February 24, 2021

Mr. Joshua Cook
NYS Department of Environmental Conservation
615 Erie Boulevard West
Syracuse, New York 13204

RE: Sub-Slab Depressurization System
Former Breneman Site – C738046
8 East Utica Street, Oswego, New York
LaBella Project #2210742

Dear Mr. Cook,

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. C738046) located at 8 East Utica Street, Oswego, New York, hereinafter referred to as the "Site." This letter work plan is to seek approval on the design of the SSDS.

PROJECT BACKGROUND

The Former Breneman Site covers approximately 2.1 acres and is situated on the southwest corner of the intersection of East Utica Street and East First Street. An approximate 21,000 square foot four-story residential building with 80 apartments is currently under construction. The lowest level of the structure will include a subgrade parking garage beneath the entire building. LaBella is currently assisting the owner, DePaul Properties, Inc. & DePaul Oswego Housing Development Fund Corporation (DePaul), with implementing the Site Management Plan (SMP) during construction activities.

Due to the presence of volatile organic compounds (VOCs) in the subsurface at the Site, an active SSDS will be installed in the building to be constructed to mitigate potential soil vapor intrusion (SVI) impacts.

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.

Three (3) separate systems are planned to be installed; System #1 located in the northern portion of the building, System #2 located in the central portion of the building and System #3 located in the southern portion of the building.

Each system will consist of a series of parallel 4-inch diameter perforated HDPE pipes connected to a solid schedule 40 PVC header pipes. The header pipes will penetrate the floor slab in the mechanical room and be routed through the building to above the roofline. The sub-base material beneath the entire garage floor slab will consist of a minimum of 12 inches of compacted drainage course. SSDS piping will be installed within a 12-inch by 12-inch pea stone trench as shown on R-200. A minimum 15-mil vapor barrier will be installed directly beneath the garage floor slab.

Six (6) monitoring points will be installed for pressure field extension (PFE) testing consisting of ¼ inch diameter stainless steel tubing routed beneath the floor slab to various locations throughout the building. The monitoring points will penetrate the floor slab in the mechanical room where they will be accessible for pressure monitoring and SVI sampling. The points are referred to as "Monitoring Points 1 through 6" on the attached figure R-100 Sub-Slab Depressurization System Layout with further details on the attached figure R-200 Sub-Slab Depressurization System Details. All six (6) of these monitoring points will be utilized for PFE testing.

Penetrations (e.g., piping, utilities) through the vapor barrier as well as the edges of the vapor barrier will be sealed using Stego® Tape, or similar.

A manometer will be installed on each vertical pipe in an accessible location. A Radon Away RP-265 fan (or equivalent) will be installed on System #1, System #2 and System #3 above the roof. 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. The completed SSDS will be documented in the Final Engineering Report.

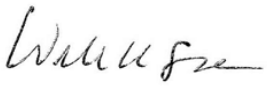
REPORTING

As-Built Drawings for the system including the final system layout, system components and typical operating pressures will be documented in an updated Site Management Plan and the next Periodic Review Report.

If you have any questions, or require additional information, please do not hesitate to contact me at (315) 243-8441.

Respectfully submitted,

LABELLA ASSOCIATES, D.P.C.

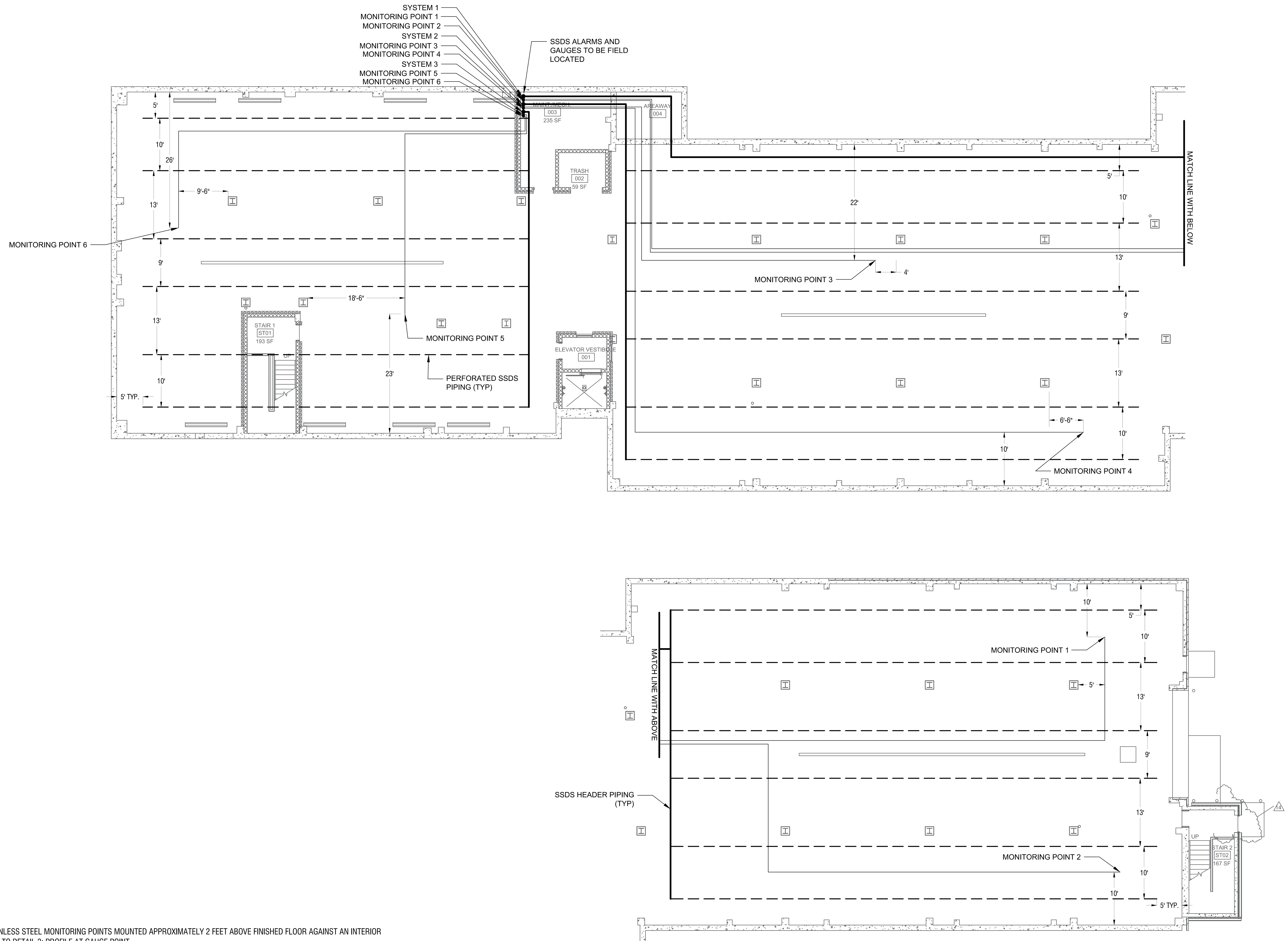


William K. Sisco
Project Manager

Attachments:
R-100 Sub-Slab Depressurization System Layout
R-200 Sub-Slab Depressurization System Details
Specification Section 026216- Sub-Slab Depressurization System

I:\DEPAUL PROPERTIES, INC\2210742 - FORMER BRENEMAN SITE OSWEGO\SSDS WORKPLAN\C738046 - FORMER BRENEMAN SSDS WORK PLAN (2.24.2021).DOC

ATTACHMENTS



SUB-SLAB DEPRESSURIZATION SYSTEM

R-100 1/8" = 1'

NORTH

NOTES:

1. 1/4 INCH STAINLESS STEEL MONITORING POINTS MOUNTED APPROXIMATELY 2 FEET ABOVE FINISHED FLOOR AGAINST AN INTERIOR WALL. REFER TO DETAIL 3: PROFILE AT GAUGE POINT.
2. 1/4 STAINLESS STEEL TUBING TERMINATED ABOVE SUB-BASE WITH FABRIC WRAPPED END. REFER TO DETAIL 6: MATERIAL PROFILE.
3. 4 INCH SCHEDULE 40 PVC RISER TO BE LOCATED AGAINST INTERIOR WALL AND VENTED UP THROUGH THE ROOF. REFER TO DETAIL 1: REAR END WALL.
4. 4 INCH SCHEDULE 40 PVC TO 4 INCH HDPE PERFORATED PIPE CONNECTION. REFER TO DETAIL 2: DETAIL AT HEADER.
5. 4 INCH HDPE PIPE WRAPPED IN FABRIC AND PLACED IN PEA STONE TRENCH. REFER TO DETAIL 6: MATERIAL PROFILE
6. MOVE PIPING AS NEEDED IN FIELD TO AVOID PLUMBING. SOLID HEADER PIPING MUST MAINTAIN POSITIVE PITCH BACK TO PERFORATED PIPING TO ALLOW DRAINAGE.
7. INSTALL 4" CAP AT EACH VAPOR COLLECTION PIPE TERMINATION.
8. ALL SUB-SLAB VAPOR COLLECTION PIPING TO BE GEOTEXTILE-WRAPPED 4 INCH PERFORATED DUAL-WALLED CORRUGATED EXTERIOR SMOOTH INTERIOR HDPE.
9. HEADER PIPING TO BE 4 INCH SCHEDULE 40 PVC. SOLID HEADER PIPING TO MAINTAIN $\frac{1}{4}$" PER FT. PITCH TO PERFORATED PIPING TO ALLOW DRAINAGE.
10. PEA STONE SHALL CONSIST OF WASHED MATERIAL THAT WILL PASS THROUGH A 2 INCH SIEVE AND BE RETAINED BY A 1/4 INCH SIEVE.
11. 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.
12. SEAL ALL PENETRATIONS AND GAPS WITH AN ELECTROMETRIC JOINT SEALANT.
13. THIS DRAWING IS NOT TO INTEND TO PROVIDE STRUCTURAL INFORMATION. REFER TO STRUCTURAL DRAWINGS.
14. CONTRACTOR TO CONFIRM NO AIR INTAKE IS WITHIN 25' FROM VENT STACK.
15. INSTALL RADONAWAY RP-265 FAN ON EACH SYSTEM ABOVE ROOF AND ALARM FOR EACH SYSTEM.
16. RISERS FOR SYSTEM 1 SHALL BE PLACED IN ELECTRIC ROOM AND RISER FOR SYSTEM 2 SHALL BE PLACED IN THE WAREHOUSE.

LEGEND

Line	Description
— — — (dashed)	FABRIC WRAPPED 4 INCH HDPE PERFORATED PIPE PLACED WITHIN MIDDLE OF PEA STONE TRENCH
▬▬▬ (heavy solid)	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 solid)	1/4 INCH STAINLESS STEEL MONITORING POINTS PLACED ABOVE COMPACTED SUB-BASE MATERIAL, FABRIC WRAPPED AT END.

NO.	REVISION	BY	DATE
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LaBella
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PROJECT/CLIENT

DEPAUL GROUP

FORMER BRENEMAN SITE
LOCK 7 APARTMENTS
220 E. FIRST ST
OSWEGO, NY

DRAWING TITLE

SUB-SLAB DEPRESSURIZATION
SYSTEM LAYOUT

ISSUED FOR: --

DATE: FEBRUARY, 2021

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

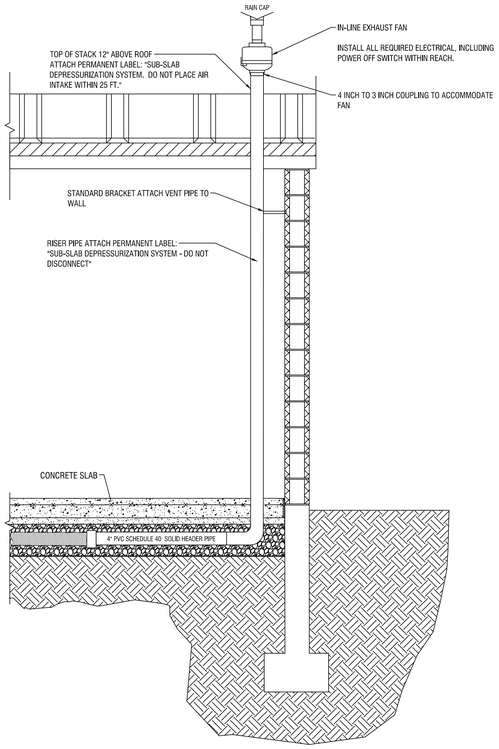
SCALE: 1/8"=1'

I:\DePaul Group\2202845 - Former Breneman Site ISMP\Drawings\SSDS Plan.dwg

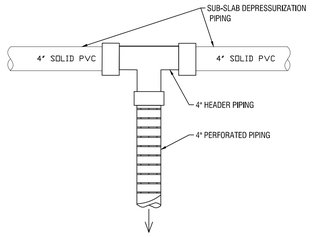
PROJECT/DRAWING NUMBER

2202845

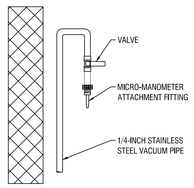
R-100



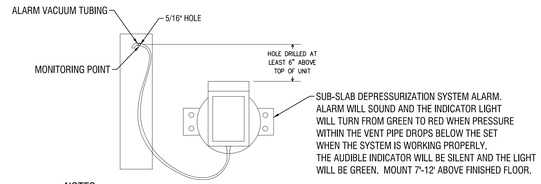
1 REAR END WALL
SCALE: NONE



2 DETAIL AT HEADER
SCALE: NONE

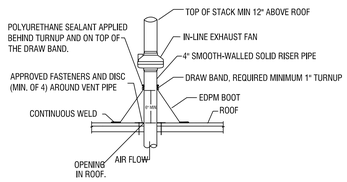


3 PROFILE AT GAUGE POINT
SCALE: NONE

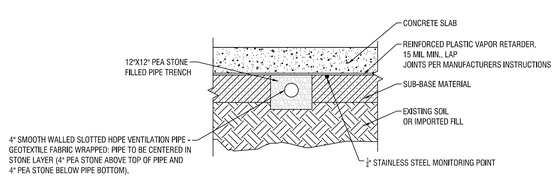


NOTES:
1. CONTRACTOR TO INSTALL ALARM ON SEPARATE CIRCUIT.
2. CONTRACTOR TO INSTALL U-TUBE MANOMETER.

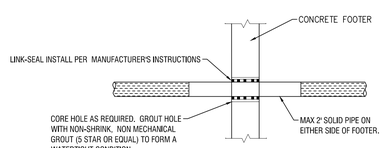
4 SUB-SLAB DEPRESSURIZATION SYSTEM ALARM
SCALE: NONE



5 DETAIL AT ROOF
SCALE: NONE



6 MATERIAL PROFILE
SCALE: NONE



7 PROFILE AT PENETRATION
SCALE: NONE

NOTES:
1. 1/4 INCH STAINLESS STEEL MONITORING POINTS MOUNTED APPROXIMATELY 2 FEET ABOVE FINISHED FLOOR AGAINST AN INTERIOR WALL. REFER TO DETAIL 3: PROFILE AT GAUGE POINT.
2. 1/4 STAINLESS STEEL TUBING TERMINATED ABOVE SUB-BASE WITH FABRIC WRAPPED END. REFER TO DETAIL 6: MATERIAL PROFILE.
3. 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.
4. INSTALL ALARM ON EACH RISER PIPE WITHIN TRASH COLLECTION ROOM. REFER TO DETAIL 4: SUB-SLAB DEPRESSURIZATION ALARM SYSTEM.
5. 4 INCH SCHEDULE 40 PVC TO 4 INCH HDPE PERFORATED PIPE CONNECTION. REFER TO DETAIL 2: DETAIL AT HEADER.
6. 4 INCH HDPE PIPE WRAPPED IN FABRIC AND PLACED IN PEA STONE TRENCH. REFER TO DETAIL 6: MATERIAL PROFILE
7. 4 INCH SOLID PVC EXTENDING MAXIMUM 2 FEET AND ON EITHER SIDE OF WALL, GROUTED IN PLACE TO FORM WATER TIGHT CONNECTION. REFER TO DETAIL 7: PROFILE AT PENETRATION.
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 FANS.
17. SYSTEM 1, 2, AND 3 INSTALL RADON AWAY RP-265 FAN, OR EQUIVALENT.

NO.	REVISION	BY	DATE
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3			
4			
5			
6			

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PROJECT/CLIENT
DEPAUL GROUP
FORMER BRENEMAN SITE
LOCK 7 APARTMENTS
220 E. FIRST ST
OSWEGO, NY

DRAWING TITLE
SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS

ISSUED FOR: --
DESIGNED BY: AA
DRAWN BY: DRP
REVIEWED BY: AA
DATE: FEBRUARY, 2021
SCALE: 1/8" = 1'
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PROJECT/DRAWING NUMBER
2202845
R-200

Section 026216 – SUB-SLAB VAPOR MITIGATION SYSTEM

PART 1 – VAPOR BARRIER

1.1 GAS PERMEABLE layer

A. A layer of gas permeable material shall be placed under all concrete floor and other floor systems that directly contact the ground and are within the walls of the interior spaces of the building, to facility 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. The aggregate shall meet the requirements of NYSDOT Bedding Material 733-23 or equivalent.

1.2 VAPOR RETARDER

A. A minimum 15-mil polyethylene or approved equivalent flexible sheeting material shall be placed above the crushed stone layer to serve as a soil-gas-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 and sealed at these seams according to the manufacturer's instructions. 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 shall be repaired according to the manufacturer's instructions. The sheeting shall meet the following requirements (Stego Wrap 15-mil Class A Vapor Retarder or approved equivalent):\

Property and ASTM Standard	**Performance Standard**
Underslab Vapor Retarders, ASTM E 1745 Class A, B, & C	Exceeds Class A, B, & C
Water Vapor Permeance, ASTM F1249	0.0254 perms
Tensile Strength, ASTM D 882	50.60 lbf/in
Puncture Resistance, ASTM D1709	3006 grams

B. 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).

C. Follow all manufacturer's instructions and specifications.

1.3 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, 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 airtight 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 drawing 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-200. Pipe trenches shall be backfilled with PEA STONE, which shall consist of material that will pass through a 2-inch sieve and be retained by a ¾-inch sieve.

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

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

E. The header pipes shall terminate at vertical standpipes at least 12 inches above the surface of the roof, in a location that is: at least 25 feet from any air intakes; at least 10 feet away from any window, air intake, 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.

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 – Do Not Disconnect."

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 and Monitoring Piping – prior to covering 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.

I. Contractor shall provide photos of piping, trenches, etc.

PART 3 – FANS

3.1 GENERAL

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

B. The fans shall meet the following requirements (in-line exhaust fans, such as the "RadonAway RP-265", or approved equivalent).

Watts	Max Pres. "wc	Typical flow [ft^3/min (cfm)] vs. static pressure [water column inches ("sc")]								
60-140	3.0	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	-- cfm	61 cfm	52 cfm	44 cfm	22 cfm	--cfm	-- 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

A. Each vertical standpipe shall be equipped with a U-tube type manometer or approved equivalent below the fan and within the room shown on drawing R-100 in a visible manner, to demonstrate that pressure within the pipe is below atmospheric pressure.

B. Each fan shall be equipped with a prominently positioned visible or audible warning system (e.., RadonAway Checkpoint IIA Mitigation Alarm or approved equivalent) to alert the building occupant is 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 fans and alarms shall be labeled with a distinct number in order to identify each fan and associated alarm system. The breakers shall also be labeled with fan number and alarm number. The breaker information will be provided to the Engineer.

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 drawing R-100. The open end of the stainless steel vacuum tubing shall be fabric-wrapped as its sub-slab termination as shown on drawing R-200. The vacuum tubing shall be routed as shown on drawings R-100 and R-200 and terminate in a barbed ¼-inch hose fitting. The terminations shall be mounted at an approximate height of three (3) feet above the local grade within the room shown on drawing R-100 and fitted with a stop valve beneath the barbed fitting as depicted in drawing R-100. The contractor shall label each test point at the termination point and provide labeling to the Engineer along with a figure illustrating the full route of the test point and the associated label.

B. If located in a high-traffic area, each gauge/test point will be protected by the Contractor.

PART 5 – MISCELLANEOUS

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

B. The Contractor shall 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 within 14 days of completing the backdraft test.

C. Contractor shall label each monitoring point and system riser numerically in a visible location above the floor slab within the room shown on drawing R-100.

END OF SECTION 026216