SECTION 312113

SUB SLAB DEPRESSURIZATION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions, including General and Supplementary Conditions and Division 1, 3, 7, 22, 26 and 28 Specification Sections, apply to this Section.

B. Specification Drawings H-200, H-201, H-202, H-203 and H-204.

C. Related Documents

1. All work shall be consistent with and adhere to: October 2006 Final Guidance for evaluating Soil Vapor Intrusion in the state of New York prepared by the New York State Department of Health (NYSDOH).

2. All applicable portions of the Building code of the city of Yonkers.

3. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, USEPA, June 2015.

1.2 SUMMARY

A. Work Included: This Section generally includes, but is not necessarily limited to, the following components of the sub-slab depressurization system (SSDS): waterproofing, vapor barrier, poly-vinyl chloride (PVC) underground collection piping, gas permeable aggregate, pipe trenching, PVC riser piping, blower and exhaust stack as shown with details on Drawings H-200 through H-204.

1. Under slab gas permeable aggregate, ASTM C33 Size #5 aggregate.
2. Under slab vapor barrier, Stego Wrap® 20 mil or approved equal.
3. Under elevator/utility pit waterproofing, GCP Applied Technologies Preprufe® 300R, Bithuthene 3000 or approved equal.
4. Geotextile fabric such as Mirafi N-Series product type 140NL or approved equal.
5. Under slab 4-inch Schedule 40 PVC vapor collection piping and 4-inch Schedule 40 0.020-inch slotted PVC pipe.
6. 4-inch Schedule 40 PVC pipe to 6-inch PVC header and pipe risers, and 8-inch PVC header, pipe riser and exhaust stack.
7. System accessories including magnehelic pressure gauges, vacuum indicator, flow meters, differential pressure switch, ball valves, cleanout tees, sampling port and alarm.
8. Vacuum monitoring points.
9. Two 500 cubic foot per minute (CFM) industrial blowers (1 as spare) and one variable frequency drive (VFD).

B. The Contractor shall supply all labor, materials, equipment, services, insurance, and incidentals necessary or required to perform the work in accordance with applicable governmental regulations and these specifications.

C. Extent of Work: Install the SSDS in coordination with the waterproofing/vapor barrier to allow for and control the collection of gas vapor from below the building for venting safely above the roof. System components include, but are not limited to: 4-inch Schedule 40 slotted PVC piping network in minimum of 16-inch wide by 16-inch deep gas permeable aggregate trench (pipe is

sloped downward away from riser location), minimum 6-inch gas permeable aggregate layer under vapor barrier in all other non-trench areas, 4-inch Schedule 40 PVC slotted to 4-inch Schedule 40 PVC solid pipe coupling at transition to 4-inch Schedule 40 PVC solid pipe, 4-inch Schedule 40 PVC solid pipe to 4-inch PVC riser legs to 6-inch PVC couplings and header, two 6-inch PVC risers to roof, then PVC couplings and header to 8-inch PVC riser above roof (including 8-inch x 8-inch x 2-inch PVC reducer tee) and blower to 8-inch exhaust stack with a sample port assembly and rain cap. Four (4) vapor monitoring points are to be installed as indicated on Drawings; exact locations to be coordinated with Architect.

D. Furnish and install at each 4-inch riser leg a magnehelic pressure gauge, flow meter assembly, cleanout and butterfly valve. Furnish and install at each 6-inch riser after manifold header pipes a magnehelic pressure gauge. Furnish and install at the 8-inch manifold header pipe a vacuum indicator and a differential pressure switch connected to an alarm indicator box. Furnish and install all parts and materials necessary to connect the 8-inch SSDS vent riser manifold to blower and exhaust stack.

E. Install all system components as indicated, specified and required in these contract documents and drawings, as well as in accordance with all applicable governmental regulations.

F. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local regulations pertaining to work practices, materials, installation, and testing of the SSDS. Contractor is responsible to advise the Owner or his/her Environmental Engineer.

1.3 SUBMITTALS

A. General: Refer to and comply with general contract for procedures and additional submittal criteria.

B. Product Data: Provide sieve analysis data for the gas permeable aggregate, and the manufacturer's product data for geotextile fabric, vapor barrier/waterproofing, PVC and connections, blower, VFD, butterfly valves, magnehelic pressure gauges, flow meters and any other materials proposed, including all related accessories, dimensional data, and installation instructions.

C. Shop Drawings: Submit shop drawings for waterproofing/vapor barrier details, piping installations, pipe fittings, couplings, connections and any other materials proposed, including all related accessories, dimensional data, and installation instructions. Submit itemized pipe and fitting materials schedule for each specified application. Submit coordinated piping layout and riser layout drawings, including pipe invert elevations, to Architect and Engineer.

D. Certifications: Submit Certification signed by the Contractor and the Installer of the waterproofing/vapor barrier and SSDS stating that the installed materials conform to the specified requirements and that the system was successfully checked and tested prior to covering.

E. As-Built Drawings: Provide as-built drawings giving actual locations and dimensions of completed waterproofing/vapor barrier and SSDS.

1.4 APPLICABLE STANDARDS, REGULATIONS, AND CODES

A. All Federal, state, and local regulations, codes, and ordinances, as applicable.

B. The following ASTM standards:

1. ASTM C33 Specification for Concrete Aggregate
2. ASTM D1785 Standard Specification for PVC Plastic Pipe, Schedules 40, 80 and 120
3. ASTM D2241 Standard Specification for PVC Pressure Rated Pipe
4. ASTM D2564 Standard Specification for Solvent Cements for PVC Plastic Piping Systems
5. ASTM D2665 Standard Specification for PVC Plastic Drain, Waste, and Vent Pipe Fittings
6. ASTM D2855 Standard Practice for Making Solvent-Cemented Joints with PVC Pipe and Fittings
7. ASTM D5926 Standard Specification for PVC Gaskets for Drain, Waste, and Vent Sewer, Sanitary and Storm Plumbing Systems
8. ASTM E1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs

1.5 COORDINATION

A. Notify the Environmental Engineer within one business day of any significant installation milestones including, but not limited to, the inspections listed in Section 3.1 (B).

B. Coordinate location and installation of waterproofing/vapor barrier and SSDS with installation of under slab foundations, trenches, sumps and utilities.

C. Coordinate location and installation of the pipe risers, control panel, VFD alarm and blower with installation of other vent piping, construction of floor slabs, pipe chases, partitions and roof/wall penetrations.

1.6 JOB CONDITIONS

A. Perform work only when existing and forecasted weather conditions are within manufacturer's recommendations for the material and product used.

B. The Contractor shall coordinate with all trades involved, the scheduling of excavation and backfill to ensure that all necessary components of work due to be buried are installed, thus avoiding duplication of excavation work, unless otherwise shown on the Drawings or noted in other sections of the documents. No other work should be performed in areas above an installed waterproofing/vapor barrier section until the Environmental Engineer has approved it. The Contractor shall verify that there are no interferences with other existing or proposed subsurface systems. Gas permeable aggregate must be rolled flat and non-angular.

C. All plumbing, electrical, mechanical and structural items to be under or passing through the waterproofing and/or vapor barrier shall be positively secured in their proper positions and appropriately protected prior to membrane application.

D. Surface preparation shall be per manufacturer's specification and in accordance with civil and structural requirements not outlined in this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the site in original unbroken packages bearing manufacturer's label showing brand, weight, volume, and batch number. Deliver materials to the site only after the submittals have been reviewed and approved.

B. Store materials at the site in strict compliance with manufacturer's instructions. Store materials in a clean, dry area on-site. Do not allow materials to freeze in containers.

C. Protect materials during handling and installation to prevent damage. Replace any damaged materials at no cost to the Client unless the damaged material can be repaired per the manufacturer's requirements and to the satisfaction of the Client and such that foundation vapor barrier protection is not compromised.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Gas Permeable Aggregate

1. The gas permeable aggregate shall be free of organic, frozen or other deleterious matter. Aggregate shall have a nominal size of 1-inch to ½-inch and conform to ASTM C33 Standard Specification for Concrete Aggregate Size #5 gradation as per the table below:

Sieve Size	Percent finer than by Mass
1.5-inch	100
1-inch	90 to 100
¾-inch	20 to 55
½-inch	0 to 10
⅜-inch	0 to 5

B. Non-Woven Geotextile Material

1. Geotextile material to be placed on prepared sub-grade below the gas permeable aggregate layer shall be a non-woven polypropylene type, such as Mirafi N-Series product type 140NL, or approved equal.

C. Subsurface PVC Collection Pipe Network and Appurtenances

1. PVC pipe for vapor collection applications for underground installation shall be 4-inch diameter Schedule 40 pipe having 0.02-inch slots cut continuously with solid pipe maintained as per manufacturer's recommendations. The pipe shall be manufactured in strict compliance to ASTM D1785. Raw, unslotted pipe shall have a wall thickness of 0.280-inches, a maximum working pressure of 180 pounds per square inch (PSI) by gauge at 73 degrees F and weigh approximately 3.7 lbs/foot. Joints shall be solvent-welded.
2. All fittings shall be of the same manufacturer, material, class, and Schedule as the pipe. Pressure rated sweep type fittings shall be used as appropriate. Any required threaded joints shall be provided with Teflon tape or flange joints with nitrile or urethane gaskets.
3. Solvent cement joints for the pipe and pipe installation shall be made in accordance with the manufacturer's recommendations and ASTM D2855.

D. Waterproofing/Vapor Barrier

1. Vapor barrier shall be 20 mil Stego® Wrap, or approved equal. Contractor required to seal vapor barrier to footings and to seal all seams and penetrations as per manufacturer's instructions (Attachment A).
2. Provide additional installation accessories as necessary, including but not limited to, Stego® Tape and Stego® Mastic.
3. Ensure accessories are from same manufacturer as product.
4. Waterproofing shall be GCP Applied Technologies Preprufe® 300R waterproofing, Bithuthene 3000 as specified in Division 3. Contractor is required to seal waterproofing barrier to elevator/utility pits that may be within the water table.
5. Contractor to ensure that transitions between vapor barrier and waterproofing are in accordance with manufactures specifications and will not affect the warranty of either product.

E. Collection Network Transition, Riser Pipe and Building Penetration

1. Subsurface piping and initial risers shall be 4-inch diameter Schedule 40 PVC and headed to two 6-inch risers on the first floor. The two interior riser legs shall be 6-inch diameter Schedule 40 PVC steel and headed and combined above the roof slab to a riser that shall be 8-inch diameter Schedule 40 PVC pipe.
2. On each 4-inch riser leg, cleanouts, and comprising 4-inch x 4-inch x 4-inch slip by slip by thread Schedule 40 PVC cleanout tees, shall be installed within 12-inches of building penetrations on the interior side at each riser leg location. Following the cleanout, a magnehelic pressure gauge, flow meter assembly and 4-inch butterfly valve shall be installed on each 4-inch SSDS riser leg. Additional cleanouts, unions, and cleanout plugs to be provided in accordance with all applicable building standards and codes.
3. Following the accessories, for each zone, groups of three 4-inch Schedule 40 PVC riser pipes will be manifolded to a 6-inch Schedule 40 PVC header with two 6-inch risers which will connect all first floor piping. Each 6-inch riser pipe will be equipped with a magnehelic pressure gauge. The two 6-inch Schedule 40 PVC riser pipes will be manifolded to an 8-inch Schedule 40 PVC header pipe above the roof slab and will collect all sub-roof piping to the roof-mounted SSDS blower and exhaust stack. Additional cleanouts, unions, cleanout plugs shall be provided in accordance with all applicable building standards and codes.
4. All building penetrations shall be in accordance with the design drawings and provided with sleeves, fire-proofing collars and/or fire-stop material in accordance with all applicable building standards and codes.
5. All pipe shall be installed as shown on the Drawings and shall terminate in and slope a minimum of 1% uniformly to each of the underground pipes.

F. Monitoring Points

1. Monitoring points shall be installed through the floor slab and shall be constructed with 1-inch diameter solid-wall Schedule 80 PVC pipe as shown on the Drawings. Penetrations through floor slab for monitoring points shall be air-tight and completed monitoring points shall be air-tight, preventing the potential for migration of gas from the sub-slab into the building.
2. Monitoring points shall terminate 3 inches below the top of the gas permeable aggregate to evaluate pressure beneath the floor slab.
3. Access covers shall be flush mounted 6-inch diameter cast iron with nickel bronze cover manufactured by Jay R. Smith Manufacturing Co. #4031NB or approved equal.
4. One-inch diameter PVC pipe shall be completed with 1-inch diameter threaded PVC cap with quick connect fitting as shown on the Drawings.
5. Quick-connect fitting with ¼-inch threads, shut off valve, and Viton seal as manufactured by Colder Products Company, or approved equal shall be installed on PVC caps.
6. Label each monitoring point at the cover with: “DO NOT OPEN – SSDS MONITORING POINT”.
7. Any monitoring points damaged during the construction shall be repaired to the satisfaction of the Owner.

G. Exhaust Stack

1. Exhaust Stack shall be at least 10 feet above the finished roof, measured from the highest point where the vent intersects the roof, and shall be at least 25 feet away from air intakes and operable windows and in accordance with all local and state building codes. The exhaust stack shall be furnished with a rain cap.

H. Accessories

1. Cleanouts
   a. Cleanouts shall be permanently installed on each 4-inch riser leg within 12 inches of the pipe entry into the building and prior to any additional joints, couplings, or pipe segments.

b. Additional cleanouts, unions, and cleanout plugs to be provided in accordance with all applicable building standards and codes.

2. Butterfly Valves
   a. Butterfly valves shall be mounted on each 4-inch riser leg (total of 6).

3. Flow Meters
   a. Flow meters shall be provided for each 4-inch Schedule 40 riser leg extending above the sub slab piping to measure flow (total of 6). Each flow meter shall include the pitot tube measurement probe, magnehelic differential pressure gauge, and any ancillary hardware necessary to install and provide direct differential pressure readings measured in units of inches of water column (to be converted to flow in cubic feet per minute during inspections).
   b. Flow meter pitot tubes shall be installed a minimum of 1 foot away from any accessories that substantively disrupt air flow within the riser pipe assembly (i.e., the ball valve, or any pipe fittings that change the direction of air flow).
   c. Each flow meter shall be labeled to correspond to the associated riser leg.

4. Magnehelic Pressure Gauge/Vacuum Indicator
   a. The magnehelic pressure gauges shall be mounted on each 4-inch (6) and 6-inch riser legs (2) and above the manifolds (total of 8).
   b. The vacuum indicator shall be mounted on the 8-inch riser leg above the manifold (total of 1).
   c. Indoor magnehelic pressure gauges shall have a range of 0-10 inches of water column (WC). The outdoor pressure gauge (vacuum indicator) shall have a range of 0-15 inches WC.

5. Differential Pressure Switch
   a. The differential pressure switch (range of 0.4-inch WC to 1.6-inch WC) shall be mounted on the 8-inch header pipe above the roof prior to the blower. Electrical connections will be required to connect the differential pressure switch to the alarm box.
   b. The set points of the switch shall be adjusted after the SSDS is fully operational. The switch shall be UL listed.
   c. The switch shall have NPT conduit connection and NPT process connection.
   d. The differential pressure switch shall signal notification to a local alarm panel on low vacuum conditions. Notification shall be indicated on the local alarm panel. One (1) differential pressure switch shall be provided. Include a relay from the local panel to alarm of the building management system.

6. Low Vacuum Alarm Panel
   a. Remote audio/visual alarm panel shall be installed in the vicinity of the associated differential pressure switch. Electrical connections will be required for the alarm panel.
   b. The panel shall contain annunciators that shall signal both an audible and visual alarm upon notification of a low vacuum condition from the differential pressure switch.
   c. The visual alarm shall be red L.E.D. indicators, which are to remain lit until the alarm condition is corrected. The audible alarms shall be an 85 to 95 decibel horn or buzzer with a manual acknowledge off switches.

7. Blower
   a. The blower and associated accessories shall meet or exceed the following specifications:
      1) Blower
         a. The Contractor shall provide local power disconnect switch for manual termination of the blower.
         b. The blower shall be direct-drive medium-pressure radial fan capable of flow rate of 500 CFM (as specified in the Drawings) at a static pressure of 7 inches water column.
         c. The motor, supplied by the blower manufacturer, shall be three phase,

1.5 HP, 60 Hz, 230/480 V, with appropriate NEMA mounting.

d. Floor mounted steel vibration isolators for the blower and related equipment as manufactured by the blower manufacturer, pursuant to the recommendations of the blower manufacturer.
e. Fan and motor shall be provided as one (1) unit by the manufacturer with a minimum five (5) year warranty on parts and service.
f. The blower, operating at full capacity, shall not generate combined noise levels greater than 65 dB at 10 meters.
g. A spare blower shall be provided.

8. On discharge of exhaust blower, Contractor shall install 8-inch Schedule 40 PVC exhaust stack with a rain cap, in accordance with the Drawings.
   a. The stacks shall be secured in accordance with applicable Sections of the construction documents and NYCDOB requirements.

9. The Contractor shall install the blower and accessories in-line between the roof riser pipe termination and the exhaust stack, as shown on the Drawings. The Contractor shall provide local power disconnect switch for manual termination of the blower. Include an access panel on the first floor at a location to be coordinated with the Architect.

10. General
    a. Provide additional installation accessories as necessary for a complete SSDS ready for use. Ensure accessories are from same manufacturers as products.

11. Approved Manufacturers/Equipment

    a. Blower and motor assemblies: NY Blower Model 116 (Arrangement 4, Direct drive) or approved equal, furnished and installed with the optional equipment, accessories, and additional and ancillary equipment specified above.
    As manufactured by:
    New York Blower Company
    7660 S Quincy St,
    Willowbrook, IL 60527
    1-800-208-7918
    www.nyb.com
    or approved equal.

    b. Differential pressure switch: Series 1900, Model 1910-1
    As manufactured by:
    Dwyer Instruments Inc.
    102 Indiana Highway
    Michigan City, IN 46361
    219-879-8000
    www.dwyer-inst.com
    or approved equal.

    c. Butterfly Valve: Series 500 K-FLO Butterfly Valve
    As manufactured by:
    Crispin-Multiplex Mfg. Co.
    600 Fowler Avenue
    Berwick, PA 18603
    or approved equal.

    d. Pressure Gauges: Magnehelic Gauges Series 2000, Model 2010 0-10-inch water column for indoor vacuum measurements
    As manufactured by:
    Dwyer Instruments, Inc.
    102 Indiana Hwy. 212

Michigan City, IN 46360
or approved equal.

e. Flow Meters: Dwyer Series DS Flow Sensors DS-300-4
As manufactured by:
Dwyer Instruments, Inc.
102 Indiana Hwy. 212
Michigan City, IN 46360
or approved equal.

f. Vacuum Indicator: NOSHOK Vacuum and Pressure Gauges Series 25-200, 0-15-inch water column for outdoor vacuum measurements
As manufactured by:
NOSHOK Inc.
1010 W. Bagley Road
Berea, Ohio 44017
or approved equal.

g. Sampling Points: Colder female quick connect fittings Model LCD15004 for sample ports and monitoring points
As manufactured by:
Colder Products Company
1001 Westgate Drive
St. Paul, Minnesota 55114
or approved equal.

h. VFD: WEG EDP11 enclosed drive panel
As manufactured by
WEG Electric Corp.
6655 Sugarloaf Pkwy
Duluth, GA 30097
Or approved equal.

i. Access Panel: Model NYSTROM NTC12-inch x 24-inch.
As manufactured by:
NYSTROM
9300 73rd Avenue North
Minneapolis, Minnesota 55428
or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION/INSPECTION

A. At a minimum, all components identified on the following Inspection Schedule for the installation of the SSDS shall be inspected and approved by the Environmental Engineer prior to completing each phase of work. Additional inspections, examinations and quality control measures may be required as per manufacturer's recommendation and are the responsibility of the Contractor.

B. The Owner reserves the right to perform additional inspections or quality control tests as deemed necessary by the Owner at any point during the construction process at no additional cost to the Owner.

Inspection #	Work Completed for Inspection
1	Compacted sub-grade preparation following foundation pile cap footing and pier installation.
2	Delivery to the site of gas permeable aggregate, prior to use.
3	Installation of collection pipe network, couplings and riser “stub-outs” prior to completion of aggregate layer.
4	Installation by section or of all vapor barrier appurtenances and seals.
5	Installation by section or of all waterproofing/vapor barrier at all penetrations and foundation contact points.
6	Final Inspection of all SSDS subsurface components, including monitoring points, one week prior to all concrete slab pours.
7	Completed installation of all portions of interior piping risers prior to enclosure within sheetrock/interior walls for visual inspection.
8	Observation of pressure test of completed interior riser pipes from penetration through first floor slab (at cleanout) to roof-mounted blower inlet pipe. See following information (Section 3.1C) regarding testing requirements.
9	Blower installation, startup, alarm and accessories diagnostic testing.
10	Final inspection of completed system and confirmation of properly installed sampling gauges and monitoring points.

C. Interior Riser Pressure Testing

1. Each of the interior risers shall undergo a pressure test to ensure all components of the SSDS that pass through the facility interior can withstand 5 PSI pressure.
2. A cleanout shall be permanently installed on each riser pipe within 12 inches of the pipe entry into the building and prior to any additional joints, couplings or pipe segments. A pressure-stop balloon shall be inflated in the pipe between the building slab and the cleanout creating an airtight seal. A temporary airtight seal shall be placed at the riser termination on the roof. A static pressure of at least 1 PSI shall be applied to the pipe and maintained for 60 minutes. All materials, gauges and equipment for this test shall be provided by the Contractor. The Owner or its Environmental Engineer shall observe the performance of this test as per the Milestones Schedule.
3. If the pipe riser does not successfully maintain pressure, it is the responsibility of the Contractor to identify and seal all leaks. The test shall be performed following all application of sealants as necessary until successful.

3.2 SURFACE PREPARATION

Preparation of all surfaces prior to the installation of the SSDS shall be as specified in the Contract Documents and Drawings.

3.3 INSTALLATION

A. All components of the SSDS shall be installed as specified in the Contract Documents and Drawings.

B. Installation of Aggregate and Collection Pipe Network

1. A minimum 6-inch layer of gas permeable aggregate shall be placed and compacted as necessary on the proof rolled subgrade.
2. The collection pipe shall be assembled and placed as identified on the Contract Drawings. In collection pipe trench areas, collection pipe shall slope away from interior riser location toward the slotted pipe as shown on the Contract Drawing. A minimum of 6 inches gas permeable aggregate bedding and 6 inches aggregate cover shall be provided at all pipe

locations. Gas permeable aggregate shall be placed a minimum of 6 inches on either side of the pipe (or 4 inches between pipes) to maintain the correct layout prior to inspection.

3. Following inspection, aggregate shall be placed and backfilled to the bottom of slab elevation.

C. Nonwoven geotextile Mirafi 140NL or approved equal shall be installed to the subgrade and prior to installation of the course aggregate layer.

1. Placement – When constructing any utility trenches the geotextile should be placed perpendicular to the direction of flow and shingled in the down-gradient direction. Geotextile rolls which are damaged or contain imperfections shall be repaired or replaced as directed. The geotextile shall be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile shall also be free of tensile stresses, folds, and wrinkles. Geotextile panels shall be continuously overlapped a minimum of 12 inches at all longitudinal and transverse joints.
2. Damage and Repairs – The geotextile shall be protected during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Torn or damaged geotextile shall be repaired. Clogged areas of geotextile shall be removed. Repairs shall be performed by placing a patch of the same type of geotextile over the damaged area. The patch shall extend a minimum of 12 inches beyond the edge of the damaged area. Patches shall be continuously fastened using approved methods. Repairs shall be performed at no additional cost to the Owner.
3. Penetrations – Engineered penetrations of the geotextile shall be constructed by methods recommended by the geotextile manufacturer.
4. Covering – Geotextile shall not be covered prior to inspection and approval by the Engineer. Aggregate shall be placed in a manner that prevents any gravel particles from entering the geotextile overlap zone, prevents tensile stress from being mobilized in the geotextile, and prevents wrinkles from folding over onto themselves. Aggregate shall not be dropped onto the geotextile from a height greater than 3 feet. No equipment shall be operated directly on top of the geotextile without approval of the Engineer.

D. Application of Vapor Barrier (20 mil Stego® Wrap)

1. The 20 mil Stego® Wrap vapor barrier, or approved equal, shall be installed in accordance with manufacturer's recommendations (Attachment A).
2. The vapor barrier consists of the placement of the sealing of all concrete joints, contact points and penetration piping (including the vapor monitoring point and SSDS pipe sleeves through the slab) with the manufacturer's recommended materials.
3. Unroll Stego® Wrap over the area where the slab is to be poured. Stego® Wrap should completely cover the floor and sidewalls prior to backfilling and concrete restoration. All joints/seams should be overlapped six inches and taped along the continuous lengths of all seams and joints using Stego® Tape.
4. Riser penetrations shall be sealed with Stego® Mastic and Tape in accordance with the manufacturer's recommendations (Attachment A).
5. Contractor to ensure that application of vapor barrier and connections to footings are in accordance with local building code.

E. Application of Waterproofing (GCP Applied Technologies Preprufe® 300R or Bithuthene 3000 waterproofing)

1. The GCP Applied Technologies Preprufe® 300R or Bithuthene 3000 waterproofing/vapor barrier, or approved equal, shall be installed in accordance with the specifications outlined in Division 3.

F. Installation of Vent Risers

1. Vent risers shall be located as identified in the Contract Documents and Drawings. All vent risers shall be installed, tested, labeled and enclosed, as identified, in the interior wall cavities.
2. A minimum of one (1) sign per floor, per riser and one on each roof location shall be permanently installed at the appropriate sizing on each riser and shall read:

CAUTION: DO NOT TAP OR PUNCTURE
SUBSURFACE VAPOR VENT PIPE
NOT FOR DOMESTIC USE

G. Piping (General)

1. The run and arrangements of all pipes shall be approximately as shown on drawings or specified and as directed during installation, and shall be as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, and neatly spaced. No pipe shall be installed where the headroom will be interfered with unless the conditions are such that it is unavoidable and permission is obtained from the Owner. Offsets will be permitted where walls reduce in thickness or beams interfere with direct runs; offsets shall be made at an angle of 45 degree to the vertical; in no case shall the space between the pipes, partitions, walls, etc., exceed 5 inches. All exposed risers shall be erected plumb, standing free, close to and parallel with walls and other pipes and be uniformly spaced. All horizontal runs of piping hung from structural floor, slab or floor beams shall be erected as closely as possible to bottom of floor slabs, ceilings, or I-beams as the case may be. In no case shall the headroom, beneath the pipe, be less than (7'-0") where the pipe is installed more than (1'-0") from wall, partition, etc.
2. Roughing underground or concealed in the floor or wall construction shall be properly installed, tested and inspected before any of the roughing is covered up. Should any work be covered up before being inspected and tested, it shall be uncovered and recovered at the expense of the Contractor. Plugged fittings shall be installed when called for.
3. All lines of piping and branches for fixtures passing through or in connection with vapor barrier/waterproofing shall be brought to the proper locations and levels so that fixtures and piping may be installed without disturbing the waterproofing.
4. All solid above ground and underground portions of piping shall be sloped a minimum of 1% towards the slotted piping or condensate drain.

H. Installation of Blower and Accessories

1. The exhaust stack shall be located, installed, and permanently supported in accordance with the SSDS Drawings, the Specifications, and with City of Yonkers requirements.
2. The blower shall be connected to the sub-slab depressurization riser legs and blower inlet piping as shown on the drawing and as directed by the Architect.
3. Contractor shall start up SSDS and demonstrate satisfactory operation, including operation of instrumentation and connection to the alarm panel, in the presence of the Environmental Engineer.
4. The blower shall be electrically grounded.
5. Contractor shall locate, install, and permanently support all system components in accordance with Building Code requirements.
6. Install pressure gauges, valves, vacuum indicators, flow meters for each SSDS manifold leg, riser and blower at a location to be coordinated with the Environmental Engineer and the Architect.
7. Install air flow rate gauge assemblies on each 4-inch riser leg, the locations of which are to be coordinated with the Environmental Engineer and the Architect.
8. Install in-line vacuum, pressure, and air flow rate gauges, and sample ports with threaded air-tight connections. All accessories shall be installed such that gauges can be easily removed and replaced.

9. Install and label one (1) differential pressure switch for the blower installation. Connect differential pressure switch to the alarm panel so that for each differential pressure switch the following condition is indicated: low vacuum.
10. Arrange roof piping with 1% slope down towards riser pipe termination, as shown on the Drawings, to prevent accumulation of condensate.
11. Coordinate with the Architect and install an access panel on the first floor for accessories.

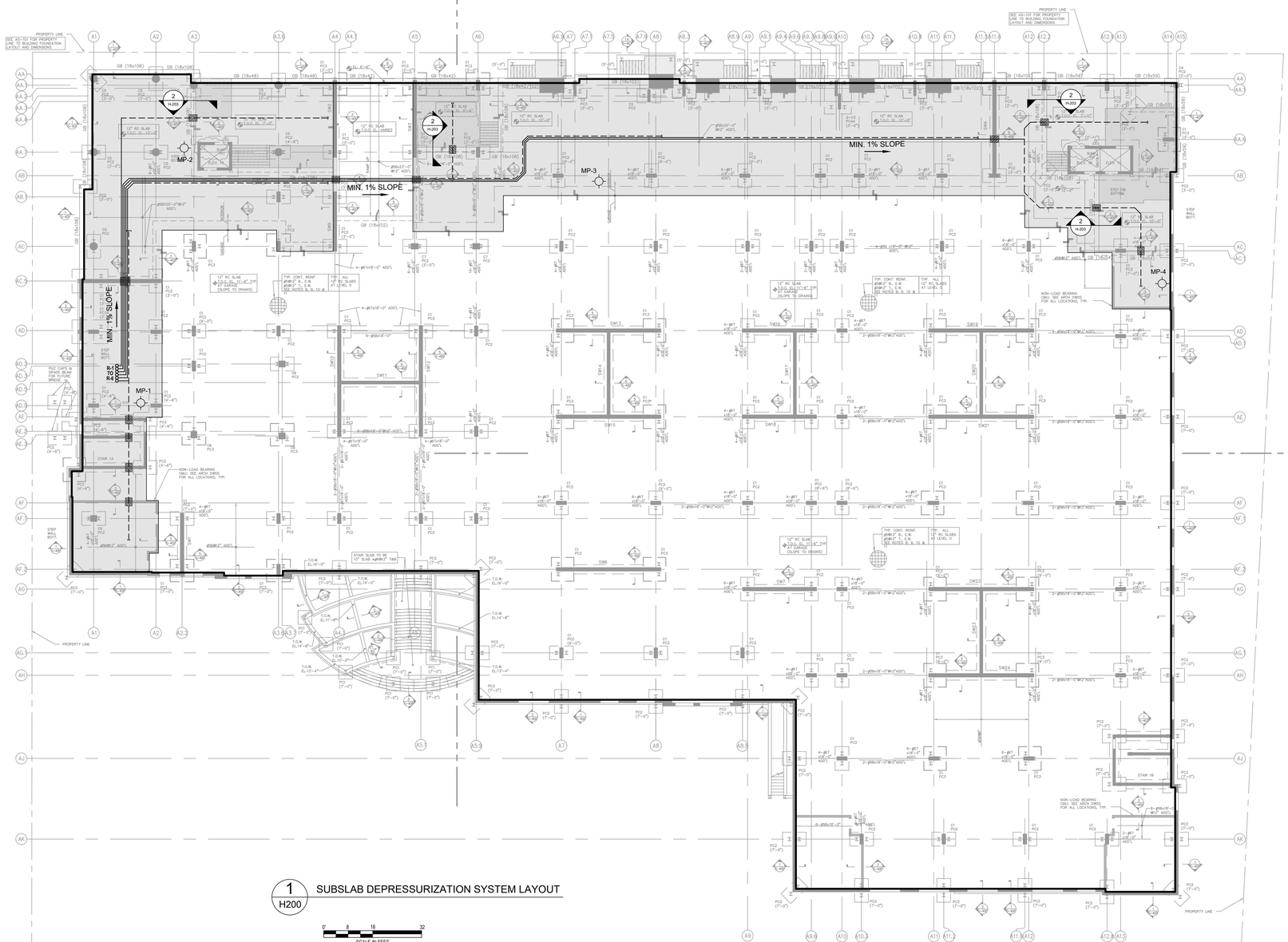
3.4 PROTECTION

It is the responsibility of the Contractor to ensure that no damage occurs to components of the SSDS, including the waterproofing/vapor barrier, prior to, during or following installation of the system, or during any subsequent performance of construction for the facility as identified on the contract drawings and plans. This includes the installation of all subsurface utilities required for the operation of building systems. Any damages to the SSDS during performance of the Work shall be repaired and tested at no additional cost to the Owner.

3.5 SUBMITTALS

Provide all submittals listed in Section 1.3 of this specification.

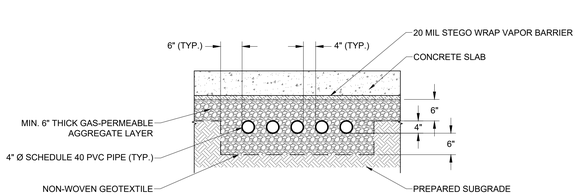
END OF SECTION



1 H200 SUBSLAB DEPRESSURIZATION SYSTEM LAYOUT

0' 8 16 32
SCALE IN FEET

NOTE: PIPE SPACING NOT TO SCALE



2 H200 TYPICAL PIPING TRENCH
SCALE: N.T.S

LEGEND

- EXTENT OF VAPOR BARRIER UNDER SLAB
- EXTENT OF GAS PERMEABLE AGGREGATE UNDER SLAB
- PIPE SLEEVE THROUGH GRADE BEAM (SEE DETAIL 3 ON H-202)
- 4" Ø SLOTTED SCHEDULE 40 PVC PIPE WITH PVC END CAP
- 4" Ø SOLID SCHEDULE 40 PVC PIPE
- 4" Ø RISER SLAB PENETRATION (SEE DETAIL 4 ON H-202)
- VACUUM MONITORING POINT (SEE DETAIL 5 ON H-202)
- REFERENCE TO DETAIL ON DRAWING H-203

MONITORING POINT LOCATIONS		
ID	COLUMN LOCATION	ROOM
MP-1	A2-AD.9	UTILITY ROOM
MP-2	A3-AA.7	LEASING OFFICE
MP-3	A7.5-AB	COORIDOR
MP-4	A14-AC.1	ELECTRICAL ROOM

NOTES

1. THIS PLAN SHALL NOT TO BE USED FOR STRUCTURAL, ARCHITECTURAL OR OTHER REFERENCE PURPOSES EXCEPT FOR THE VENTING SYSTEM AND VAPOR BARRIER.
2. COORDINATE ALL WORK FOR VENTING SYSTEM INSTALLATION WITH OTHER TRADES BEFORE INSTALLATION.
3. THE FULL EXTENTS OF THE BUILDING CONSTRUCTION BENEATH THE FLOOR SLABS SHALL BE LINED WITH GAS PERMEABLE AGGREGATE AND VAPOR BARRIER EXCEPT AS NOTED ON THIS DRAWING AND AS REQUIRED BY FOUNDATION ELEMENT LAYOUTS IN STRUCTURAL PLANS. ALL DEVIATIONS SHALL BE PROPOSED IN SHOP DRAWING SUBMITTALS PRIOR TO INSTALLATION IN THE FIELD.
4. SLOPE SOLID HORIZONTAL VENTING SYSTEM PIPE A MINIMUM OF 1% UNIFORMLY TOWARDS THE VENTING SYSTEM SLOTTED PIPING OR CONDENSATE DRAIN.
5. REFER TO DRAWINGS H-202 AND H-204 FOR VENTING SYSTEM PIPING, RISER, GAS VAPOR BARRIER, GAS PERMEABLE AGGREGATE, AND EXHAUST STACK DETAILS AND SECTIONS.
6. CONTRACTORS TO SUPPLY SHOP DRAWINGS OF PROPOSED PIPE LAYOUTS & PIPE INVERTS IN COORDINATION WITH LATEST FOUNDATION PLANS TO ENSURE ACCEPTABLE PIPE PITCH & INSTALLATION DETAILS.
7. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AGAINST ARCHITECTURAL AND BUILDING PLANS. NOTIFY ENGINEER OF ANY DISCREPANCY PRIOR TO CONSTRUCTION.
8. BASEMAP FROM PERKINS EASTMAN "BLDG 1 S110 FDN.DWG", DATED 11-20-2017.
7. GAS PERMEABLE AGGREGATE SHALL HAVE NOMINAL SIZE OF 1-INCH TO 1/2-INCH AND COMFORM TO ASTM C33 STANDARD SPECIFICATION FOR CONCRETE AGGREGATE SIZE #5 AS PER THE TABLE BELOW::

ASTM #5 AGGREGATE GRADATION
(FOR PIPE TRENCHES)

SIEVE SIZE	PERCENT FINER BY MASS
1.5-inch	100
1-inch	90 to 100
3/4-inch	20 to 55
1/2-inch	0 to 10
3/8-inch	0 to 5

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SEAL

KEY PLAN

Perkins Eastman
422 SUMMER STREET
STAMFORD, CT 06901
T. 203.251.7400
F. 203.251.7474

Owner:
AvalonBay
1499 POST ROAD, SECOND FL
FAIRFIELD, CT 06824

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PS&S
55 MAIN ST, 3RD FL
YONKERS, NY 10701

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SAN DIEGO, CA 92106

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639 GRANITE STREET
BRAINTREE, MA 02184

MEP/FP:
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THE SCHRAFFT CENTER
529 MAIN STREET, SUITE 203
BOSTON, MA 02129

ENVIRONMENTAL:
AKRF
THE SCHRAFFT CENTER
34 SOUTH BROADWAY
4TH FLOOR
WHITE PLAINS, NY 10601

PROJECT TITLE:
AVALON YONKERS BUILDING 1

ALEXANDER ST, YONKERS, NY

PROJECT No: 65190.00

DRAWING TITLE:
SSDS AND VAPOR BARRIER PLAN

SCALE: AS NOTED

H-200

FINAL CONSTRUCTION DRAWINGS

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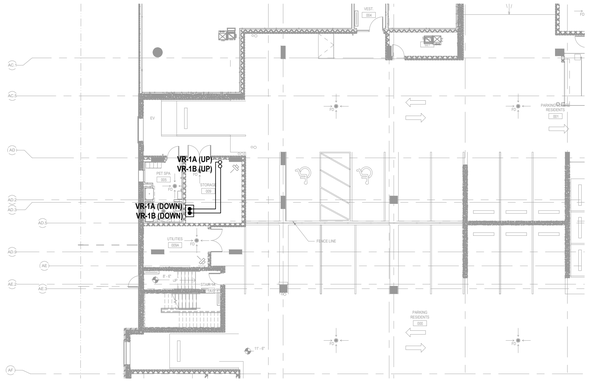
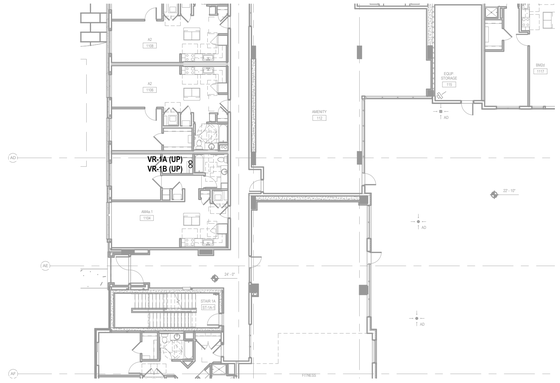
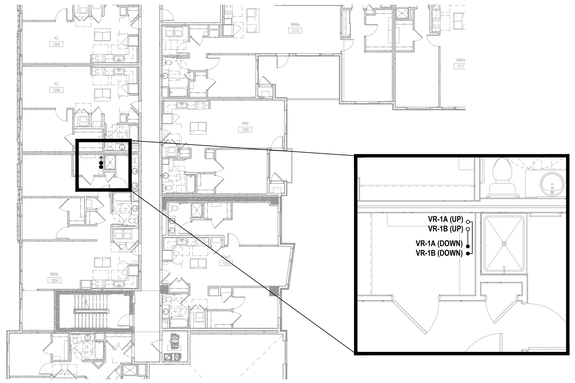


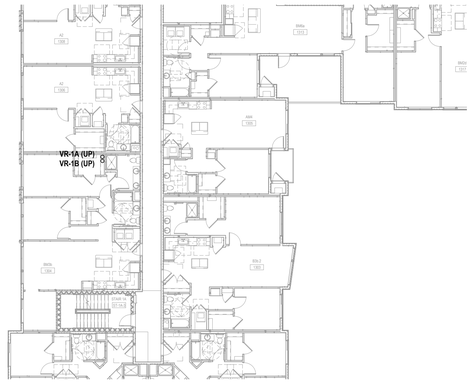
1 H201 LEVEL 0
SCALE: 3/4" = 1'-0"



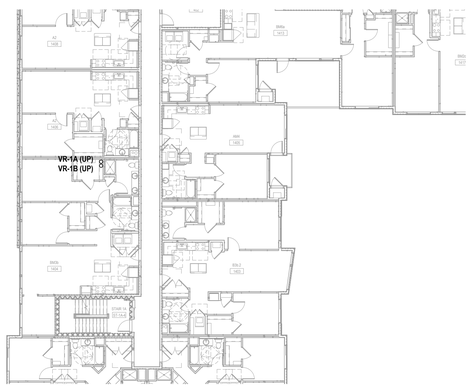
2 H201 LEVEL 1
SCALE: 3/4" = 1'-0"



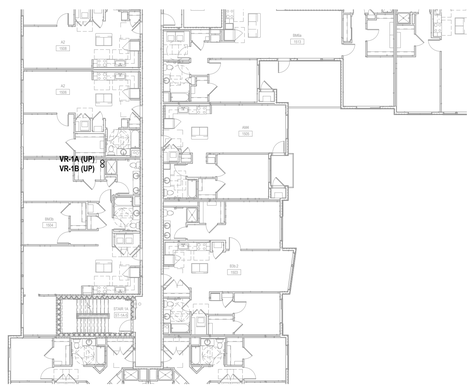
3 H201 LEVEL 2
SCALE: 3/4" = 1'-0"



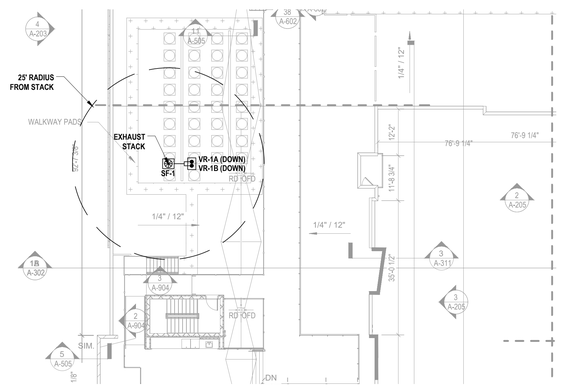
4 H201 LEVEL 3
SCALE: 3/4" = 1'-0"



5 H201 LEVEL 4
SCALE: 3/4" = 1'-0"



6 H201 LEVEL 5
SCALE: 3/4" = 1'-0"



7 H201 ROOF
SCALE: 3/4" = 1'-0"

LEGEND

———	6" Ø SCH. 40 PVC PIPE
VR-1A ○	VERTICAL RISER AND IDENTIFICATION NUMBER
UP ○—● DOWN	VERTICAL RISER OFFSET (SEE DETAIL 6 ON H-203)
	PIPING MANIFOLD (SEE DETAIL 8 ON H-202)
	BLOWER AND EXHAUST STACK (SEE DETAIL 1 ON H-204)

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PROJECT TITLE:
AVALON YONKERS
BUILDING 1

ALEXANDER ST, YONKERS, NY

PROJECT No: 65190.00

DRAWING TITLE:
SSDS RISER PLAN

SCALE: AS NOTED

H-201

FINAL CONSTRUCTION DRAWINGS
NOTE: SEE DRAWING H-203 FOR GENERAL NOTES

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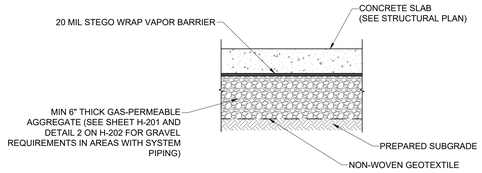
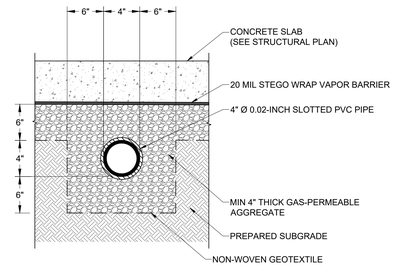
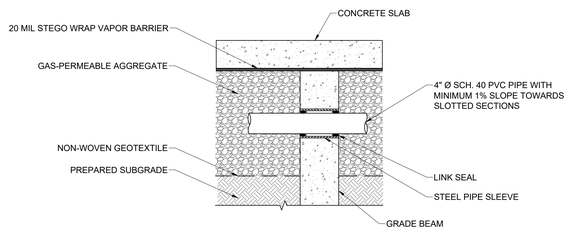


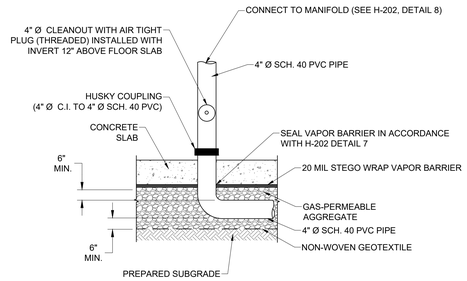
1 H-202 TYPICAL SECTION THROUGH SUB-SLAB
Not to Scale



2 H-202 TYPICAL SLOTTED PIPE DETAIL
Not to Scale



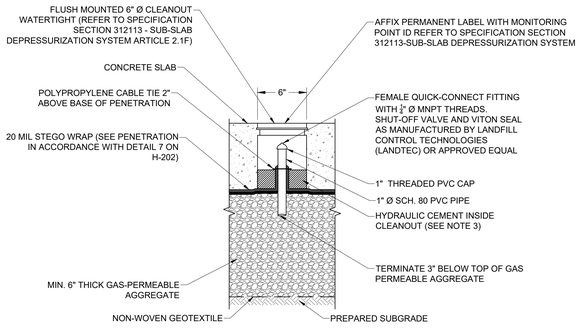
3 H-202 TYPICAL PIPE SLEEVE DETAIL
Not to Scale



NOTES:

1. NOT ALL FITTINGS SHOWN. CONTRACTOR SHALL SUBMIT SCALED SKETCH SHOWING PROPOSED PIPE JOINT LOCATIONS. ENGINEER'S APPROVAL OF PIPE JOINT LOCATIONS SHALL BE REQUIRED PRIOR TO CONSTRUCTION.
2. FURNISH ESCUTCHEONS AS SPECIFIED IN CONTRACT DRAWINGS.

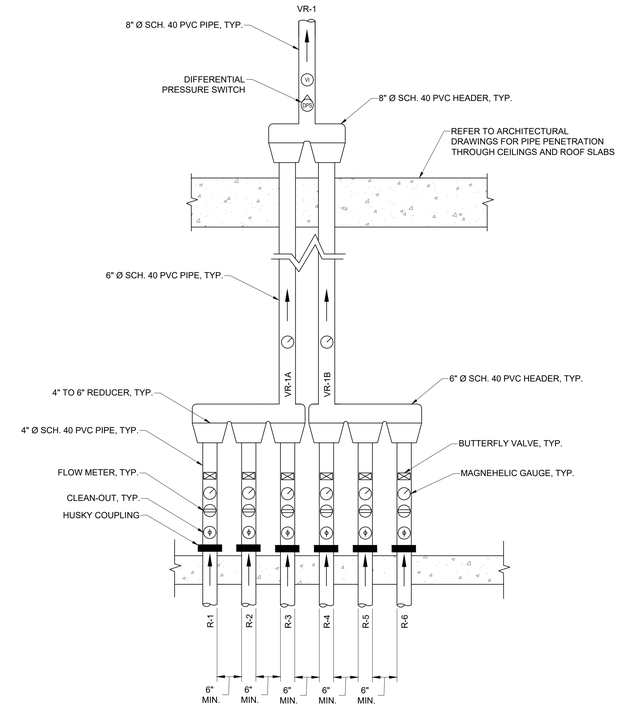
4 H-202 TYPICAL RISER SLAB PENETRATION
Not to Scale



NOTES:

1. ANY DEVIATION FROM THIS INSTALLATION MUST BE SUBMITTED TO THE AUTHORITY FOR APPROVAL.
2. REFER TO SECTION 312113 FOR TYPICAL MONITORING POINT ACCESS COVER SPECIFICATION.
3. THREE INCHES OF HYDRAULIC CEMENT TO BE POURED INSIDE CLEANOUT OVER PROPERLY SEALED PENETRATION

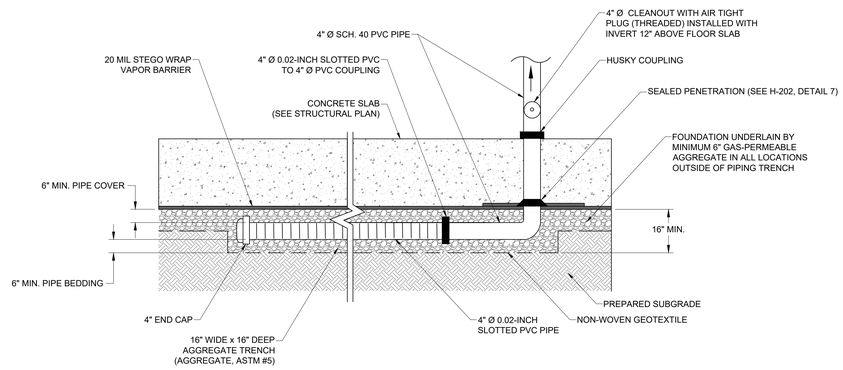
5 H-202 TYPICAL MONITORING POINT
Not to Scale



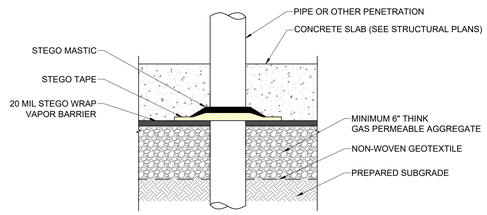
NOTES:

1. NOT ALL FITTINGS SHOWN. CONTRACTOR SHALL SUBMIT TO SCALE SKETCH SHOWING PROPOSED PIPE JOINT LOCATIONS. ENGINEER'S APPROVAL OF PIPE JOINT LOCATIONS SHALL BE REQUIRED PRIOR TO CONSTRUCTION.
2. FURNISH ESCUTCHEONS AS SPECIFIED.
3. FURNISH PIPE HANGERS AND WALL MOUNTS AS SPECIFIED IN PLUMBING AND HVAC SPECIFICATIONS AND DRAWINGS, AND AS REQUIRED BY CITY OF YONKERS BUILDING CODE.
4. ALL HORIZONTAL PIPE RUNS (ABOVE GROUND AND UNDERGROUND) MUST BE PITCHED A MINIMUM OF 1/8-INCH VERTICAL PER FOOT HORIZONTAL (1% SLOPE) TOWARDS SSDS RISER OR CONDENSATE DRAIN. THE SYSTEM SHALL BE INSTALLED SUCH THAT NO PORTION WILL ALLOW EXCESS ACCUMULATION OF CONDENSATION.
5. FLOW SENSORS TO BE INSTALLED WITH MINIMUM CLEARANCE AS PER MANUFACTURER SPECIFICATIONS.
6. PROVIDE ACCESS DOORS FOR CLEAN OUTS AND GAUGES (SEE ARCHITECTURAL DRAWINGS), AS NECESSARY.
7. DIFFERENTIAL PRESSURE SWITCH SHALL BE CONNECTED TO SSDS ALARM INDICATION STATION.
8. ROOF/SLAB PENETRATIONS AND FIRE PROOFING, INCLUDING FIRE COLLAR, TO BE COMPLETED IN ACCORDANCE WITH DRAWING A-505 DETAIL 6 AND PLUMBING SPECIFICATIONS.

8 H-202 TYPICAL PIPING MANIFOLD
Not to Scale



6 H-202 TYPICAL SSDS PIPING PROFILE AT R-1 TO R-6
Not to Scale



7 H-202 TYPICAL VAPOR BARRIER PENETRATION
Not to Scale

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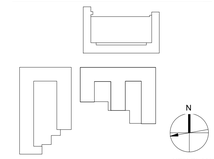

Perkins Eastman
422 SUMMER STREET
STAMFORD, CT 06901
T. 203.251.7400
F. 203.251.7474

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Civil / Site:
PS&S
55 MAIN ST, 3RD FL
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BUILDING 1

ALEXANDER ST, YONKERS, NY

PROJECT No: 65190.00

DRAWING TITLE:
SSDS
DETAILS I

SCALE: AS NOTED

H-202

FINAL CONSTRUCTION DRAWINGS
NOTE: SEE DRAWING H-203 FOR GENERAL NOTES

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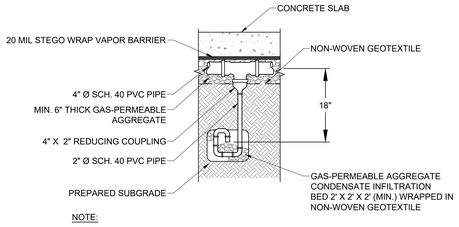
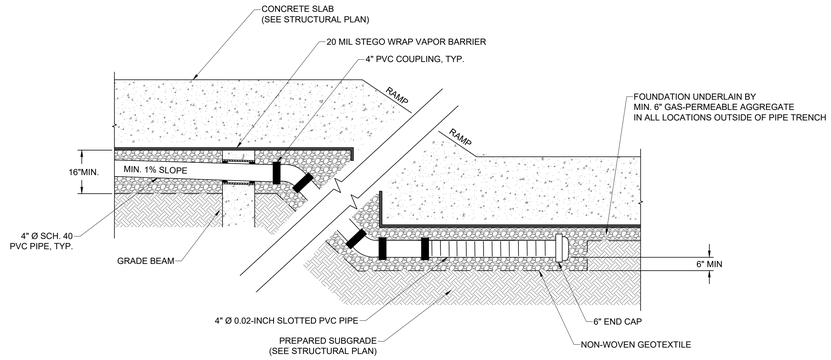


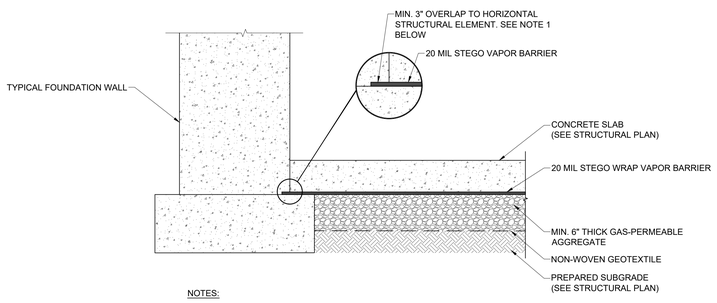
NOTE:

1. INSTALL, AS NECESSARY, AT ALL LOW POINTS IN SUB-SLAB DEPRESSURIZATION SYSTEM PIPING WHEN PIPING CANNOT BE SLOPED TO SLOTTED PIPING.

1 H-203 TYPICAL CONDENSATE DRAIN DETAIL
Not to Scale



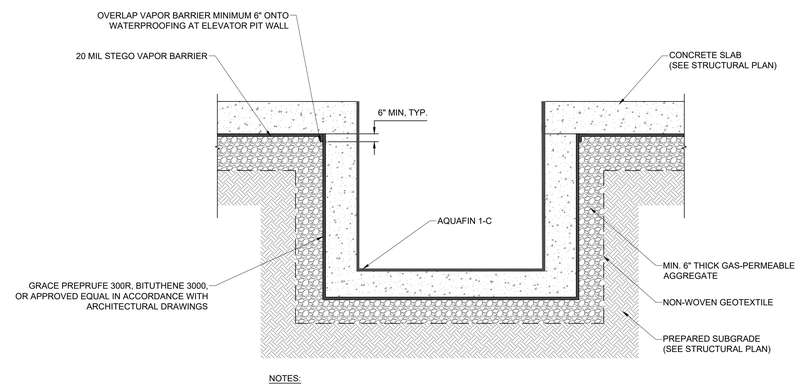
2 H-203 TYPICAL PROFILE AT FLOOR ELEVATION CHANGE (R-1, R-2 AND R-5)
Not to Scale



NOTES:

1. VAPOR BARRIER INSTALLED AT FOUNDATION WALL PER MANUFACTURER'S SPECIFICATIONS.
2. REFER TO STRUCTURAL DRAWINGS FOR EXTERIOR FOUNDATION WALL DETAILS.

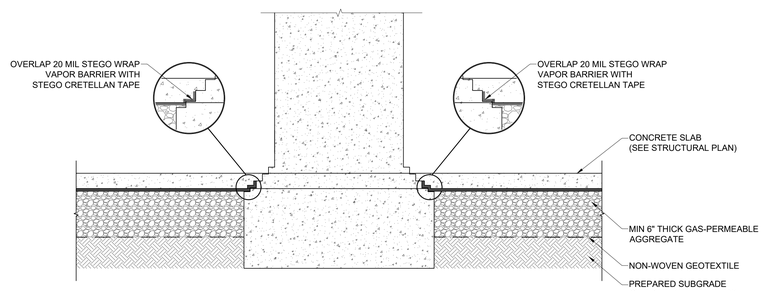
3 H-203 VAPOR BARRIER AND SSDS SUB-SLAB DETAIL AT TYPICAL EXTERIOR FOUNDATION WALL/PILE CAP
Not to Scale



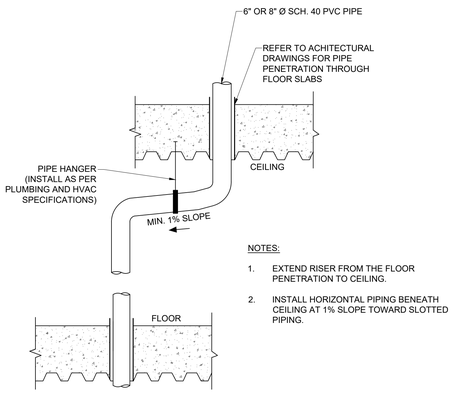
NOTES:

1. GAS-PERMEABLE AGGREGATE NOT REQUIRED BELOW OBSERVED GROUNDWATER TABLE.

4 H-203 WATERPROOFING, VAPOR BARRIER, AND SSDS SUB-SLAB DETAIL AT TYPICAL ELEVATOR/SUMP PIT/UTILITY PIT, ETC.
Not to Scale



5 H-203 VAPOR BARRIER DETAIL FOR TYPICAL INTERIOR PILE CAP WITH COLUMN
Not to Scale



NOTES:

1. EXTEND RISER FROM THE FLOOR PENETRATION TO CEILING.
2. INSTALL HORIZONTAL PIPING BENEATH CEILING AT 1% SLOPE TOWARD SLOTTED PIPING.

6 H-203 TYPICAL PIPING OFFSET
Not to Scale

GENERAL NOTES:

1. DRAWING SHALL NOT BE USED FOR STRUCTURAL, ARCHITECTURAL, UTILITY, OR OTHER REFERENCE EXCEPT FOR THE SUB-SLAB DEPRESSURIZATION SYSTEM AND RELATED VAPOR BARRIER DETAILS.

2. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF ALL PIPE LAYOUTS, SUB-SLAB SLEEVE, SLAB PENETRATION, AND RISER LOCATIONS FOR APPROVAL.

3. INSTALLATION OF THE SUB-SLAB COMPONENTS AND VENT AND RISER PIPING, AND ROOF PENETRATIONS MUST BE COORDINATED WITH OTHER TRADES FOR THE INSTALLATION OF OTHER UTILITIES AND STRUCTURAL COMPONENTS. LOCATIONS OF RISER PIPE FROM SUB-SLAB TO ROOF SHALL BE COORDINATED WITH ARCHITECT AND MECHANICAL ENGINEER. RISER PIPE SHALL BE EXTENDED TO THE ROOF WITH MINIMAL CHANGES IN DIRECTION.

4. ALL SOLID HORIZONTAL PIPE RUNS MUST BE PITCHED A MINIMUM OF 1/8-INCH VERTICAL PER FOOT HORIZONTAL (1% SLOPE) TOWARDS EACH SECTION OF SLOTTED VENTING PIPE. THE SYSTEM SHALL BE INSTALLED SUCH THAT NO PORTION WILL ALLOW EXCESS ACCUMULATION OF CONDENSATION. SOLID UNDERGROUND PIPING MAY BE PITCHED TO CONDENSATE DRAIN, SHOULD THEY BE NECESSARY (SEE DETAIL 1, H-203).

5. ALL CONNECTIONS AT PIPE FITTINGS AND JOINTS SHALL BE LEAK FREE. THIS SHALL BE DEMONSTRATED BY THE PERFORMANCE OF A POSITIVE 5 POUNDS PER SQUARE INCH (PSI) (MIN.) PRESSURE TEST FOLLOWING PIPE/FITTINGS ASSEMBLY BY THE CONTRACTOR. UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND PIPING SHALL BE CONSTRUCTED OF 4-INCH SCHEDULE 40 PVC AND ALL ABOVEGROUND RISER PIPING SHALL BE CONSTRUCTED OF 4-INCH, 6-INCH, OR 8-INCH PVC PIPE AS SHOWN ON DRAWINGS.

6. REFER TO DRAWINGS H-200 THROUGH H-203 FOR SSDS PIPING, VAPOR BARRIER, GAS PERMEABLE AGGREGATE, AND COMMUNICATION AND PIPE SLEEVE/OTHER FOUNDATION ELEMENT PENETRATION LOCATIONS.

7. RISER PIPE SHALL BE PERMANENTLY IDENTIFIED WITHIN EACH FLOOR LEVEL. BACKGROUND SHALL BE SAFETY BLUE WITH WHITE LETTERING. LETTERING SHALL READ:

"CAUTION: DO NOT ALTER. SUBSURFACE VAPOR VENT PIPE."

8. EXHAUST STACK SHALL BE SECURELY ANCHORED WITH ADEQUATE STRUCTURAL SUPPORTS.

9. SSDS DESIGN DETAILS AND DRAWINGS ARE ADAPTED FROM EPA DOCUMENT EPA/625/R-92/016.

10. SYSTEM INSTALLATION SHALL ADHERE TO: OCTOBER 2006 FINAL GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK PREPARED BY NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH), ALL APPLICABLE PORTIONS OF THE BUILDING CODE OF THE CITY OF YONKERS. AS SUCH, POINT OF EXHAUST SHALL BE:
- MINIMUM 10 FEET ABOVE ROOF.
- AT LEAST 25 FEET FROM ANY ADJOINING OR ADJACENT BUILDINGS, OPERABLE WINDOWS, HVAC INTAKES, SUPPLY REGISTERS, OR ANY OTHER AIR INLETS.

11. CONTRACTOR TO ENSURE THAT TRANSITIONS BETWEEN VAPOR BARRIER AND WATERPROOFING ARE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS AND WILL NOT AFFECT THE WARRANTY OF EITHER PRODUCT.

12. ROOF/SLAB PENETRATIONS AND FIRE PROOFING, INCLUDING FIRE COLLAR, TO BE COMPLETED IN ACCORDANCE WITH DRAWING A-505 DETAIL 6 AND PLUMBING SPECIFICATIONS.

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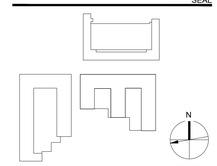

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ENVIRONMENTAL:
AKRF
THE SCHRAFFT CENTER
34 SOUTH BROADWAY
4TH FLOOR
WHITE PLAINS, NY 10601

PROJECT TITLE:
AVALON YONKERS
BUILDING 1

ALEXANDER ST, YONKERS, NY

PROJECT No: 65190.00

DRAWING TITLE:
SSDS
DETAILS II

SCALE: AS NOTED

H-203

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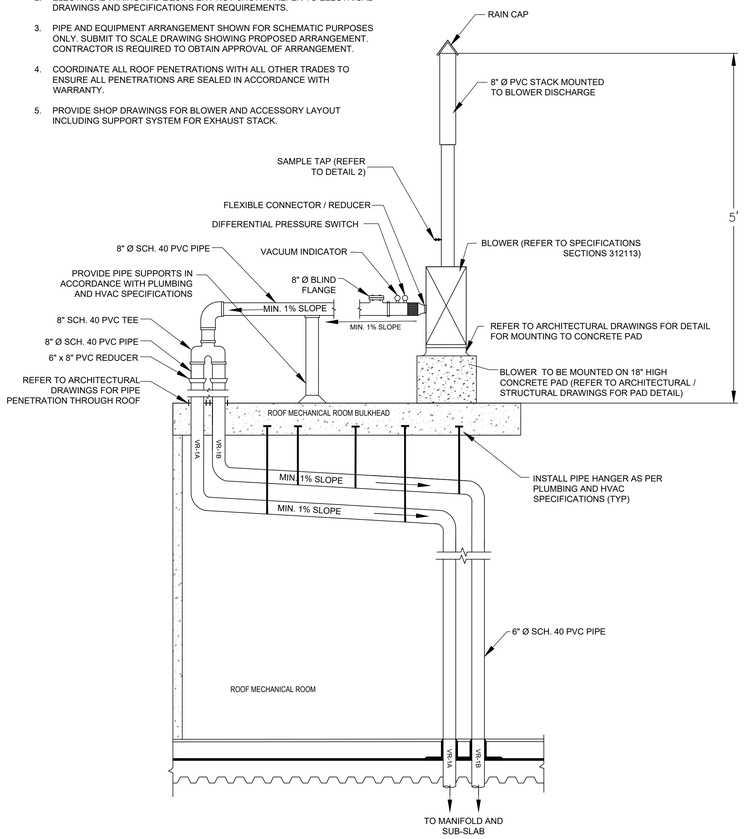
FINAL CONSTRUCTION DRAWINGS

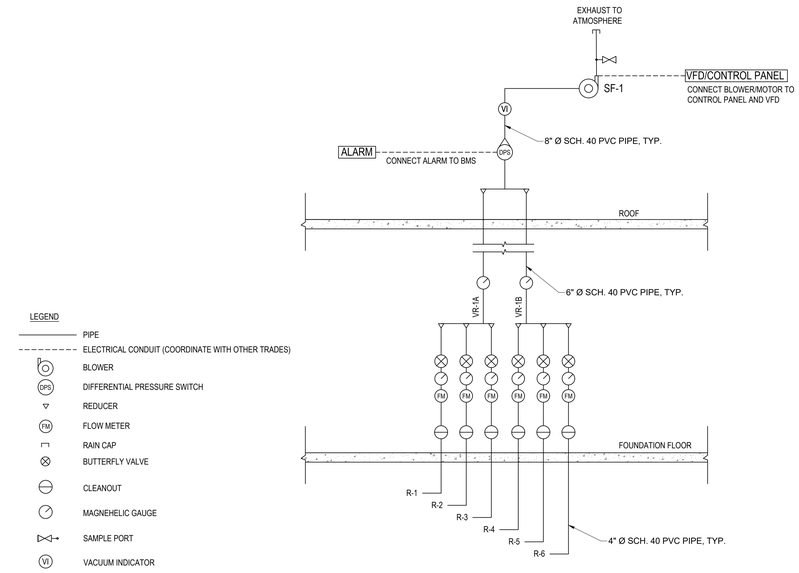
NOTES:

1. NOT ALL REQUIRED ACCESSORIES ARE SHOWN. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. ELECTRICAL WIRING AND EQUIPMENT NOT SHOWN. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR REQUIREMENTS.
3. PIPE AND EQUIPMENT ARRANGEMENT SHOWN FOR SCHEMATIC PURPOSES ONLY. SUBMIT TO SCALE DRAWING SHOWING PROPOSED ARRANGEMENT. CONTRACTOR IS REQUIRED TO OBTAIN APPROVAL OF ARRANGEMENT.
4. COORDINATE ALL ROOF PENETRATIONS WITH ALL OTHER TRADES TO ENSURE ALL PENETRATIONS ARE SEALED IN ACCORDANCE WITH WARRANTY.
5. PROVIDE SHOP DRAWINGS FOR BLOWER AND ACCESSORY LAYOUT INCLUDING SUPPORT SYSTEM FOR EXHAUST STACK.



1 H-204 BLOWER CONNECTION DETAIL
Not to Scale

2 H-204 SAMPLE TAP ASSEMBLY
Not to Scale



LEGEND

- PIPE
- ELECTRICAL CONDUIT (COORDINATE WITH OTHER TRADES)
- BLOWER
- DPS — DIFFERENTIAL PRESSURE SWITCH
- REDUCER
- FM — FLOW METER
- RAIN CAP
- BUTTERFLY VALVE
- CLEANOUT
- MAGNEHELIC GAUGE
- SAMPLE PORT
- VI — VACUUM INDICATOR

3 H-204 PIPING AND INSTRUMENTATION DIAGRAM
Not to Scale

INSTRUMENT SCHEDULE							
ITEM	**DESCRIPTION**	**SERVICE**	**LOCATION**	**REQUIREMENTS**	**RANGE**	**REMARKS**	**MANUFACTURER/MODEL**
MAGNEHELIC GAUGE	PRESSURE DIFFERENTIAL	SSD SYSTEM	RISER MANIFOLD	N/A	0-10" WC	FOR EACH 4" MANIFOLD LEG AND 6" RISERS	DWYER INSTRUMENTS SERIES 2000 MODEL 2010
VACUUM INDICATOR	VACUUM GAUGE	SSD SYSTEM	BLOWER INLET	N/A	0-15" WC	8" PVC PIPE	NOSHOK 25-500-15IN H_2OVAC-1/4-BP3
VFD	VARIABLE FREQUENCY DRIVE	SSD SYSTEM	MAIN ROOF	3 PHASE, 60 HZ, 208 VAC	N/A	COORDINATE LOCATION WITH ARCHITECT	WEG EDP11S007DN3R10000
DPS	DIFFERENTIAL PRESSURE SWITCH	SSD SYSTEM ALARM	BLOWER INLET	N/A	0.4 - 1.6" WC	CONNECT TO BMS FOR EACH BLOWER ASSEMBLY	DWYER INSTRUMENTS SERIES 1900, MODEL 1910-1
CONTROL PANEL	BLOWER	SSD SYSTEM	MAIN ROOF	1 PHASE, 60 HZ, 115 VOLT	N/A	FOR EACH BLOWER ASSEMBLY	INCLUDES LOCAL AUDIBLE AND VISUAL ALARM
FLOW METER	FLOW	SSD SYSTEM	RISERS @ FIRST FLOOR	N/A	N/A	FOR EACH 4" MANIFOLD LEG	DWYER INSTRUMENTS SERIES MODEL DS-300-4
ALARM INDICATION STATION	SSDS MONITOR	SSD SYSTEM	ROOF	TBD	N/A	FOR EACH SSDS BLOWER	KELE INC, MODEL AIS

BLOWER SCHEDULE										
UNIT NO.	**AREAS SERVED**	**SERVICE**	**LOCATION**	**SIZE**	**MIN. CFM**	**MIN. RATE (INCHES WC)**	**MOTOR REQUIREMENTS**			**MANUFACTURER/MODEL**
SF-1	OCCUPIED SPACES	SSD SYSTEM	MECHANICAL ROOF	1.5 HP	500	7	60 HZ	3 PHASE	230/460 VOLTS	NYBLOWER,CGI FAN, SIZE 116, ARRANGEMENT 4
SPARE	N/A	N/A	N/A	1.5 HP	500	7	60 HZ	3 PHASE	230/460 VOLTS	NYBLOWER,CGI FAN, SIZE 116, ARRANGEMENT 4

BLOWER NOTES:

1. THE BLOWER SCHEMATICS ARE SHOWN TO ILLUSTRATE THE REQUIRED COMPONENTS AND THE GENERAL LOCATIONS IN THE PIPING RUN AND SHALL NOT BE CONSIDERED TO BE ACCURATE. THE ACTUAL CONFIGURATION AND DIMENSIONS OF THE BLOWER ASSEMBLY WILL VARY BASED ON MANUFACTURING METHODS AND FIELD CONDITIONS. FINAL DESIGN AND BLOWER SYSTEM SELECTED ARE SUBJECT TO APPROVAL BY THE AUTHORITY. CONTRACTOR SHALL PROVIDE ALL BLOWER SPECIFICATIONS AND CUT SHEETS FOR THE AUTHORITY'S APPROVAL PRIOR TO INSTALLATION.
2. A DIFFERENTIAL PRESSURE SWITCH SHALL BE INSTALLED ON THE 8" RISER PIPE ON THE ROOF. THE DIFFERENTIAL PRESSURE SWITCH SHALL BE CONNECTED TO THE SSDS MONITORING PANEL IN ACCORDANCE WITH SECTIONS 312113.
3. BLOWER MOTOR WILL REQUIRE A THREE-PHASE, 60HZ, 208-230/480 VOLT POWER SUPPLY. THE CONTROL PANEL FOR THE BLOWER WILL REQUIRE A ONE PHASE, 60 HZ, 115 VOLT POWER SUPPLY. THE ELECTRICAL SERVICE TO THE BLOWER MOTOR IS SHOWN ON THE ELECTRICAL DRAWINGS. COORDINATE POWER SUPPLIES WITH BUILDING POWER FLOOR PLAN. COORDINATE POWER SUPPLY FOR FLOW METER AT RISER THROUGH FLOOR SLAB.
4. CONTRACTOR TO PROVIDE CONNECTION TO GROUNDING FOR ROOF TOP BLOWER.
5. CONTRACTOR TO PROVIDE SPARE BLOWER AND PARTS.
6. REFER TO SPECIFICATION SECTION 312113 - SUB-SLAB DEPRESSURIZATION SYSTEM FOR REQUIREMENTS RELATING TO SUB-SLAB DEPRESSURIZATION SYSTEM ACCESSORIES.
7. CONTRACTOR REQUIRED TO PROVIDE PLAN/DRAWING DETAILING A SUPPORT SYSTEM FOR THE EXHAUST PIPE STACK AND RAIN CAP.

NO.	DATE	
1	12/28/17	COORDINATION PLAN
2	01/31/18	FINAL DESIGN
3	02/09/18	REVISION 1

SEAL

KEY PLAN

Perkins Eastman
422 SUMMER STREET
STAMFORD, CT 06901
T. 203.251.7400
F. 203.251.7474

Owner:
AvalonBay
1499 POST ROAD, SECOND FL
FAIRFIELD, CT 06824

Civil / Site:
PS&S
55 MAIN ST, 3RD FL
YONKERS, NY 10701

Landscape:
Topia
5055 NORTH HARBOR DR, SUITE 200
SAN DIEGO, CA 92106

Structural:
VEITAS & VEITAS ENGINEERS, INC.
639 GRANITE STREET
BRAINTREE, MA 02184

MEP/FP:
R.W. SULLIVAN ENGINEERING
THE SCHRAFFT CENTER
529 MAIN STREET, SUITE 203
BOSTON, MA 02129

ENVIRONMENTAL:
AKRF
THE SCHRAFFT CENTER
34 SOUTH BROADWAY
4TH FLOOR
WHITE PLAINS, NY 10601

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AVALON YONKERS BUILDING 1

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SSDS EQUIPMENT SCHEDULE AND PROCESS FLOW DIAGRAM

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FINAL CONSTRUCTION DRAWINGS

STEGO® WRAP VAPOR BARRIER/RETARDER INSTALLATION INSTRUCTIONS

IMPORTANT: Please read these installation instructions completely, prior to beginning any Stego Wrap installation. The following installation instructions are based on ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs. If project specifications call for compliance with ASTM E1643, then be sure to review the specific installation sections outlined in the standard along with the techniques referenced in these instructions.

UNDER-SLAB INSTRUCTIONS:

FIGURE 1: UNDER-SLAB INSTALLATION

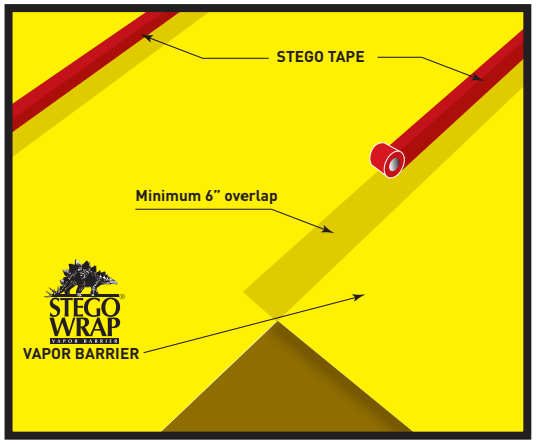


FIGURE 2a: SEAL TO SLAB AT PERIMETER

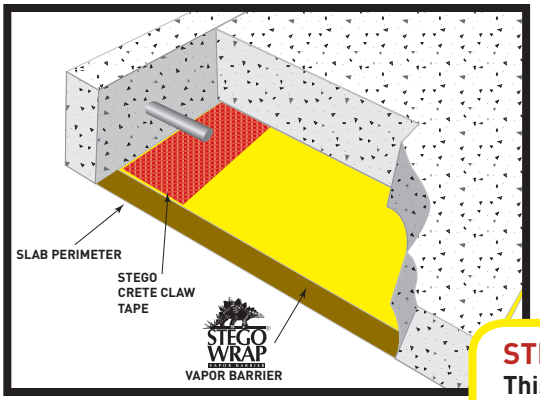
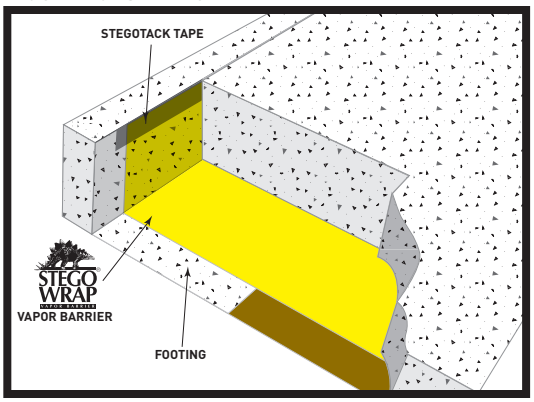


FIGURE 2b: SEAL TO PERIMETER WALL



1. Stego Wrap can be installed over an aggregate, sand, or tamped earth base. It is not necessary to have a cushion layer or sand base, as Stego Wrap is tough enough to withstand rugged construction environments.

2. Unroll Stego Wrap over the area where the slab is to be placed. Stego Wrap should completely cover the concrete placement area. All joints/seams both lateral and butt should be overlapped a minimum of 6" and taped using Stego® Tape.

   NOTE: The area of adhesion should be free from dust, dirt, moisture, and frost to allow maximum adhesion of the pressure-sensitive tape.

3. ASTM E1643 requires sealing the perimeter of the slab. *Extend vapor retarder over footings and seal to foundation wall, grade beam, or slab at an elevation consistent with the top of the slab or terminate at impediments such as waterstops or dowels.* Consult the structural engineer of record before proceeding.

SEAL TO SLAB AT PERIMETER:*

NOTE: Clean the surface of Stego Wrap to ensure that the area of adhesion is free from dust, dirt, moisture, and frost to allow maximum adhesion of the pressure-sensitive adhesive.

a. Install Stego® Crete Claw® Tape on the entire perimeter edge of Stego Wrap.

b. Prior to the placement of concrete, ensure that the top of Stego Crete Claw Tape is free of dirt, debris, or mud to maximize the bond to the concrete.

STEGO LABOR SAVER!

This method not only complies with ASTM E1643, but it also:

- **reduces labor compared to other perimeter sealing techniques.**
- **can be used even without an existing wall or footing, unlike alternatives.**

OR **SEAL TO PERIMETER WALL WITH STEGOTACK® TAPE:***

a. Make sure area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion.

b. Remove release liner on one side and stick to desired surface.

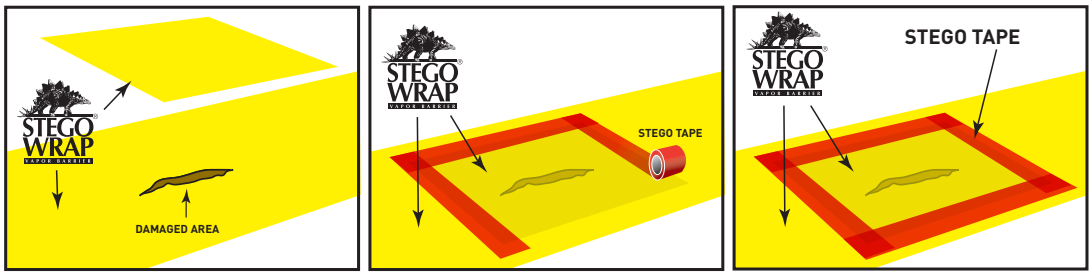
c. When ready to apply Stego Wrap, remove the exposed release liner and press Stego Wrap firmly against StegoTack Tape to secure.

* If ASTM E1643 is specified, consult with project architect and structural engineer to determine which perimeter seal technique should be employed for the project.

Continued...
Note – legal notice on page 2.

4. In the event that Stego Wrap is damaged during or after installation, repairs must be made. For holes, cut a piece of Stego Wrap to a size and shape that covers any damage by a minimum overlap of 6" in all directions. Clean all adhesion areas of dust, dirt, moisture, and frost. Tape down all edges using Stego Tape **(See Figure 3)**.

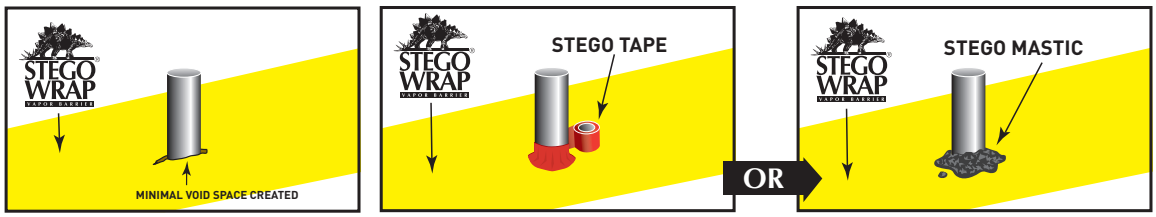
FIGURE 3: SEALING DAMAGED AREAS



NOTE: Stego Industries recommends the use of vapor barrier-safe concrete accessories, like Beast® Screed, to help minimize the amount of penetrations in a Stego Wrap Installation.

5. **IMPORTANT: ALL PENETRATIONS MUST BE SEALED.** All pipe, ducting, rebar, wire penetrations and block outs should be sealed using Stego Wrap, Stego Tape and/or Stego Mastic **(See Figure 4a)**. If penetrations are encased in other materials, such as expansive materials like foam, unless otherwise specified, Stego Wrap should be sealed to the underlying penetration directly.

FIGURE 4a: PIPE PENETRATION SEALING



STEGO WRAP PIPE PENETRATION REPAIR DETAIL:

1: Install Stego Wrap around pipe penetrations by slitting/cutting material as needed. Try to minimize the void space created.

2: If Stego Wrap is close to pipe and void space is minimized then seal around pipe penetration with Stego Tape and/or Stego Mastic. **(See Figure 4a)**

3: If detail patch is needed to minimize void space around penetration, then cut a detail patch to a size and shape that creates a 6" overlap on all edges around the void space at the base of the pipe. Stego Pre-Cut Pipe Boots are also available to speed up the installation.

4: Cut an "X" the size of the pipe diameter in the center of the pipe boot and slide tightly over pipe.

5: Tape down all sides of the pipe boot with Stego Tape.

6: Seal around the base of the pipe using Stego Tape and/or Stego Mastic. **(See Figure 4b)**

FIGURE 4b: DETAIL PATCH FOR PIPE PENETRATION SEALING

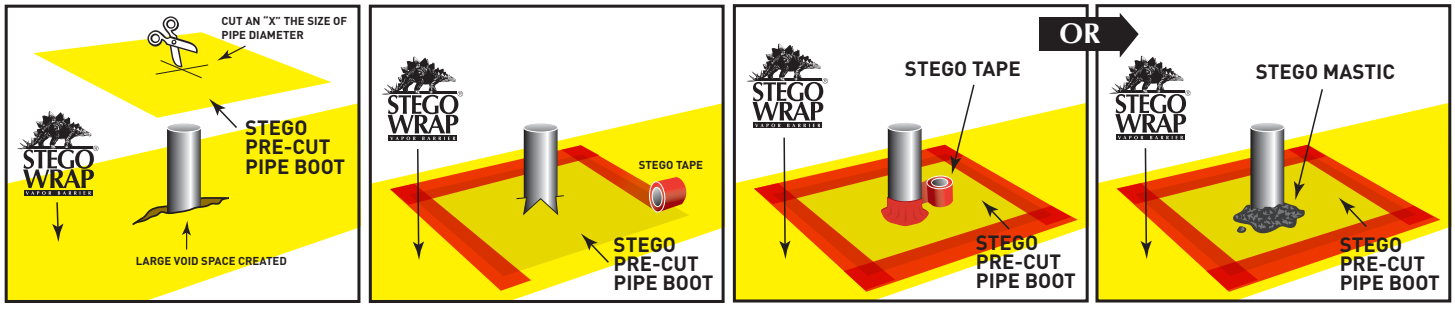
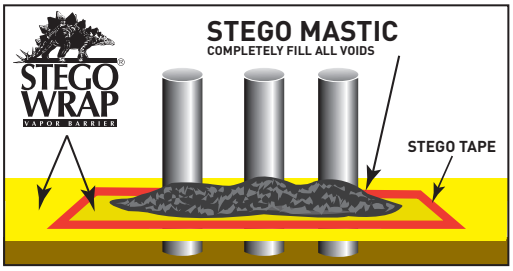


FIGURE 5: MULTIPLE PIPE PENETRATION SEALING



MULTIPLE PIPE PENETRATION SEALING:
Multiple pipe penetrations in close proximity and very small pipes may be sealed using Stego Wrap and Stego Mastic for ease of installation **(See Figure 5)**.

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.* These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.