

June 28, 2015

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Re: 595 Trabold Rd., Gates, NY
NYSDEC Site #C828110
Soil Vapor Intrusion Mitigation System Completion Report

CONSTRUCTION COMPLETION REPORT

1. OVERVIEW

This document presents a construction report, performance evaluation, O&M advice and certification of effectiveness for the Sub-Slab Depressurization system (SSDS) installed by *Mitigation Tech* at 595 Trabold Rd., Gates, NY, 14624, as commissioned May 1, 2015.

The subject area consists of the approximately 10,000 sq. ft. footprint of the west addition of this commercial use building. Based on an analysis of sub-slab air communication data and a general building assessment, a multi-suction point SSD System was installed using principles and equipment typically used for soil vapor intrusion mitigation in buildings. The primary objective of implementing this preemptive measure was to mitigate potential intrusion of vapors related to former manufacturing operations that could migrate into occupied space from beneath the slab. This would be achieved by maintaining a negative pressure of at least .004 water column inches (wci) below the slab relative to the air pressure above the slab. All work is in compliance with the NYS DOH document, "Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006".

2. BUILDING ASSESSMENT

Preliminary sub-slab air communication testing was performed at job start as part of a general assessment of the scope of work. The test procedure included drilling core borings into the concrete at likely suction cavity locations, at which vacuum was temporarily applied. Small diameter test holes were established to measure vacuum influence away from core boring locations. Because of relatively moderate sub-slab porosity, it was determined that a single fan system could provide comprehensive coverage. Defects in slab integrity that would require sealing were observed.

Work began with an analysis of appropriate locations for fan, suction cavities and other SSD system components. Both for physical protection and minimum impact on active use areas, riser pipes were embedded where practicable in existing I-beam columns and horizontal pipe was installed no lower than existing mechanical features. Work was coordinated with occupants to minimize disturbance of work areas, relocate obstacles and control dust. Vacuum testing was performed continuously during construction determine the most efficient system configuration and verify integrity of design. At commissioning, all components inspected for condition and proper operation.

3. SUB-SLAB DEPRESSURIZATION SYSTEM GENERAL DESCRIPTION

3.1. Introduction. The SSDS is maintaining sub-slab vacuum at all subject areas. The system consists of a sidewall mounted fan and three vapor extraction points. The system was constructed using principles and equipment typically used for radon mitigation in buildings as detailed in the United States Environmental Protection Agency (EPA) EPA 402-K-03-007 (May 2006), and the final NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). The SSDS was installed as permanent, integral addition to the structure. The key components of the SSDS are described below and are shown on attached diagrams titled "Sub-Slab Depressurization System".

3.2. Suction Points. The location of each suction point (vapor extraction point) is given in the attachment to this document titled "Sub-slab Depressurization System" which shows a site diagram. The suction point consists of a 5" core boring into the slab through which 1- 2 cubic feet of sub-slab material has been removed. Mechanically suspended Schedule 40 3" steel pipe (eastern pipe is SCH 80 PVC) has been inserted into the boring and sealed with urethane sealant.

3.3. Riser Piping. The riser piping consists of 3" schedule 80 PVC pipe and SCH 40 Steel pipe that follows a route from the extraction point to a 4" manifold then to an exterior mounted vacuum fan, through a sidewall penetration. Weatherproof flashing or sealant has been applied to all penetrations. Vent pipes were installed at a pitch that ensures that any rainwater or condensation within the pipes drains downward into the ground beneath the slab. Piping is independently supported, and not supported from existing building mechanical systems. Piping is labeled at each level as "Sub-Slab Vent". Risers are protected by the columns in which they are installed.

3.4. Exhaust Fan. Exhaust fan consists of a RADONAWAY GP-501 centrifugal fan. The RADONAWAY GP-501 consumes approximately 150w of electricity and produces a static pressure differential of up to 4.0 water column inch (wci). The GP-501 and RP-265 are 120V. Fan has an exterior disconnect switch. The circuit is also switched at the electrical panel near the north single door. Fan is mounted with rubber Fernco couplings, for simplified replacement. Exhaust stack from fan is routed to 2' above the roofline. No air intakes were observed within 10' of the exhaust point.

3.5. Instrumentation and Control. There is no centralized instrumentation or control for the SSDS. The fan can be switched either from the roof positioned disconnect or at the breaker. The exhaust fan system is equipped with a vacuum indicator mounted in a visible location on a riser pipe as shown on the attached document titled "Sub-Slab Depressurization System. The indicator consists of an oil filled U-tube style manometer. The indicator is inspected by observing the level of colored fluid. This indicator is designed primarily to give a simple visual check that vacuum is present in the riser pipe, specifically by observation that the fluid levels on each side of the indicator are not even. Indicators are marked at levels observed on May 1, 2015.

3.7. Sealing measures. Polyurethane sealants and mechanical barriers have been applied to floor cracks, slab penetrations and the perimeter floor to wall joint to enhance the barrier between sub-slab and ambient air and improve the efficiency of the SSD System. Sealant has been applied also in the vicinity of suction points and at cracks in concrete bases of columns. Smoke testing has been employed to guide sealing operations.

3.6. Monitoring Points. Monitoring Points are indicated on the attached system diagrams. These consist of 3/4" drill points through the slab into which a digital micromanometer probe can be inserted. They are semi-permanently closed with closed cell backer rod and polyurethane sealant. These were established to aid in original system design and confirmatory testing, and in some cases are difficult to access. The primary future use would be in recertification of system effectiveness.

3.7 System Configuration (see also attached diagram)

SSD SYSTEM

- (1) RADONAWAY GP-501 fan, sidewall mount, to provide sub-slab depressurization via 3" schedule 40 PVC pipe to roof exhaust
- (3) Suction points, east, central and west, following existing columns
- (1) U-tube manometer
- Electrical connection
- Concrete patching and urethane sealant

3.8. PERFORMANCE EVALUATION

(Measurement date – May 1, 2015- In order to verify system effectiveness and as a performance evaluation, test points were established at various distances from the suction cavities suitable to determine that the sub-slab of the entire subject area was being depressurized at least to the objective, as shown in the following table: (locations per schematic)

| Test Point | Vacuum in negative wci |
|-------------------|-------------------------------|
| 1 | .010 |
| 2 | .005 |
| 3 | .004 |
| 4 | .004 |
| 5 | .011 |
| 6 | .006 |
| 7 | .024 |

4. SUB-SLAB DEPRESSURIZATION SYSTEM OPERATION

4.1. All fans should be kept in continuous operation. New York State Soil Vapor Intrusion Guidance (2006) specifies that operation, maintenance and monitoring of the SSD system should be included as part of site management. Until subsurface remediation efforts eventually address VOCs in soil and/or groundwater to

June 28, 2015

Page 4

acceptable levels (i.e. SSD operation no longer required) operation of the SSD system should continue. At that point, the vapor mitigation system may be shut down and/or removed and O&M requirements would cease.

4.2. Reset. Fans restart automatically in event of power loss.

4.3. In the event of unusual fan noise, failure to start, physical damage, or repeated circuit breaker trip, turn fan off and call for service. MITIGATION TECH – 637-7430

4.4. Regularly inspect fan gauge to verify that value, indicated by a mark on the gauge, has not changed significantly from the position of the mark. Gauge is inspected by observing the level of colored fluid or, in the case of a dial gauge, the position of the indicator needle.

4.5. Normal system operation requires unchanged structural conditions. Report any changes in structure, HVAC systems, slab conditions, etc., so that the change can be evaluated for impact on the SSD System. For service, call MITIGATION TECH at 637-7430

4.6. Ensure that a periodic inspection is performed

5. SUB-SLAB DEPRESSURIZATION SYSTEM PERFORMANCE MONITORING

5.1. Monthly Monitoring

5.1.1. Inspect each fan vacuum indicator to verify that value, indicated by a mark on the gauge, has not changed significantly from the position of the mark. Gauge is inspected by observing the level of colored fluid.

5.1.2. Record the observed measurement for each fan vacuum indicator on form labeled “SSD System Vacuum Gauge Record”. Store all forms in the facility maintenance office.

5.1.3. Inspect visible components of SSD system in vicinity of gauge for degraded condition.

5.1.4. Investigate and report any gauge reading that deviates 50% or more from its historical average, or any degraded condition of visible components. For reporting, call MITIGATION TECH at 637-7430.

5.2. Annual Inspection

5.2.1. Conduct a visual inspection of the complete System (e.g., vent fans, piping, warning devices, labeling)

5.2.2. Inspect all components for condition and proper operation;

5.2.3. Identify and repair any leaks in accordance with Sections 4.3.1(a) and 4.3.4(a) of the NYS DOH VI Guidance (i.e.; with the systems running, use smoke sticks to check for leaks through concrete cracks, floor joints and at the suction points; any leaks will be resealed until smoke is no longer observed flowing through the opening).

5.2.4. Inspect the exhaust or discharge point of each exhaust fan to verify that no air intakes have been located within 10 feet

5.2.5. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab). Perform at least one differential pressure reading for each building slab section enclosed by a separate footer

5.2.6. Interview appropriate building occupants seeking comments and observations regarding the operation of the System

June 28, 2015

Page 5

5.2.7. Check to see that the circuit breakers controlling the circuits on which the soil vapor vent fans operate are labeled "Soil Vapor System"

5.3. Annual Certification of Effectiveness

5.3.1. Upon completion of the tasks outlined in section 5.2 above, the installing contractors shall submit a Certification of Effectiveness document, stating that the SSD system continues to perform to the purpose for which it was designed.

6. SUB-SLAB DEPRESSURIZATION SYSTEM MAINTENANCE

6.1. Routine Maintenance

6.1.1. Perform procedures as specified in sections 5.2 and 5.3

6.1.2. There are no routine component replacement procedures; Replace components upon findings of damage or failure

6.1.3. All routine and non-routine maintenance activities should be documented and reported to the agencies, as appropriate

6.2. Non-Routine Maintenance

6.2.1. Non-routine maintenance may also be appropriate during the operation of the mitigation system. Examples of such situations include the following:

6.2.2. It is determined through inspection or notification by others that the warning device indicates the mitigation system is not operating properly

6.2.3. the mitigation system becomes damaged

6.2.4. the building has undergone renovations that may reduce the effectiveness of the mitigation system.

6.2.5. Activities conducted during non-routine maintenance visits will vary depending upon the reason for the visit. In general, building-related activities may include examining the building for structural or HVAC system changes, or other changes that may affect the performance of the depressurization system (e.g., new combustion appliances, deterioration of the concrete slab, or other significant changes). Depressurization system-related activities may include examining the operation of the warning device or indicator and the vent fan, or measurement of the extent of sub-slab depressurization. Repairs or adjustments should be made to the system as appropriate.

Certification

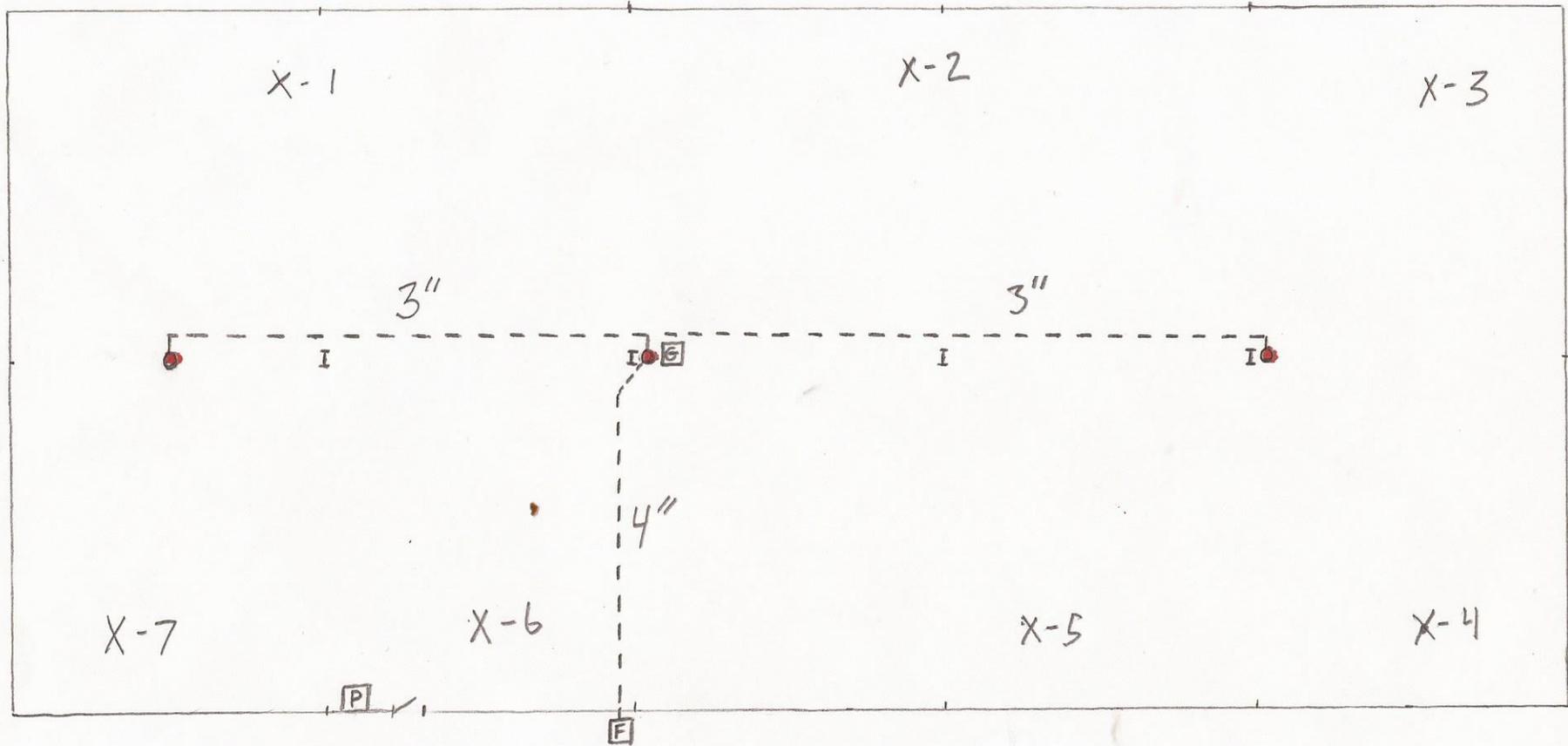
I hereby certify that the SSD System at this location is installed properly and is effective in achieving its above stated purpose.

End of Report

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722

55 SHUMWAY ROAD, BROCKPORT, NEW YORK, 14420 * OFFICE/FAX 585-637-7430



SUB-SLAB DEPRESSURIZATION SYSTEM DIAGRAM
 Installed by: Mitigation Tech, 55 Shumway Rd., Brockport, NY 14420
 595 Trabold Rd., Gates, NY NYSDEC Site #C828110

| | |
|------------------------------|--------------------|
| [F] = Fan w/ exterior switch | ● = Suction Point |
| [P] = circuit breaker | x = Test Point |
| [G] = vacuum gauge | - - - - = Pipe Run |

MAY 1, 2015



