System Installation Record
## For
## 1465 Forest Avenue
## Staten Island, New York

# Mitigation System Installation Record

☒ Structure was sampled previously

**System Information**

Site No: 243018

System ID: KES # 455.11214.1

Site Name: Former Paul Miller Dry Cleaner

Owner Name: Eleanor Nalitt / 1465 Forest LLC ☐ Owner Occupied

System Address: 1465 Forest Avenue Telephone: N/A

City: Staten Island Zip: 10302 Alt. Telephone: N/A

**Contractor Information**

Installer Name: Keystone Environmental Services Company: Keystone Environmental Service

Telephone: 607-770-9098

**Building Conditions** Building Type: Commercial

Slab Integrity: ◉ Poor ○ Average ○ Good ○ Excellent

Slab Penetrations: ☒ Sump ☒ Floor drain ☐ Perimeter drain ☒ Other

Describe:

Multiple floor drains in the kitchen area, large slab opening in the basement that has been plexiglas sealed

Observed Water: ○ Dry ◉ Damp ○ Sump only ○ Standing

Describe:

Water staining observed in basement area. High ground water table.

**System Installation**

Installation Type: Sub-Slab Depressurization (Active) Date Installed: Feb 12, 2016

Slab Thickess (inches): 3 to 5 in.

Subslab Material: Clay Subslab Moisture: Damp

Number of Suction Points: 4 Number of Fans Installed: 3

| | ☒ Fan #1 Operating | ☒ Fan #2 Operating | ☒ Fan #3 Operating |
|---|---|---|---|
| Fan Model No(s): | HP-220 | HS-5000 | HS-5000 |
| Fan Serial No(s): | N/A | N/A | N/A |
| Final U-Tube Levels: | 2.5" | 1" | 1" |

Additional Mitigation Elements (check all that apply):

☒ Drainjer ☒ Membrane ☒ Sealed cracks ☒ New floor ☒ Rain cap ☒ Other

Comments:

Installed plexiglas cover over open slab areas in the basement level. Slab on grade section of the building (i.e., kitchen/dining area) has a layer of blacktop pavement below the concrete slab.

**Communication Testing**

Test Method: Micromanometer Meter Type/Manufacturer: TEC DG-700

| Location | Reading/Result | Dist. From Suction Point (ft) | Passed? |
|---|---|---|---|
| A | NOTE: SEE POST | | ☐ |
| B | MITIGATION COMMUNICATION | | ☐ |
| C | TEST RESULTS | | ☐ |
| D | | | ☐ |
| E-F | | | ☐ |

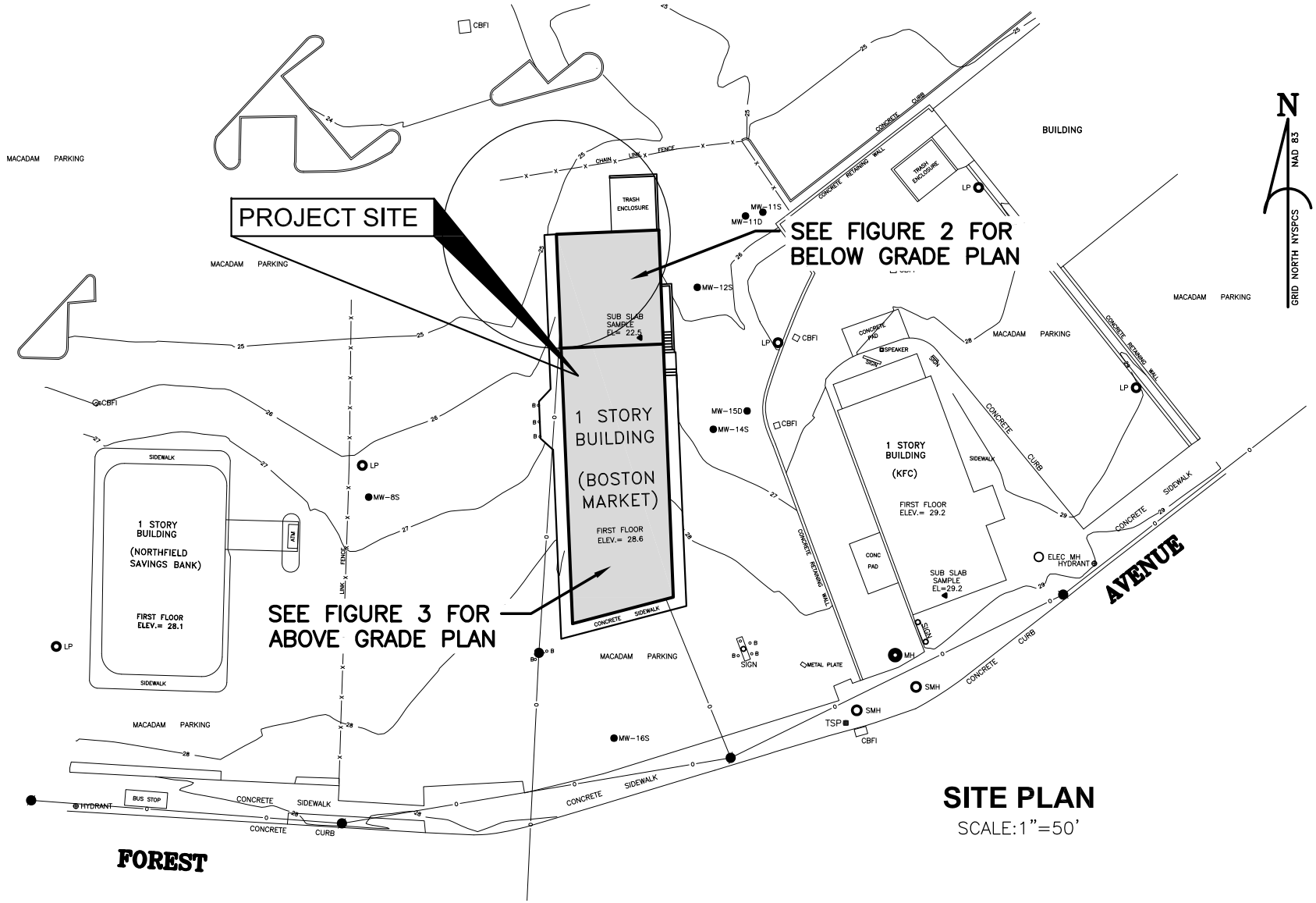
**System Sketch**
(indicate notable features, location of extraction points, and communication test holes)

NORTH

SEE AS-BUILT SKETCHES

# APPENDIX B

## As-Built System Drawings




# SITE PLAN

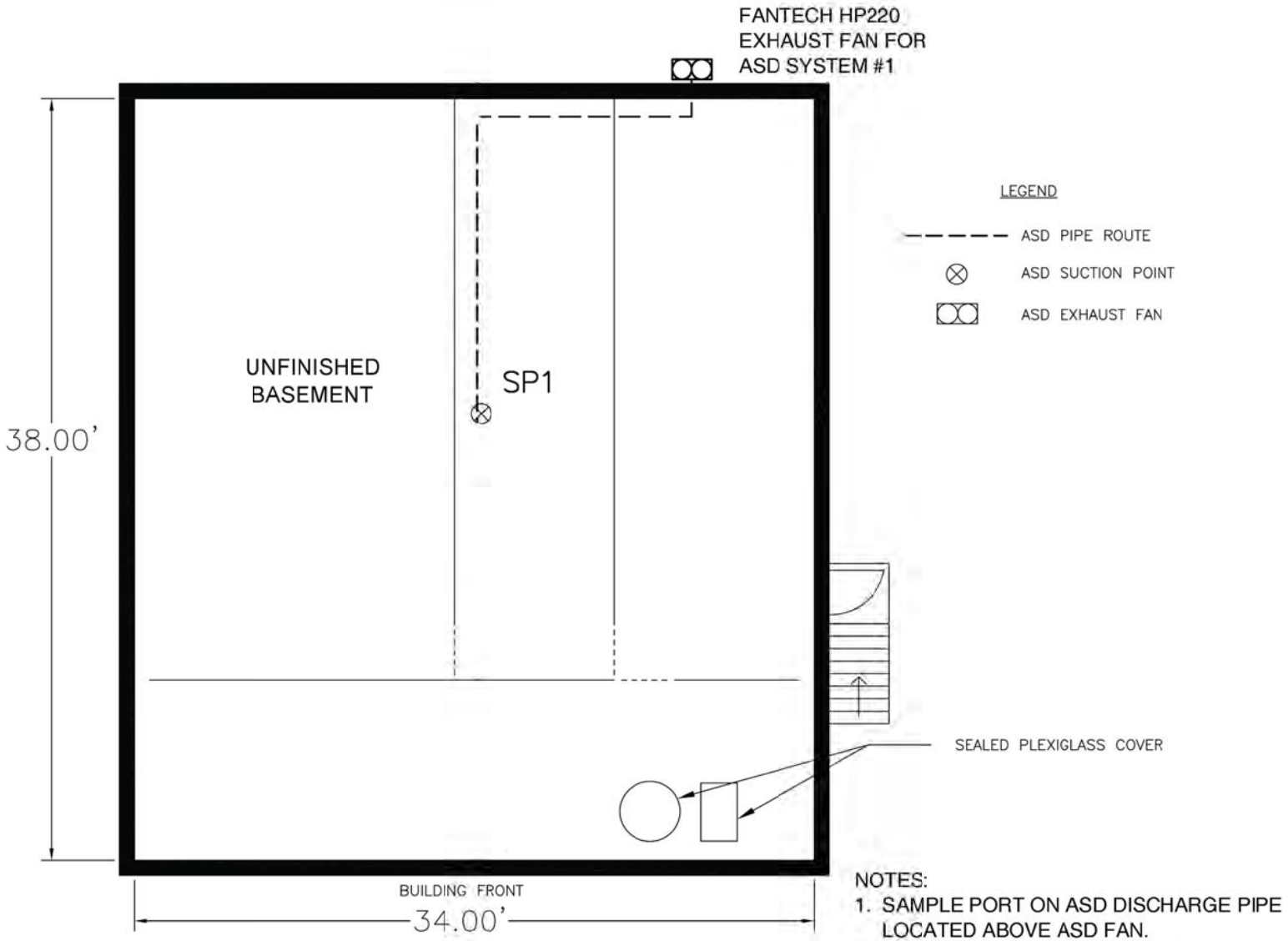
SCALE:1"=50'

| | | |
|---|---|---|
| CAD FILE NO. 455.11214.1_SITE ASB | DATE 2/23/16 | PROJECT NO. 455.11214.1 |
| SHEET NO. 1 | **CDM SMITH**<br>**SOIL VAPOR REMEDIATION**<br>**1465 FOREST AVE, STATEN ISLAND, NY**<br>**BASEMENT LEVEL** | NO. 1 — REVISIONS AND DESCRIPTION: AS BUILT ASD REVISION — DATE: 2/23/16 |
| **SITE PLAN** | | |

WARNING: Each work area will be done in accordance with NYS Industrial Code Rule 56, Site Specific Variances and all other applicable regulations. All proposed deviations from the design shall be approved in writing by the Certified Project Designer.



KEYSTONE ENVIRONMENTAL SERVICES
58 Exchange Street
Binghamton, New York 13901
Phone: 607.723.5117
Fax: 607.722.2515
Email: info@kecompanies.com
www.kecompanies.com




GRAPHIC SCALE: NOT TO SCALE

NOTES:
1. SAMPLE PORT ON ASD DISCHARGE PIPE LOCATED ABOVE ASD FAN.
2. VACUUM GUAGE LOCATED ON RISER PIPE FOR EACH ASD SYSTEM.

CAD FILE ID: 455.11214.1_SITE
SWR

DATE: 2/23/16

PROJECT NO. 455.11214.1

SHEET NO. 2

# CDM SMITH
# SOIL VAPOR REMEDIATION

## 1465 FOREST AVE, STATEN ISLAND, NY
## BASEMENT LEVEL

| NO. | REVISIONS AND DESCRIPTIONS | DATE |
|---|---|---|
| 1 | AS BUILT ASD REVISION | 2/23/16 |

WARNING:
Each work area will be done in accordance with NYS Industrial Code Rule 56, Site Specific Variances and all other applicable regulations. All proposed deviations from the design shall be approved in writing by the Certified Project Designer.



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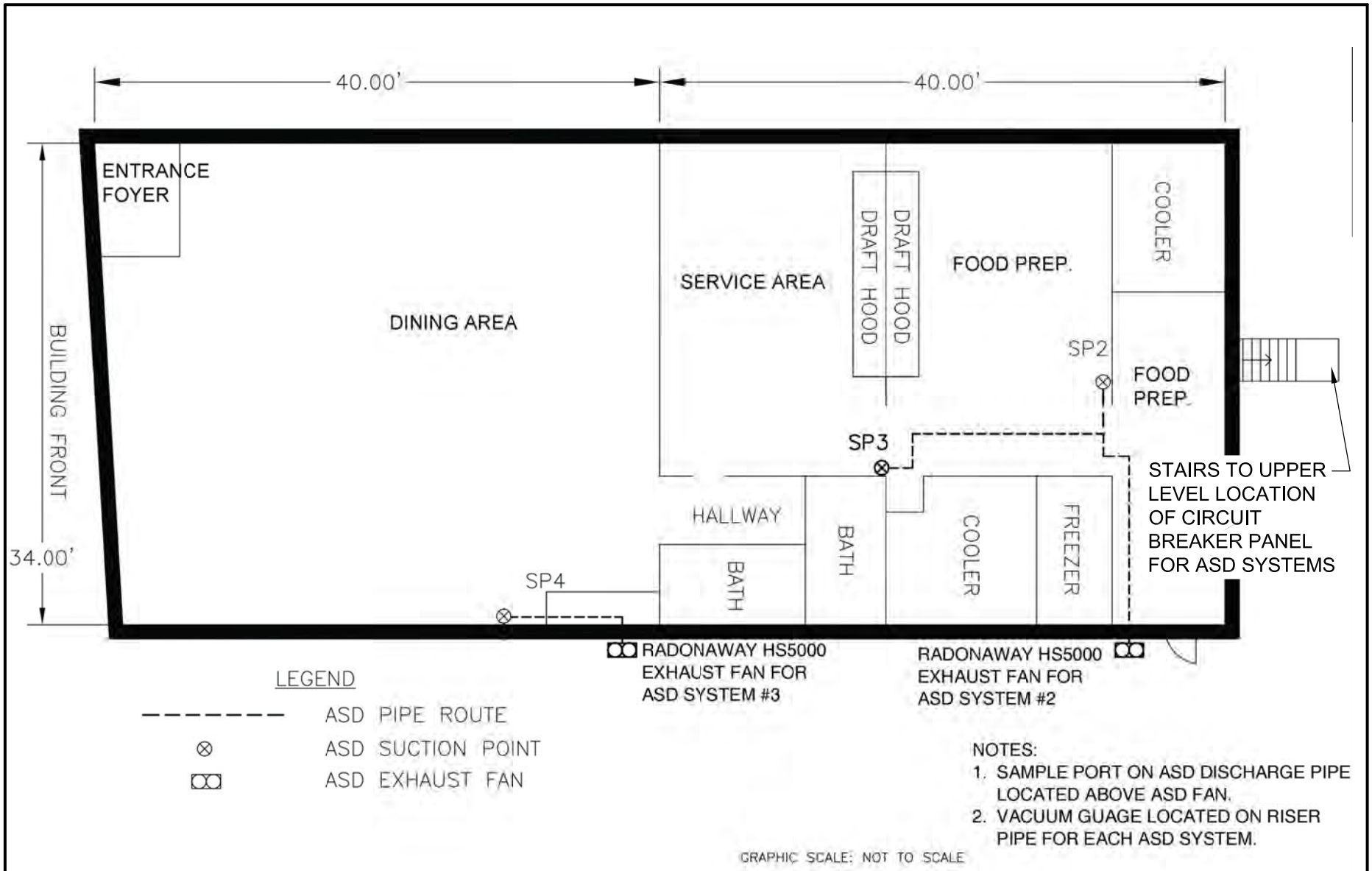


CAD FILE ID: 455.11214.1_SITE
DATE: 2/23/16
PROJECT NO: 455.11214.1
SHEET NO: 3

**CDM SMITH**
**SOIL VAPOR REMEDIATION**

**1465 FOREST AVE, STATEN ISLAND, NY**
**FIRST FLOOR SLAB ON GRADE**

| NO. | REVISIONS AND DESCRIPTION | DATE |
|---|---|---|
| 1 | AS BUILT ASD REVISION | 2/23/16 |

WARNING:
Each work area will be done in accordance with NYS Industrial Code Rule 56, Site Specific Variances and all other applicable regulations. All proposed deviations from the design shall be approved in writing by the Certified Project Designer.



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# APPENDIX C

## Contractor Daily Reports

KEYSTONE
ENVIRONMENTAL SERVICES

# Contractor's Daily Report

Project # 0455.11214.1
Soil Vapor Mitigation Project: Boston Market ASD Installation

| Date | Address | Crew |
|---|---|---|
| 2/8/16 | 1465 Forest Avenue, Staten Island, New York | T. Polovick, C. Tarnowski, B. Aylward |

Provide a brief description of daily work performed:

6:00 a.m. - KES crew meets at Binghamton office. Leaves for 1456 Forest Avenue, Staten Island.
10:15 a.m. - KES arrives on site, meets with CDM Smith, Boston Market representative, electrician and NYS DEC.
All parties discuss health/safety plan, work scope and schedule.
11:00 a.m. - KES begins to install ASD System #2 (basement).
5:00 p.m. - KES has all interior pipe installed in the basement and has HP220 fan mounted to the exterior. KES begins cleaning up for the day and locks all material in the basement.
6:00 p.m. - KES arrives at hotel.

**Manpower and Equipment**

Provide a detailed list of manpower and equipment resources. The Trade field refers to type of manpower, i.e. Carpenter, Electrician, etc. The Classification field refers to qualifications, i.e. Foreman, Journeyman, Apprentice, etc.

| HRS | NAME | CLASSIFICATION |
|---|---|---|
| 12 | T. Polovick | |
| 12 | C. Tarnowski | |
| 12 | B. Aylward | |
| | | |
| | | |
| | | |
| | | |

| QTY | EQUIPMENT |
|---|---|
| 2 | Construction Vehicles with equipment |
| | |
| | |
| | |
| | |
| | |
| | |

Manpower Units: Manhours ☐ Mandays ☐ Other_____

Equipment Units: Days ☐ Hours ☐ Other_____

**Events or Issues**

Provide a description of any significant events or issues to report. Include quantities and units if applicable:

**KES required to work after hours in dining area and kitchen.**

KEYSTONE
ENVIRONMENTAL SERVICES

# Contractor's Daily Report

Project # 0455.11214.1
Soil Vapor Mitigation Project: Boston Market ASD Installation

| Date | Address | Crew |
|---|---|---|
| 2/9/16 | 1465 Forest Avenue, Staten Island, New York | T. Polovick, C. Tarnowski, B. Aylward |

Provide a brief description of daily work performed:

7:00 a.m. - KES leaves hotel for project work site.
7:15 a.m. - KES on site. C. Tarnowski sets up to run diagnostics. Install crew finishes basement installation.
8:00 a.m. - KES runs diagnostics throughout the building with various operation modes (i.e., draft hoods on only, make up air on only, and both on at the same time).
11:30 a.m. - KES completes basement install and finish sealing all basement openings.
12:00 p.m. - KES off site. Will return at 10:00 p.m. when restaurant is not in operation.
10:00 p.m. - KES on site to work in the dining room (System #3).

**Manpower and Equipment**

Provide a detailed list of manpower and equipment resources. The Trade field refers to type of manpower, i.e. Carpenter, Electrician, etc. The Classification field refers to qualifications, i.e. Foreman, Journeyman, Apprentice, etc.

| HRS | NAME | CLASSIFICATION |
|---|---|---|
| 7 | T. Polovick | |
| 7 | C. Tarnowski | |
| 7 | B. Aylward | |
| | | |
| | | |
| | | |
| | | |

| QTY | EQUIPMENT |
|---|---|
| 2 | Construction vehicles with equipment |
| | |
| | |
| | |
| | |
| | |
| | |

Manpower Units: Manhours ☐ Mandays ☐ Other_____

Equipment Units: Days ☐ Hours ☐ Other_____

**Events or Issues**

Provide a description of any significant events or issues to report. Include quantities and units if applicable:

**KES begins overnight work due to Boston Market's operating hours of 11:00 a.m. - 10:00 p.m.**

KEYSTONE
ENVIRONMENTAL SERVICES

# Contractor's Daily Report

Project # 0455.11214.1
Soil Vapor Mitigation Project: Boston Market ASD Installation

| Date | Address | Crew |
|---|---|---|
| 2/10/16 | 1465 Forest Avenue, Staten Island, New York | T. Polovick, C. Tarnowski, B. Aylward |

Provide a brief description of daily work performed:

12:00 a.m. - KES completes digging out suction points 2, 3 and 4 and finds two (2) inches of blacktop pavement directly below concrete slab with clay below the blacktop.
(Suction point 3 has loose broken up blacktop pavement).
5:00 a.m. - KES has system #3 98% installed. Need to finish stack. KES cleans up.
6:00 a.m. - KES returns to the hotel.
8:00 a.m. - KES (C. Tarnowski) on site to meet electricians.
9:00 a.m. - KES off site. Will return at 10:00 p.m.
10:00 p.m. - KES on site. Begins installing System #2.

**Manpower and Equipment**

Provide a detailed list of manpower and equipment resources. The Trade field refers to type of manpower, i.e. Carpenter, Electrician, etc. The Classification field refers to qualifications, i.e. Foreman, Journeyman, Apprentice, etc.

| HRS | NAME | CLASSIFICATION |
|---|---|---|
| 8 | T. Polovick | |
| 9 | C. Tarnowski | |
| 8 | B. Aylward | |
| | | |
| | | |
| | | |
| | | |

| QTY | EQUIPMENT |
|---|---|
| 2 | Construction vehicles with equipment |
| | |
| | |
| | |
| | |
| | |
| | |

Manpower Units: Manhours ☐ Mandays ☐ Other_____

Equipment Units: Days ☐ Hours ☐ Other_____

**Events or Issues**

Provide a description of any significant events or issues to report. Include quantities and units if applicable:

**Appears structure was built over an existing parking area as evidenced by blacktop pavement directly below concrete slab of structure.**

KEYSTONE ENVIRONMENTAL SERVICES

# Contractor's Daily Report

Project # 0455.11214.1
Soil Vapor Mitigation Project: Boston Market ASD Installation

| Date | Address | Crew |
|---|---|---|
| 2/11/16 | 1465 Forest Avenue, Staten Island, New York | T. Polovick, C. Tarnowski, B. Aylward |

Provide a brief description of daily work performed:

12:00 a.m. - KES has fan installed at exterior. Return to inside to continue with interior pipe run.
1:00 a.m. - Boston Market representative (Tom) stops in to check progress.
3:00 a.m. - KES continues to install interior pipe run for System #2.
4:30 a.m. - KES has suction point #3 installed.
6:00 a.m. - KES completes ASD install and cleans up. Returns all ceiling tiles back in place.
7:00 a.m. - KES off site. Will return in afternoon for final data.

**Manpower and Equipment**

Provide a detailed list of manpower and equipment resources. The Trade field refers to type of manpower, i.e. Carpenter, Electrician, etc. The Classification field refers to qualifications, i.e. Foreman, Journeyman, Apprentice, etc.

| HRS | NAME | CLASSIFICATION |
|---|---|---|
| 13 | T. Polovick | |
| 9.5 | C. Tarnowski | |
| 13 | B. Aylward | |
| | | |
| | | |
| | | |
| | | |

| QTY | EQUIPMENT |
|---|---|
| 2 | Construction vehicles with equipment |
| | |
| | |
| | |
| | |
| | |
| | |

Manpower Units: Manhours ☐ Mandays ☐ Other_____

Equipment Units: Days ☐ Hours ☐ Other_____

**Events or Issues**

Provide a description of any significant events or issues to report. Include quantities and units if applicable:

**4:45 p.m. - KES returns to site to complete outside stack and run final sub-slab data. KES cannot set good data due to amount of customers in the Boston Market opening and closing entrance doors.**

**7:00 p.m. - KES 2 man install crew off site and drive back to Binghamton (T. Polovick, B. Aylward).**

**KES (C. Tarnowski) to return on 2/12/2016 to run final sub-slab data.**

KEYSTONE ENVIRONMENTAL SERVICES

# Contractor's Daily Report

Project # 0455.11214.1
Soil Vapor Mitigation Project: Boston Market ASD Installation

| Date | Address | Crew |
|---|---|---|
| 2/12/16 | 1465 Forest Avenue, Staten Island, New York | C. Tarnowski |

Provide a brief description of daily work performed:

8:00 a.m. - KES (C. Tarnowski) on site to meet with CDM Smith and to run final sub-slab data numbers in the basement and slab on grade portion of the building.

KES seals all test points, installs labels and cleans site.

12:00 p.m. - KES off site. Travel to Binghamton office and unloads equipment.

**Manpower and Equipment**

Provide a detailed list of manpower and equipment resources. The Trade field refers to type of manpower, i.e. Carpenter, Electrician, etc. The Classification field refers to qualifications, i.e. Foreman, Journeyman, Apprentice, etc.

| HRS | NAME | CLASSIFICATION |
|---|---|---|
| 8 | C. Tarnowski | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Manpower Units: Manhours ☐ Mandays ☐ Other_____

| QTY | EQUIPMENT |
|---|---|
| 1 | Construction vehicle with equipment |
| | |
| | |
| | |
| | |
| | |
| | |

Equipment Units: Days ☐ Hours ☐ Other_____

**Events or Issues**

Provide a description of any significant events or issues to report. Include quantities and units if applicable:

**Sub-slab communication test data shows make up air for HVAC must be operational for ASD systems successful operation.**

**KES will prepare a final submission package for CDM Smith.**

# APPENDIX D

## Sub-Slab Diagnostic / Final Communication Testing Data Tables

KEYSTONE ENVIRONMENTAL SERVICES

**Job Site: CDM Smith - 1465 Forest Avenue, Staten Island NY**
**Date: 2/8/2016 - 2/12/2016**
**KES File #: 0455.11214.1**

| Suction Device | Date | Vacuum Test Point | Static Vacuum inch WC | Air Flow CFM | Diagnostic Test Hole | Approximate Distance in Feet from Vacuum Test Point | Suction Device Off (inch WC) | Suction Device On (inch WC) | Pressure Differential (inch WC) | Communication Pass >-0.0040 Pressure differntial | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ADDITIONAL DIAGNOSTIC TESTING PERFORMED PRIOR TO ASD INSTALLATION WITH HVAC OPERATING, MAKE UP AIR OFF & DRAFT HOODS OFF** | | | | | | | | | | | |
| 6.5 HP Vac | 2/9/16 | SP2 | 30" | 49 | | | | | | | |
| Kitchen / Food Prep Area | | | | | 2A | 21' | 0.0016 | 0.0004 | -0.0012 | No | |
| | | | | | 2B | 29' | 0.0040 | -0.0180 | -0.0220 | Yes | |
| | | | | | 2C | 16' | 0.0010 | -0.0009 | -0.0019 | No | Test Point was filled with grease, had to be cleaned out |
| | | | | | 2D | 17' | 0.0010 | -0.0048 | -0.0058 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP3 | 44" | 25 | | | | | | | Not making a suction point (New Test Point) |
| Kitchen / Food Prep Area | | | | | 3A | 22' | 0.0010 | 0.0010 | 0.0000 | No | |
| | | | | | 2D | 11' | 0.0013 | -0.0040 | -0.0053 | Yes | |
| | | | | | 2C | 13' | 0.0010 | -0.0055 | -0.0065 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP2-D | 42" | 27 | | | | | | | Turning into a suction point (New SP 3) |
| Kitchen / Food Prep Area | | | | | SP3 | 11' | 0.0010 | -0.0045 | -0.0055 | Yes | |
| | | | | | 3A | 34' | 0.0010 | 0.0010 | 0.0000 | No | |
| | | | | | SP2 | 17' | 0.0010 | -0.0038 | -0.0048 | Yes | |
| | | | | | 2A | 25' | 0.0020 | 0.0020 | 0.0000 | No | |
| | | | | | 2B | 22' | 0.0040 | 0.0040 | 0.0000 | No | |
| | | | | | 2C | 10' | 0.0010 | -0.0056 | -0.0066 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP4 | 27" | 70 | | | | | | | |
| Dining Room Area | | | | | 4A | 28' | 0.0010 | -0.0040 | -0.0050 | Yes | |
| | | | | | 4B | 44' | 0.0100 | 0.0100 | 0.0000 | No | |
| | | | | | 4C | 26' | 0.0020 | -0.0150 | -0.0170 | Yes | |
| | | | | | SP5-1 | 25' | 0.0020 | -0.0430 | -0.0450 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP5-1 | 26" | 68 | | | | | | | Drilled new Suction Point for SP5 |
| Dining Room Area | | | | | SP4 | 22' | 0.0020 | -0.0062 | -0.0082 | Yes | |
| | | | | | 4C | 20' | 0.0010 | -0.0080 | -0.0090 | Yes | |
| | | | | | 4B | 15' | 0.0130 | 0.0130 | 0.0000 | No | |
| | | | | | 4A | 19' | 0.0010 | -0.0200 | -0.0210 | Yes | |

**NOTES* Testing was performed before the store opend for lunch, only prep work was being conducted. Weather conditions were overcast with a light wind.**

| Suction Device | Date | Vacuum Test Point | Static Vacuum inch WC | Air Flow CFM | Diagnostic Test Hole | Approximate Distance in Feet from Vacuum Test Point | Suction Device Off (inch WC) | Suction Device On (inch WC) | Pressure Differential (inch WC) | Communication Pass >-0.0040 Pressure differntial | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ADDITIONAL DIAGNOSTIC TESTING PERFORMED PRIOR TO ASD INSTALLATION WITH HVAC OPERATING, MAKE UP AIR ON & DRAFT HOODS ON** | | | | | | | | | | | |
| 6.5 HP Vac | 2/9/16 | SP2 | 30" | 49 | | | | | | | |
| Kitchen / Food Prep Area | | | | | 2A | 21' | -0.0040 | -0.0050 | -0.0010 | No | |
| | | | | | 2B | 29' | -0.0060 | -0.0300 | -0.0240 | Yes | |
| | | | | | 2C | 16' | -0.0020 | -0.0042 | -0.0022 | No | |
| | | | | | 2D | 17' | -0.0020 | -0.0076 | -0.0056 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP3 | 44" | 25 | | | | | | | Not making a suction point (New Test Point) |
| Kitchen / Food Prep Area | | | | | 3A | 22' | -0.0040 | -0.0040 | 0.0000 | No | |
| | | | | | 2D | 11' | -0.0020 | -0.0078 | -0.0058 | Yes | |
| | | | | | 2C | 13' | -0.0020 | -0.0098 | -0.0078 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP2-D | 42" | 27 | | | | | | | Turning into a suction point (New SP 3) |
| Kitchen / Food Prep Area | | | | | SP3 | 11' | -0.0032 | -0.0089 | -0.0057 | Yes | |
| | | | | | 3A | 34' | -0.0040 | -0.0039 | 0.0001 | No | |
| | | | | | SP2 | 17' | -0.0050 | -0.0105 | -0.0055 | Yes | |
| | | | | | 2A | Unknown | -0.0040 | -0.0043 | -0.0003 | No | |
| | | | | | 2B | Unknown | -0.0060 | -0.0060 | 0.0000 | No | |
| | | | | | 2C | 10' | -0.0020 | -0.0087 | -0.0067 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP4 | 27" | 70 | | | | | | | |
| Dining Room Area | | | | | 4A | 28' | -0.0056 | -0.0109 | -0.0053 | Yes | |
| | | | | | 4B | 44' | -0.0100 | -0.0102 | -0.0002 | No | |
| | | | | | 4C | 26' | -0.0040 | -0.0230 | -0.0190 | Yes | |
| | | | | | SP5-1 | 25' | -0.0010 | -0.0554 | -0.0544 | Yes | |
| 6.5 HP Vac | 2/9/16 | SP5-1 | 26" | 68 | | | | | | | Drilled new Suction Point for SP5 |
| Dining Room Area | | | | | 4C | 20' | -0.0040 | -0.0135 | -0.0095 | Yes | |
| | | | | | 4B | 15' | -0.0100 | -0.0100 | 0.0000 | No | |
| | | | | | 4A | 19' | -0.0056 | -0.0260 | -0.0204 | Yes | |

**NOTES* Testing was performed before the store opend for lunch as well as after hours. Weather conditions were overcast with light rain/ snow. 10-15 mph wind gusts. Due to a lack of influence of Suction Point 5 to Test Point 4B, KES along with CDM Smith deceided not to install Suction Point 5 which was origanlly to be installed in the center of the dinning room.**

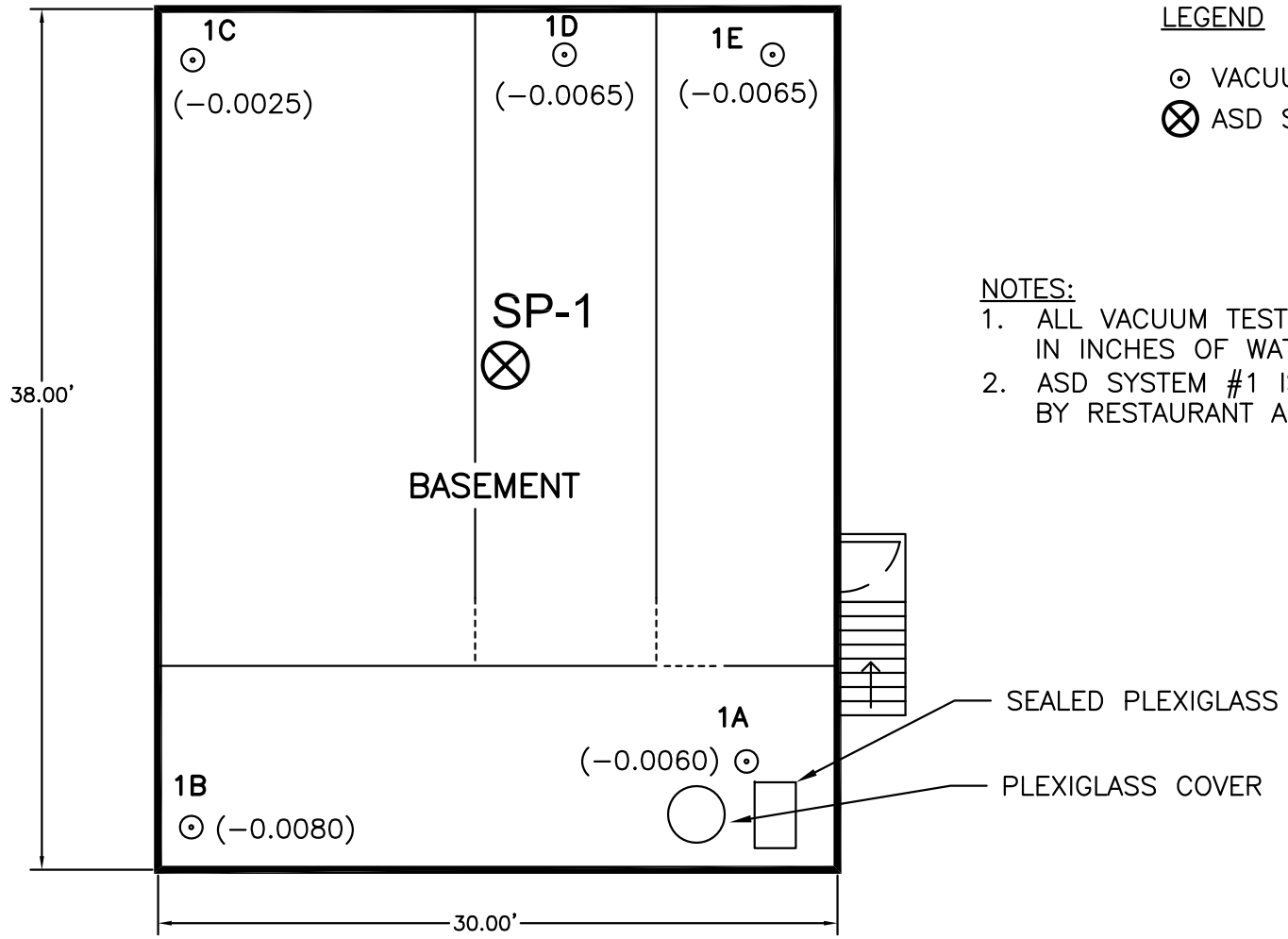
KEYSTONE ENVIRONMENTAL SERVICES

**Job Site: CDM Smith - 1465 Forest Avenue, Staten Island NY**
**Date: 2/8/2016 - 2/12/2016**
**KES File #: 0455.11214.1**

| Date | Diagnostic Test Hole | Approximate Distance in Feet from closest suction point | Pressure Differential reading (inch w/c) | Communication Pass >-0.0040 (inch w/c) | Notes |
|---|---|---|---|---|---|
| **FINAL VACUUM TESTING PERFORMED WITH HVAC OPERATING, MAKE UP AIR OFF, DRAFT HOODS OFF & ASD SYSTEMS RUNNING** | | | | | |
| 2/12/16 | 1A | 16' | -0.0060 | Yes | Suction point located in the basement (not influenced by draft hoods) |
| | 1B | 21' | -0.0080 | Yes | |
| | 1C | 17' | -0.0025 | No | |
| | 1D | 19' | -0.0065 | Yes | |
| | 1E | 20' | -0.0065 | Yes | |
| | 2A | 21' | 0.0015 | No | Suction points located in the kitchen / food prep areas |
| | 2B | 29' | -0.0350 | Yes | |
| | 2C | 16' | -0.0070 | Yes | |
| | 3B (SP3 converted to a test point) | 11' | -0.0055 | Yes | |
| | 3A | 27' | 0.0000 | No | |
| | 4A | 28' | 0.0010 | No | Suction point located in the dining room |
| | 4B | 44' | 0.0240 | No | |
| | 4C | 26' | -0.0125 | Yes | |
| | 4D | 36 | 0.0100 | No | |
| | 4E | 30' | 0.0040 | No | |
| | 5A | 25' | -0.0550 | Yes | |
| **FINAL VACUUM TESTING PERFORMED WITH HVAC OPERATING, MAKE UP AIR OFF, DRAFT HOODS ON & ASD SYSTEMS RUNNING** | | | | | |
| 2/12/16 | 2A | 21' | 0.0630 | No | Suction points located in the kitchen / food prep areas |
| | 2B | 29' | 0.0370 | No | |
| | 2C | 16' | 0.0010 | No | |
| | 3B (SP3 converted to a test point) | 11' | 0.0010 | No | |
| | 3A | 27' | 0.0550 | No | |
| | 4A | 28' | 0.0150 | No | Suction point located in the dining room |
| | 4B | 44' | 0.1640 | No | |
| | 4C | 26' | 0.0330 | No | |
| | 4D | 36 | 0.1566 | No | |
| | 4E | 30' | 0.0670 | No | |
| | 5A | 25' | -0.0010 | No | |

| Date | Diagnostic Test Hole | Approximate Distance in Feet from closest suction point | Pressure Differential reading (inch w/c) | Communication Pass >-0.0040 (inch w/c) | Notes |
|---|---|---|---|---|---|
| **FINAL VACUUM TESTING PERFORMED WITH HVAC OPERATING, MAKE UP AIR ON, DRAFT HOODS ON & ASD SYSTEMS RUNNING** | | | | | |
| 2/12/16 | 2A | 21' | -0.0200 | Yes | Suction points located in the kitchen / food prep areas |
| | 2B | 29' | -0.0100 | Yes | |
| | 2C | 16' | -0.0150 | Yes | |
| | 3B (SP3 converted to a test point) | 11' | -0.0100 | Yes | |
| | 3A | 27' | -0.0170 | Yes | |
| | 4A | 28' | -0.0200 | Yes | Suction point located in the dining room |
| | 4B | 44' | -0.0100 | Yes | |
| | 4C | 26' | -0.0200 | Yes | |
| | 4D | 36 | -0.0200 | Yes | |
| | 4E | 30' | -0.0100 | Yes | |
| | 5A | 25' | -0.0600 | Yes | |

**NOTE: See final as built test data diagrams for test point locations.**




LEGEND

⊙ VACUUM TEST POINT

⊗ ASD SUCTION POINT

NOTES:

1. ALL VACUUM TEST READINGS RECORDED IN INCHES OF WATER COLUMN.
2. ASD SYSTEM #1 IS NOT INFLUENCED BY RESTAURANT AIR HANDLING UNITS.

CAD FILE NO. 455.11214.1_ASB VAC TEST DATA

DATE 3/24/16

PROJECT NO. 455.11214.1

SHEET NO. 4

**CDM SMITH**
**SOIL VAPOR REMEDIATION**

**1465 FOREST AVE, STATEN ISLAND, NY**
**BASEMENT LEVEL**

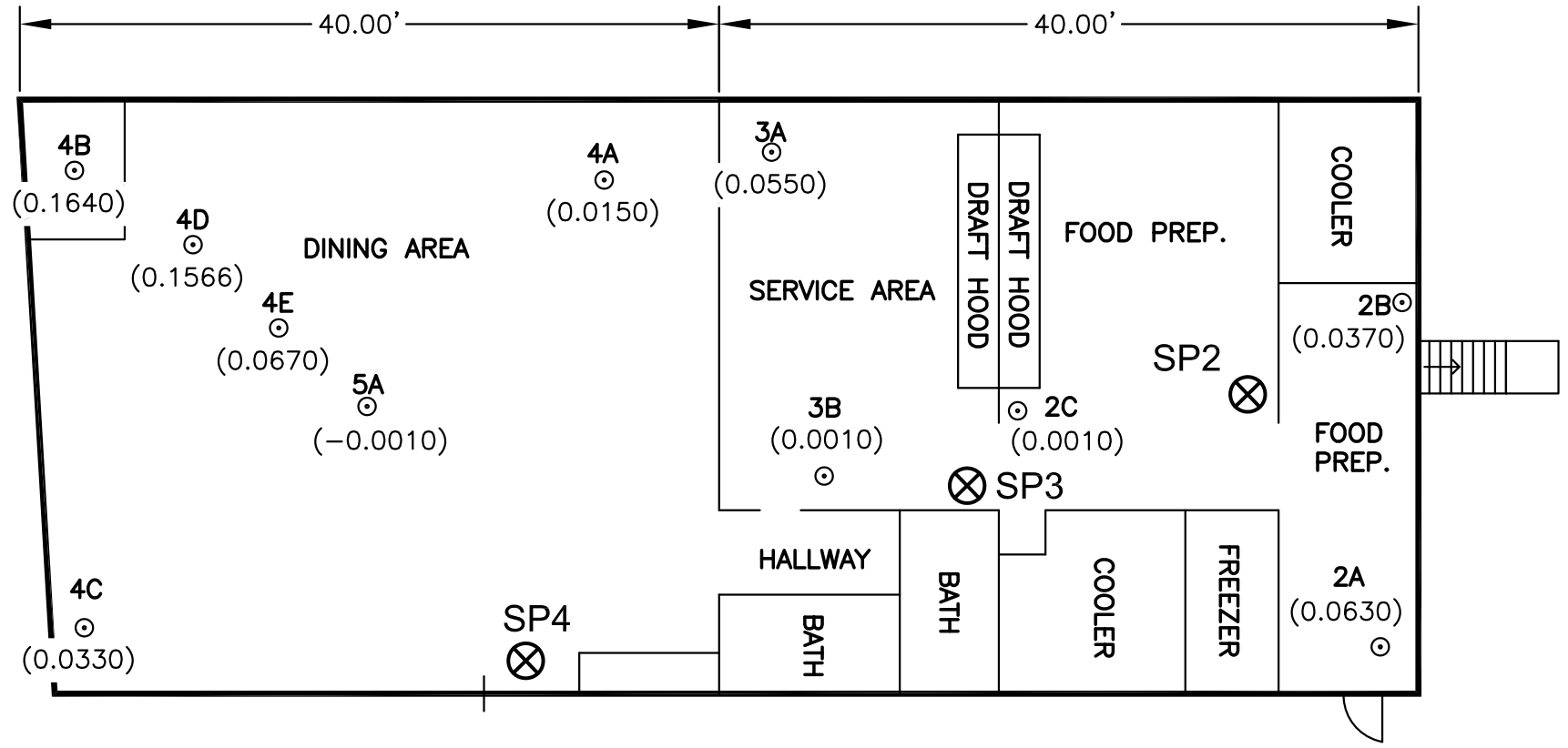
| NO. | REVISIONS AND DESCRIPTION | DATE |
|---|---|---|
| 1 | AS BUILT ASD REVISION | 5/23/16 |

WARNING:
Each work area will be done in accordance with NYS Industrial Code Rule 56, Site Specific Variances and all other applicable regulations. All proposed deviations from the design shall be approved in writing by the Certified Project Designer.



**FINAL AS BUILT**
**VACUUM TEST DATA**

KEYSTONE ENVIRONMENTAL SERVICES
58 Exchange Street
Binghamton, New York 13901
Phone: 607.723.5117
Fax: 607.722.2515
Email: info@kecompanies.com
www.kecompanies.com




LEGEND

⊙ VACUUM TEST POINT

⊗ ASD SUCTION POINT

NOT TO SCALE

NOTES:

1. FINAL AS BUILT VACUUM TESTING PERFORMED WITH HVAC OPERATING, MAKE UP AIR OFF, DRAFT HOOD ON AND ASD SYSTEMS RUNNING.

2. ALL VACUUM TEST READINGS RECORDED IN INCHES OF WATER COLUMN.

CAD FILE ID: 455.11214.1_ASB VAC TEST DATA

DATE: 3/24/16

PROJECT NO: 455.11214.1

SHEET NO: 5

**CDM SMITH**
**SOIL VAPOR REMEDIATION**

**1465 FOREST AVE, STATEN ISLAND, NY**
**FIRST FLOOR SLAB ON GRADE**

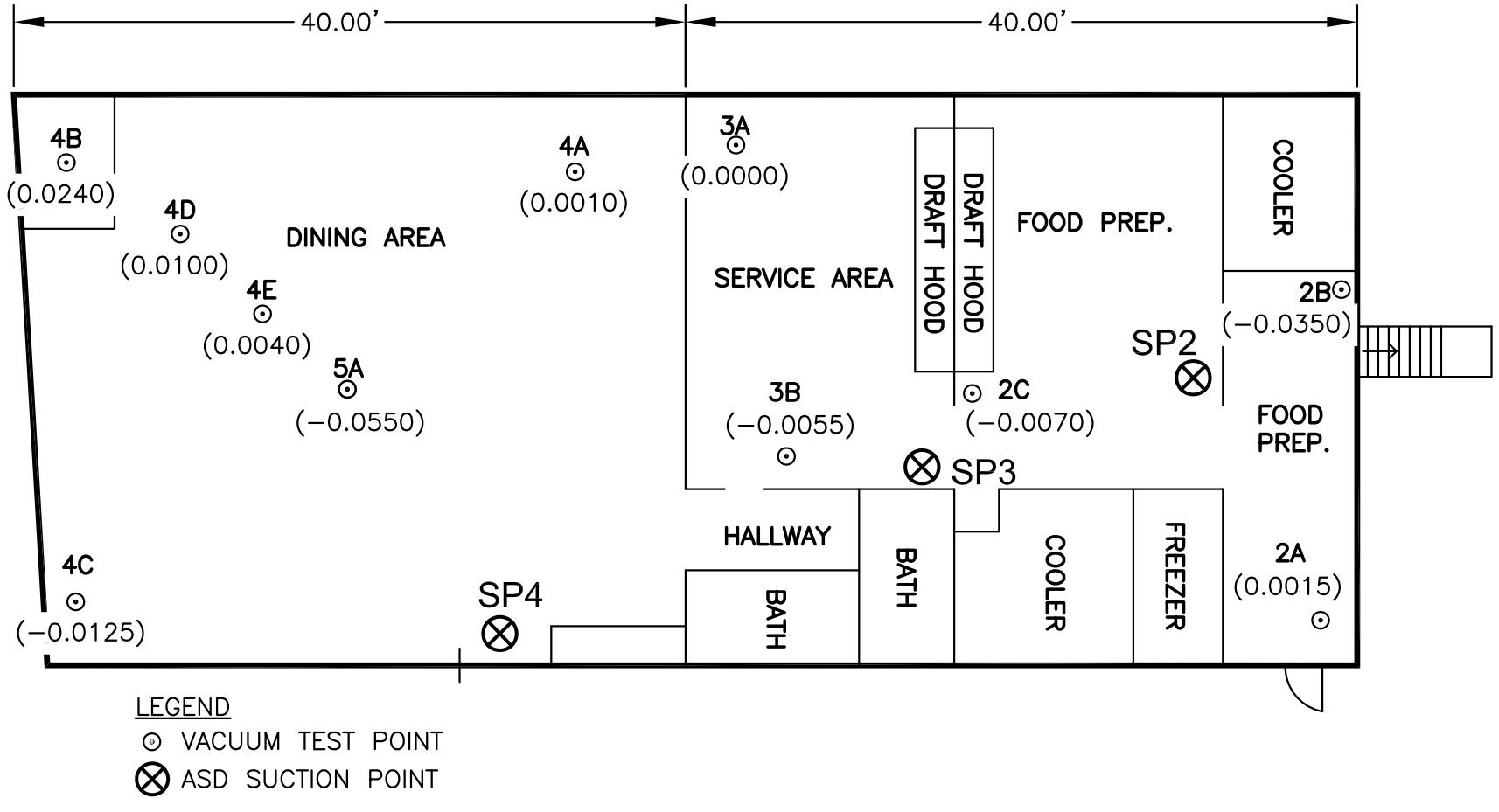
| NO. | REVISIONS AND DESCRIPTION | DATE |
|---|---|---|
| 1 | AS BUILT ASD REVISION | 5/23/16 |



**FINAL AS BUILT VACUUM TEST DATA**

KEYSTONE ENVIRONMENTAL SERVICES

58 Exchange Street
Binghamton, New York 13901
Phone: 607.723.5117
Fax: 607.722.2515
Email: info@kecompanies.com
www.kecompanies.com




NOT TO SCALE

NOTES:

1. FINAL AS BUILT VACUUM TESTING PERFORMED WITH HVAC OPERATING, MAKE UP AIR OFF, DRAFT HOOD OFF AND ASD SYSTEMS RUNNING.

2. ALL VACUUM TEST READINGS RECORDED IN INCHES OF WATER COLUMN.

CAD FILE ID: 455.11214.1_ASB VAC TEST DATA

DATE: 3/24/16

PROJECT NO. 455.11214.1

SHEET NO. 6

**CDM SMITH**
**SOIL VAPOR REMEDIATION**

**1465 FOREST AVE, STATEN ISLAND, NY**
**FIRST FLOOR SLAB ON GRADE**

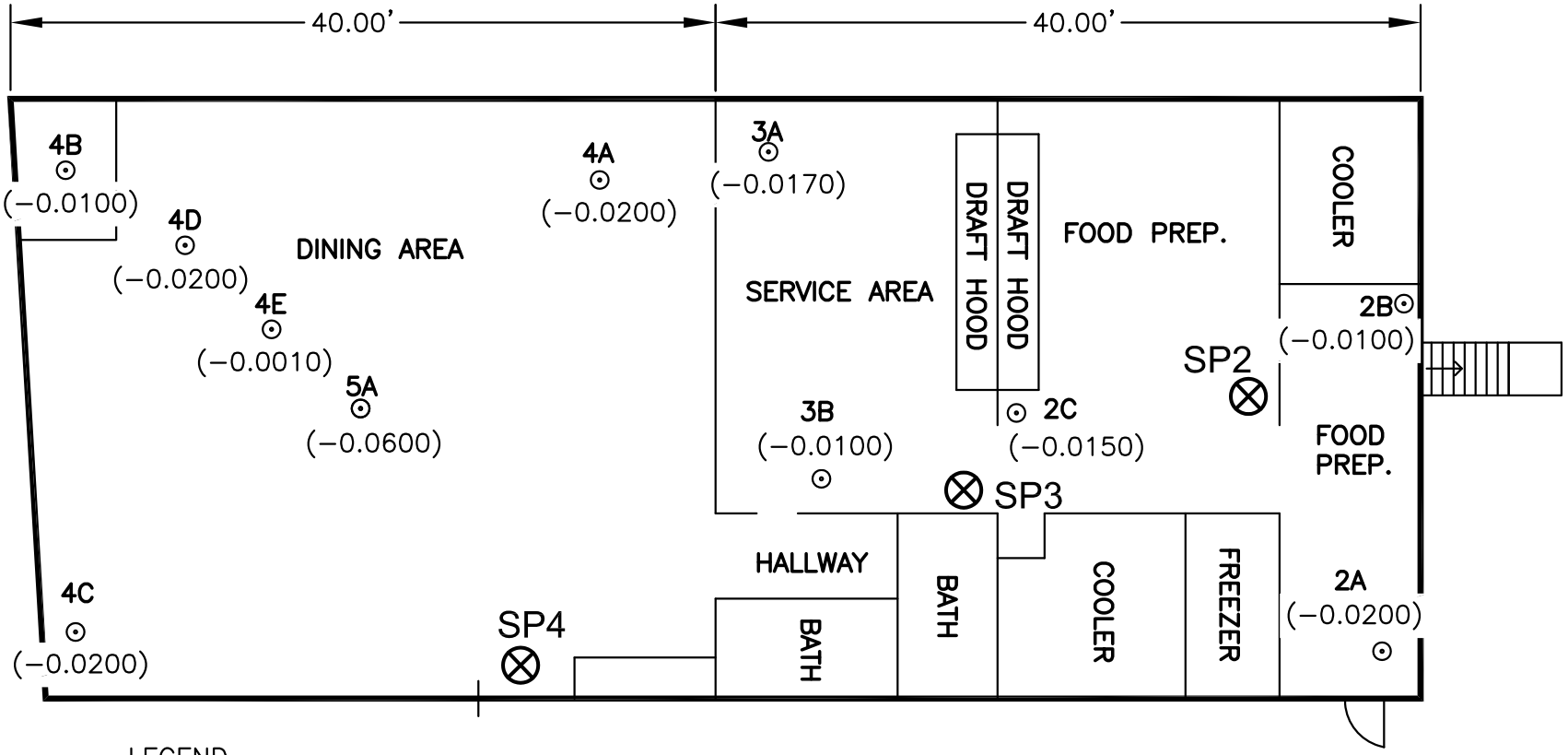
| NO. | REVISIONS AND DESCRIPTION | DATE |
|---|---|---|
| 1 | AS BUILT ASD REVISION | 5/23/16 |



**FINAL AS BUILT**
**VACUUM TEST DATA**

KEYSTONE ENVIRONMENTAL SERVICES

58 Exchange Street
Binghamton, New York 13901
Phone: 607.723.5117
Fax: 607.722.2515
Email: info@kecompanies.com
www.kecompanies.com




LEGEND

⊙ VACUUM TEST POINT

⊗ ASD SUCTION POINT

NOT TO SCALE

NOTES:

1. FINAL AS BUILT VACUUM TESTING PERFORMED WITH HVAC OPERATING, MAKE UP AIR ON, DRAFT HOOD ON AND ASD SYSTEMS RUNNING.

2. ALL VACUUM TEST READINGS RECORDED IN INCHES OF WATER COLUMN.

CAD FILE ID: 455.11214.1_ASB VAC TEST DATA

DATE: 3/24/16

PROJECT NO. 455.11214.1

SHEET NO. 7

**CDM SMITH**
**SOIL VAPOR REMEDIATION**

**1465 FOREST AVE, STATEN ISLAND, NY**
**FIRST FLOOR SLAB ON GRADE**

| NO. | REVISIONS AND DESCRIPTION | DATE |
|---|---|---|
| 1 | AS BUILT ASD REVISION | 5/23/16 |



**FINAL AS BUILT VACUUM TEST DATA**

KEYSTONE ENVIRONMENTAL SERVICES

58 Exchange Street
Binghamton, New York 13901
Phone: 607.723.5117
Fax: 607.722.2515
Email: info@kecompanies.com
www.kecompanies.com

# APPENDIX E

## On Site Photo Documentation

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**


| | |
|---|---|
| Photo No. | 1 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
Project work site.

| | |
|---|---|
| Photo No. | 2 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of a slab opening in the dining room showing existing subbase material.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**

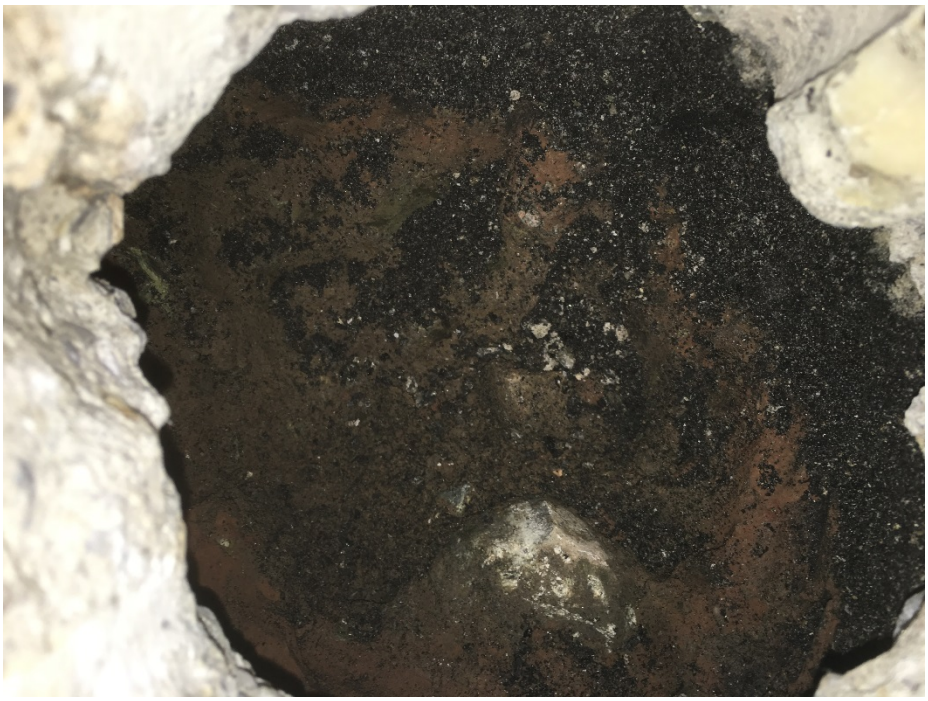
| | |
|---|---|
| Photo No. | 3 |
| Date | 02/12/2016 |
| Location: 1465 Forest Avenue Staten Island, NY | |
| Subject: View of concrete sealed slab opening shown in Photo #2. | |

| | |
|---|---|
| Photo No. | 4 |
| Date | 02/12/2016 |
| Location: 1465 Forest Avenue Staten Island, NY | |
| Subject: View of existing plate re-installed over the sealed slab opening shown in Photo #2. | |

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**



| | |
|---|---|
| Photo No. | 5 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point #3 showing asphalt over a clay subbase located in the service/food prep area of the structure.

| | |
|---|---|
| Photo No. | 6 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point #3 showing the slab poured directly over pavement, with the pavement over compacted dirt/clay.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**

| | |
|---|---|
| Photo No. | 7 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point #4 in the dining room showing the pavement below the slab being lose and permeable which is different than ASD suctions points #2 and #3.

| | |
|---|---|
| Photo No. | 8 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point #4 in the dining room showing a void between the slab and the pavement below.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**

| | |
|---|---|
| Photo No. | 9 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point # 1 of ASD system #1 located in the lower basement.

| | |
|---|---|
| Photo No. | 10 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of the exterior mounted FanTech HP220 exhaust fan installed for ASD system #1. Sample port located above fan at an estimated 8 feet above grade level.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**

| | |
|---|---|
| Photo No. | 11 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point #2 of ASD system #2 addressing the rear food prep area of the restaurant.

| | |
|---|---|
| Photo No. | 12 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point #3 of ASD system #2 addressing the service/food prep area of the restaurant.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**


| | |
|---|---|
| Photo No. | 13 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of ASD suction point #4 of ASD system #3 addressing the front dining area of the restaurant.


| | |
|---|---|
| Photo No. | 14 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of the exterior mounted Radon Away HS5000 exhaust fan for ASD system #2. Sample port is located above exhaust fan at an estimated 18-20 feet above grade level.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**


| | |
|---|---|
| Photo No. | 15 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of vacuum gauge (i.e., U-tube manometer) and system labeling in basement for ASD System #1. Right side of manometer indicates vacuum pressure in pipe.


| | |
|---|---|
| Photo No. | 16 |
| Date | 02/16/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of high suction fan magnahelic vacuum gauge and system labeling at kitchen area for ASD System #2.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**

| | |
|---|---|
| Photo No. | 17 |
| Date | 02/12/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of the exterior mounted Radon Away HS5000 exhaust fan for ASD system #3. Sample port is located above fan at an estimated 18-20 feet above grade level.

| | |
|---|---|
| Photo No. | 18 |
| Date | 02/16/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
View of electric panels for project site. Panel to left with blank slots remaining controls ASD fans.

KEYSTONE ENVIRONMENTAL SERVICES

# PHOTO LOG

**Soil Vapor Remedial Activates**
**1465 Forest Avenue, Staten Island, NY**
**KES Project # 0455.11214.1**

| | |
|---|---|
| Photo No. | 19 |
| Date | 02/16/2016 |

Location:
1465 Forest Avenue
Staten Island, NY

Subject:
Close up view of newly installed electrical sub panel for all three ASD fans. Breaker switches are labeled for each ASD exhaust fan/system.

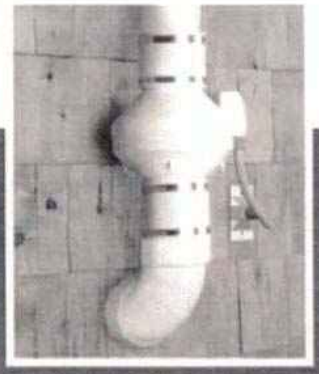
# APPENDIX F

## Fan Specifications / Warranty

Fantech

# HP SERIES

## FANS FOR RADON APPLICATIONS
## WITH IMPROVED UV RESISTANCE!



### TRUST THE INDUSTRY STANDARD.
### HERE'S WHY:

Don't put your reputation at stake by installing a fan you know won't perform like a Fantech! For nearly twenty years, Fantech has manufactured quality ventilation equipment for Radon applications. Fantech is the fan Radon contractors have turned to in over 1,000,000 successful Radon installations worldwide.

Fantech external rotor motor

### FANTECH HP SERIES FANS MEET THE CHALLENGES OF RADON APPLICATIONS:

HOUSING
- UV resistant, UL Listed durable plastic
- UL Listed for use in commercial applications
- Factory sealed to prevent leakage
- Watertight electrical terminal box
- Approved for mounting in wet locations - i.e. Outdoors

MOTOR
- Totally enclosed for protection
- High efficiency EBM motorized impeller
- Automatic reset thermal overload protection
- Average life expectancy of 7-10 years under continuous load conditions

RELIABILITY
- Five Year Full Factory Warranty
- Over 1,000,000 successful radon installations worldwide

IMPROVING INDOOR AIR QUALITY THROUGH BETTER VENTILATION

**www.fantech.net**

# Fantech

## HP Series Fans are Specially Designed with Higher Pressure Capabilities for Radon Mitigation Applications

MOST RADON MITIGATORS WHO PREVIOUSLY USED THE FANTECH FR SERIES FANS HAVE SWITCHED TO THE NEW HP SERIES.

## PERFORMANCE DATA

| Fan Model | Volts | Wattage Range | Max. Amps | CFM vs. Static Pressure in Inches W.G. | | | | | | | | Max. Ps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0" | 0.5" | 0.75" | 1.0" | 1.25" | 1.5" | 1.75" | 2.0" | |
| HP2133 | 115 | 14 - 20 | 0.17 | 134 | 68 | 19 | - | - | - | - | - | 0.84 |
| HP2190 | 115 | 60 - 85 | 0.78 | 163 | 126 | 104 | 81 | 58 | 35 | 15 | - | 1.93 |
| HP175 | 115 | 44 - 65 | 0.57 | 151 | 112 | 91 | 70 | 40 | 12 | - | - | 1.66 |
| HP190 | 115 | 60 - 85 | 0.78 | 157 | 123 | 100 | 80 | 57 | 45 | 18 | - | 2.01 |
| HP220 | 115 | 85 - 152 | 1.30 | 344 | 260 | 226 | 193 | 166 | 137 | 102 | 58 | 2.46 |

HVI MEMBER

## PERFORMANCE CURVES

*Fantech provides you with independently tested performance specifications.*

The performance curves shown in this brochure are representative of the actual test results recorded at Texas Engineering Experiment Station/Energy Systems Lab, a recognized testing authority for HVI. Testing was done in accordance with AMCA Standard 210-85 and HVI 916 Test Procedures. Performance graphs show air flow vs. static pressure.

*Use of HP Series fans in low resistance applications such as bathroom venting will result in elevated sound levels. We suggest FR Series or other Fantech fans for such applications.*

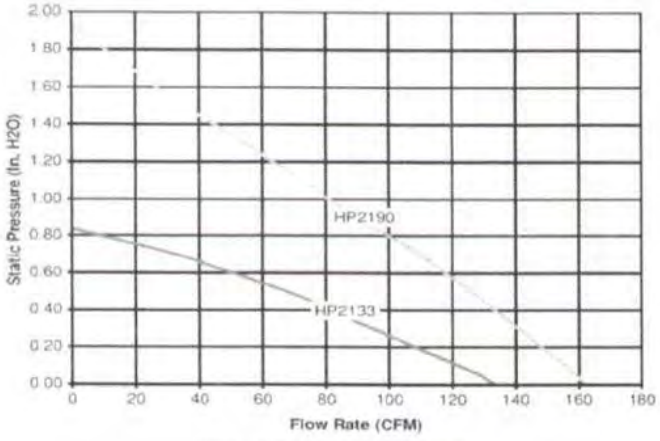
### HP FEATURES INCLUDE

- Improved UV resistant housings approved for commercial applications.
- UL Approved for Wet Locations (Outdoors)
- Sealed housings and wiring boxes to prevent Radon leakage or water penetration
- Energy efficient permanent split capacitor motors
- External wiring box
- Full Five Year Factory Warranty

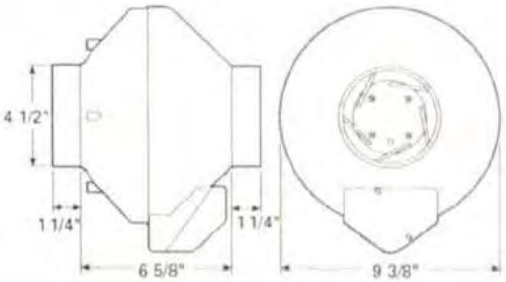
c UL us

*NOTE:*
*Installations that will result in condensate forming in the outlet ducting should have a condensate bypass installed to route the condensate outside of the fan housing. Conditions that are likely to produce condensate include but are not limited to: outdoor installations in cold climates, long lengths of outlet ducting, high moisture content in soil and thin wall or aluminum outlet ducting. Failure to install a proper condensate bypass may void any warranty claims.*

## HP2133 & HP2190 RADON MITIGATION FANS




*Tested with 4" ID duct and standard couplings*

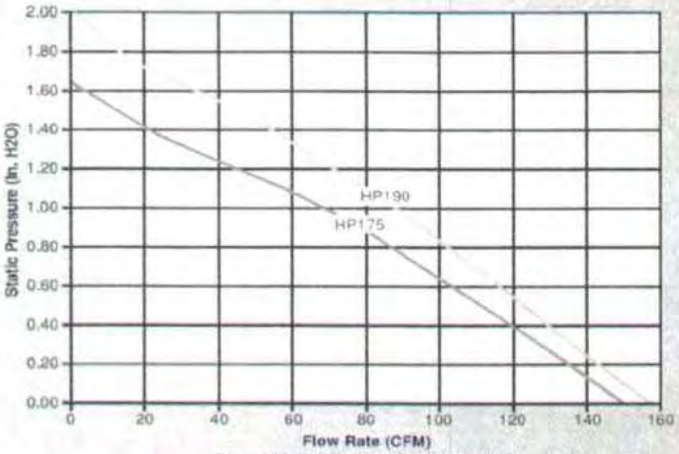



**HP2133** – For applications where lower pressure and flow are needed. Record low power consumption of 14-20 watts! Often used where there is good sub slab communication and lower Radon levels.

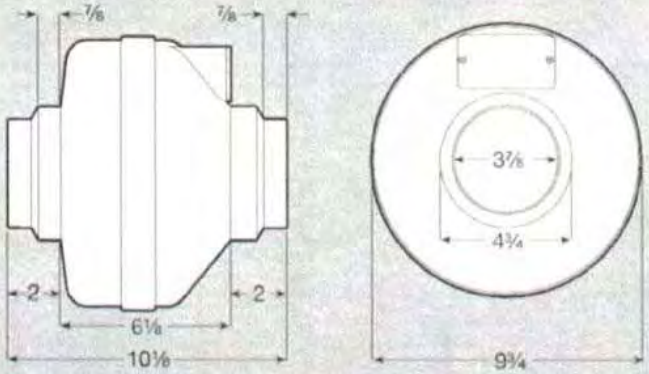
**HP2190** – Performance like the HP190 but in a smaller housing. Performance suitable for the majority of installations.

***Fans are attached to PVC pipe using flexible couplings.***
*For 4" PVC pipe use Indiana Seals #156-44, Pipeconx PCX 56-44 or equivalent*
*For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent*

## HP175 & HP190 RADON MITIGATION FANS




*Tested with 4" ID duct and standard couplings*

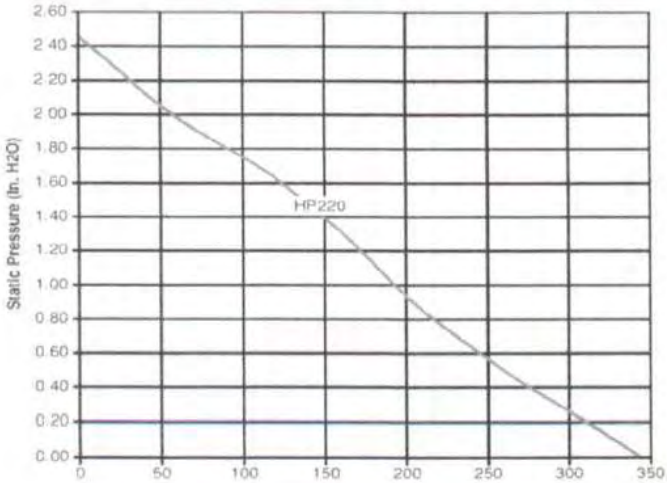



**HP175** – The economical choice where slightly less air flow is needed. Often used where there is good sub slab communication and lower Radon levels.

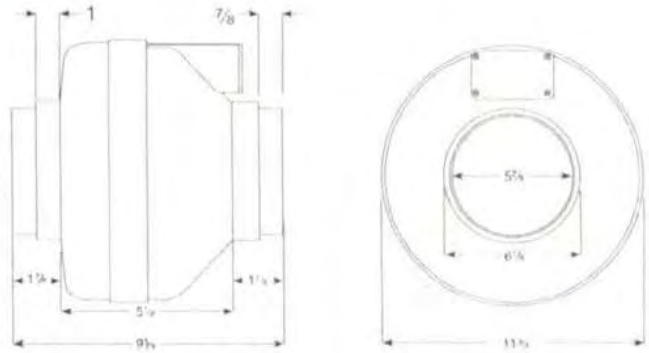
**HP190** – The standard for Radon Mitigation. Ideally tailored performance curve for a vast majority of your mitigations.

***Fans are attached to PVC pipe using flexible couplings.***
*For 4" PVC pipe use Indiana Seals #151-44, Pipeconx PCX 51-44 or equivalent.*
*For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent.*

## HP220 RADON MITIGATION FAN




*Tested with 6" ID duct and standard couplings*



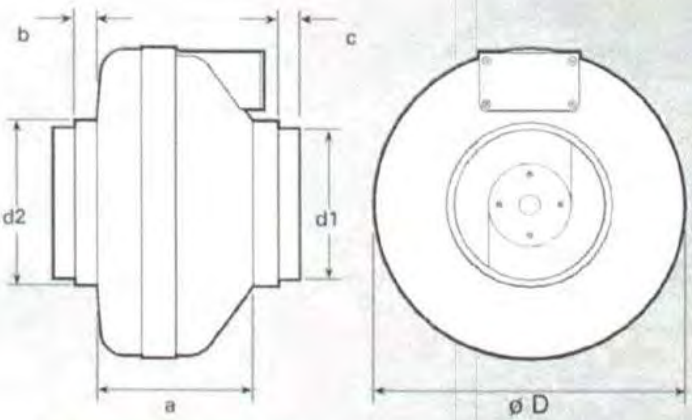

**HP 220** – Excellent choice for systems with elevated radon levels, poor communication, multiple suction points and large subslab footprint. Replaces FR 175.

***Fans are attached to PVC pipe using flexible couplings.***
*For 4" PVC pipe use Indiana Seals #156-64, Pipeconx PCX 56-64 or equivalent.*
*For 3" PVC pipe use Indiana Seals #156-63, Pipeconx PCX 56-63 or equivalent.*

# Fantech

# FR SERIES

## THE ORIGINAL MITIGATOR




## DIMENSIONAL DATA

| model | øD | d1 | d2 | a | b | c |
|---|---|---|---|---|---|---|
| FR100 | 9 1/2 | 3 7/8 | 4 7/8 | 6 1/8 | 7/8 | 7/8 |
| FR110 | 9 1/2 | 3 7/8 | 4 7/8 | 6 1/8 | 7/8 | 7/8 |
| FR125 | 9 1/2 | – | 4 7/8 | 6 1/8 | 7/8 | – |
| FR140 | 11 3/4 | 5 7/8 | 6 1/4 | 5 7/8 | 1 | 7/8 |
| FR150 | 11 3/4 | 5 7/8 | 6 1/4 | 5 7/8 | 1 | 7/8 |
| FR160 | 11 3/4 | 5 7/8 | 6 1/4 | 6 3/8 | 1 | 7/8 |
| FR200 | 13 1/4 | 7 7/8 | 9 7/8 | 6 1/4 | 1 1/2 | 1 1/2 |
| FR225 | 13 1/4 | 7 7/8 | 9 7/8 | 6 1/4 | 1 1/2 | 1 1/2 |
| FR250 | 13 1/4 | – | 9 7/8 | 6 1/4 | – | 1 1/2 |

*All dimensions in inches*

## PERFORMANCE DATA

| Fan Model | Energy Star | RPM | Volts | Rated Watts | Wattage Range | Max. Amps | CFM vs. Static Pressure in Inches W.G. | | | | | | | Max. Ps | Duct Dia. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0" | .2" | .4" | .6" | .8" | 1.0" | 1.5" | | |
| FR100 | ✓ | 2950 | 120 | 21.2 | 13 - 22 | 0.18 | 137 | 110 | 83 | 60 | 21 | - | - | 0.90" | 4" |
| FR125 | ✓ | 2950 | 115 | 18 | 15 - 18 | 0.18 | 148 | 120 | 88 | 47 | - | - | - | 0.79" | 5" |
| FR150 | ✓ | 2750 | 120 | 71 | 54 - 72 | 0.67 | 263 | 230 | 198 | 167 | 136 | 106 | 17 | 1.58" | 6" |
| FR160 | - | 2750 | 115 | 129 | 103 - 130 | 1.14 | 289 | 260 | 233 | 206 | 179 | 154 | 89 | 2.32" | 6" |
| FR200 | ✓ | 2750 | 115 | 122 | 106 - 128 | 1.11 | 408 | 360 | 308 | 259 | 213 | 173 | 72 | 2.14" | 8" |
| FR225 | ✓ | 3100 | 115 | 137 | 111 - 152 | 1.35 | 429 | 400 | 366 | 332 | 297 | 260 | 168 | 2.48" | 8" |
| FR250* | - | 2850 | 115 | 241 | 146 - 248 | 2.40 | 649 | 600 | 553 | 506 | 454 | 403 | 294 | 2.58" | 10" |

*FR Series performance is shown with ducted outlet. Per HVI's Certified Ratings Program, charted air flow performance has been derated by a factor based on actual test results and the certified rate at .2 inches WG.*
** Also available with 8" duct connection. Model FR 250-8. Special Order.*

*NOTE:*

*Installations that will result in condensate forming in the outlet ducting should have a condensate bypass installed to route the condensate outside of the fan housing. Conditions that are likely to produce condensate include but are not limited to: outdoor installations in cold climates, long lengths of outlet ducting, high moisture content in soil and thin wall or aluminum outlet ducting. Failure to install a proper condensate bypass may void any warranty claims.*

## FIVE YEAR WARRANTY

**DURING ENTIRE WARRANTY PERIOD:**

FANTECH will replace any fan which has a factory defect in workmanship or material. Product may need to be returned to the Fantech factory, together with a copy of the bill of sale and identified with RMA number.

**FOR FACTORY RETURN YOU MUST:**

- Have a Return Materials Authorization (RMA) number. This may be obtained by calling FANTECH either in the USA at 1.800.747.1762 or in CANADA at 1.800.565.3548. Please have bill of sale available.
- The RMA number must be clearly written on the outside of the carton, or the carton will be refused.
- All parts and/or product will be repaired/replaced and shipped back to buyer; no credit will be issued.

OR

The Distributor may place an order for the warranty fan and is invoiced.
The Distributor will receive a credit equal to the invoice only after product is returned prepaid and verified to be defective.

FANTECH WARRANTY TERMS DO NOT PROVIDE FOR REPLACEMENT WITHOUT CHARGE PRIOR TO INSPECTION FOR A DEFECT. REPLACEMENTS ISSUED IN ADVANCE OF DEFECT INSPECTION ARE INVOICED, AND CREDIT IS PENDING INSPECTION OF RETURNED MATERIAL. DEFECTIVE MATERIAL RETURNED BY END USERS SHOULD NOT BE REPLACED BY THE DISTRIBUTOR WITHOUT CHARGE TO THE END USER, AS CREDIT TO DISTRIBUTOR'S ACCOUNT WILL BE PENDING INSPECTION AND VERIFICATION OF ACTUAL DEFECT BY FANTECH.

THE FOLLOWING WARRANTIES DO NOT APPLY:

- Damages from shipping, either concealed or visible. Claim must be filed with freight company.
- Damages resulting from improper wiring or installation.
- Damages or failure caused by acts of God, or resulting from improper consumer procedures, such as:
  1. Improper maintenance
  2. Misuse, abuse, abnormal use, or accident, and
  3. Incorrect electrical voltage or current
- Removal or any alteration made on the FANTECH label control number or date of manufacture.
- Any other warranty expressed, implied or written, and to any consequential or incidental damages, loss of property, revenues, or profit, or costs of removal, installation or reinstallation, for any breach of warranty.

**WARRANTY VALIDATION**

- The user must keep a copy of the bill of sale to verify purchase date.
- These warranties give you specific legal rights, and are subject to an applicable consumer protection legislation. You may have additional rights which vary from state to state.

## DISTRIBUTED BY:


Fantech **United States** 10048 Industrial Blvd. • Lenexa, KS 66215 • 1.800.747.1762 • www.fantech.net
**Canada** 50 Kanalflakt Way • Bouctouche, NB E4S 3M5 • 1.800.565.3548 • www.fantech.net



Item # 411741
Rev Date: 021010

# Fantech

## Installation Instructions for Radon Fans Model HP/FR

READ & SAVE THESE INSTRUCTIONS!

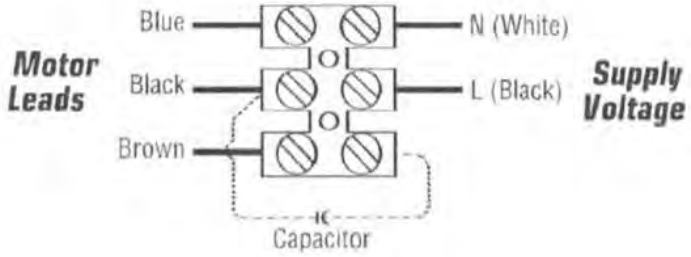
### Warnings

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO THE FAN IS LOCKED IN "OFF" POSITION.

1. Suitable for use with solid-state speed control.
2. This unit has rotating parts and safety precautions should be exercised during installation, operation and maintenance.
3. CAUTION: "For General Ventilation Use Only. Do Not Use To Exhaust Hazardous Or Explosives Materials and Vapors."
4. **WARNING: TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS-OBSERVE THE FOLLOWING:**
   a. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the factory.
   b. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
   c. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
   d. The combustion airflow needed for safe operation of fuel burning equipment may be affected by this unit's operation. Follow the heating equipment manufacturer's guidelines and safety standards such as those published by the National Fire Protection Association (NFPA), the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) and the local code authorities.
   e. When cutting or drilling into wall or ceiling, do not damage electrical wires or other hidden utilities.
   f. Ducted fans must always be vented to the outdoors.
   g. If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application.
   h. NEVER place a switch where it can be reached from a tub or shower.
5. WARNING! Check voltage at the fan to see if it corresponds to the motor nameplate.

**GUARDS MUST BE INSTALLED WHEN FAN IS WITHIN REACH OF PERSONNEL OR WITHIN SEVEN (7) FEET OF WORKING LEVEL OR WHEN DEEMED ADVISABLE FOR SAFETY.**

### Wiring Diagram



## Five (5) Year Warranty

*This warranty supersedes all prior warranties*

Installation that will result in condensate forming in the outlet ducting should have a condensate bypass installed to route the condensate outside of the fan housing. Conditions that are likely to produce condensate include but are not limited to: outdoor installations in cold climates, long lengths of outlet duction, high moisture content in soil and thin wall or aluminum outlet ducting. Failure to install a proper condensate bypass may void any warranty claims.

**DURING ENTIRE WARRANTY PERIOD:**

FANTECH will repair or replace any part which has a factory defect in workmanship or material. Product may need to be returned to the fantech factory, together with a copy of the bill of sale and identified with RMA number.

**FOR FACTORY RETURN YOU MUST:**

- Have a Return Materials Authorization (RMA) number. This may be obtained by calling FANTECH either in the USA at 1.800.747.1762 or in CANADA at 1.800.565.3548. Please have bill of sale available.
- The RMA number must be clearly written on the outside of the carton, or the carton will be refused.
- All parts and/or product will be repaired/replaced and shipped back to buyer; no credit will be issued.

OR

The Distributor may place an order for the warranty part and/or product and is invoiced. The Distributor will receive a credit equal to the invoice only after product is returned prepaid and verified to be defective.

FANTECH WARRANTY TERMS DO NOT PROVIDE FOR REPLACEMENT WITHOUT CHARGE PRIOR TO INSPECTION FOR A DEFECT. REPLACEMENTS ISSUED IN ADVANCE OF DEFECT INSPECTION ARE INVOICED, AND CREDIT IS PENDING INSPECTION OF RETURNED MATERIAL. DEFECTIVE MATERIAL RETURNED BY END USERS SHOULD NOT BE REPLACED BY THE DISTRIBUTOR WITHOUT CHARGE TO THE END USER, AS CREDIT TO DISTRIBUTOR'S ACCOUNT WILL BE PENDING INSPECTION AND VERIFICATION OF ACTUAL DEFECT BY FANTECH.

**THE FOLLOWING WARRANTIES DO NOT APPLY:**

- Damages from shipping, either concealed or visible. Claim must be filed with freight company.
- Damages resulting from improper wiring or installation.
- Damages or failure caused by acts of God, or resulting from improper consumer procedures, such as:
  1. Improper maintenance
  2. Misuse, abuse, abnormal use, or accident, and
  3. Incorrect electrical voltage or current.
- Removal or any alteration made on the FANTECH label control number or date of manufacture.
- Any other warranty, expressed, implied or written, and to any consequential or incidental damages, loss or property, revenues, or profit, or costs of removal, installation or reinstallation, for any breach of warranty.

**WARRANTY VALIDATION**

- The user must keep a copy of the bill of sale to verify purchase date.
- These warranties give you specific legal rights, and are subject to an applicable consumer protection legislation. You may have additional rights which vary from state to state.

United States
1712 Northgate Blvd.
Sarasota, FL 34234
Phone: 800.747.1762, 941.309.6000
Fax: 800.487.9915, 941.309.6099
www.fantech.net, info@fantech.net

Canada
50 Kanalflakt Way,
Bouctouche, NB E4S 3M5
Phone: 800.565.3548, 506.743.9500
Fax: 877.747.8116, 506.743.9600
www.fantech.ca, info@fantech.ca



Article #: 301077
Item #: 401443
Rev Date: 010307

RadonAway™

The World's Leading
Radon Fan Manufaturer

# HS Series

# Installation & Operating Instructions

**RadonAway**
3 Saber Way | Ward Hill, MA 01835
www.radonaway.com

P/N IN007-REV J 9/13

RadonAway Ward Hill, MA.

# HS Series Fan Installation & Operating Instructions

## *Please Read and Save These Instructions.*

## DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
   **See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion**
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
   **Do NOT attempt to open.** Return unit to the factory for service.
6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.
7. **WARNING!** In the event that the fan is immersed in water, return unit to factory for service before operating.
8. **WARNING!** Do not twist or torque fan inlet or outlet piping as Leakage may result.
9. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
10. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

    a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

    b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

# 1.0 SYSTEM DESIGN CONSIDERATIONS

## 1.1 INTRODUCTION

The HS Series Fan is intended for use by trained, certified/licensed, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of the HS Series Fan. This instruction should be considered as a supplement to EPA/Radon Industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

## 1.2 ENVIRONMENTALS

The HS Series Fan is designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the HS Series Fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F. The HS Series Fan is thermally protected such that it will shut off when the internal temperature is above 104 degrees F. Thus if the HS Series Fan is idle in an area where the ambient temperature exceeds this shut off, it will not restart until the internal temperature falls below 104 degrees F.

## 1.3 ACOUSTICS

The HS Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. There are, however, some considerations to be taken into account in the system design and installation. When installing the HS Series Fan above sleeping areas, select a location for mounting which is as far away as possible from those areas. Avoid mounting near doors, fold-down stairs or other uninsulated structures which may transmit sound. Insure a solid mounting for the HS Series Fan to avoid structure-borne vibration or noise.

The velocity of the outgoing air must also be considered in the overall system design. With small diameter piping, the "rushing" sound of the outlet air can be disturbing. The system design should incorporate a means to slow and quiet the outlet air. The use of the RadonAway Exhaust Muffler, p/n 24002, is strongly recommended.

## 1.4 GROUND WATER

Under no circumstances should water be allowed to be drawn into the inlet of the HS Series Fan as this may result in damage to the unit. The HS Series Fan should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the HS Series Fan with water in installations with occasional high water tables.

In the event that a temporary high water table results in water at or above slab level, water will be drawn into the riser pipes thus blocking air flow to the HS Series Fan. The lack of cooling air will result in the HS Series Fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the HS Series Fan be disconnected until the water recedes allowing for return to normal operation.

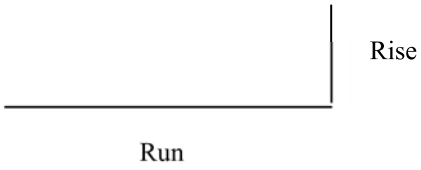
## 1.5 CONDENSATION & DRAINAGE

***(WARNING!:*** Failure to provide adequate drainage for condensation can result in system failure and damage the HS Series Fan).

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation.

The use of small diameter piping in a system increases the speed at which the air moves. The speed of the air can pull water uphill and at sufficient velocity it can actually move water vertically up the side walls of the pipe. This has the potential of creating a problem in the negative pressure (inlet) side piping. For HS Series Fan inlet piping, the following table provides the minimum recommended pipe diameters as well as minimum pitch under several system conditions. Use this chart to size piping for a system.

| Pipe Diam. | Minimum Rise per Foot of Run* | | |
|---|---|---|---|
| | @ 25 CFM | @ 50 CFM | @ 100 CFM |
| 4" | 1/32 " | 3/32 " | 3/8 " |
| 3" | 1/8 " | 3/8 " | 1 1/2 " |




*Typical operational flow rates:

| | |
|---|---|
| HS3000, or HS5000 | 20 - 40 CFM |
| HS2000 | 50 - 90 CFM |

**All exhaust piping should be 2" PVC.**

## 1.6 SYSTEM MONITOR AND LABEL

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A Magnehelic pressure gauge is recommended for this purpose. The indicator should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the gauge with water in installations with occasional high water tables. A System Label (P/N 15022) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.

## 1.7 SLAB COVERAGE

The HS Series Fan can provide coverage of well over 1000 sq. ft. per slab penetration. This will, of course, depend on the sub-slab aggregate in any particular installation and the diagnostic results. In general, sand and gravel are much looser aggregates than dirt and clay. Additional suction points can be added as required. It is recommended that a small pit (2 to 10 gallons in size) be created below the slab at each suction hole.

## 1.8 ELECTRICAL WIRING

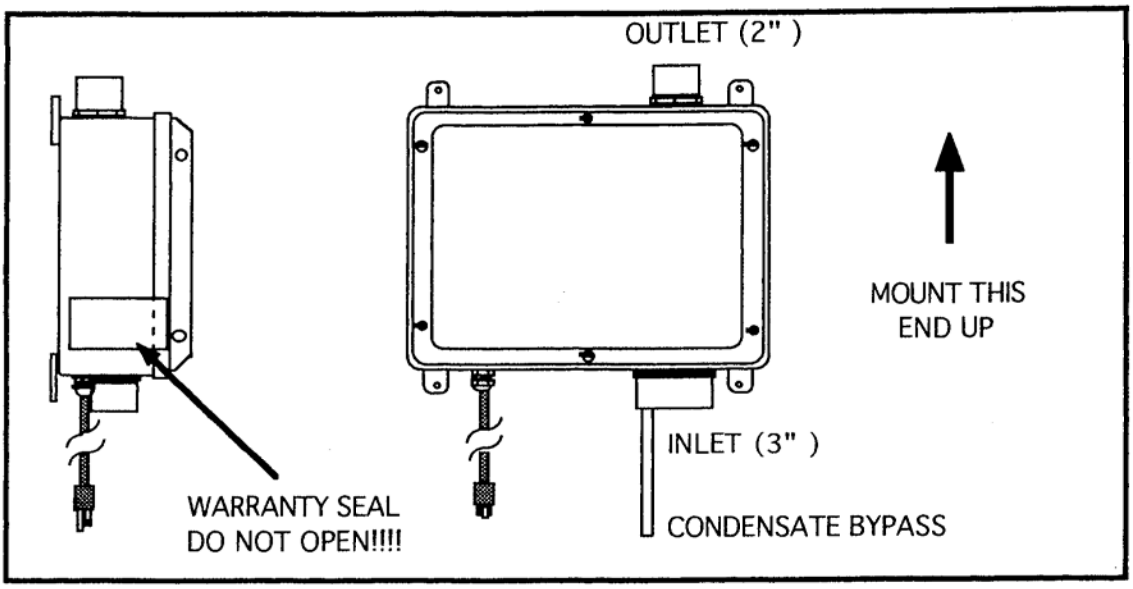
The HS Series Fan plugs into a standard 120V outlet. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

## 1.8a ELECTRICAL BOX (optional)

The optional Electrical Box (p/n 20003) provides a weather tight box with switch for outdoor hardwire connection. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

## 1.9 SPEED CONTROLS

Electronic speed controls can **NOT** be used on HS Series units.




## 2.0 INSTALLATION

### 2.1 MOUNTING

Mount the HS Series Fan to the wall studs, or similar structure, in the selected location with (4) 1/4" x 1 1/2" lag screws (not provided). Insure the HS Series Fan is both plumb and level.

### 2.2 DUCTING CONNECTIONS

Make final ducting connection to HS Series Fan with flexible couplings. Insure all connections are tight. Do not twist or torque inlet and outlet piping on HS Series Fan or leaks may result.

### 2.3 VENT MUFFLER INSTALLATION

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed above the roofline at the end of the vent pipe.

### 2.5 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

____ Make final operation checks by verifying all connections are tight and leak-free.

____ Insure the HS Series Fan and all ducting is secure and vibration-free.

____ Verify system vacuum pressure with Magnehelic. Insure vacuum pressure is within normal operating range and less than the maximum recommended as shown below:

| | |
|---|---|
| HS2000 | 14" WC |
| HS3000 | 21" WC |
| HS5000 | 40" WC |

(Above are based on sea-level operation, at higher altitudes reduce above by about 4% per 1000 Feet.) If these are exceeded, increase number of suction points.

____ Verify Radon levels by testing to EPA protocol.

## PRODUCT SPECIFICATIONS

| Model | Maximum Static Suction | Typical CFM vs Static Suction WC (Recommended Operating Range) | | | | | | Power* Watts @ 115 VAC |
|---|---|---|---|---|---|---|---|---|
| | | 0" | 10" | 15" | 20" | 25" | 35" | |
| HS2000 | 18" | 110 | 72 | 40 | - | - | - | 150-270 |
| HS3000 | 27" | 40 | 33 | 30 | 23 | 18 | - | 105-195 |
| HS5000 | 50" | 53 | 47 | 42 | 38 | 34 | 24 | 180-320 |

*Power consumption varies with actual load conditions

**Inlet:** 3.0" PVC

**Outlet:** 2.0" PVC

**Mounting:** Brackets for vertical mount

**Weight:** Approximately 18 lbs.

**Size:** Approximately 15"W x 13"H x 8"D

**Minimum recommended inlet ducting (greater diameter may always be used ):**

HS3000, HS5000 --- 2.0" PVC Pipe

HS2000 --- Main feeder line of 3.0" or greater PVC Pipe

Branch lines (if 3 or more) may be 2.0" PVC Pipe

**Outlet ducting:** 2.0" PVC

**Storage temperature range:** 32 - 100 degrees F.

**Thermally protected**

**Locked rotor protection**

**Internal Condensate Bypass**

## IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the HS Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the HS Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

### WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the HS Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of one (1) year from the date of manufacture (the "Warranty Term"). Outside the Continental United States and Canada the Warranty Term is one (1) year from the date of manufacture.

RadonAway will repair any fan which fails due to defects in materials or workmanship. The Fan must be returned (at owner's cost) to the RadonAway factory. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

**EXCEPT AS STATED ABOVE, THE HS SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.**

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

**Record the following information for your records:**

Serial No._____
Purchase Date_____

# APPENDIX G

# System Operating Instructions

# BOSTON MARKET
# 1465 FOREST AVENUE
# STATEN ISLAND, NEW YORK

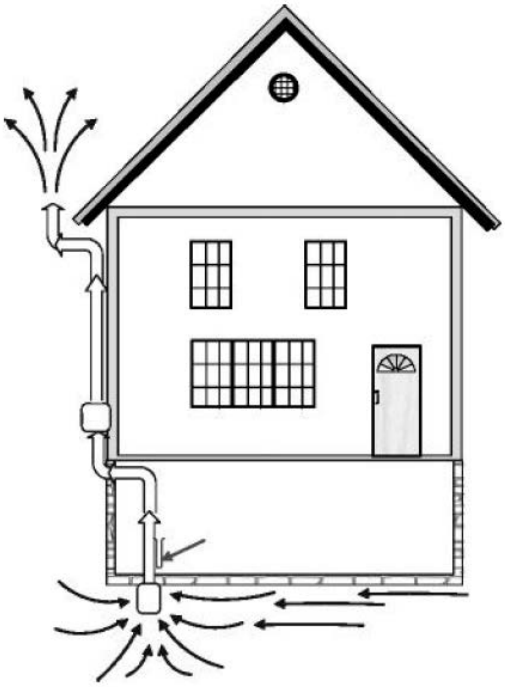
# SOIL VAPOR INTRUSION MITIGATION SYSTEM OWNER'S MANUAL 2016

The 1465 Forest Avenue Vapor Intrusion Mitigation System was installed to mitigate potential human exposures to Volatile Organic Chemical (VOC) soil vapors in the air beneath the building foundation (called sub-slab vapor).

**HOW DO MITIGATION SYSTEMS WORK?**

The Active Soil Depressurization (ASD) mitigation systems installed at 1465 Forest Avenue includes a total of three (3) separate ASD systems addressing the front, rear and lower basement of the structure. Each ASD system has an exterior mounted exhaust fan and 3" PVC vent piping to suction pits installed below the existing concrete slabs in the structure. These ASD systems were designed to maintain a zone of negative pressure (a vacuum) below the structure and need to be operated in conjunction with existing HVAC make up air when the Boston Market Restaurant is in normal operation. Failure to operate make up air units during normal business operations may result in the ASD systems not operating at 100% efficiency.

The ASD system pipes capture VOC vapors and redirects them to a point above the roof. The diagram below and Exhibit A illustrates these concepts based on a "typical" residential mitigation system. Photos in Appendix E of the project close out documents show actual components of the installed mitigation systems at the former Paul Miller Dry Cleaner site (now Boston Market) at 1465 Forest Avenue in Staten Island, New York.



In order for the mitigation systems to be effective, they should run continuously.

**HOW WILL I KNOW IF THE MITIGATION SYSTEM IS WORKING PROPERLY?**

At the time of installation, pressure and flow tests were performed to confirm that the mitigation system was operational. The system includes either a liquid gauge "U-tube manometer" or a Magnahelic vacuum gauge installed inside the structure along a vertical section of pipe which is used to monitor the system vacuum. Periodically (i.e., monthly) check to make sure the vacuum gauge levels indicate that a vacuum is being applied. The U-tube levels should be unequal and the Magnahelic gauge should show a level above zero (0) as shown in the diagram below. If they are equal or reading zero (0), it means that the system may not be operating properly and you should call the New York State Department of Environmental Conservation, Mr. Charles Post at (518) 402-9768.


**WHAT HAPPENS IF THE SYSTEMS SHUT DOWN DURING A POWER OUTAGE?**
The ASD systems should restart when power is restored. If not, locate your electrical panel and check to make sure that the circuit breakers for your systems are not tripped. Reset the circuit breakers if necessary. If the systems won't restart after resetting the circuit breakers, please call the NYS DEC contact number in the "Contacts" section of this manual.

**HOW MUCH NOISE SHOULD THE EXHAUST FANS MAKE?**
The fan motors should make about as much noise as a refrigerator fan. Because the fan motors are located outside on the exterior wall of the structure, many people will not notice it is operating unless they stand nearby. If you notice a loud noise coming from your fans, please call the NYS DEC contact number in the "Contacts" section of this manual.

**INSPECTING AND MAINTAINING THE MITIGATION SYSTEMS**
Periodically (i.e., monthly), you should check to make sure the vacuum gauges are operating. You should also confirm that the fans are running by listening for the hum of the motor or feeling the exhaust pipe for vibrations. If the systems need repairs, such as fixing a section of pipe or replacing the fans, access to the fans or to system components located inside the structure may be required.

As these mitigation systems were installed to mitigate VOC soil vapors, their operation, maintenance and monitoring are part of a NYS DEC Site Management Plan (SMP). The site system identification number for this project location is 243018. Routine maintenance inspections per the NYS DOH document "Guidance for Evaluating Soil Vapor Instruction in the State of New York, October 2006" are recommended within 18 months after the systems become operational, and should occur every 12 to 18 months thereafter. Based upon a demonstration of the system's reliability, the State recommends that, if a different frequency is desired, a petition describing the alternative frequency and the reasons that frequency is preferred be submitted to the State. Any comments the State may have on the petition should be considered before the frequency is altered.

Routine maintenance activities, which are identified in the SMP, will occur. The following activities (at a minimum) should be conducted:

A) A visual inspection of the complete systems (e.g., vent fan, piping, vacuum gauge, labeling on systems, slab sealing, etc.),
B) Identification and repair of leaks, and
C) Inspection of the exhaust or discharge points to verify no air intakes have been located nearby.

Any appropriate preventative maintenance (e.g., replacing vent fans), repairs and/or adjustments should be made to the systems to ensure their continued effectiveness at mitigating exposures related to soil vapor intrusion. The need for preventative maintenance will depend upon the life expectancy and warranty for the specific part, as well as visual observations over time. The need for repairs and/or adjustments will depend upon the results of a specific activity compared to that obtained when systems operations were initiated.

**POST MITIGATION/CONFIRMATION TESTING**

Per the NYS DOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York October 2006", post mitigation sampling should be conducted no sooner than 30 days after installing an ASD and during heating season conditions.

**ANNUAL CERTIFICATION AND NOTIFICATION RECOMMENDATIONS**

Mitigation systems are considered engineering controls, defined as any physical barrier or method employed to:

1) Actively or passively contain, stabilize, or monitor hazardous waste or petroleum,
2) Restrict the movement of hazardous waste or petroleum to ensure the long-term effectiveness of remedial actions, or
3) Eliminate potential exposure pathways to hazardous waste or petroleum.

Therefore, depending upon the remedial program, submission of an annual certification to the State may be required. This certification must be prepared and submitted by a professional engineer or environmental professional and affirm that the engineering controls are in place, are performing properly and remain effective. This requirement of certification remains in effect until the State provides notification, in writing, that this certification is no longer needed.

**WHERE CAN I GET MORE INFORMATION ABOUT MITIGATION SYSTEMS?**
Because soil vapor mitigation systems and radon mitigation systems are similar, information on radon mitigation systems can be found in "Consumer's Guide to Radon Reduction" (see USEPA Office of Air and Radiation, Office of Radiation and Indoor Air (6609J) 402-K03-002, revised February 2003, or visit their website: http://www.epa.gov/radon/pubs/consguide.html). Additional information can be found in the following documents: EPA 402-R-93-078 "USEPA Radon Mitigation Standards" and ASTM Standard E 2121-13 "Standard Practice for Installing Radon Mitigation Systems".

**CONTACTS**

To report problems with your system or if you intend to sell the property, contact the New York State Department of Environmental Conservation, Mr. Charles Post, Engineering Geologist, 625 Broadway, Albany, New York 12233-1706, (518) 402-9768.

When calling, please provide the following information about your system:

Owner: _____

Street Address/Zip Code: _____

Date Installed: February 12, 2016

System ID: NYS DEC Site #243018