November 26, 2018

Charlotte B. Theobald
New York State Department of Environmental Conservation
6274 East Avon-Lima Road
Avon, New York 14414

Re: Sub-Slab Depressurization System Work Plan
Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York
NYSDEC BCP Site C828201
LaBella Project No. 2172056

Dear Ms. Theobald,

LaBella Associates, D.P.C. (LaBella) is pleased to submit this Sub-Slab Depressurization System (SSDS) Work Plan associated with the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) Site (BCP ID No. C828201) known as the Former Sherwood Shoe Company located at 625 South Goodman Street, Rochester, New York herein after referred to as "the Site." This letter work plan is to seek approval on the design of the SSDS.

PROJECT BACKGROUND

The Site was historically utilized for shoe manufacturing from approximately 1905 to the late 1930s, various industrial and commercial uses from the late 1930s to the late 1960s and appears to have been vacant since the 1930s. A fire in July 1971 reportedly destroyed the Site buildings. The Site was entered into the BCP in March 2018 and a Remedial Investigation (RI) is currently in progress. The RI has identified the presence of petroleum and chlorinated volatile organic compounds (VOCs) in soil and groundwater at the Site. Due to the presence of VOCs in soil and groundwater, there is a potential for soil vapor intrusion (SVI) into buildings being constructed at the Site.

The Site is currently undeveloped land but a multi-family residential building is currently under construction and planned to be completed in 2019. Approximately 18,000 square feet of occupied ground floor space is planned including apartments and common areas.

The SSDS will be installed as passive systems and activated if needed based on indoor air sampling conducted prior to occupancy. A sampling work plan will be submitted under separate cover following installation of the system detailing the indoor air sampling plan.

SSDS DESIGN

Design drawings and specifications for the SSDS are attached. If any alterations to building plans

result from permit approvals, etc. that warrant substantial changes to the SSDS, an amendment will be made to this document detailing necessary changes based on any architectural/ structural changes.

Two (2) separate systems are planned to be installed; "West System" and "East System". The East System will be installed beneath apartments and the West System will be installed beneath common areas.

Each system will consist of a series of parallel 4-inch diameter perforated HDPE pipes connected to a solid schedule 40 PVC header pipe. The header pipes will penetrate the floor slab and be routed through the building to above the roofline. All piping will be installed within the pea stone sub-base. A 15 mil vapor barrier will be installed directly beneath the floor slab.

Monitoring points consisting of ¼ inch diameter stainless steel tubing will be routed beneath the floor slab to various locations throughout the building to monitor sub-slab pressure. The monitoring points will also penetrate the floor slab in the electric room.

Turbine vent fans will be installed on the vertical vent stacks above the roof. A manometer will be installed on each vertical pipe in an accessible location. If activated, a Radon Away HS2000 (or equivalent) will be installed on the East System and a Radon Away GP-501 fan (or equivalent) will be installed on the West System above the roof. If activated, alarms (RadonAway Checkpoint IIA Mitigation System Alarm or equivalent) will be installed on the vertical pipes in an accessible location to alert if a loss of pressure occurs. Labels will be attached to the vertical risers indicating the piping is for a SSDS.

If you have any questions, or require additional information, please do not hesitate to contact me at (585) 295-6648.

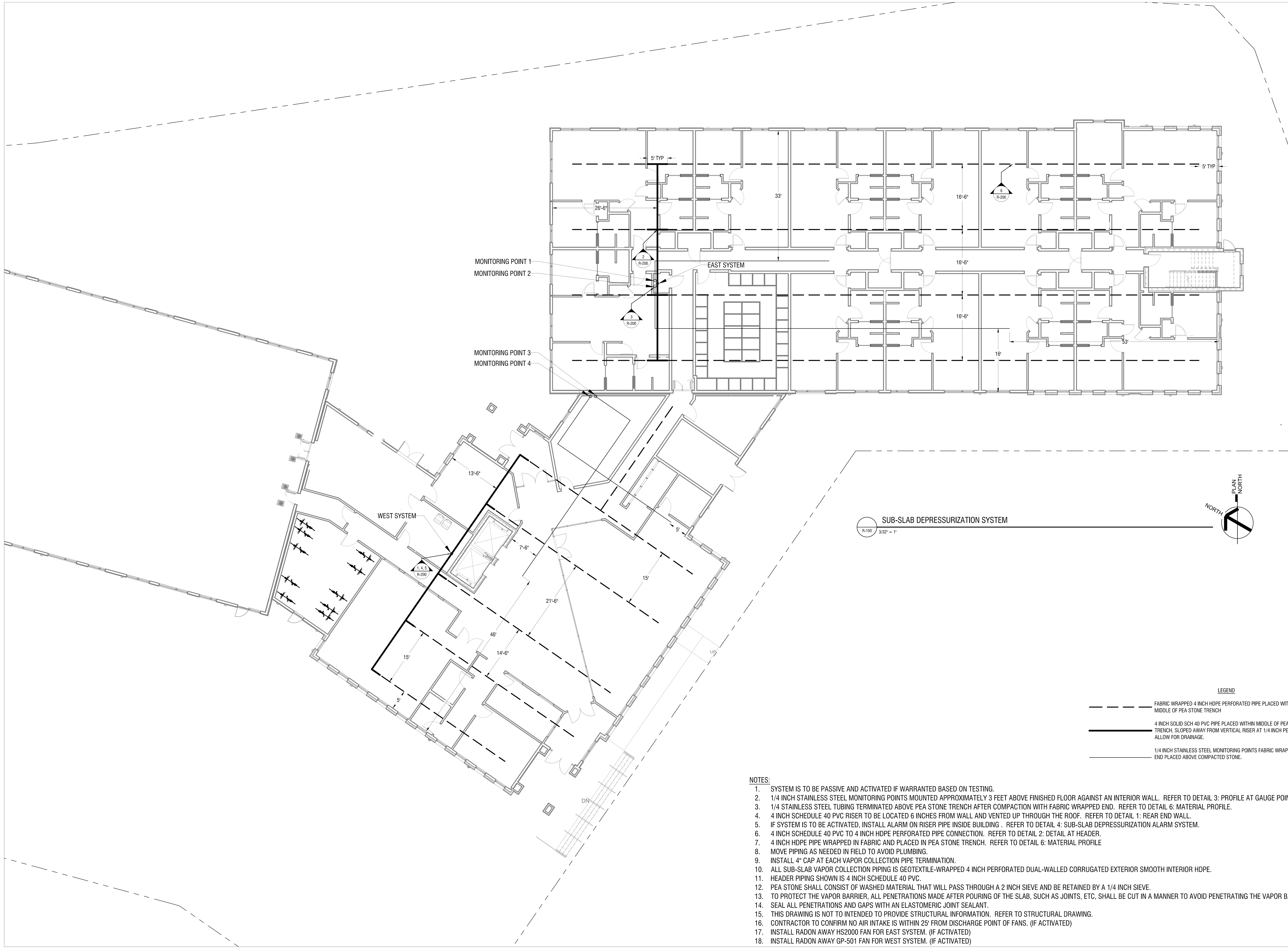
Respectfully submitted,

LABELLA ASSOCIATES, D.P.C.

Jennifer M. Gillen, PG
Project Manager

Attachments:
R-100 Sub-Slab Depressurization System Layout
R-200 Sub-Slab Depressurization System Details
Specification Section 071100- Sub-Slab Vapor Mitigation System

ATTACHMENTS



LEGEND

— — — — (dashed line)	FABRIC WRAPPED 4 INCH HDPE PERFORATED PIPE PLACED WITHIN MIDDLE OF PEA STONE TRENCH
——— (heavy line)	4 INCH SOLID SCH 40 PVC PIPE PLACED WITHIN MIDDLE OF PEA STONE TRENCH, SLOPED AWAY FROM VERTICAL RISER AT 1/4 INCH PER FOOT TO ALLOW FOR DRAINAGE.
——— (thin line)	1/4 INCH STAINLESS STEEL MONITORING POINTS FABRIC WRAPPED AT END PLACED ABOVE COMPACTED STONE.

NOTES:

1. SYSTEM IS TO BE PASSIVE AND ACTIVATED IF WARRANTED BASED ON TESTING.
2. 1/4 INCH STAINLESS STEEL MONITORING POINTS MOUNTED APPROXIMATELY 3 FEET ABOVE FINISHED FLOOR AGAINST AN INTERIOR WALL. REFER TO DETAIL 3: PROFILE AT GAUGE POINT.
3. 1/4 STAINLESS STEEL TUBING TERMINATED ABOVE PEA STONE TRENCH AFTER COMPACTION WITH FABRIC WRAPPED END. REFER TO DETAIL 6: MATERIAL PROFILE.
4. 4 INCH SCHEDULE 40 PVC RISER TO BE LOCATED 6 INCHES FROM WALL AND VENTED UP THROUGH THE ROOF. REFER TO DETAIL 1: REAR END WALL.
5. IF SYSTEM IS TO BE ACTIVATED, INSTALL ALARM ON RISER PIPE INSIDE BUILDING . REFER TO DETAIL 4: SUB-SLAB DEPRESSURIZATION ALARM SYSTEM.
6. 4 INCH SCHEDULE 40 PVC TO 4 INCH HDPE PERFORATED PIPE CONNECTION. REFER TO DETAIL 2: DETAIL AT HEADER.
7. 4 INCH HDPE PIPE WRAPPED IN FABRIC AND PLACED IN PEA STONE TRENCH. REFER TO DETAIL 6: MATERIAL PROFILE
8. MOVE PIPING AS NEEDED IN FIELD TO AVOID PLUMBING.
9. INSTALL 4" CAP AT EACH VAPOR COLLECTION PIPE TERMINATION.
10. ALL SUB-SLAB VAPOR COLLECTION PIPING IS GEOTEXTILE-WRAPPED 4 INCH PERFORATED DUAL-WALLED CORRUGATED EXTERIOR SMOOTH INTERIOR HDPE.
11. HEADER PIPING SHOWN IS 4 INCH SCHEDULE 40 PVC.
12. PEA STONE SHALL CONSIST OF WASHED MATERIAL THAT WILL PASS THROUGH A 2 INCH SIEVE AND BE RETAINED BY A 1/4 INCH SIEVE.
13. TO PROTECT THE VAPOR BARRIER, ALL PENETRATIONS MADE AFTER POURING OF THE SLAB, SUCH AS JOINTS, ETC, SHALL BE CUT IN A MANNER TO AVOID PENETRATING THE VAPOR BARRIER.
14. SEAL ALL PENETRATIONS AND GAPS WITH AN ELASTOMERIC JOINT SEALANT.
15. THIS DRAWING IS NOT TO INTENDED TO PROVIDE STRUCTURAL INFORMATION. REFER TO STRUCTURAL DRAWING.
16. CONTRACTOR TO CONFIRM NO AIR INTAKE IS WITHIN 25' FROM DISCHARGE POINT OF FANS. (IF ACTIVATED)
17. INSTALL RADON AWAY HS2000 FAN FOR EAST SYSTEM. (IF ACTIVATED)
18. INSTALL RADON AWAY GP-501 FAN FOR WEST SYSTEM. (IF ACTIVATED)

NO.	REVISION	BY	DATE
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STATE OF NEW YORK
DANIEL P. NOLL
No. 081956
LICENSED PROFESSIONAL ENGINEER

LaBella
Powered by partnership.

PROJECT/CLIENT

MARK IV ENTERPRISES

HIGHLAND GROVE
625 GOODMAN STREET
ROCHESTER, NEW YORK

DRAWING TITLE

SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT

ISSUED FOR: CONSTRUCTION

DATE: 11-26-2018

DESIGNED BY: AA

DRAWN BY: DRP

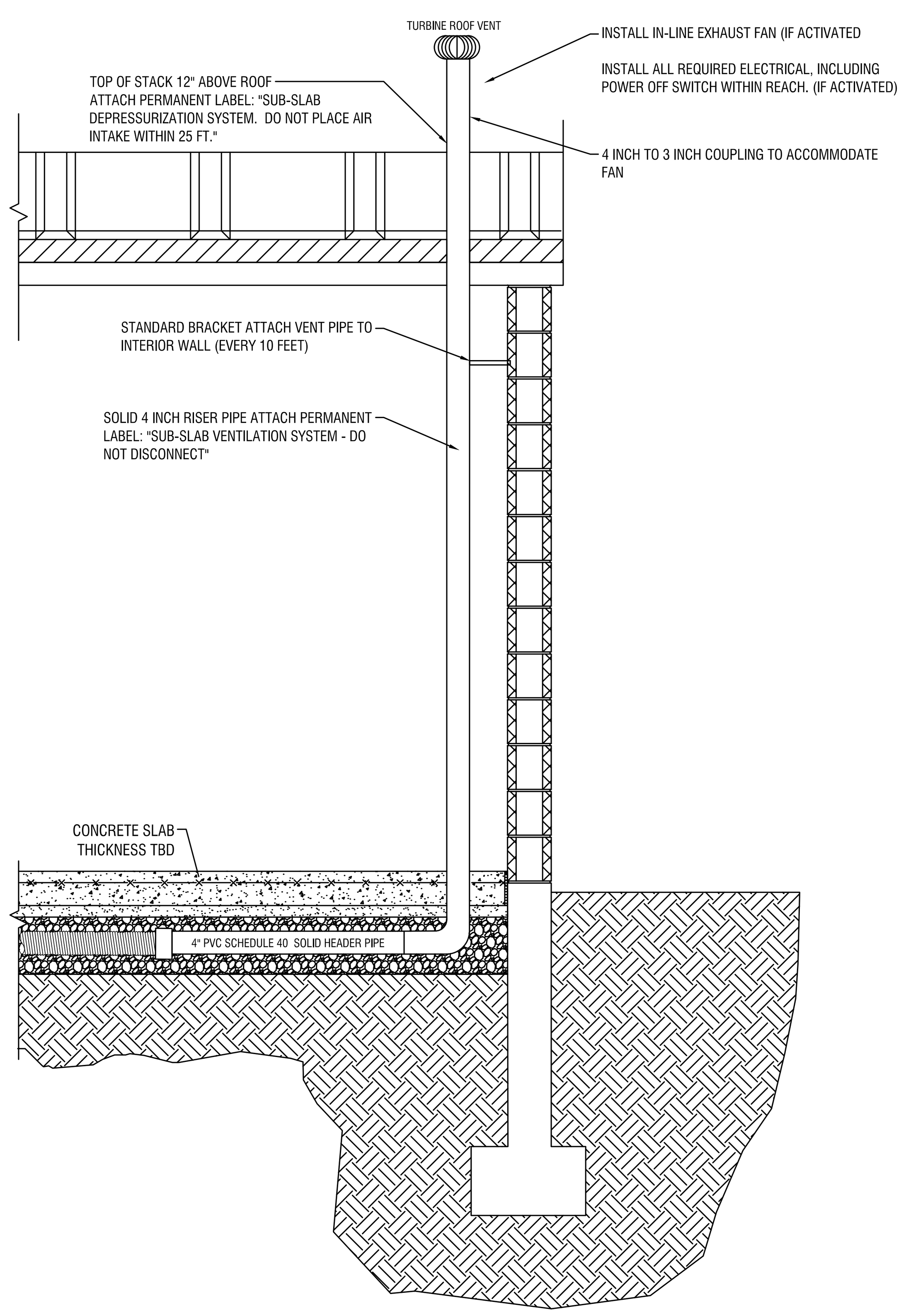
REVIEWED BY: AA

SCALE: 3/32" = 1'

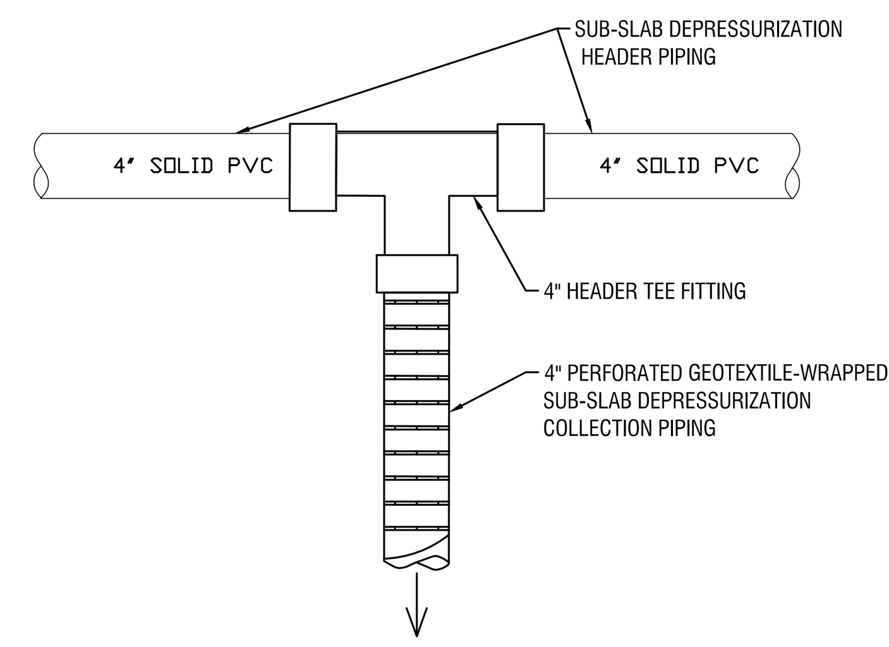
PROJECT/DRAWING NUMBER

2172056

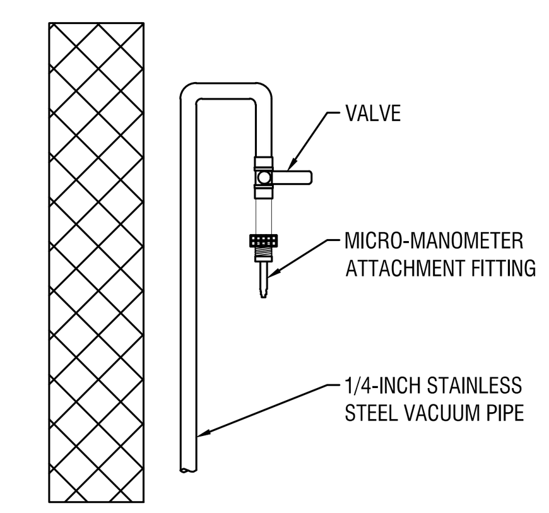
R-100



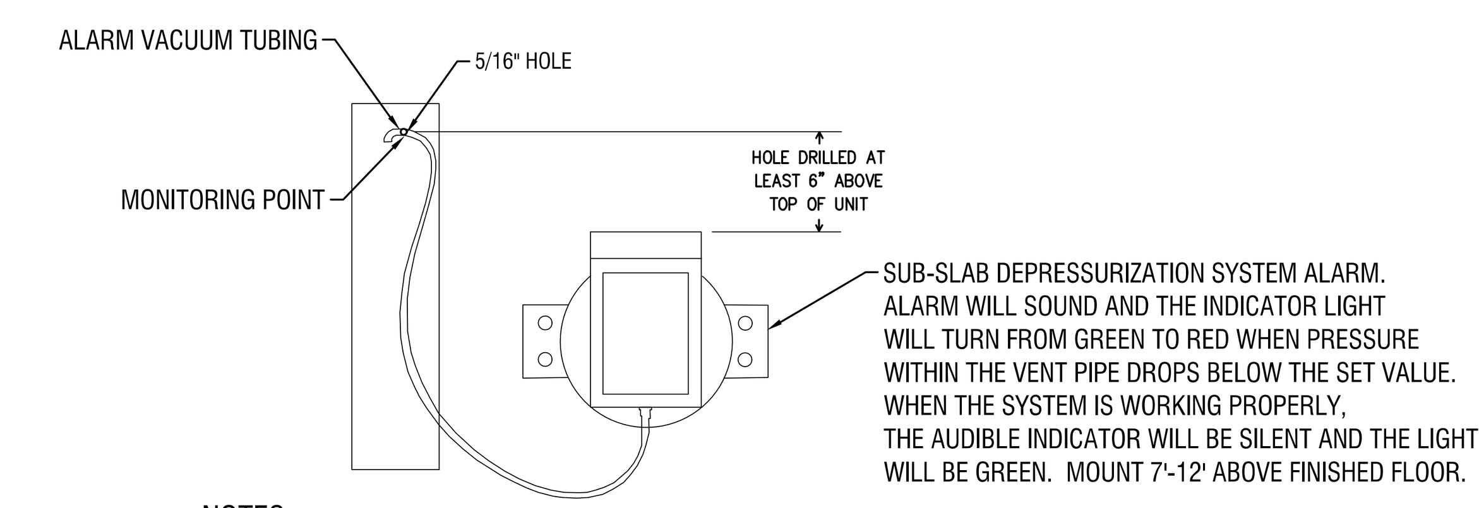
1 REAR END WALL
SCALE: NONE



2 DETAIL AT HEADER
SCALE: NONE



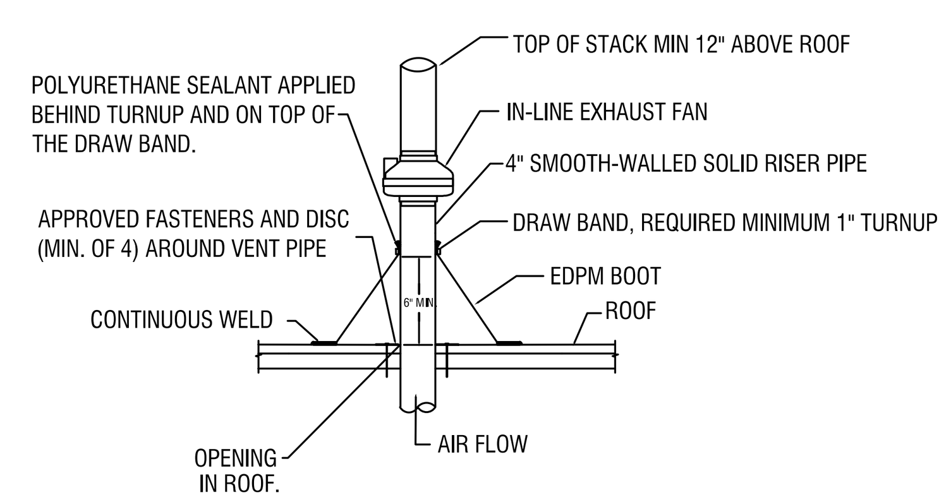
3 PROFILE AT GAUGE POINT
SCALE: NONE



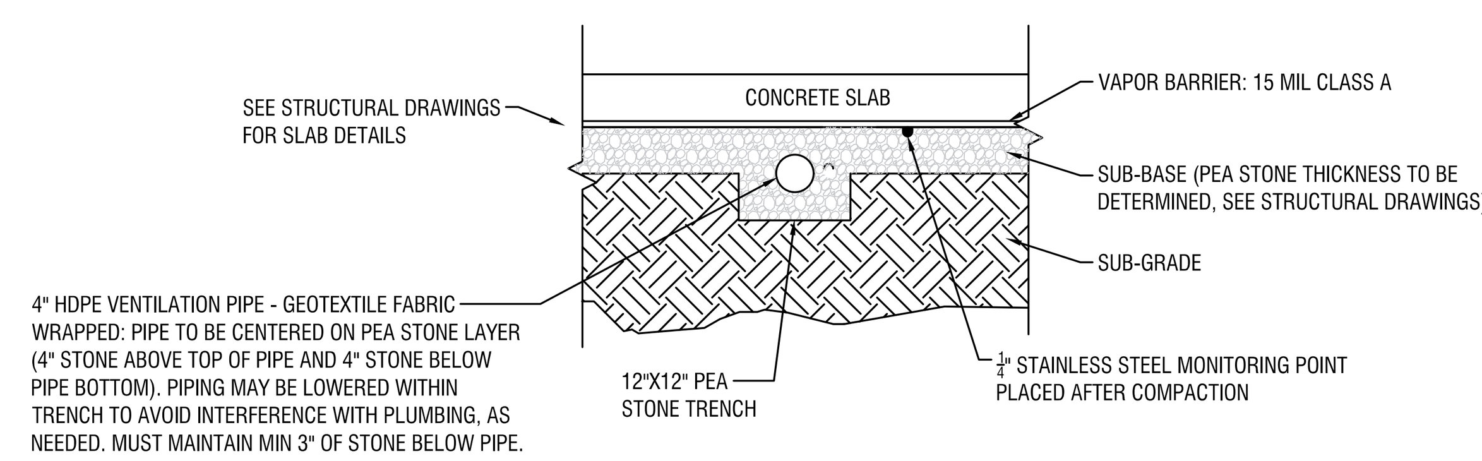
NOTES:

1. CONTRACTOR TO INSTALL ALARM ON SEPARATE CIRCUIT, IF SYSTEM IS ACTIVATED

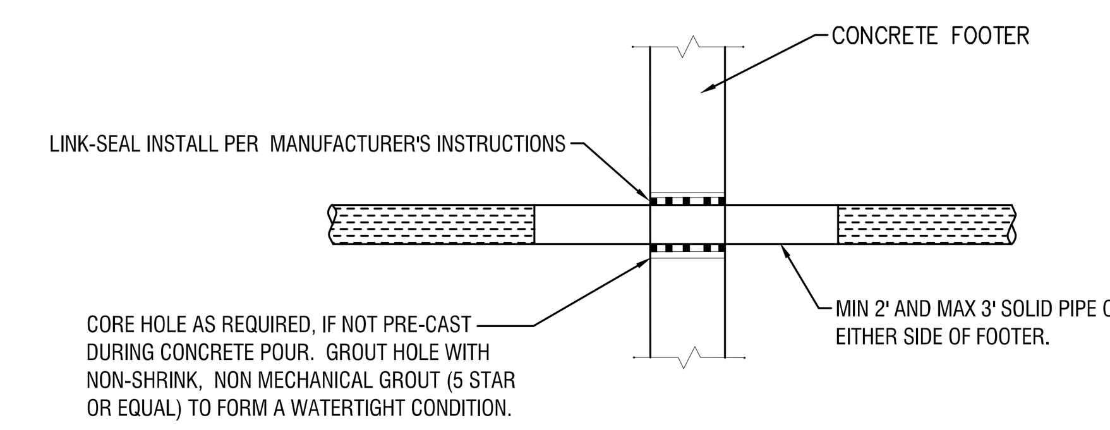
4 SUB-SLAB DEPRESSURIZATION SYSTEM ALARM (IF ACTIVATED)
SCALE: NONE



5 DETAIL AT ROOF
SCALE: NONE



6 MATERIAL PROFILE
SCALE: NONE



7 PROFILE AT PENETRATION
SCALE: NONE

NO.	REVISION	BY	DATE
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It is a violation of New York Education Law Article 145 Sec.7209, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

STATE OF NEW YORK
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PROJECT/CLIENT
MARK IV ENTERPRISES
HIGHLAND GROVE
625 GOODMAN STREET
ROCHESTER, NEW YORK

DRAWING TITLE
SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS

ISSUED FOR
CONSTRUCTION
DATE: 11-26-2018

DESIGNED BY: AA
DRAWN BY: DRP
REVIEWED BY: AA

PROJECT/DRAWING NUMBER
2172056

R-200

SECTION 071100 – SUB-SLAB VAPOR MITIGATION SYSTEM

PART 1 - VAPOR BARRIER

1.1 GAS PERMEABLE LAYER

A layer of gas permeable material shall be placed under all concrete floor slabs and other floor systems that directly contact the ground and are within the walls of the interior spaces of the building, to facilitate installation of a Sub-Slab Depressurization System (SSDS). The gas permeable material shall consist of a uniform layer of clean aggregate, a minimum of 6-inches thick.

1.2 VAPOR RETARDER

A minimum 15-mil polyethylene or approved equivalent flexible sheeting material shall be placed above (on top of) the Gas Permeable Layer prior to pouring the slab or placing the floor assembly to serve as a soil-vapor-barrier, by bridging any cracks that develop in the slab or floor assembly. The sheeting should cover the entire floor area, and separate sections of sheeting should be overlapped at least 12 inches. The sheeting shall be sealed around any pipe, wire or other penetrations of the material, per the manufacturer's instructions. All punctures or tears in the material repaired according to the manufacturer's instructions. The sheeting shall meet the following requirements (e.g., Stego Wrap 15-mil Class A Vapor Barrier or approved equivalent):

Property and ASTM Standard	**Performance Standard**
Underslab Vapor Retarders, ASTM E 1745 Class A	Meet or Exceed
Water Vapor Permeance, ASTM F1249	0.0086 perms (0.0036 water vapor transmission rate)
Tensile Strength, ASTM D 882	70.6 lbf./in.
Puncture Resistance, ASTM D 1709	2266 grams
Methane Transmission Rate, ASTM D1434	192.8 GTR mL(STP)/m^2*day
Radon Diffusion Coefficient K124/02/95	8.8 x 10^{-12} m^2/second
Chemical Resistance, ASTM E 154	Unaffected
Life Expectancy, ASTM E 154	Indefinite

A. Seams in the vapor barrier shall be sealed with a product designed to be compatible with the vapor barrier (e.g., Stego Tape for Stego Wrap products).

B. Follow all manufacturer's instructions and specifications.

C. As an alternative to flexible sheeting material, a spray-on application membrane (e.g., liquid boot, or other) may be used for the entire vapor barrier or for select areas where significant sealing against footer walls and penetrations are needed. Any proposed spray-on application must be approved by the Engineer.

PREVENTION OF SOIL VAPOR ENTRY

A. All concrete floor slabs shall be designed, mixed, placed, reinforced, consolidated, finished, and cured to minimize the formation of cracks in accordance with standards set forth in the Model Building Codes.

B. Large openings, if any, through the concrete floor slab, grade beams, or other foundation components in contact with the soil (e.g., spaces around storm sewer piping, etc.) shall be filled or closed with materials that provide a permanent airtight seal such as non-shrink mortar, grouts, expanding foam, or similar materials designed for such application.

C. Smaller gaps around all pipe, wire, or other objects, if any, that penetrate concrete floor slab or other floor assemblies shall be made air-tight with an elastomeric joint sealant, as defined in ASTM C920-87, and applied in accordance with the manufacturer's recommendations.

D. All control joints, isolation joints, construction joints, and any other joints in the concrete floor slab or between the floor slab and the building's walls shall be sealed. A continuous formed gap (for example, a "tooled edge") which allows the application of a sealant that will provide a continuous, airtight seal shall be created along all joints. When the slab has cured, the gap shall be cleared of loose material and filled with an elastomeric joint sealant, as defined in ASTM C920-97, and applied in accordance with the manufacturer's recommendations.

E. Joints, cracks, or other openings around all penetrations of both exterior and interior surfaces of masonry block or poured concrete foundation components below the ground surface shall be sealed with an elastomeric sealant that provides an air-tight seal. Penetrations of poured concrete walls should also be sealed on the exterior surface. This includes sealing of wall tie penetrations, if applicable.

PART 2 – VAPOR COLLECTION AND VENT SYSTEM

A. Lengths of sub-slab vapor collection piping shall be installed beneath the vapor barrier as depicted on R-100. Sub-slab vapor collection piping shall be geotextile-wrapped, 4-inch diameter, perforated, dual-walled, corrugated exterior, smooth interior high density polyethylene (HDPE).

B. Vapor collection piping shall be installed in the center of 12" x 12" pipe trenches as depicted on Drawing R-100. Pipe trenches shall be backfilled with a washed PEA STONE, which shall consist of material that will pass through a 2-inch sieve and be retained by a ¼-inch sieve.

C. Install perforated cap at each vapor collection pipe termination, and slope all solid PVC pipe up ¼-inch per foot from connection with vapor collection piping.

D. The collection piping shall be connected via the appropriate fittings to 4-inch, schedule 40, polyvinyl chloride (PVC) header pipe. The header pipes shall penetrate the building envelope, through the concrete floor slab, as depicted on drawings R-100 and R-200.

E. The header pipes shall daylight above the floor slab with vertical pipes that are installed within the interior Electric Room, as depicted on R-100. The vertical pipes shall extend through the roof and terminate at least 12 inches above the surface of the roof, in a location that is: at least 25 feet from any air intakes, any window, or other opening into the conditioned spaces of the building that is less than 2 feet below the exhaust point; and at least 10 feet from any adjoining or adjacent buildings. All roof penetrations must be properly sealed and completed in accordance with other

related specifications.

F. All exposed and visible interior and exterior vent pipes shall be identified with labels placed at least every 25 feet. The labels shall read: "Sub-Slab Depressurization System."

G. Vent pipes shall be installed in a configuration and supported in a manner that ensures that any rain water or condensation accumulating within the pipes drains downward into the ground beneath the vapor barrier.

H. Completion is subject to owner/environmental consultant approval. The owner and environmental consultant shall be provided 48-hour notice to inspect the system prior to any portion being covered. Inspections will include at least (but not limited to) the following:

a. Below Grade Portions of Sub-Slab Depressurization System Piping – prior to covering any piping with stone

b. Soil Vapor Barrier – after sealing all penetrations, foundations edges and seams and prior to pouring of concrete

c. Above Grade Portions of Sub-Slab Depressurization System – Prior to any portions being sealed behind walls, pipe chases, etc.

In addition, the contractor shall provide photo documentation for all piping prior to covering.

PART 3 – FANS (IF REQUIRED)

3.1 GENERAL

A. "Activation" of the SSDS (if required) shall be completed by adding exhaust fans in the vertical stand pipes, as shown on R-200.

B. The fans shall meet the following requirements (in-line exhaust fans, such as the "RadonAway HS2000" or approved equivalent for the East System and "RadonAway GP-501" or equivalent for the West System):

East System Fan Specifications

Watts	Recommended Max Pres. "wc	Typical flow [ft^3/min (cfm)] vs. static pressure [water column inches ("wc)]		
159-318	14	0.0" wc	10" wc	15" wc
		63 cfm	37 cfm	12 cfm

West System Fan Specifications

Watts	Max Pres. "wc	Typical flow [ft^3/min (cfm)] vs. static pressure [water column inches ("wc)]								
60-140	4.2	0.0" wc	0.5" wc	1.0" wc	1.5" wc	2.0" wc	2.5" wc	3.0" wc	3.5" wc	4.0" wc
		-- cfm	-- cfm	95 cfm	87 cfm	80 cfm	70 cfm	57 cfm	30 cfm	10 cfm

C. The fans in the vent pipes and all positively-pressurized portions of the vent pipes shall be located outside the habitable space of the building or within interior mechanical pipe chases if open to the

atmosphere and closed to interior spaces.

D. The fans in the vent pipes shall be installed in vertical runs of the vent pipes, at an approximate height of at least 1-ft. above the roofline to facilitate maintenance and repair.

3.2 WARNING SYSTEMS (IF REQUIRED)

A. Each vertical standpipe (regardless of if a fan is required or not) shall be equipped with a U-tube type manometer or approved equivalent below the fan and within the Electric Rooms as depicted on R-100 in a visible location, to demonstrate that pressure within the pipe is below atmospheric pressure.

B. Each fan (if required) shall be equipped with a prominently positioned visible or audible warning system (e.g., RadonAway Checkpoint IIA Mitigation Alarm or approved equivalent) to alert the building occupant if there is loss of pressure or air flow in the vent pipe, or if the fan ceases operation. Location of the warning system shall be subject to owner/Environmental Project Monitor approval. The Contractor will connect the alarm and fan on separate breakers and provide that information to the Environmental Project Monitor. The Contractor will clearly label the breakers "SSDS Fan" and "SSDS Alarm".

PART 4 – TEST POINTS

A. Test Points, consisting of an open length of stainless steel vacuum tubing, shall be installed beneath the slab as depicted on R-200. The open end of the stainless steel vacuum tubing shall be fabric-wrapped at its sub-slab termination as shown on R-100. The vacuum tubing shall be routed to the Electric Room and terminate in a barbed ¼-inch hose fitting mounted at an approximate height of three (3) feet above the local grade and fitted with a stop valve beneath the barbed fitting as depicted in R-200.

B. The Test Points will be installed after all other utilities are installed, gas permeable layer is placed and vapor collection piping is installed and immediately before placing the vapor barrier. No equipment shall be driven over the Test Points and associated steel tubing. The Test Point tubing shall not be bent at any angle greater than 45 degrees. If located in a high-traffic area, each gauge/test point will be protected by the Contractor until the floor slab is poured.

PART 5 – MISCELLANEOUS

A. Heating, Ventilating, and Air Conditioning (HVAC) systems shall be designed and installed to avoid depressurization of the building relative to underlying and surrounding soil. Specifically, joints in air ducts and plenums passing through unconditioned spaces shall be sealed.

B. The Contractor will conduct a backdraft test to ensure the operation of the SSDS system does not create backdraft when the HVAC system is in operation. The Contractor will complete the backdraft test per the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October 2016. The Contractor will provide a letter or report documenting the backdraft test to the Environmental Project Monitor.

C. The Contractor will label each vertical riser within Electric Room with the appropriate system (i.e., "East System" and "West System") and label each monitoring point 1, 2, and 3 as shown on R-100.

END OF SECTION 071100