Avery Dennison Corporation
Environmental, Health & Safety
207 Goode Avenue
Glendale, California 91203

February 12, 2019 by email

Daniel R. Lanners, P.E.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau C
625 Broadway, 11th Floor
Albany, NY 12233-7014
Email: daniel.lanners@dec.ny.gov

RE: Sub-Slab Depressurization System Design
Avery Dennison Corporation Property
524 Route 303, Orangeburg, New York
NYSDEC Site No. 344072

Dear Mr. Lanners,

Please find attached a Sub-Slab Depressurization (SSD) System Design Report for the subject property, revised to include modifications requested by New York State Department of Environmental Conservation (NYSDEC) in its January 14, 2019 letter to Avery Dennison Corporation (ADC), and accepted by ADC on January 28, 2019. ADC plans to proceed with installation of the SSD system as described in the attached Design Report as soon as possible to support the pending sale of the property.

If you have any questions or comments, please do not hesitate to call.

Sincerely,

Paul P. Gallagher
Avery Dennison
Global Manager – Remediation

cc: George Lester, P.E., and Chris Turner, The Johnson Company

Attachment

SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN REPORT

524 Route 303
Rockland County
Orangeburg, New York

NYSDEC Site No: 344072

Prepared for:

Avery Dennison Corporation
8080 Norton Parkway
Mentor, Ohio 44060

January 2019

The Johnson Company

ENVIRONMENTAL SCIENCE AND ENGINEERING SOLUTIONS

PARTNERS FOR SMART THINKING AND CREATIVE STRATEGIES

SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN REPORT

524 Route 303
Rockland County
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NYSDEC Site No: 344072

Prepared for:
Avery Dennison Corporation
8080 Norton Parkway
Mentor, Ohio 44060

Prepared by:
The Johnson Company, Inc.
100 State Street, Suite 600
Montpelier, Vermont 05602

January 2019

I, George W. Lester, certify that I am currently a NYS registered Professional Engineer and that this Design Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

George W. Lester, PE
Project Engineer
The Johnson Company, Inc.

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

This Sub-Slab Depressurization Design Report (the Design) was prepared by The Johnson Company, Inc. (JCO) for the Avery Dennison Corporation (ADC) facility at 529 Route 303 in Orangeburg, Rockland County, New York (the Facility; see **Figure 1**) in accordance New York State Department of Environmental Conservation (NYSDEC) *DER-10: Technical Guidance for Site Investigation and Remediation* (NYSDEC, 2010), New York State Department of Health (NYSDOH) *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006), and subsequent updates to the NYSDOH guidance (NYSDOH, 2017).

The Facility is an approximately 55,000 square-foot structure of slab-on-grade construction containing both office space and a large open area formerly used to manufacture clothing labels (see **Figure 2**). It is located on an 8.3-acre property with asphalt parking and driveway areas to the south and east of the Facility; an open-sided covered storage structure to the west; and a grass-covered lawn area to the north. Former manufacturing operations at the Facility consisted of fabric coating and associated finishing operations, including ironing, slitting, cutting, and tubing of fabric in preparation for off-site label printing. Supporting warehousing, facility maintenance, shipping/receiving, and office operations were also performed at the Facility. The Facility is currently vacant.

Sub-slab soil gas samples were initially collected from the Facility in 2008 as a component of a site-wide environmental investigation. A focused soil vapor intrusion (SVI) investigation was performed in accordance with NYSDEC-approved work plans in 2016 through 2018 and included a collection of co-located sub-slab soil gas and indoor air samples for analysis of ten chlorinated volatile organic compounds (VOCs) during the winter heating seasons in 2016, 2017, and 2018. Four VOCs present on NYSDOH SVI guidance decision matrices were detected in one or more of the sub-slab soil gas samples collected in 2016 through 2018: TCE, PCE, carbon tetrachloride, and TCA. Carbon tetrachloride and PCE were also detected in some indoor air samples but at concentrations below NYSDOH Indoor Air Guidelines and USEPA screening levels. Results from sub-slab soil gas and indoor air sampling performed in 2016 through 2018 are provided in **Tables 1 and 2**, and soil gas sampling locations are shown on **Figure 2**. The most recent sub-slab soil gas and indoor air sampling results, from January 2018, are shown on **Figure 3**.

Concentrations of VOCs in indoor air samples were below NYSDOH Indoor Air Guidelines and USEPA screening levels for all analytes. Detected PCE concentrations in indoor air in January 2018 were between 0.24 and 0.69 micrograms per cubic meter ($\mu g/m^3$), below the NYSDOH Indoor Air Guideline of 30 $\mu g/m^3$ and USEPA screening level of 47 $\mu g/m^3$. Carbon tetrachloride was detected at concentrations from 0.37 to 0.44 $\mu g/m^3$ in the January 2018 indoor air samples, compared to a USEPA screening level of 2.0 $\mu g/m^3$. NYSDOH has not established an Indoor Air Guideline for carbon tetrachloride. Carbon tetrachloride was also detected at similar concentrations in outdoor air samples collected by JCO and others in the Orangeburg area during the 2016 to 2018 investigation period (see **Table 3**).

Results for sub-slab soil gas samples collected in January 2018 fall into the "no further action" category on NYSDOH SVI decision matrices, except for a TCE concentration of 180 $\mu g/m^3$ in the sample from location SS-1. That concentration falls into the "mitigate" category on Matrix A. TCE was not detected in any of the indoor air samples collected from the Facility over the three annual sampling events. In an August 22, 2018 letter to ADC, NYSDEC recommended further evaluating the potential for vapor intrusion when the Facility is reoccupied.

This Design was prepared to mitigate potential soil vapor intrusion (SVI) of TCE into Facility indoor air. The results of the 2018 SVI investigation were used to determine the target SVI mitigation area shown on **Figure 2**. The boundaries of the target SVI mitigation area are located at the approximate mid-point between the SS-1 sample location and each surrounding sub-slab sample location to the south and west. The target SVI mitigation area extends north from SS-1 to the building exterior wall and east to the nearest sub-slab soil gas sample location in the office area (SS-2). The Design is based on the Facility layout shown in **Figure 2** and may require modification if future use of the Facility involves significant changes to the heating ventilation and air conditioning (HVAC) systems and/or reconfiguration of interior partitions.

2.0 SYSTEM ANALYSIS AND DESIGN

2.1 Mitigation Concept

Mitigation will be achieved through the installation and continuous operation of a sub-slab depressurization (SSD) system. According to the NYSDOH guidance, an SSD system is the preferred method for buildings with a slab-on-grade foundation. An SSD system uses sub-slab suction points, a fan or blower, and associated piping to draw vapors from the sub-slab soil and discharge them to the atmosphere. The resulting pressure differential between the sub-slab soils and the indoor atmosphere prevents sub-slab vapors from entering the building through the floor slab. An SSD system schematic design is shown on **Figure 4**.

2.2 Diagnostic Testing

Diagnostic testing was performed inside the Facility in August 2018 to determine the quantity and distribution of sub-slab suction points and the vacuum and air flow parameters required to mitigate potential SVI within the target SVI mitigation area. Testing was performed by Obar Systems, Inc., a Rockland County Certified Radon Mitigation Contractor with extensive experience in the design and installation of SSD systems in New York State. The diagnostic testing methods and results are discussed below. Test data are provided in **Appendix A.**

Five diagnostic suction points were installed through the Facility floor slab with several test holes surrounding each suction point; the locations of the diagnostic suction points are shown on **Figure 2**. A detailed layout of suction points and test hole locations is provided in **Appendix A**. Two vacuum tests were performed at each diagnostic suction point: an initial test utilizing an applied vacuum of 20 inches of water column (inch wc), followed by a second test with an applied vacuum of 30 inch wc. During each test, the corresponding extraction air flow rate at the diagnostic suction point and the induced vacuum at the surrounding test holes were measured. The data were used to estimate the radius of influence (ROI) for each diagnostic suction point and to evaluate the impact of sub-slab vacuum impedances, such as foundation footings. Diagnostic testing results were also used to select the quantity and specifications of vacuum blowers and conveyance pipes required for full-scale application.

The diagnostic testing results showed that a typical ROI[1] for each diagnostic suction point was 20 feet with an applied vacuum of 20 inch wc and an air flow rate of less than 5 cubic feet per minute (cfm).

[1] To determine the ROI, vacuum was measured at positioned holes at various distances (typically 10, 20, and 30 feet) from each diagnostic suction point. The ROI was defined as the farthest distance with a measurable vacuum.

This was true for each of the diagnostic suction points except for location S-4 (see **Figure 2**), which yielded air flows of 30 and 40 cfm at 20 and 30 inch wc applied vacuum, respectively. Testing results showed the sub-slab conditions were homogeneous throughout the target SVI mitigation area. Surface observations suggest exterior concrete spread footings and interior concrete column footings are likely present. The test results indicate these features, if present, do not impede vacuum propagation beneath the floor slab.

2.3 SSD System Components

Component specifications for the SSD System are provided on cut sheets in **Appendix B**.

2.3.1 Suction Points

The SSD System includes two roof-mounted vacuum blowers and 15 sub-slab suction points to maintain a minimum continuous sub-slab vacuum of 0.004 inch wc within the target SVI mitigation area. The 0.004-inch wc sub-slab vacuum target is based on current New Jersey Vapor Intrusion Technical Guidance (NJDEP, 2018), and is commonly applied as a performance criterion for SSD systems installed in New York State. The proposed locations of the blowers and suction points are shown on **Figure 4.**

A suction point detail is provided on **Figure 4**. Each suction point will be constructed by coring a 2.5-inch-diameter hole through the concrete floor slab and excavating approximately six inches into the underlying sub-slab soil. The sub-slab void will be backfilled with crushed stone. A 2-inch PVC riser pipe will be inserted into the hole and cemented in place to create an air-tight seal between the riser pipe and the floor slab. Each riser pipe will be fitted with a ball valve that will be used for balancing the SSD System air flow. The riser pipes will tie into the conveyance piping as high as possible, either within the space above the drop ceiling in the office area or near the ceiling rafters in the other areas.

The proposed suction points are located adjacent to existing walls or columns so that they will not create an obstruction or unnecessarily reduce usable space within the Facility. The exact locations of each suction point will be determined during construction to minimize the visual impact of exposed piping.

2.3.2 Conveyance Piping

All SSD System conveyance piping and fittings will be nominal 2- or 3-inch diameter PVC. Overhead piping will be installed in the approximate locations shown on **Figure 4**. Overhead piping will be installed as high as possible within the Facility (above drop ceilings where applicable) and slope toward the suction points so that any moisture build-up within the piping can drain back to the suction points. Overhead pipe will be secured with threaded rod and swivel loop hangers. Vertical pipe will be secured to the walls with struts, strut clamps, and metal pipe straps. Exposed SSD System piping will be labeled with decals identifying it as a vapor intrusion mitigation system component.

2.3.3 Blowers

The SSD System will be comprised of two sub-systems, each equipped with a dedicated blower installed on the roof of the building at the approximate locations shown on **Figure 4**. The blowers require a 220-

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For example, if a vacuum of 0.02 inch wc measured at 20 feet from the diagnostic suction point and no vacuum was measured at 30 feet, then the ROI was interpreted to be 20 feet.

volt power source and dedicated circuit breakers. Each blower is designed to handle combustible materials, is capable of generating a vacuum of 40 inch wc with a maximum airflow of 195 cfm, and can be tuned after installation to achieve optimal vacuum coverage and energy efficiency. Blower exhausts will terminate at least 2 feet above or 10 feet lateral distance from any intake or opening into the Facility. Equipment cut sheets for the blowers and roof-mounting equipment are provided in **Appendix B**.

2.3.4 Control Panel

The SSD System control panel will include Magnehelic vacuum gauges for each of the two sub-systems. A red light on the control panel will illuminate, and an audible alarm will sound in case of an SSD System failure. If desired, the control panel may be configured to support remote monitoring of SSD System parameters. A decal displaying contact information for the SSD System installer will be located on the control panel.

2.3.5 Test Ports

Sub-slab test ports will be installed within the SVI mitigation area to confirm sub-slab vacuum meets the target minimum differential pressure target of -0.004 inches wc. The sub-slab test ports will be installed by coring a 0.8-inch diameter hole in the floor slab and installing a permanent Floor Port assembly (see **Appendix B**). Eight permanent sub-slab test ports will be installed at the approximate locations shown on **Figure 4**. In addition, riser test ports will be installed in each suction point riser pipe for vacuum measurement and air sampling.

3.0 SYSTEM INSTALLATION AND TESTING

3.1 Design Modifications

Prior to the SSD System installation, planned modifications to interior layout, including the locations of partitions or function of the interior space, will be identified and the location of the proposed suction point locations will be modified as needed to minimize the visual impact and encroachment on future Facility operations.

3.2 Installation Contractor

The SSD System will be installed by Obar Systems, Inc., a Rockland County Certified Radon Mitigation Contractor with extensive experience in the design and installation of SSD systems in New York State and elsewhere.

3.3 Waste Handling

Dust generated from coring holes through the concrete floor slab for SSD System installation will be captured using a portable vacuum. Sub-slab soil removed from the suction points will be collected and containerized. The excavated soils will be sampled and characterized for off-site disposal at an appropriate disposal facility.

3.4 Permitting

All required building and electrical permits must be obtained prior to installing the SSD System.

Electrical work will be performed by a licensed electrician in accordance with New York State and local electrical codes and permit requirements.

SSD System conveyance piping will be installed and supported according to local building code and permit requirements.

3.5 System Start-Up

Following installation, the SSD System blowers and suction point valves will be adjusted to balance airflow, sub-slab vacuum distribution, and optimize energy efficiency. System-induced vacuum will be measured at each of the eight sub-slab test ports to verify the SSD System achieves its performance criterion of generating a minimum sub-slab vacuum 0.004 inch wc throughout the target SVI mitigation area.

3.6 Confirmation Testing

After a minimum of 30-days following SSD System startup, indoor air samples will be collected from five locations inside the target mitigation area during the winter heating season per NYSDOH guidance (NYSDOH, 2006; 2017). Indoor air sampling locations are shown on Figure 5. In addition, one outdoor air sample will be collected approximately upwind of the Site facility at the time of sampling. Air samples will be collected into 6-liter evacuated stainless steel canisters equipped with 8-hour flow controllers. Air sample collection and analysis will be performed in accordance with the NYSDEC-approved Soil Vapor Intrusion Investigation Work Plan dated September 29, 2017 (the SVI Work Plan) (JCO, 2017a). Results from the previous indoor air sampling events performed in 2016, 2017, and 2018 showed no VOC analytes were detected in indoor air samples at concentrations exceeding NYSDOH Indoor Air Guidelines or United States Environmental Protection Agency (USEPA) risk-based screening levels (JCO, 2018).

Concurrent with indoor air sample collection, SSD System-induced vacuum will be measured again at each of the eight sub-slab test ports to verify the SSD System achieves its performance criterion of generating a minimum sub-slab vacuum 0.004-inch wc throughout the target SVI mitigation area. Blower settings and suction point valves will be rebalanced, if necessary.

Confirmation testing results will be reported in the Final Engineering Report.

4.0 REPORTING

A Final Engineering Report will be produced following the SSD System installation, startup and performance testing. The report will include SSD System as-built drawings, confirmation testing results, and operation and maintenance procedures.

5.0 OPERATION AND MAINTENANCE

The SSD System is designed to operate unattended. If a blower is not providing adequate vacuum, an alarm light and audible alarm at the control panel will be triggered. Maintenance personnel can investigate the cause of the SSD System failure and take steps to address the issue. A decal displaying contact information for the System installer will be located on the control panel.

The applied sub-slab vacuum should be measured at the sub-slab test ports shown on Figure 4 on an annual basis during the winter heating season. The System blower speeds and throttle valves may be adjusted as necessary to maintain sufficient sub-slab vacuum throughout the target SVI mitigation area.

ADC will be responsible for SSD System installation, startup and confirmation testing, and preparing a Final Engineering Report. Responsibility for routine monitoring and maintenance of the SSD System following startup and confirmation testing will be assigned in a Site Management Plan (SMP). The SMP will include an institutional control requiring operation of the SSD System.

6.0 FUTURE BUILDING MODIFICATIONS

If the building floor plan in the target mitigation area (see Figure 4) is modified or redesigned at any point in the future while continued operation of the SSD System remains a requirement under the SMP, the SSD System-induced vacuum must be measured again at each of the eight sub-slab test ports to verify the SSD System achieves its performance criterion of generating a minimum sub-slab vacuum 0.004-inch wc throughout the target SVI mitigation area. Blower settings and suction point valves should then be rebalanced, if necessary, to achieve the performance criterion. Modification of the SSD System (e.g., installation of a higher-capacity blower or additional suction points) will be necessary if the performance criterion cannot be met through operational adjustments. SSD System modifications will be reported to NYSDEC in accordance with the SMP.

7.0 REFERENCES

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The Johnson Company (JCO, 2017). Final January 2017 Indoor Air and Sub-Slab Soil Vapor Sampling Results, Avery Dennison Corporation – Orangeburg Facility, NYSDEC Site No. 344072. Orangeburg, Rockland County, NY. May 2, 2017.

The Johnson Company (JCO, 2017a). Soil Vapor Intrusion Investigation Work Plan, Avery Dennison Corporation, 524 Route 303, Orangeburg, Rockland County, New York, NYSDEC Site No. 344072. September 29, 2017.

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TABLES

Table 1: Sub-Slab Soil Gas and Indoor Air Analytical Results - 2016-2017

524 Route 303, Orangeburg, New York

NYSDEC Site No. 344072

					Sample Date:	3/23/2016	1/25/2017	3/23/2016	1/25/2017	3/23/2016	1/25/2017	3/23/2016	1/25/2017	3/23/2016	3/23/2016	1/25/2017	1/25/2017
Sample Type	**Sample Duration**	**Analyte**	**NYSDOH Decision Matrix**	**USEPA Screening Level[1] (µg/m³)**		**SS-1**	**SS-1**	**SS-2**	**SS-2**	**SS-3**	**SS-3**	**SS-4**	**SS-4**	**SS-5**	**SS-5 Duplicate**	**SS-5**	**SS-5 Duplicate**
Sub-Slab Soil Vapor	8 hours	Tetrachloroethene	Matrix B	1,600		140	150	4.5	4.8	8.1	7.3	8.5	7.3	160	150	130	130
		Trichloroethene	Matrix A	100		14	28	ND (<0.90)	ND (<0.96)	1.1	0.9 J	ND (<0.88)	ND (<0.98)	15	15	10	11
		cis-1,2-Dichloroethene	Matrix A	--		ND (<0.65)	3.4	ND (<0.67)	ND (<0.71)	ND (<0.62)	ND (<0.68)	ND (<0.65)	ND (<0.72)	ND (<0.64)	ND (<0.61)	ND (<0.68)	ND (<0.67)
		trans-1,2-Dichloroethene	--	--		ND (<0.65)	ND (<0.69)	ND (<0.67)	ND (<0.71)	ND (<0.62)	ND (<0.68)	ND (<0.65)	ND (<0.72)	ND (<0.64)	ND (<0.61)	ND (<0.68)	ND (<0.67)
		1,1-Dichloroethene	Matrix A	29,000		ND (<0.65)	ND (<0.69)	ND (<0.67)	ND (<0.71)	ND (<0.62)	ND (<0.68)	ND (<0.65)	ND (<0.72)	1.1	1.1	ND (<0.68)	0.75
		Vinyl chloride	Matrix C	93		ND (<0.42)	ND (<0.45)	ND (<0.43)	ND (<0.46)	ND (<0.40)	ND (<0.44)	ND (<0.42)	ND (<0.47)	ND (<0.41)	ND (<0.39)	ND (<0.44)	ND (<0.43)
		1,1,1-Trichloroethane	Matrix B	730,000		1.0	1.0	ND (<0.92)	ND (<0.98)	ND (<0.86)	ND (<0.93)	ND (<0.89)	ND (<1.0)	14	14	13	14
		Carbon Tetrachloride	Matrix A	68		6.8	ND (<1.1)	29	ND (<1.1)	6.3	1.0 J	31	ND (<1.2)	7.1	7.4	5.2	5.6
		1,1-Dichloroethane	--	260		ND (<0.66)	ND (<0.71)	ND (<0.68)	ND (<0.72)	ND (<0.64)	ND (<0.69)	ND (<0.66)	ND (<0.74)	140	140	74	75
		1,2-Dichloroethane	--	16		ND (<0.66)	ND (<0.71)	ND (<0.68)	ND (<0.72)	ND (<0.64)	ND (<0.69)	ND (<0.66)	ND (<0.74)	ND (<0.65)	ND (<0.62)	ND (<0.69)	ND (<0.68)

						Sample Date:	3/23/2016	1/24/2017	3/23/2016	1/24/2017	3/23/2016	1/24/2017	3/23/2016	3/23/2016	1/24/2017	1/24/2017	3/23/2016	1/24/2017	3/23/2016	1/24/2017
Sample Type	**Sample Duration**	**Analyte**	**NYSDOH Decision Matrix**	**NYSDOH Indoor Air Guideline (µg/m³)**	**USEPA Screening Level[1] (µg/m³)**		**IA-1**	**IA-1**	**IA-2**	**IA-2**	**IA-3**	**IA-3**	**IA-4**	**IA-4 Duplicate**	**IA-4**	**IA-4 Duplicate**	**IA-5**	**IA-5**	**OA-1**	**OA-1**
Indoor and Ambient Air	8 hours	Tetrachloroethene	Matrix B	30	47		0.74	ND (<0.62)	0.66	ND (<0.46)	ND (<1.1)	ND (<1.1)	0.70	0.70	ND (<0.30)	ND (<0.40)	ND (<2.2)	ND (<120)	ND (<0.22)	ND (<0.22)
		Trichloroethene	Matrix A	2	3		ND (<0.45)	ND (<0.49)	ND (<0.35)	ND (<0.37)	ND (<0.85)	ND (<0.90)	ND (<0.43)	ND (<0.34)	ND (<0.24)	ND (<0.32)	ND (<1.7)	ND (<96)	ND (<0.17)	ND (<0.18)
		cis-1,2-Dichloroethene	Matrix A	--	--		ND (<0.33)	ND (<0.36)	ND (<0.26)	ND (<0.27)	ND (<0.63)	ND (<0.67)	ND (<0.32)	ND (<0.25)	ND (<0.17)	ND (<0.24)	ND (<1.3)	ND (<71)	ND (<0.13)	ND (<0.13)
		trans-1,2-Dichloroethene	--	--	--		ND (<1.7)	ND (<1.8)	ND (<1.3)	ND (<1.4)	ND (<3.1)	ND (<3.3)	ND (<1.6)	ND (<1.2)	ND (<0.87)	ND (<1.2)	ND (<6.4)	ND (<71)	ND (<0.63)	ND (<0.65)
		1,1-Dichloroethene	Matrix A	--	880		ND (<0.17)	ND (<0.18)	ND (<0.13)	ND (<0.14)	ND (<0.31)	ND (<0.33)	ND (<0.16)	ND (<0.12)	ND (<0.087)	ND (<0.12)	ND (<0.64)	ND (<71)	ND (<0.063)	ND (<0.065)
		Vinyl chloride	Matrix C	--	2.8		ND (<0.11)	ND (<0.12)	ND (<0.082)	ND (<0.087)	ND (<0.20)	ND (<0.21)	ND (<0.10)	ND (<0.081)	ND (<0.056)	ND (<0.076)	ND (<0.41)	ND (<46)	ND (<0.041)	ND (<0.042)
		1,1,1-Trichloroethane	Matrix B	--	22,000		ND (<0.46)	ND (<0.50)	ND (<0.35)	ND (<0.37)	ND (<0.86)	ND (<0.92)	ND (<0.44)	ND (<0.34)	ND (<0.24)	ND (<0.32)	ND (<1.8)	ND (<98)	ND (<0.17)	ND (<0.18)
		Carbon Tetrachloride	Matrix A	--	2		0.65	ND (<0.58)	0.60	ND (<0.43)	ND (<0.99)	ND (<1.0)	0.74	0.69	0.45	0.45	ND (<2.0)	ND (<110)	0.47	0.53
		1,1-Dichloroethane	--	--	7.7		ND (<0.34)	ND (<0.37)	ND (<0.26)	ND (<0.28)	ND (<0.64)	ND (<0.68)	ND (<0.32)	ND (<0.26)	ND (<0.18)	ND (<0.24)	ND (<1.3)	ND (<72)	ND (<0.13)	ND (<0.13)
		1,2-Dichloroethane	--	--	0.47		ND (<0.34)	ND (<0.37)	ND (<0.26)	ND (<0.28)	ND (<0.64)	ND (<0.68)	ND (<0.32)	ND (<0.26)	ND (<0.18)	ND (<0.24)	ND (<1.3)	ND (<72)	ND (<0.13)	ND (<0.13)

Notes:

1. USEPA Screening Levels from Vapor Intrusion Screening Level Calculator version 3.5, June 2017 RSLs. Commercial Scenario, TCR = $1x10^{-6}$; THQ = 1.0 (USEPA, 2017)
2. Indoor Air and Outdoor Air Samples analyzed by Eurofins Air Toxics using USEPA Method TO-15 SIM
3. Sub-Slab Soil Vapor Samples analyzed by Eurofins Air Toxics using modified USEPA Method TO-15
4. Concentrations expressed in units of micrograms per cubic meter (µg/m³)

Abbreviations:

"ND" = compound not detected above analytica reporting limit, limit provided

"--" = no guidance value or screening level for this compound

NYSDOH Soil Vapor / Indoor Air Decision Matrix Comparison:

No Further Action
Monitor
Mitigate

No applicable NYSDOH matrix for trans-1,2-dichloroethene; 1,1-dichlroethane; 1,2-dichloroethane; or outdoor air sample OA-1

Table 2: Sub-Slab Soil Gas and Indoor Air Analytical Results - 2018

524 Route 303, Orangeburg, New York

NYSDEC Site No. 344072

Sample Type	Sample Duration	Analyte	NYSDOH Decision Matrix	USEPA Screening Level[1] (µg/m^3)	Sample Date:	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018
						SS-1	SS-2	SS-3	SS-4	SS-5	SS-5 Duplicate	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11
Sub-Slab Soil Vapor	8 hours	Tetrachloroethene	Matrix B	1,600		470	4.7	10	8.1	120	130	340	40	29	930	370	17
		Trichloroethene	Matrix A	100		180	ND (<0.84)	1.1	ND (<0.86)	9.5	9.8	ND (<1.6)	ND (<0.88)	2.8	ND (<2.9)	ND (<1.8)	ND (<0.83)
		cis-1,2-Dichloroethene	Matrix A	--		58	ND (<0.62)	ND (<0.64)	ND (<0.63)	ND (<0.67)	ND (<0.67)	ND (<1.2)	ND (<0.65)	ND (<0.63)	ND (<2.2)	ND (<1.3)	ND (<0.61)
		trans-1,2-Dichloroethene	--	--		2.0	ND (<0.62)	ND (<0.64)	ND (<0.63)	ND (<0.67)	ND (<0.67)	ND (<1.2)	ND (<0.65)	ND (<0.63)	ND (<2.2)	ND (<1.3)	ND (<0.61)
		1,1-Dichloroethene	Matrix A	29,000		ND (<1.3)	ND (<0.62)	ND (<0.64)	ND (<0.63)	ND (<0.67)	ND (<0.67)	ND (<1.2)	ND (<0.65)	ND (<0.63)	ND (<2.2)	ND (<1.3)	ND (<0.61)
		Vinyl chloride	Matrix C	93		ND (<0.81)	ND (<0.40)	ND (<0.41)	ND (<0.41)	ND (<0.43)	ND (<0.41)	ND (<0.78)	ND (<0.42)	ND (<0.41)	ND (<1.4)	ND (<0.83)	ND (<0.40)
		1,1,1-Trichloroethane	Matrix B	730,000		ND (<1.7)	ND (<0.85)	ND (<0.88)	ND (<0.87)	9.5	8.7	7.3	4.0	14	6.5	2.5	ND (<0.84)
		Carbon Tetrachloride	Matrix A	68		ND (<2.0)	ND (<0.98)	ND (<1.0)	ND (<1.0)	3.6	3.6	ND (<1.9)	ND (<1.0)	2.6	ND (<3.4)	ND (<2.0)	1.3
		1,1-Dichloroethane	--	260		ND (<1.3)	ND (<0.63)	ND (<0.65)	ND (<0.65)	39	38	ND (<1.2)	ND (<0.66)	0.87	ND (<2.2)	ND (<1.3)	ND (<0.61)
		1,2-Dichloroethane	--	16		ND (<1.3)	ND (<0.63)	ND (<0.65)	ND (<0.65)	ND (<0.69)	ND (<0.68)	ND (<1.2)	ND (<0.66)	ND (<0.64)	ND (<2.2)	ND (<1.3)	ND (<0.63)

Sample Type	Sample Duration	Analyte	NYSDOH Decision Matrix	NYSDOH Indoor Air Guideline (µg/m^3)	USEPA Screening Level[1] (µg/m^3)	Sample Date:	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018	1/31/2018
							IA-1	IA-2	IA-3	IA-4	IA-5	IA-6	IA-7	IA-8	IA-9	IA-10	IA-10 Duplicate	IA-11	OA-1
Indoor and Ambient Air	8 hours	Tetrachloroethene	Matrix B	30	47		0.56	0.69	0.52	0.61	0.24	0.30	0.31	0.24	0.32	0.31	0.36	0.37	ND (<0.20)
		Trichloroethene	Matrix A	2	3		ND (<0.18)	ND (<0.18)	ND (<0.16)	ND (<0.17)	ND (<0.17)	ND (<0.18)	ND (<0.17)	ND (<0.17)	ND (<0.17)	ND (<0.18)	ND (<0.17)	ND (<0.18)	ND (<0.16)
		cis-1,2-Dichloroethene	Matrix A	--	--		ND (<0.13)	ND (<0.13)	ND (<0.12)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.12)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.12)
		trans-1,2-Dichloroethene	--	--	--		ND (<0.66)	ND (<0.65)	ND (<0.61)	ND (<0.64)	ND (<0.63)	ND (<0.67)	ND (<0.64)	ND (<0.64)	ND (<0.62)	ND (<0.65)	ND (<0.64)	ND (<0.67)	ND (<0.59)
		1,1-Dichloroethene	Matrix A	--	880		ND <0.066)	ND (<0.065)	ND (<0.061)	ND (<0.064)	ND (<0.063)	ND (<0.067)	ND (<0.064)	ND (<0.064)	ND (<0.062)	ND (<0.065)	ND (<0.064)	ND (<0.067)	ND (<0.059)
		Vinyl chloride	Matrix C	--	2.8		ND (<0.042)	ND (<0.042)	ND (<0.039)	ND (<0.041)	ND (<0.041)	ND (<0.043)	ND (<0.041)	ND (<0.041)	ND (<0.040)	ND (<0.042)	ND (<0.041)	ND (<0.043)	ND (<0.038)
		1,1,1-Trichloroethane	Matrix B	--	22,000		ND (<0.18)	ND (<0.18)	ND (<0.17)	ND (<0.18)	ND (<0.17)	ND (<0.18)	ND (<0.18)	ND (<0.18)	ND (<0.17)	ND (<0.18)	ND (<0.18)	ND (<0.18)	ND (<0.16)
		Carbon Tetrachloride	Matrix A	--	2		0.43	0.39	0.44	0.40	0.42	0.40	0.42	0.42	0.37	0.41	0.44	ND (<0.21)	0.40
		1,1-Dichloroethane	--	--	7.7		ND (<0.13)	ND (<0.13)	ND (<0.12)	ND (<0.13)	ND (<0.13)	ND (<0.14)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.14)	ND (<0.12)
		1,2-Dichloroethane	--	--	0.47		ND (<0.13)	ND (<0.13)	ND (<0.12)	ND (<0.13)	ND (<0.13)	ND (<0.14)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.13)	ND (<0.14)	ND (<0.12)

Notes:

1. USEPA Screening Levels from Vapor Intrusion Screening Level Calculator version 3.5, June 2017 RSLs. Commercial Scenario, TCR = 1x10^{-6}; THQ = 1.0 (USEPA, 2017)
2. Indoor Air and Outdoor Air Samples analyzed by Eurofins Air Toxics using USEPA Method TO-15 SIM
3. Sub-Slab Soil Vapor Samples analyzed by Eurofins Air Toxics using modified USEPA Method TO-15
4. Concentrations expressed in units of micrograms per cubic meter (µg/m^3)

Abbreviations:

"ND (<##)" = compound not detected above analytical reporting limit, limit provided

"--" = no guidance value or screening level for this compound

NYSDOH Soil Vapor / Indoor Air Decision Matrix Comparison:

No applicable NYSDOH matrix for trans-1,2-dichloroethene; 1,1-dichlroethane; 1,2-dichloroethane; or outdoor air sample OA-1

No Further Action
Monitor
Mitigate

Table 3: Comparison of Carbon Tetrachloride in Indoor and Ambient Air

524 Route 303, Orangeburg, New York

NYSDEC Site No. 344072

Sample Type	Sampler	Sample Date	Number of Sample Locations	Carbon Tetrachloride Results ($\mu g/m^3$)
ADC Facility Indoor Air Sampling Results	Avery Dennison Corporation[1]	3/23/2016	5	0.60 to 0.74
		1/24/2017	5	ND (<0.43) to 0.45
		1/31/2018	11	ND (<0.21) to 0.44
Outdoor (Ambient) Air Sampling Results	NYSDEC[2]	9/2/16 - 9/11/16	4	0.52 to 0.55
	Town of Orangeburg[3]	1/20/2017	6	0.31 to 0.69
	Avery Dennison Corporation[1]	3/26/2016	1	0.47
		1/24/2017	1	0.53
		1/31/2018	1	0.40
	2015 NY Statewide 24-hour Average[2]	--	--	0.52

References and Abbreviations:

1. JCO (2016b, 2017, 2018)

2. NYSDEC (2016)

3. Langan (2017)

$\mu g/m^3$ = micrograms per cubic meter

ND (<##) = compound not detected above the analytica reporting limit, limit provided

FIGURES

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N

1 0.5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000

FEET

CONTOUR INTERVAL 10 FEET

QUADRANGLE LOCATION

BASE MAP: USGS 7.5 Minute Topographic Quadrangle NYACK, NY-NJ

Figure 1
Site Location
524 Route 303, Orangeburg, New York

The Johnson Company

100 State Street, Suite 600
Montpelier, VT 05602

Drawn by: TJK	Date: 09/11/18
Reviewed by: CMT	Date: 09/11/18
Scale: As Shown	Project: 1-0145-15

LEGEND

- BUILDING FOOTPRINT
- APPROXIMATE BUILDING INTERIOR PARTITION
- SUB-SLAB SOIL GAS & INDOOR AIR SAMPLING LOCATION
- TARGET SOIL VAPOR INTRUSION (SVI) MITIGATION AREA
- FACILITY ROOF VENT LOCATION
- DIAGNOSTIC SUCTION POINT

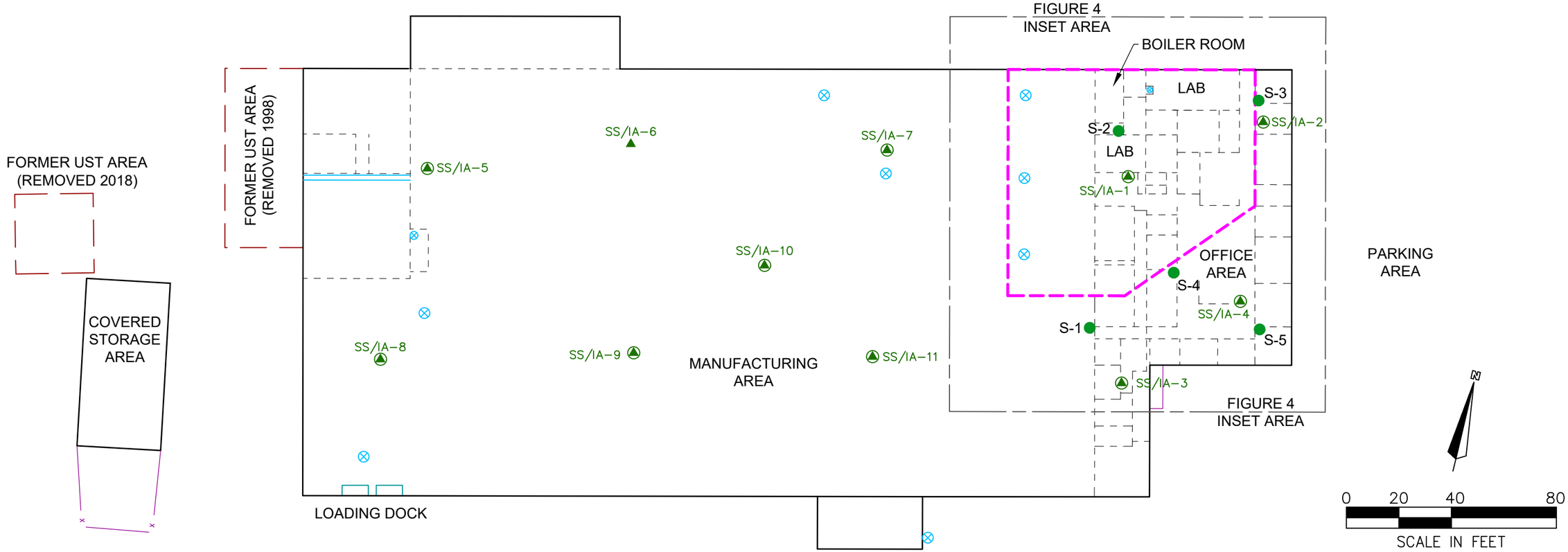

Figure 2
Facility Layout
524 Route 303
Orangeburg, New York

The Johnson Company
100 State Street, Suite 600
Montpelier, VT 05602

Drawn by: GWL	Date: 09/24/18
Reviewed by: CMT	Date: 09/25/18
Scale: 1" = 40'	Project: 1-0145-15

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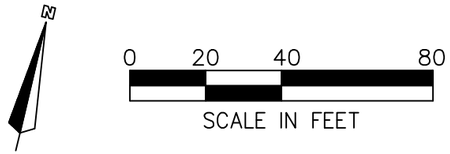


Type	SOIL GAS	INDOOR AIR
Sample	SS-5	IA-5
Date	1/31/2018	1/31/2018
PCE	130	0.24
TCE	9.5	ND (<0.17)
c12DCE	ND (<0.67)	ND (<0.13)
t12DCE	ND (<0.67)	ND (<0.63)
11DCE	ND (<0.67)	ND (<0.063)
VC	ND (<0.43)	ND (<0.041)
111TCA	9.5	ND (<0.17)
CT	3.6	0.42
11DCA	39	ND (<0.13)
12DCA	ND (<0.69)	ND (<0.13)

SS/IA–5

Type	SOIL GAS	INDOOR AIR
Sample	SS-6	IA-6
Date	1/31/2018	1/31/2018
PCE	340	0.30
TCE	ND (<1.6)	ND (<0.18)
c12DCE	ND (<1.2)	ND (<0.13)
t12DCE	ND (<1.2)	ND (<0.67)
11DCE	ND (<1.2)	ND (<0.067)
VC	ND (<0.78)	ND (<0.043)
111TCA	7.3	ND (<0.18)
CT	ND (<1.9)	0.40
11DCA	ND (<1.2)	ND (<0.14)
12DCA	ND (<1.2)	ND (<0.14)

SS/IA–6

Type	SOIL GAS	INDOOR AIR
Sample	SS-7	IA-7
Date	1/31/2018	1/31/2018
PCE	40	0.31
TCE	ND (<0.88)	ND (<0.17)
c12DCE	ND (<0.65)	ND (<0.13)
t12DCE	ND (<0.65)	ND (<0.64)
11DCE	ND (<0.65)	ND (<0.064)
VC	ND (<0.42)	ND (<0.041)
111TCA	4.0	ND (<0.18)
CT	ND (<1.0)	0.42
11DCA	ND (<0.66)	ND (<0.13)
12DCA	ND (<0.66)	ND (<0.13)

SS/IA–7

Type	SOIL GAS	INDOOR AIR
Sample	SS-1	IA-1
Date	1/31/2018	1/31/2018
PCE	470	0.56
TCE	180	ND (<0.18)
c12DCE	58	ND (<0.13)
t12DCE	2.0	ND (<0.66)
11DCE	ND (<1.3)	ND (<0.066)
VC	ND (<0.81)	ND (<0.042)
111TCA	ND (<1.7)	ND (<0.18)
CT	ND (<2.0)	0.43
11DCA	ND (<1.3)	ND (<0.13)
12DCA	ND (<1.3)	ND (<0.13)

SS/IA–1

Type	SOIL GAS	INDOOR AIR
Sample	SS-2	IA-2
Date	1/31/2018	1/31/2018
PCE	4.7	0.69
TCE	ND (<0.84)	ND (<0.18)
c12DCE	ND (<0.62)	ND (<0.13)
t12DCE	ND (<0.62)	ND (<0.65)
11DCE	ND (<0.62)	ND <0.065)
VC	ND (<0.40)	ND (<0.042)
111TCA	ND (<0.85)	ND (<0.18)
CT	ND (<0.98)	0.39
11DCA	ND (<0.63)	ND (<0.13)
12DCA	ND (<0.63)	ND (<0.13)

SS/IA–2

Type	SOIL GAS	INDOOR AIR
Sample	SS-4	IA-4
Date	1/31/2018	1/31/2018
PCE	8.1	0.61
TCE	ND (<0.86)	ND (<0.17)
c12DCE	ND (<0.63)	ND (<0.13)
t12DCE	ND (<0.63)	ND (<0.64)
11DCE	ND (<0.63)	ND (<0.064)
VC	ND (<0.41)	ND (<0.041)
111TCA	ND (<0.87)	ND (<0.18)
CT	ND (<1.0)	0.40
11DCA	ND (<0.65)	ND (<0.13)
12DCA	ND (<0.65)	ND (<0.13)

OFFICE AREA

SS/IA–4

Type	SOIL GAS	INDOOR AIR
Sample	SS-3	IA-3
Date	1/31/2018	1/31/2018
PCE	10	0.52
TCE	1.1	ND (<0.16)
c12DCE	ND (<0.64)	ND (<0.12)
t12DCE	ND (<0.64)	ND (<0.61)
11DCE	ND (<0.64)	ND (<0.061)
VC	ND (<0.41)	ND (<0.039)
111TCA	ND (<0.88)	ND (<0.17)
CT	ND (<1.0)	0.44
11DCA	ND (<0.65)	ND (<0.12)
12DCA	ND (<0.65)	ND (<0.12)

SS/IA–3

Type	SOIL GAS	INDOOR AIR
Sample	SS-8	IA-8
Date	1/31/2018	1/31/2018
PCE	29	0.24
TCE	2.8	ND (<0.17)
c12DCE	ND (<0.63)	ND (<0.13)
t12DCE	ND (<0.63)	ND (<0.64)
11DCE	ND (<0.63)	ND (<0.064)
VC	ND (<0.41)	ND (<0.041)
111TCA	14	ND (<0.18)
CT	2.6	0.42
11DCA	0.87	ND (<0.13)
12DCA	ND (<0.64)	ND (<0.13)

SS/IA–8

LOADING DOCK

Type	SOIL GAS	INDOOR AIR
Sample	SS-9	IA-9
Date	1/31/2018	1/31/2018
PCE	930	0.32
TCE	ND (<2.9)	ND (<0.17)
c12DCE	ND (<2.2)	ND (<0.12)
t12DCE	ND (<2.2)	ND (<0.62)
11DCE	ND (<2.2)	ND (<0.062)
VC	ND (<1.4)	ND (<0.040)
111TCA	6.5	ND (<0.17)
CT	ND (<3.4)	0.37
11DCA	ND (<2.2)	ND (<0.13)
12DCA	ND (<2.2)	ND (<0.13)

SS/IA–9

Type	SOIL GAS	INDOOR AIR
Sample	SS-10	IA-10
Date	1/31/2018	1/31/2018
PCE	370	0.36
TCE	ND (<1.8)	ND (<0.18)
c12DCE	ND (<1.3)	ND (<0.13)
t12DCE	ND (<1.3)	ND (<0.65)
11DCE	ND (<1.3)	ND (<0.065)
VC	ND (<0.83)	ND (<0.042)
111TCA	2.5	ND (<0.18)
CT	ND (<2.0)	0.44
11DCA	ND (<1.3)	ND (<0.13)
12DCA	ND (<1.3)	ND (<0.13)

SS/IA–10

Type	SOIL GAS	INDOOR AIR
Sample	SS-11	IA-11
Date	1/31/2018	1/31/2018
PCE	17	0.37
TCE	ND (<0.83)	ND (<0.18)
c12DCE	ND (<0.61)	ND (<0.13)
t12DCE	ND (<0.61)	ND (<0.67)
11DCE	ND (<0.61)	ND (<0.067)
VC	ND (<0.40)	ND (<0.043)
111TCA	ND (<0.84)	ND (<0.18)
CT	1.3	ND (<0.21)
11DCA	ND (<0.61)	ND (<0.14)
12DCA	ND (<0.63)	ND (<0.14)

SS/IA–11

Type	OUTDOOR AIR
Sample	OA-1
Date	1/31/2018
PCE	ND (<0.20)
TCE	ND (<0.16)
c12DCE	ND (<0.12)
t12DCE	ND (<0.59)
11DCE	ND (<0.059)
VC	ND (<0.038)
111TCA	ND (<0.16)
CT	0.40
11DCA	ND (<0.12)
12DCA	ND (<0.12)

Abbreviations:

PCE	Tetrachloroethene
TCE	Trichloroethene
c12DCE	cis-1,2-Dichloroethene
t12DCE	trans-1,2-Dichloroethene
11DCE	1,1-Dichloroethene
VC	Vinyl chloride
111TCA	1,1,1-Trichloroethane
CT	Carbon Tetrachloride
11DCA	1,1-Dichloroethane
12DCA	1,2-Dichloroethane

Notes:

1. USEPA Screening Levels from Vapor Intrusion Screening Level Calculator version 3.5, June 2017 RSLs. Commercial Scenario, TCR = $1x10^{-6}$; THQ = 1.0 (USEPA, 2017)
2. Indoor Air Samples analyzed by Eurofins Air Toxics using USEPA Method TO-15 SIM
3. Sub-Slab Soil Vapor Samples analyzed by Eurofins Air Toxics using modified USEPA Method TO-15
4. Concentrations expressed in units of micrograms per cubic meter ($\mu g/m^3$)
5. "ND" = analyte not detected; analytical reporting limit provided in parentheses
6. Blue shaded values fall into 'mitigate' category on DOH decision matrices

LEGEND

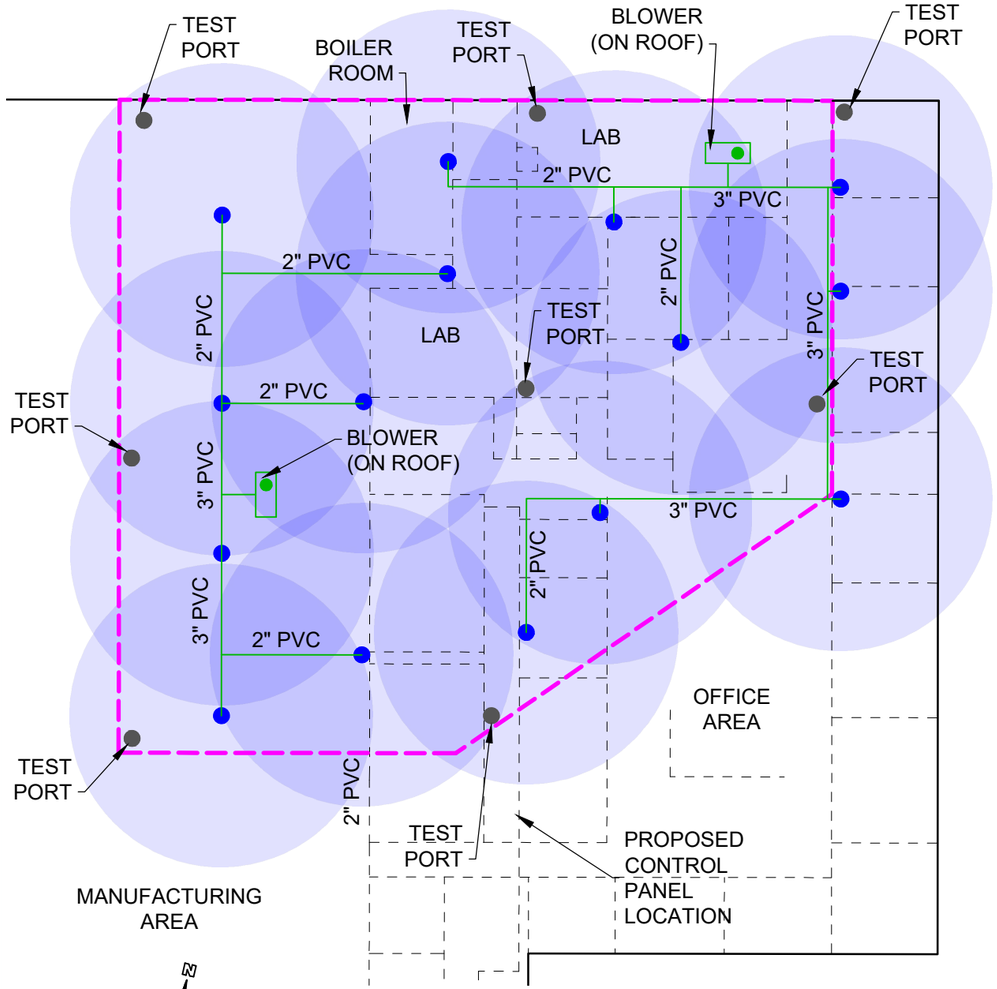
- Building Footprint
- Approximate Building Interior Partition
- Target Area for Potential Future Vapor Mitigation
- Sub–Slab Soil Gas and Indoor Air Sampling Location

Figure 3:
Sub-Slab Soil Gas and
Indoor Air Analytical Results - 2018
524 Route 303, Orangeburg, New York

SITE2018–TJK.dwg

The Johnson Company
100 State Street, Suite 600
Montpelier, VT 05602

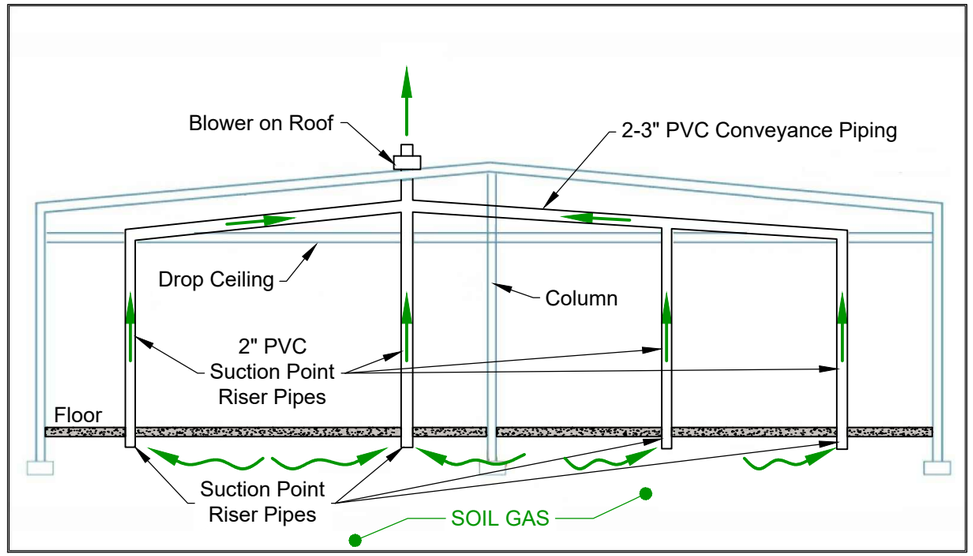
Drawn by: GWL Date: 09/24/18
Reviewed by: CMT Date: 09/25/18
Scale: As Shown Project: 1-0145-15



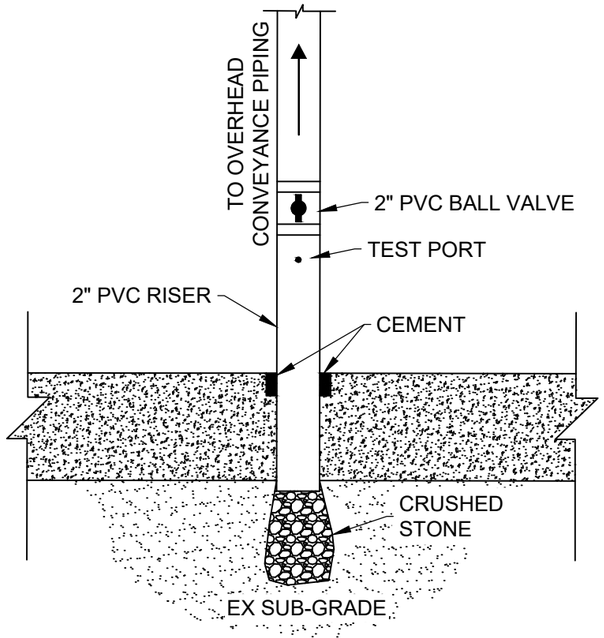
SSD SYSTEM LAYOUT
1" = 20'

LEGEND

- BUILDING FOOTPRINT
- APPROXIMATE BUILDING INTERIOR PARTITION
- TARGET SOIL VAPOR INTRUSION (SVI) MITIGATION AREA
- PROPOSED SSD SYSTEM CONVEYANCE PIPING
- PROPOSED SUCTION POINT
- PROPOSED SUCTION POINT RADIUS OF INFLUENCE
- PROPOSED TEST PORT



SSD SYSTEM SCHEMATIC
NOT TO SCALE



SUCTION POINT DETAIL
NOT TO SCALE

NOTES

1. LOCATIONS OF SUCTION POINTS AND PIPING SHOWN ARE APPROXIMATE. ACTUAL LOCATIONS WILL BE DETERMINED BASED ON FIELD CONDITIONS.
2. ALL PIPING SHALL BE INSTALLED AND SUPPORTED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.
3. ALL ELECTRICAL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.
4. ALL EQUIPMENT AND PIPING SHALL BE SECURED TO MINIMIZE MOVEMENT.
5. ALL PIPING SHALL BE SIZED AS SHOWN AND CONTINUOUSLY SLOPED TOWARDS A SUCTION POINT.
6. CONTRACTOR TO SECURE ALL NECESSARY PERMITS PRIOR TO INSTALLATION OF SSD SYSTEM.
7. A MINIMUM SUB-SLAB PRESSURE DIFFERENTIAL OF 0.004 INCH WC SHALL BE MAINTAINED AT ALL LOCATIONS.
8. SYSTEM DESIGNED BY OBAR SYSTEMS, INC. AS PRESENTED IN "DIAGNOSTIC REPORT AND SYSTEM DESIGN, 524 ROUTE 303, ORANGEBURG, NEW YORK" DATED AUGUST 16, 2018.

Figure 4 - Proposed Sub-Slab Depressurization System
524 Route 303
Orangeburg, New York

The Johnson Company
100 State Street, Suite 600
Montpelier, VT 05602

Drawn by: GWL Date: 01/16/19
Reviewed by: CMT Date: 01/16/19
Scale: 1" = 20' Project: 1-0145-15

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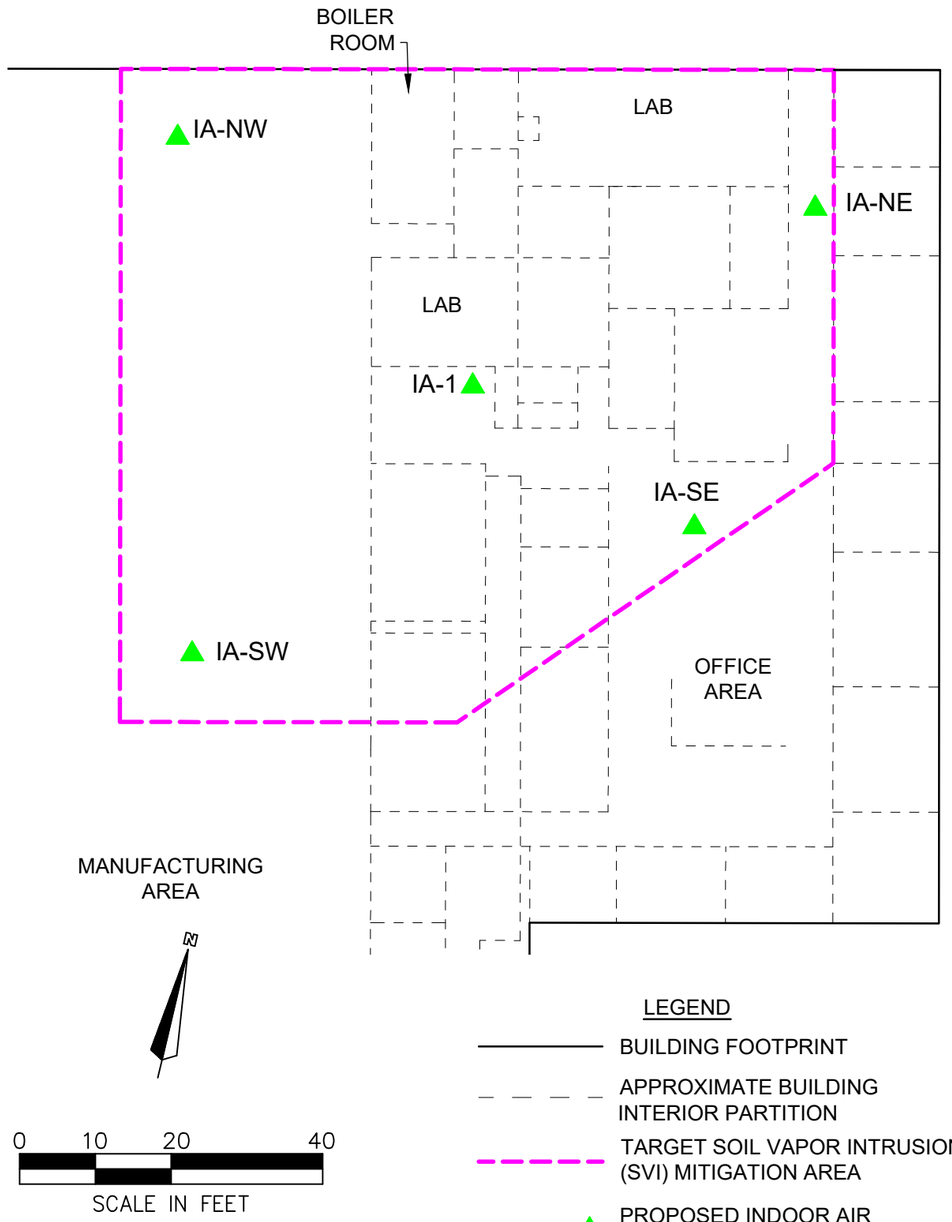

Figure 5 - Confirmation Testing
Indoor Air Sample Locations
524 Route 303
Orangeburg, New York

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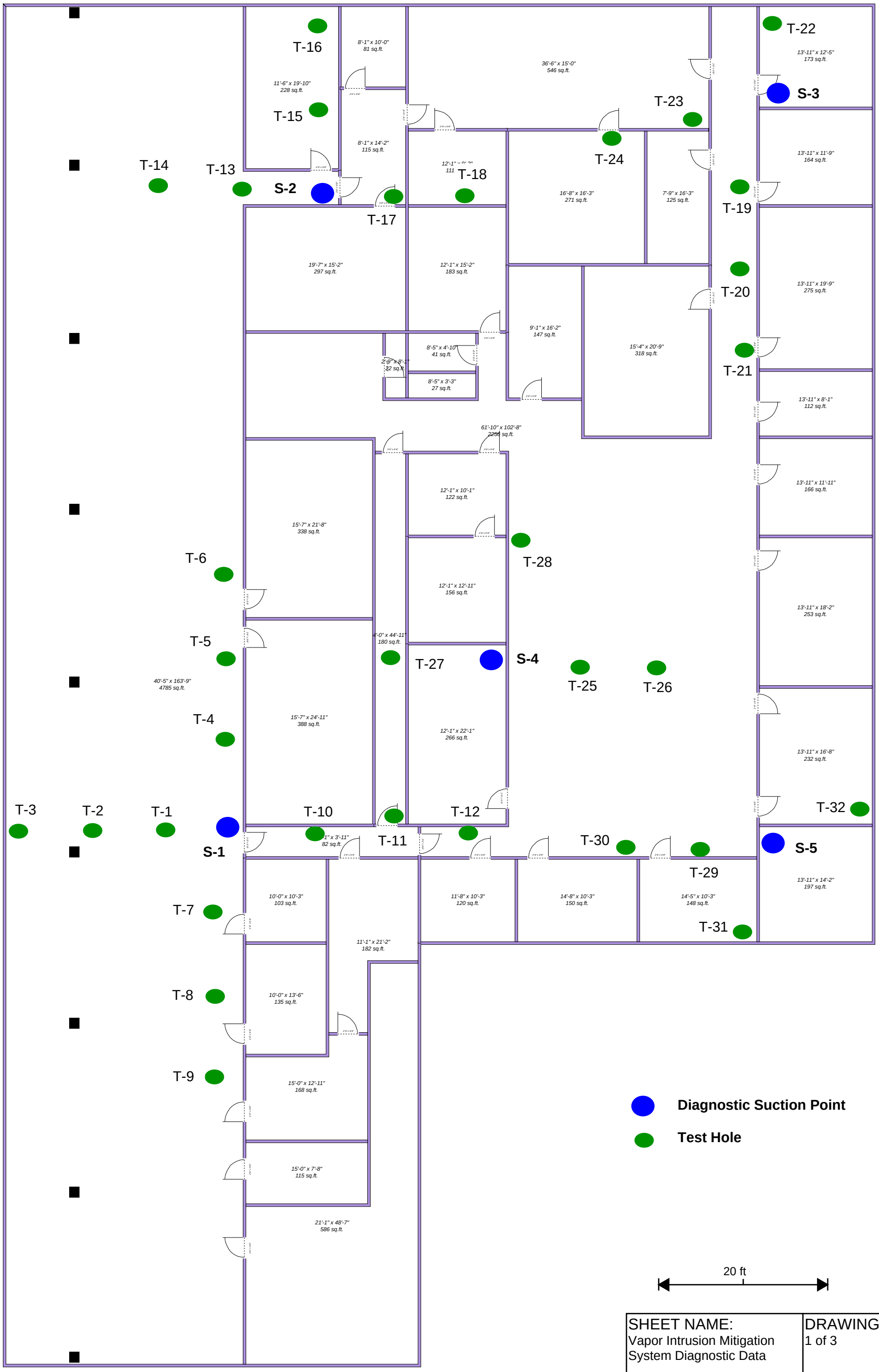
The Johnson Company
100 State Street, Suite 600
Montpelier, VT 05602

Drawn by: GWL	Date: 01/16/19
Reviewed by: CMT	Date: 01/16/19
Scale: 1" = 20'	Project: 1-0145-15

APPENDIX A

Diagnostic Testing Data



SHEET NAME:	DRAWING NO:
Vapor Intrusion Mitigation System Diagnostic Data	1 of 3

OBAR Systems Inc. 2696 Rt. 23 South Newfoundland, NJ 07435 OBAR SYSTEMS, INC.	Mitigation Specialist Gunnar Barr NJDEP MIS 10056	SITE ADDRESS: 524 Rt. 303 Orangeburg, NY	DATE: 8/9/2018

Suction Point # :	S1			
Location / Description :	In warehouse on block wall			
Soil Description	Tightly compacted red soils			
Temperature :	80°F			
Weather :	Clear			
Background ΔP :	0.0002			
	Distance (ft.)	**Series 1**	**Series 2**	**Max**
Airflow Yield (cfm)		5	<5	18
Applied Vacuum (''w.c.)		30	20	96
SSP 1 (1' from applied)		12	9	31
T-1	10	0.1360	0.0910	
T-2	20	0.0280	0.0200	
T-3	30	0.0055	0.0030	
T-4	10	0.5857	0.4830	
T-5	20	0.0060	0.0030	
T-6	30	BG	BG	
T-7	10	0.1360	0.1005	
T-8	20	0.0140	0.0110	
T-9	30	0.0018	0.0010	
T-10	10	0.2960	0.2388	
T-11	20	BG	BG	
T-12	30	BG	BG	

Test Point data is reported in inches of water column.
All pressure values negative unless indicated otherwise.
BG: Background

Suction Point # :	S2			
Location / Description :	In warehouse on block wall			
Soil Description	Moderatly compacted red soils			
Temperature :	86°F			
Weather :	Clear			
Background ΔP :	0.0003			
	Distance (ft.)	**Series 1**	**Series 2**	**Max**
Airflow Yield (cfm)		< 5	< 5	10
Applied Vacuum (''w.c.)		30	20	94
SSP 1 (1' from applied)		13	9	34
T-13	10	1.2000	0.8900	
T-14	20	0.0300	0.0100	
T-15	10	0.0080	0.0046	
T-16	20	0.0020	BG	
T-17	6	0.0745	0.0500	
T-18	18	0.0036	0.0020	

Test Point data is reported in inches of water column.
All pressure values negative unless indicated otherwise.
BG: Background

Suction Point # :	S3			
Location / Description :	In front office			
Soil Description	Moderatly compacted red soils			
Temperature :	86°F			
Weather :	Clear			
Background ΔP :	0.0003			
	Distance (ft.)	**Series 1**	**Series 2**	**Max**
Airflow Yield (cfm)		< 5	< 5	5
Applied Vacuum (''w.c.)		30	20	90
SSP 1 (1' from applied)		13	9	16
T-19	10	0.0160	0.0110	
T-20	20	0.0051	0.0040	
T-21	30	0.0070	BG	
T-22	10	0.0200	0.0147	
T-23	10	0.0650	0.0542	
T-24	20	0.0051	0.0043	

Test Point data is reported in inches of water column.
All pressure values negative unless indicated otherwise.
BG: Background

Suction Point # :	S4			
Location / Description :	In conference room			
Soil Description	Moderatly compacted red soils			
Temperature :	86°F			
Weather :	Clear			
Background ΔP :	0.0003			
	Distance (ft.)	**Series 1**	**Series 2**	**Max**
Airflow Yield (cfm)		40	30	60
Applied Vacuum (''w.c.)		30	20	60
SSP 1 (1' from applied)		10	6.5	16
T-12	20	0.3269	0.2420	
T-25	10	0.0640	0.0430	
T-26	20	0.0160	0.0090	
T-27	10	0.0040	0.0027	
T-28	15	0.0754	0.0530	
T-10	28	0.0058	0.0034	
T-11	20	0.0310	0.0190	

Test Point data is reported in inches of water column.
All pressure values negative unless indicated otherwise.
BG: Background

Suction Point # :	S5			
Location / Description :	In front office			
Soil Description	Moderatly compacted red soils			
Temperature :	86°F			
Weather :	Clear			
Background ΔP :	0.0003			
	Distance (ft.)	**Series 1**	**Series 2**	**Max**
Airflow Yield (cfm)		< 5	< 5	< 5
Applied Vacuum (''w.c.)		30	20	88
SSP 1 (1' from applied)		10	7	25
T-29	10	0.0960	0.0740	
T-30	20	0.0025	0.0020	
T-31	10	0.0490	0.0380	
T-32	10	0.0040	BG	
T-26	20	0.0094	0.0071	

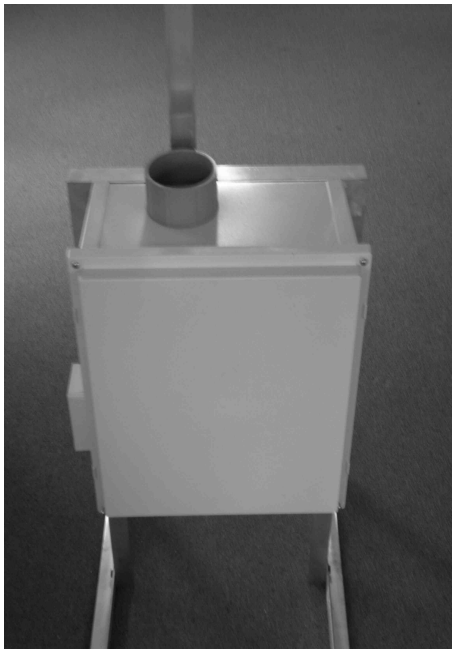
Test Point data is reported in inches of water column.
All pressure values negative unless indicated otherwise.
BG: Background

APPENDIX B

SSD System Equipment Cut Sheets

THE OBAR GBR76
COMPACT RADIAL BLOWER

Based on 25 years of experience and 2 years of research and development, the patent pending GBR series of compact radial blowers provide the perfect combination of performance and design.



GBR76 WITH ROOF MOUNT

PERFORMANCE

- GBR76 SOE 16” WC @ 0 Max flow 155 CFM.
- GBR76 UD 40” WC @ 0 Max flow 195 CFM.
- Built in speed control to customize performance.
- Condensate bypass built in.
- 12 month warranty 40,000 hr sealed bearings.

DESIGN

- Our modular design means the blower and manifold assembly can be removed and replaced as a unit. This makes repairs cost effective and easy and allows contractors to upgrade systems simply by swapping assemblies.
- The GBR series is based on a bypass blower designed to handle combustible materials.
- The housing is not required to be air tight so you can add gauges and alarms without compromising the system.
- Built in condensate bypass.
- Built in speed control.
- Quick disconnect electrical harness.
- All UL listed components including UL listed enclosure for outside use.
- Wall fastening lugs included.
- GBR series roof and wall mounts available to quickly configure the blowers for your installation while providing a custom built look.
- Compact design 16”x 14”x 8” weighing only 18 lbs.
- 3” schedule 40 inlet and exhaust.
- Universal Drive accepts voltage from 120-240V without alteration

GBR76 SOE	0”	2”	4”	6”	8”	10”	12”	16”	Wattage
SOE 16	150	140	129	118	105	90	75	35	150-320
SOE 12	125	115	100	83	62	39	0		110-200
SOE 8	105	90	70	42	0				60-120
SOE 4	75	50	0						37-50

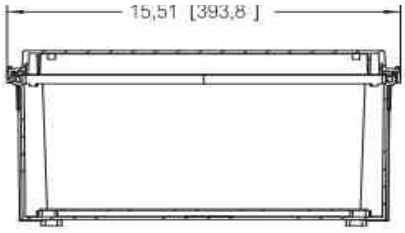
GBR SOE performance using built in potentiometer set at sealed vacuums of 16, 12, 8, and 4” WC

GBR76 UD	0”	10”	20”	30”	37”	Wattage
110V	195	158	118	63	20	700-870
220V	197	162	130	89	50	800-1100

Blower Specifications

Notes:

- **Input Voltage Range:** 108-132 Volts AC RMS, 50/60 Hz, single phase.
- **Input Current:** 6 amps AC RMS
- **Operating Temperature (Ambient Air and Working Air):** 0°C to 50°C
- **Storage Temperature:** -40°C to 85°C
- **Dielectric Testing:** 1500 Volts AC RMS 60 Hz applied for one second between input pins and ground, 3mA leakage maximum.
- **Speed Control Methods:** PWM (Pulse Width Modulation) (1 kHz to 10 kHz)
  0 to 10 VDC speed control.
  Mechanical: A potentiometer is available for speed control of the blower. The potentiometer can be preset for a specific speed. Access for speed adjustment located in motor housing.
- **Approximate Weight:** 4.8 Lbs. / 2.2 Kg
- **Regulatory Agency Certification:** Underwriters Laboratories Inc. UL507 Recognized under File E94403 and compliant under the CE Low Voltage Directive 2006/95/EC.
- **Design Features:** Designed to provide variable airflow for low NOx & CO emission in high efficiency gas fired combustion systems. Built with non-sparking materials. Blower housing assembly constructed of die cast aluminum. Impeller constructed from hardened aluminum. Rubber isolation mounts built into blower construction to dampen vibration within the motor. Two piece blower housing assembly sealed with O-ring gasket for combustion applications. Customer is responsible to check for any leakage once the blower is installed into the final application.
- **Miscellaneous:** Blower inlet, discharge, and all motor cooling inlet and discharge vents must not be obstructed. Motor ventilation air to be free of oils and other foreign particles, (i.e. breathing quality air). Blower is to be mounted so ventilation air cannot be re-circulated.
  POWER CONNECTION: Blower connector, AMP Universal MATE-N-LOK, part no. 1-350943-0.
  SPEED CONNECTION: Blower connector, Molex Mini-Fit Jr., part no. 39-30-3056.
  Mating harnesses available upon request.



Screw cover

Enclosure Specifications

Rating:

Ingress Protection (EN 60529): 66/67

Electrical insulation: Totally insulated

Halogen free (DIN/VDE 0472, Part 815): yes

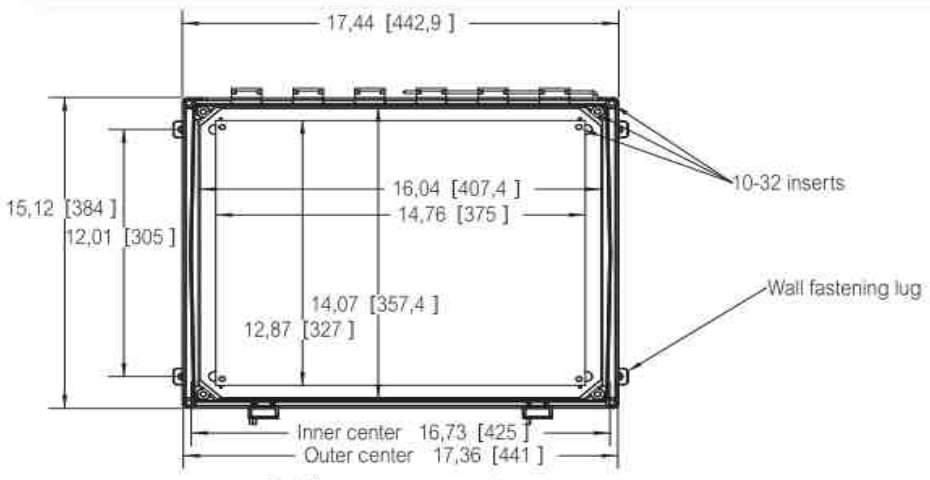
UV resistance: UL 508

Flammability Rating (UL 746 C 5): complies with UL 508

Glow Wire Test (IEC 695-2-1) °C: 960

NEMA Class: UL Type 4, 4X, 6, 6P, 12 and 13

Certificates: Underwriters Laboratories



Top View - cover removed

CHARLOTTE PIPE AND FOUNDRY COMPANY®

SUBMITTAL FOR CHARLOTTE PIPE®
PVC SCHEDULE 40 SOLID WALL PIPE AND PVC DWV FITTING SYSTEM

Date: _____

Job Name: _____ Location: _____

Engineer: _____ Contractor: _____

Scope:
This specification covers PVC Schedule 40 solid wall pipe and PVC DWV fittings used in sanitary drain, waste and vent (DWV), sewer and storm drainage applications. This system is intended for use in non-pressure applications where the operating temperature will not exceed 140° F.

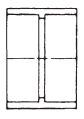
Specification:
Pipe shall be manufactured from virgin rigid PVC (polyvinyl chrloride) vinyl compounds with a cell class of 12454 as identified in ASTM D 1784. PVC Schedule 40 pipe shall be Iron Pipe Size (IPS) conforming to ASTM D 1785 and ASTM D 2665. Injection molded PVC DWV fittings shall conform to ASTM D 2665. Fabricated PVC DWV fittings shall conform to ASTM F 1866. All pipe and fittings shall be manufactured in the United States. All systems shall utilize a separate waste and vent system. Pipe and fittings shall conform to NSF International Standard 14.

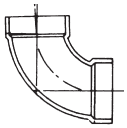
Installation:
Installation shall comply with the latest installation instructions published by Charlotte Pipe and Foundry and shall conform to all applicable plumbing, fire, and building code requirements. Buried pipe shall be installed in accordance with ASTM D 2321 and ASTM F 1668. Solvent cement joints shall be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire-stopping materials, thread sealant, plasticized-vinyl products or other aggressive chemical agents not compatible with PVC compounds. The system shall be hydrostatically tested after installation.
WARNING! Never test with or transport/store compressed air or gas in PVC pipe or fittings. Doing so can result in explosive failures and cause severe injury or death.

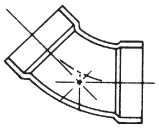
Referenced Standards:

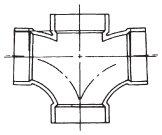
ASTM D 1784:	Rigid Vinyl Compounds
ASTM D 1785:	PVC Plastic Pipe, Schedule 40
ASTM D 2665:	PVC Drain, Waste and Vent Pipe and Fittings
ASTM D 2564:	Solvent Cements for PVC Pipe and Fittings
ASTM D 2321:	Underground Installation of Thermoplastic Pipe (non-pressure applications)
ASTM F 656:	Primers for PVC Pipe and Fittings
ASTM F 1668:	Procedures for Buried Plastic Pipe
ASTM F 1866:	Fabricated PVC DWV Fittings
NSF Standard 14:	Plastic Piping Components and Related Materials

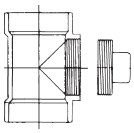
MADE IN USA

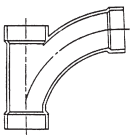

Coupling

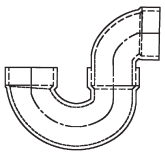

Quarter Bend

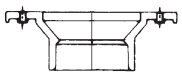

Eighth Bend


Double Sanitary Tee


Cleanout Tee w/Plug


Combination Wye & Eighth Bend


P-Trap


Closet Flange

Not all fitting patterns shown

PVC Schedule 40 DWV Pipe

PVC Schedule 40 DWV Pipe

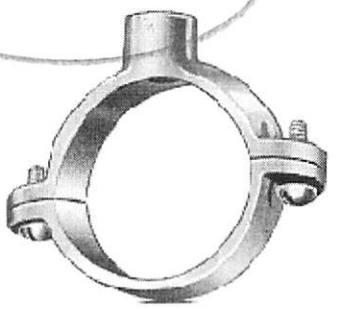
NSF

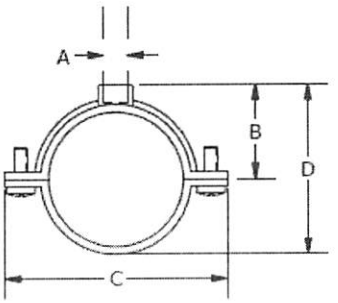
PVC SCHEDULE 40 (WHITE)		PLAIN END		PVC 1120		ASTM D 2665
PART NO.	NOM. SIZE	UPC # 611942-	QTY. PER SKID	AVG. OD (IN.)	MIN. WALL (IN.)	WT. PER 100 FT. (LBS.)
PVC 7100*	1¼″x10′	03945	2120′	1.660	.140	42.4
PVC 7100*	1¼″x20′	03946	4240′	1.660	.140	42.4
PVC 7112*	1½″x10′	03947	1650′	1.900	.145	51.8
PVC 7112*	1½″x20′	03948	3300′	1.900	.145	51.8
PVC 7200*	2″x10′	03949	1110′	2.375	.154	69.5
PVC 7200*	2″x20′	03950	2220′	2.375	.154	69.5
PVC 7300*	3″x10′	03951	1040′	3.500	.216	144.2
PVC 7300*	3″x20′	03952	920′	3.500	.216	144.2
PVC 7400†	4″x10′	03953	600′	4.500	.237	205.5
PVC 7400†	4″x20′	03954	1200′	4.500	.237	205.5
PVC 7500†	5″x20′	04837	760′	5.563	.258	272.5
PVC 7600†	6″x10′	03955	280′	6.625	.280	361.2
PVC 7600†	6″x20′	03956	560′	6.625	.280	361.2
PVC 7800†	8″x10′	13087	180′	8.625	.322	543.6
PVC 7800†	8″x20′	03958	360′	8.625	.322	543.6
PVC 7910†	10″x20′	03959	220′	10.750	.365	770.7
PVC 7912†	12″x20′	03961	120′	12.750	.406	1019.0
PVC 7914†	14″x20′	04862	60′	14.000	.437	1205.0
PVC 7916†	16″x20′	04918	60′	16.000	.500	1575.7

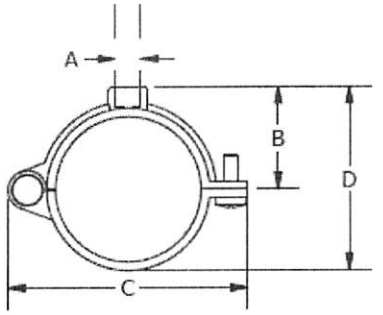
*** Dual Marked ASTM D 1785 & ASTM D 2665.**
† Triple Marked ASTM D 1785 & ASTM D 2665 & ASTM F 480.

FIG. 100

SPLIT RING EXTENSION HANGER







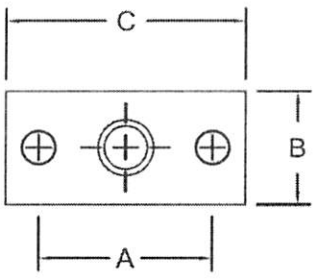
MATERIAL: Malleable iron, stainless steel.
FINISH: Black or electro galvanized.
SERVICE: For suspension of non-insulated stationary pipe lines.
ORDERING: Specify pipe size, figure number and finish.
APPROVALS: Complies with Federal Specification WW-H-171E Type 25 and Manufacturers' Standardization Society SP-58 & SP-69 Type 12.

PIPE SIZE	A	B	WEIGHT/C APPROX.	MAX REC. LOAD, LB.
3/8*	3/8	11/16	16	180
1/2	3/8	13/16	17	180
3/4	3/8	15/16	20	180
1	3/8	1 1/16	21	180
1 1/4	3/8	1 1/4	29	180
1 1/2	3/8	1 5/16	31	180
2	3/8	1 5/8	35	180
2 1/2*	1/2	1 15/16	57	300
3*	1/2	2 3/8	72	300
4*	1/2	2 7/8	116	300

*Sizes 3/8, 2 1/2, 3 and 4 are hinged style

FIG. 105

HANGER FLANGE



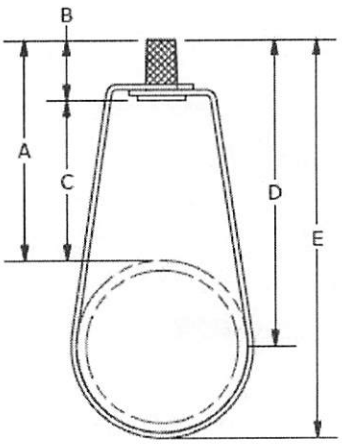
MATERIAL: Malleable iron, stainless steel.
FINISH: Black or electro-galvanized.
SERVICE: For attachment to wood beams, ceilings or floors.
ORDERING: Specify tap size, figure number and finish.

BOLT TAP	A	B	C	WEIGHT (APPROX.) PER 100
3/8	1 15/16	1 15/16	2 3/4	18
1/2	1 15/16	1 15/16	2 3/4	17

FIG. 110

ADJUSTABLE SWIVEL RING HANGER, STD. & NFPA

MATERIAL: Carbon steel.
FINISH: Electro-galvanized.
SERVICE: Recommended for suspension of non-insulated, stationary pipe lines and conduit. Approved for use without additional locking nuts normally required with pipe hangers.
ORDERING: Specify pipe size and figure number.
APPROVALS: Underwriter's Laboratories Listed for ¾"-2" and Factory Mutual Approved for ¾"-4". Complies with Federal Specification WW-H-171E Type 10 and Manufacturers' Standardization Society SP-58 & SP-69 Type 10.

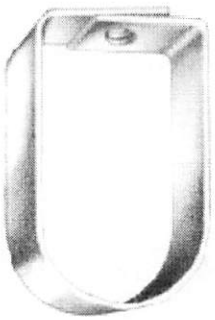


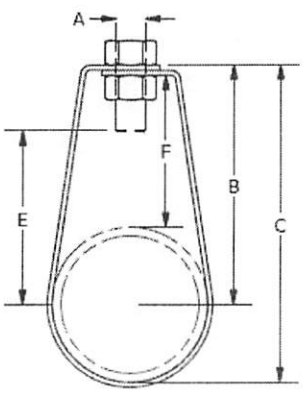
PIPE SIZE	WEIGHT PER 100	MAX. REC. LOAD LB.	DIMENSIONS					MATERIAL SIZE	ROD SIZE	NFPA ROD SIZE
			A	B	C	D	E			
½	11	400	2¼	⅞	1½	2⅝	3 3/16	16ga x ⅝	⅜	⅜
¾	11	400	2 1/16	⅞	1¼	2½	3 3/16	16ga x ⅝	⅜	⅜
1	12	600	2	⅞	1⅛	2⅝	3⅜	16ga x ⅝	⅜	⅜
1¼	13	600	2	⅞	1⅛	2¾	3¾	16ga x ⅝	⅜	⅜
1½	14	600	1⅞	⅞	1⅛	2⅞	4	16ga x ⅝	⅜	⅜
2	15	600	2⅛	⅞	1¼	3¼	4⅝	16ga x ⅝	⅜	⅜
2½	32	600	2½	1⅛	1⅜	3¾	5⅝	13ga x ¾	½	⅜
3	34	600	2⅞	1⅛	2⅞	4½	6¼	13ga x ¾	½	⅜
3½	37	600	3	1⅛	1¾	5	7	13ga x ¾	½	⅜
4	78	1250	2¾	1⅛	1¾	5	7⅜	11ga x 1	⅝	⅜
5	94	1250	3¼	1⅛	1⅞	6	9⅛	11ga x 1	⅝	½
6	120	1250	3¾	1½	2½	7¼	10⅝	11ga x 1	¾	½
8	145	1250	4½	1½	3⅛	8⅞	13⅛	11ga x 1	¾	½

FIG. 115

ADJUSTABLE BAND HANGER

MATERIAL: Carbon steel.
FINISH: Black, electro-galvanized.
SERVICE: For suspension of non-insulated, stationary pipe lines and conduit.
ORDERING: Specify pipe size, figure number and finish.
APPROVALS: Complies with Federal Specification WW-H-171E Type 7 and Manufacturers' Standardization Society SP-58 & SP-69 Type 7.

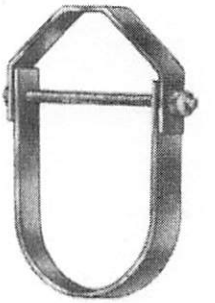




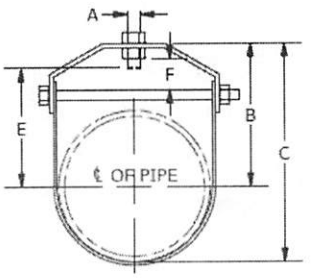
PIPE SIZE	MATERIAL SIZE	MAX. REC. LOAD LB.	A	B	C	E	F	WEIGHT PER 100
⅜	16ga x ⅞	610	⅜	2 5/16	2⅝	1 9/16	1⅜	11
½	16ga x ⅞	610	⅜	2 3/16	2⅝	1 7/16	1¼	11
¾	16ga x ⅞	610	⅜	2 1/16	2⅝	1 5/16	1	12
1	16ga x ⅞	610	⅜	2 1/16	2 11/16	1 5/16	1 5/16	12
1¼	16ga x ⅞	610	⅜	2 9/16	3 7/16	1 13/16	1¼	14
1½	16ga x ⅞	610	⅜	2¾	3 11/16	2	1 3/16	16
2	16ga x ⅞	610	⅜	3	4 3/16	2¼	1 3/16	23
2½	14ga x 1	970	½	3 7/16	4⅞	2 7/16	1¼	28
3	13ga x 1	970	½	4¼	6	3¼	1⅝	41
3½	13ga x 1	970	½	4⅛	6⅛	3⅛	1⅜	44
4	11ga x 1	1250	½	4½	6¾	3¼	1⅜	87
5	11ga x 1	1250	½	5	7¾	4¾	1¼	100
6	11ga x 1½	1600	¾	6 11/16	10	5 3/16	2⅛	160
8	11ga x 1½	1800	¾	7 9/16	11⅞	6 13/16	2	260

FIG. 200

ADJUSTABLE CLEVIS HANGER



MATERIAL: Carbon steel and 304/316 stainless steel.
FINISH: Black, electro or hot-dipped galvanized.
SERVICE: For the suspension of non-insulated, stationary pipe lines.
ORDERING: Specify pipe size, figure number and finish.
APPROVALS: Underwriters Laboratories Listed and Factory Mutual Approve ¾"-8". Complies with Federal Specification WW-H-171E Type 1 and Manufacturers' Standardization Society SP-58 & SP-69 Type 1.



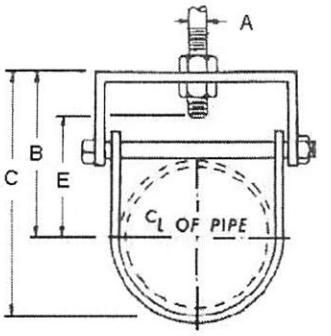
PIPE SIZE	SIZE OF STEEL		A	B	C	E	F	WGT. PER 100	MAX. REC. LOAD, LBS.
	UPPER	LOWER							
½	13ga x ⅞	13ga x ⅞	⅜	1 11/16	2 1/16	1 5/16	7/16	18	610
¾	13ga x ⅞	13ga x ⅞	⅜	1 11/16	2 9/16	1 5/16	7/16	18	610
1	13ga x ⅞	13ga x ⅞	⅜	2 1/16	2 11/16	1 5/8	5/8	22	610
1¼	13ga x ⅞	13ga x ⅞	⅜	2½	3 3/16	2 1/16	⅞	26	610
1½	12ga x ⅞	12ga x ⅞	⅜	2⅞	3 11/16	2 7/16	1 1/16	34	610
2	12ga x ⅞	12ga x ⅞	⅜	3 5/16	4 7/16	2 7/8	1¼	38	610
2½	9ga x 1 3/16	10ga x 1 3/16	½	4½	5 7/8	3 7/8	1 15/16	86	1130
3	9ga x 1 3/16	10ga x 1 3/16	½	4¾	6½	4 3/16	1¾	96	1130
3½	8ga x 1 3/16	10ga x 1 3/16	½	5⅞	7 15/16	5 5/16	2 9/16	114	1130
4	8ga x 1 3/16	10ga x 1 3/16	⅝	5 15/16	8 3/16	5 3/16	2⅛	126	1430
5	4ga x 1¼	8ga x 1¼	⅝	5 11/16	8 7/16	4 15/16	1 7/16	220	1430
6	3ga x 1½	8ga x 1½	¾	6 13/16	10⅛	5 15/16	1¾	300	1940
7	3ga x 1½	8ga x 1½	¾	7 13/16	11⅝	6 15/16	2	420	2000
8	3ga x 1¾	8ga x 1¾	¾	8 1/16	12 7/16	7⅛	1⅞	450	2000
10	⅜ x 1¾	3ga x 1¾	⅞	10	15 7/16	8⅞	2¼	806	3600
12	⅜ x 2	3ga x 2	⅞	11 9/16	18	10 7/16	2 13/16	1100	3800
14	½ x 2	¼ x 2	1	12 9/16	19 9/16	10 9/16	2 9/16	1480	4200
16	½ x 2½	¼ x 2½	1	13 15/16	21 15/16	11 15/16	2 13/16	2100	4600
18	½ x 2½	¼ x 2½	1	16	25	13⅞	3¾	2440	4800
20	⅝ x 3	⅜ x 3	1¼	17½	27½	15⅛	3¾	4700	4800
24	⅝ x 3	⅜ x 3	1¼	19¾	31¾	17⅜	4	5400	4800
30	¾ x 3	⅜ x 3	1¼	24⅛	39⅛	21½	4¾	6950	6000

NOTE: CLEVIS HANGERS FOR 20" PIPE AND LARGER ARE FURNISHED WITH PIPE SPACER ON CROSS BOLTS

FIG. 205

FLAT TOP CLEVIS HANGER

MATERIAL: Carbon steel.
FINISH: Black, electro or hot-dipped galvanized.
SERVICE: General piping, where space does not permit installation of standard figure 200 clevis hanger.
ORDERING: Specify pipe size, figure number and finish.



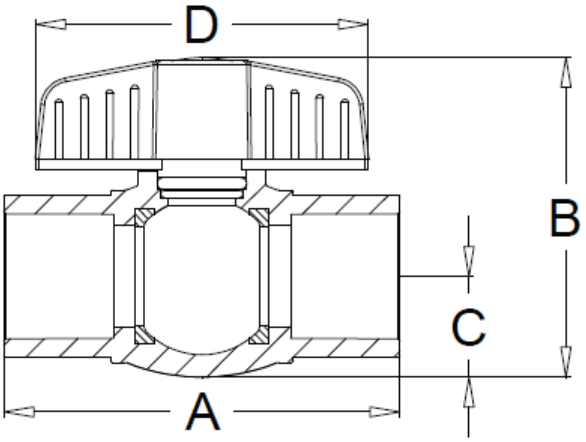
PIPE SIZE	SIZE OF STEEL		A	B	C	E	MAX. REC. LOAD, LBS.	WGT. PER 100
	UPPER YOKE	LOWER STRAP						
2	8ga x 1	12ga x ⅞	⅜	2½	3 11/16	2 1/16	300	46
2½	8ga x 1¼	10ga x 1 3/16	½	2⅞	4 3/16	2 5/16	500	78
3	8ga x 1¼	10ga x 1 3/16	½	3⅝	5⅜	3 1/16	500	98
3½	8ga x 1¼	10ga x 1 3/16	½	4 1/16	6 1/16	3 7/16	500	136
4	4ga x 1¼	10ga x 1 3/16	⅝	4 1/16	6 5/16	3 5/16	700	138
5	4ga x 1¼	8ga x 1¼	⅝	4⅞	7⅝	4⅛	700	208
6	3ga x 1½	8ga x 1½	¾	5½	8⅞	4⅝	900	282
8	3ga x 1¾	8ga x 1¾	⅞	6⅜	10⅞	5½	1000	434

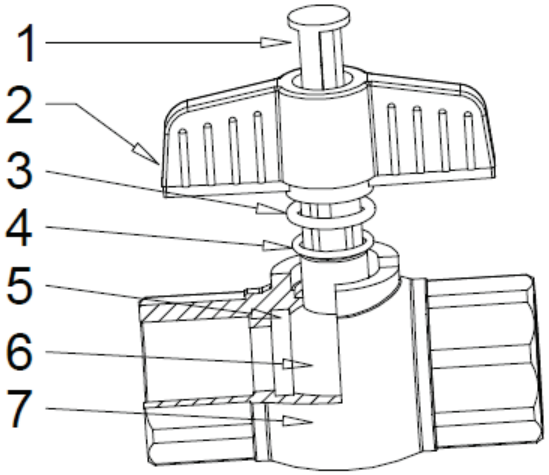
770 White PVC Ball Valve • Spec Sheet

Sizes 1/2” - 2”

FEATURES & BENEFITS

- ISO 9002
- 150 PSI @ 73 Deg. F.
- White Color
- NSF Approved
- Fits Sch. 40 & Sch. 80 Pipe
- Threaded or Solvent Ends
- Threaded Ends Comply With ANSI B1.20.1
- Solvent Ends Comply With ASTM D2466





DIMENSIONS

Part # Threaded	Part # Solvent	Size	A	B	C	D
770T03	770S03	1/2”	3.16	2.46	0.71	2.74
770T04	770S04	3/4”	3.61	2.98	0.87	3.01
770T05	770S05	1”	4.19	3.39	1.06	3.53
770T06	770S06	1-1/4”	4.76	3.80	1.21	3.54
770T07	770S07	1-1/2”	5.13	4.32	1.46	4.42
770T08	770S08	2”	5.93	5.36	1.83	5.53

MATERIAL SPECIFICATIONS

No.	Part	Material
1	Cap	ABS
2	Handle	ABS
3	O-Ring	EPDM
4	O-Ring	EPDM
5	Seat (2)	PTFE
6	Ball	PC + ABS
7	Body	PVC

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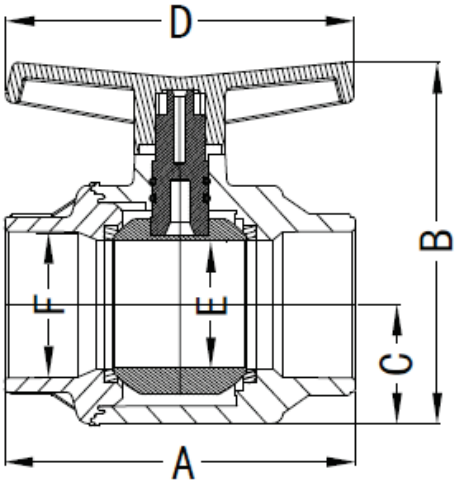
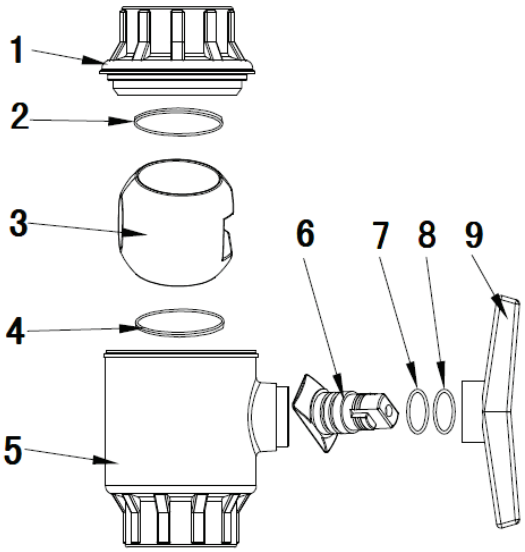
770 White PVC Ball Valve • Spec Sheet

Sizes 2-1/2" - 4"

FEATURES & BENEFITS

- ISO 9002
- 150 PSI @ 73 Deg. F.
- White Color
- NSF Approved
- Fits Sch. 40 & Sch. 80 Pipe
- Threaded or Solvent Ends
- Threaded Ends Comply With ANSI B1.20.1
- Solvent Ends Comply With ASTM D2466





DIMENSIONS

Part # Threaded	Part # Solvent	Size	A	B	C	D	E	F
770T09	770S09	2-1/2"	7.48	7.68	2.26	7.09	2.62	2.87
770T10	770S10	3"	8.66	8.86	2.66	9.05	3.06	3.49
770T11	770S11	4"	10.24	10.24	3.35	10.04	4.03	4.49

MATERIAL SPECIFICATIONS

No.	Part	Material
1	Nut	PVC
2, 4	Seat (2)	PTFE
3	Ball	PVC
5	Body	PVC
6	Stem	PVC
7, 8	O-Ring (2)	EPDM
9	Handle	ABS

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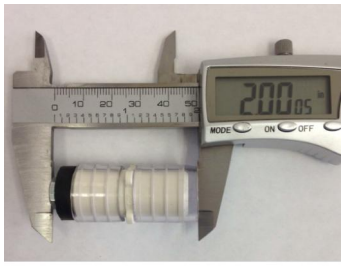
OBAR SYSTEMS 2969 RT 23 SOUTH NEWFOUNDLAND NJ 07435

FLOOR PORT

Components

1. A hard plastic inner core that measures 1.5" in length with a .50 inch bore, a .75 inch outside diameter and 4 lugs that extend to .84 inches.
2. A plastic sleeve that has a.75 inch inside diameter and a .80 inch outside diameter
3. A 1/4 -20 x 1/2 rubber insulated brass rivet nut
4. A stainless steel 1/4-20 x1" bolt

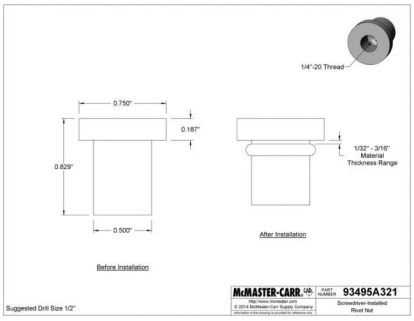
Port assembly



Port assembly

Rubber insulated nut

Rubber insulated nut



Installation

Warning: Installation requires the use of concrete drilling equipment. The installer must be familiar with and follow all safety procedures required for the use of such equipment including but not limited to the use of hearing and eye protection.

1. Select the area to drill the hole for the port. The contractor should make every effort to determine the the selected area is free of any utilities or pipes in or under the selected point. In addition the use of a drill interrupter such as the Protek11 is highly recommended .

2. Drill a 20MM (.79") hole through the concrete and clean all dust and debris from both in and around the hole with a commercial vacuum equipped with a HEPA filter.

3. Insert the port assembly into the clean hole and using a dead blow hammer and the driver tool drive the assembly into floor to a point where the top of the bolt is flush with the surface of the floor. The port is now ready to use.

Protek 11 Drill Interrupter