

Geology

Hydrology

Remediation

Water Supply

REF: 10-15

NOV 15 2007

**Site Management Plan
ShopRite Plaza, Newburgh, New York
NYSDEC Agreement Index No. W3-0867-99-11**

Prepared for:

**Newburgh Plaza Associates, LLC
257 Mamaroneck Avenue
Newburgh, New York 10605**

Prepared by:

**Alpha Geoscience
679 Plank Road
Clifton Park, New York 12065**

November 8, 2007

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1.0 INTRODUCTION

Alpha Geoscience (Alpha) has prepared this Site Management Plan on behalf of Newburgh Plaza Associates, LLC for the ShopRite Plaza, which includes the former Mr. Sharp Dry Cleaners, located on North Plank Road, Newburgh, New York (the Site). The location of the site is shown in Figure 1.

The site currently is part of the Voluntary Cleanup Program pursuant to New York State Department of Environmental Conservation (NYSDEC) Agreement Index No. W3-0867-99-11. A Remedial Action Work Plan describing the completed remedial measures at the site, and an engineering analysis of the appropriateness of those measures, was submitted to the NYSDEC on June 5, 2007.

The objective of this Site Management Plan is to describe the activities that will be performed to monitor the future environmental conditions at the site following the previously completed remedial actions. These activities will continue until the NYSDEC and the New York State Department of Health (NYSDOH) approve cessation and discontinuation of these activities, as supported by the monitoring data.

2.0 EXISTING SITE CONDITIONS

The site consists of a retail shopping plaza located on North Plank Road, Newburgh, N.Y. Figure 2 is a map of the primary area of environmental concern at the site (i.e. the area south of the plaza buildings) where volatile organic compounds (VOCs) associated with the former Mr. Sharp dry cleaners were detected in ground water monitoring wells. Most of the area beyond the site buildings is paved asphalt parking for the plaza. Plaza tenants currently include a ShopRite supermarket, a Dollar Store, an ice cream store, a Chinese take-out style restaurant, a hair salon, and an Italian restaurant. The former dry cleaner was located in the space now occupied by the Chinese restaurant.

The site and surrounding area are serviced by municipal water and sanitary sewers. The storm sewer at the site was replaced circa 1995 as part of the site remediation.

2.1 Sub-Slab Depressurization System

A sub-slab depressurization (SSD) system was installed in May 2006 in response to NYSDOH concerns that VOCs might enter site buildings as soil vapor. The SSD system was installed by Alpine Environmental Services, Inc. (Alpine). A complete report presenting the system installation,

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design, and performance testing is contained in the June 5, 2007, Remedial Action Work Plan and is also included herein as Appendix A.

The SSD System Installation Report describes the system construction details and the methods used to install the system. The report contains a map showing the layout of the system piping and fans; the system fan specifications; and recommended operations and maintenance for the components that comprise the system.

2.2 Ground Water Monitoring Network

The ground water monitoring well network consists of eight monitoring wells including, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, SB-1 and SB-3. Wells MW-3, MW-5, MW-6, MW-7, and MW-8 are constructed of 2-inch diameter PVC and are completed in the overburden. Wells S-1 and SB-3 are constructed of 1-inch diameter PVC and also are completed in the overburden. Well MW-4 is constructed of 4-inch diameter steel casing and is completed in bedrock.

Ground water samples were most recently collected and analyzed from wells MW-3, MW-5, MW-7, SB-1 and SB-3 on August 9, 2007. Sampling at wells MW-4, MW-6, and MW-8 was performed in the past but was discontinued with the approval of the NYSDEC, based on the absence of VOCs in these wells. Water level measurements indicate that the direction of ground water flow is consistently to the southwest.

The ground water quality investigation and analytical data collected to date document that the area of impact is local and that ground water quality is stable or improving within the area of concern. The existing monitoring well network has defined the areal extent of ground water quality impact as a localized area that is approximately 90 feet in length along an axis defined by upgradient wells SB-3 and MW-7 to downgradient wells SB-1 and MW-5. The highest concentrations of VOCs have historically been detected in well MW-7. Wells MW-6 and MW-8 are located cross-gradient and define the lateral boundaries where no ground water quality impact has been detected and ground water quality meets NYSDEC standards. Analytical results of samples collected from monitoring well MW-3 document that only low concentrations of VOCs have been detected downgradient.

Wells MW-3 and MW-5 are located at the farthest downgradient edge of the contaminant plume, based on the very low concentration of VOCs in these wells. The decrease in the concentration of VOCs from well MW-7 to wells MW-3, SB-1 and MW-5 indicates that contamination is not migrating. The relatively stable or decreasing concentration of VOCs in the ground water suggests that a concentration equilibrium has been achieved (i.e., concentrations will not, and have not, increased substantially above historical levels), that the area of contamination is defined and localized, and that the contaminants in the ground water are not a threat to off site receptors. These conditions indicate that it is unlikely that VOCs have, or will migrate off site.

3.0 SITE INSPECTION AND MONITORING

The objective of the site monitoring will be to document the environmental conditions following the remedial measures that were completed and described in the June 5, 2007 Remedial Action Work Plan. Site monitoring will be performed annually to confirm the operation of the SSD system and to document ground water quality. Data from the site monitoring described below will be reported annually to the NYSDEC and NYSDOH.

3.1 Sub-Slab Depressurization System

The SSD will be inspected annually, consistent with the requirements of the New York State Department of Health's "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006). The NYSDEC will be notified if any substantial changes in the SSD system or the building occur that might affect the performance of the system.

The system pressure will be observed and recorded for each trunk line to assure that the system continues to operate effectively. No maintenance is typically required for the vapor extraction points and SSD suction points. The three trunk lines, exhaust pipes and fans will be inspected at least annually to assure integrity and proper functioning. Leaks or cracks identified during inspection will be repaired and documented. System components outside the building also will be inspected to verify proper functioning and to confirm that no air intakes have been located near the vent pipes since the previous inspection.

Each trunk line is fitted with a magnehelic gage (pressure gage) to allow direct reading of the system pressure. A pressure sensor with a status indicator light alarm is installed near each fan. The alarm is set to sound if the pressure in the system decreases below the set point. The building maintenance staff is responsible for responding to system alarms and notifying the owner of needed repairs. The response action for system alarms is to contact the owner and arrange for service. The manufacturer's recommendations for routine operation and maintenance of system components, as applicable, are included in the system installation report (Appendix A).

3.2 Ground Water Monitoring

Ground water samples will be collected on an annual basis beginning in the first quarter following agency approval of this Site Management Plan. An annual sampling frequency is reasonable and sufficient to monitor ground water quality, based on the eight years of historical ground water monitoring data that indicate that a concentration equilibrium has been achieved, the area of contamination is very localized, and that the VOCs in the ground water are not a threat to off site receptors or ground water quality, as described in Section 2.2. Samples will be collected from wells MW-3, MW-5, MW-7, SB-1, and SB-3 until such time as the NYSDEC approves discontinued monitoring based on analytical results. Water levels will be measured in wells MW-3, MW-5, MW-6, MW-7, MW-8, SB-1, and SB-3 to evaluate the ground water flow direction.

The wells will be purged before sampling to ensure that representative samples are collected. Ground water samples will be collected using industry-standard, scientifically-accepted methods and will be properly documented. Samples will be delivered under chain of custody to a NYSDOH-certified analytical laboratory for analysis of VOCs by EPA Method 8260.

3.3 Quality Assurance/Quality Control

Quality assurance/quality control for ground water monitoring will include collecting of a blind duplicate sample and analyzing a transport blank. The blind duplicate sample will be a second set of laboratory-supplied glass vials filled with a sample selected from one of the three sampled wells. The blind duplicate sample will be labeled "DUP" with no sampling time indicated on the sample vial label or the chain of custody form. The identity of the DUP sample will be indicated

on the ground water sampling form. The purpose of the duplicate sample will be to assure that sampling procedures have not introduced a bias and to check the reproducibility of the laboratory analytical results.

The transport blank will be a glass vial filled with laboratory-certified, analyte-free water. The transport blank will accompany the sampling vials from the laboratory to the site and back to the laboratory. The transport blank will be identified as "TB" on the chain of custody, with no sampling date or time indicated. The transport blank will provide a control sample to monitor environmental conditions during sampling and transport of ground water samples.

The DUP and TB samples will accompany the samples and be submitted to the laboratory for analysis of VOCs by EPA Method 8260.

3.4 Health and Safety

Ground water monitoring will be performed by environmental personnel that have completed 40-hour "Hawwoper" training in accordance with their employer's Corporate Health and Safety Manual and policies. Site specific health and safety concerns related to ground water monitoring include the following:

- Ground water may contain low levels of chlorinated VOCs, including tetrachloroethylene (PCE). The inhalation hazard is negligible based on the historical ground water analytical results. Health and safety precautions will focus on limiting physical contact with ground water.
- Ground water monitoring wells are located within an active, commercial parking lot. Health and safety precautions will focus on controlling traffic access to the sampling area.
- Soil vapor samples may contain low levels of chlorinated VOCs, including PCE. The inhalation hazard is negligible based on sampling procedures and the historical soil vapor analytical results. No personal protective equipment is considered necessary during collection of soil vapor samples.

Site-specific health and safety precautions will be taken to address the above health and safety concerns, including the following:

- Field personnel will don clean vinyl gloves during purging and sample collection. Clean gloves will be donned at each well and whenever gloves are soiled.
- Field personnel will cordon off the monitoring wells using orange traffic cones and will wear high-visibility safety vests during field operations, if determined necessary.

4.0 ANNUAL REPORTING

An annual report will be prepared and submitted to NYSDEC. The annual report will document SSD system operation for the prior year, including the results of the system measurements and inspection. The report will include a description of any system operational issues encountered and the results of appropriate response actions. A certification of the system performance and operation will be included in the report until the agencies provide notification that the certification is no longer needed.

The annual report also will present the results of ground water monitoring events and the results of any other sampling of environmental media, if required by the agencies. This report will include sampling field forms, water level elevations, a ground water contour map, tabulated and graphical ground water concentration data, and laboratory analytical reports, as appropriate. The annual report will include a discussion of field methodologies and observations, a summary interpretation of results, and conclusions based on the results.

5.0 TERMINATION OF MONITORING

The inspection and monitoring activities described herein must be continued until such time as written approval is received from the agencies that one or more of the site monitoring activities may be discontinued.

An evaluation of the VOC concentration in the sub-slab soil gas must be performed in

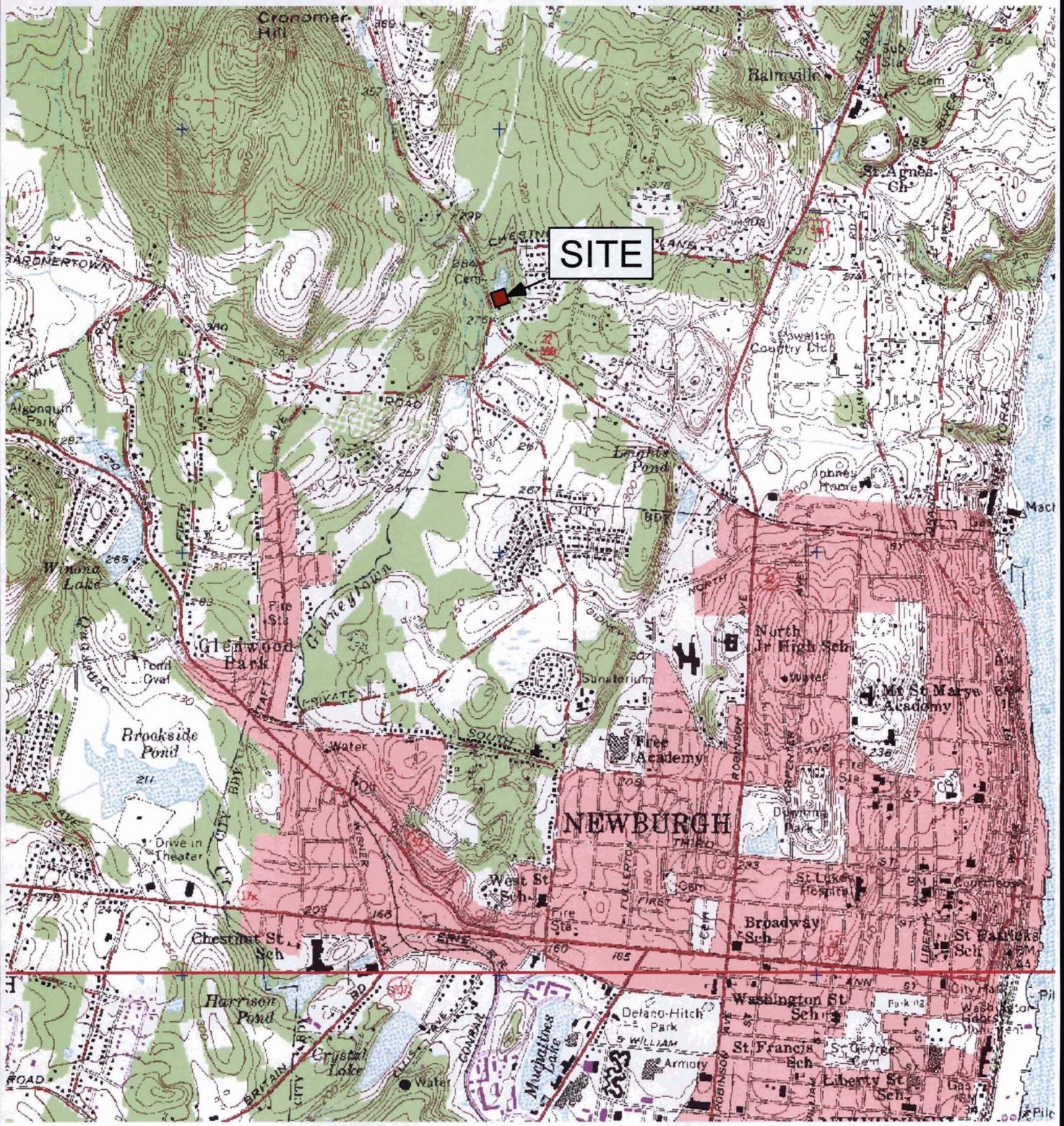
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accordance with the procedures and methods in the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006) before the operation of the SSD system is discontinued. A work plan to perform this evaluation will be submitted and approved by the agency. The plan will describe the sampling that will be performed to evaluate whether the SSD system has adequately reduced the concentration of VOCs and must present a method to evaluate the possibility of concentration rebound after the system is temporarily shut down. Sampling locations should include, but not necessarily be limited to, the locations of previous sub-slab soil gas samples beneath the current Chinese restaurant and the Italian restaurant.

The annual report will include the data necessary to evaluate the concentration of VOCs in the ground water relative to the New York State Ground Water Standards. The owner may petition the NYSDEC to discontinue ground water monitoring based on data that demonstrates that the ground water quality meets the New York State Ground Water Standards or does not constitute a potential threat to human health and the environment.

Z:\PROJECTS\1998\98100-120\98106-NEWBURGH-SHOPRITE\REPORTS\SITE MANAGEMENT PLAN JUNE 2007.DOC

FIGURES



Newburgh Quadrangle
 New York
 United States Geological Survey
 7.5 Minute Series



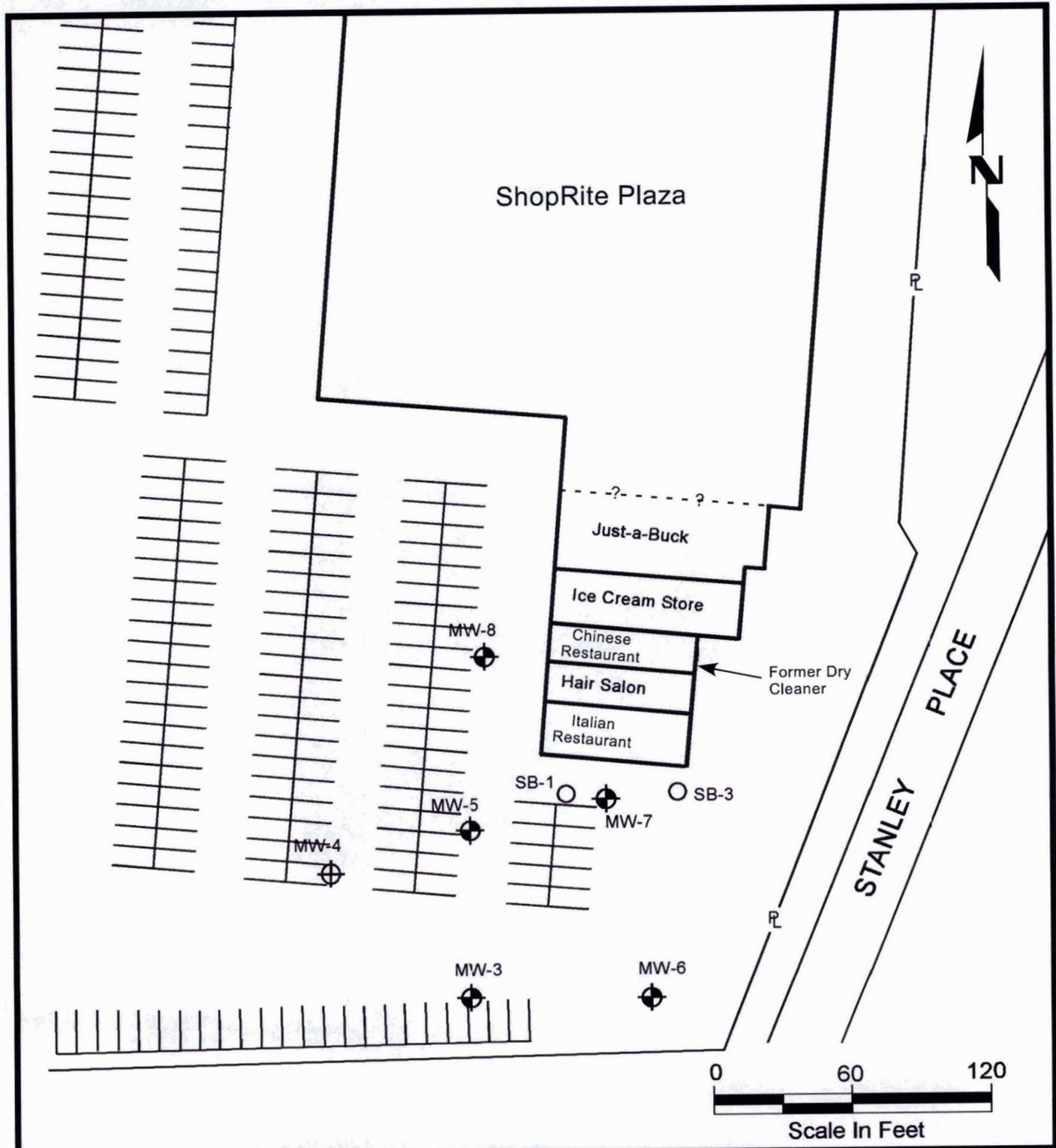
Scale: 1"=2,000 ft.



**FIGURE 1
 SITE LOCATION MAP**

**ShopRite Plaza
 Route 32
 Newburgh, New York**

Project No. 07141



LEGEND

- SB-1 GEOPROBE BORING/WELL
- ⊕ MW- 4 BEDROCK MONITORING WELL
- ⊙ MW- 5 OVERBURDEN MONITORING WELL



Project No. 98106

**FIGURE 2
Site Map**

**ShopRite Plaza
Newburgh, New York**

APPENDIX A

Sub-Slab Venting System Installation Report, May 2006



**Alpine
Environmental
Services, Inc.**

Sub-Slab Venting System Installation Report
Shop Rite Plaza, 88 North Plank Road
Newburgh, New York

May 2006

Designed and Installed by:

Alpine Environmental Services, Inc.
1146 Central Avenue
Albany, New York 12205
Phone (518) 453-0146
Fax (518) 453-0175



June 12, 2006

Sub-slab Depressurization System Installation Report
Shop Rte Plaza, 88 North Plank Road, Newburgh, New York

General Installation Conditions

- Very tight, compacted sub-slab soils exist at the Shop Rite Plaza. High suction fans, capable of a static operating pressure up to 40 inches of water, were installed to extend the pressure field throughout the building footprint.

- A series of concrete footings were determined to run in an east-west direction through the entire strip mall, apparently running along bearing lines, in line with dividing block walls. Interior footings were estimated to be approximately 12 inches below the cement floor, "shallow footings". Testing demonstrated that the high suction fans were capable of drawing under these footings, extending influence outside each footing confined area.

- The system includes three distinct trunk lines in three separate tenant spaces (See drawing). Each trunk line exits through the rear (East) of the respective tenant space, with a fan mounted above the suspended ceiling (where a ceiling exists). The trunk lines extend forward, above the suspended ceiling in the tenant space, with a series of four suction stacks dropping into the tenant space, entering a penetration through the cement floor. The planned number and location of suction points was modified from the preliminary design based on installation diagnostic testing. The three depressurization systems are located in the following tenant spaces.
 1. Dollar Store
 2. Ice Cream Store
 3. Hair Salon

Construction Materials and "As Built" Conditions

All trunk lines and suction risers were constructed of Schedule 20 PVC piping and schedule 20 PVC pipe fittings, with the exception of the 3 inch PVC piping entering each fan and the 2 inch PVC exiting each fan which was schedule 40. All connections were cemented, with the exception of the fan connections, which were secured with flexible PVC, screw tightened couplings. Suction points were sealed into the cement floor slab with a floor flange, sealed air tight, with polyurethane caulk.

- 3-inch ball valves and 4-inch metal duct dampers were installed as needed for system balancing and control of the pressure field.
- Exhaust pipes were installed in the rear of the structure, a minimum of 10 feet above grade, away from any intakes or openings.
- Each trunk line was fitted with a Mahnehelic Manometer (pressure meter). These devices maintain a real-time analog pressure reading on the system. Periodic monitoring of the system pressure has been incorporated into the building maintenance. Any significant change in the pressure will be cause for service on the system.
- A pressure sensor with status indicator light and system alarm was installed on each system. The alarm will sound if pressure in the system drops below the alarm set point. Each alarm was tested as part of the installation.

Installation Balancing And Evaluation of Effectiveness:

Post installation testing and balancing was performed following the installation. The system was balanced utilizing ball valves to control the Pressure Field Extension (PFE). PFE was verified by drilling numerous, 3/8" test holes, distributed throughout the floor slab. A micro manometer was used to verify negative pressure extension and adjust valves for a complete PFE distribution. Test holes were sealed with polyurethane caulk following completion of test data collection. Test locations and results are documented in this report.

System airflow and pressures were checked in each of the trunk lines following installation to verify each system was operating within the fan manufacturers operating requirements. Readings were documented in the "Post SSD Installation Testing" section of the report.

References

Radon Mitigation Standards, US Environmental Protection Agency 402-R-93-078
April 1994

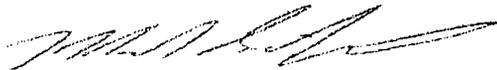
DESIGN, EFFECTIVENESS, AND RELIABILITY OF SUB-SLAB
DEPRESSURIZATION SYSTEMS FOR MITIGATION OF CHLORINATED
SOLVENT VAPOR INTRUSION, presented at the US EPA Seminar on Indoor
Air Vapor Intrusion, December 4, 2002 [Folkes].

Guidance for Evaluating Soil Vapor Intrusion in the State of New York, New York
State Department of Health, February 2005

If you have any questions concerning this design or need additional information,
please do not hesitate to contact me (518) 453-0146.

Sincerely,

ALPINE ENVIRONMENTAL SERVICES, INC.



Mark W. Schnitzer, PE
Environmental Engineer

Included:

- Post SSD Installation Test Data (Pressure Test Results)
- Drawing of Installed System Layout
- Dynavac HS-5000 Fan Installation Instructions
- Fantech Fan FR Series Specifications
- Operations and Maintenance Procedures and Checklist



**Alpine
Environmental
Services, Inc.**

Sub-Slab Venting System
Shop Rite Plaza, 88 North Plank Road, Newburgh, New York

System #1: Dollar Store
Fan Installed: RadonAway HS5000
Static Pressure in System: 5 inches of water
Air Flow In System: 50 cubic feet per minute
Number of Suction Points: 4

Test Results:

S1-1	< 0.1 ppm	N/A
S1-2	< 0.1 ppm	N/A
S1-3	< 0.1 ppm	N/A
S1-4	< 0.1 ppm	N/A
T1-1	< 0.1 ppm	- 0.008
T1-2	< 0.1 ppm	- 0.017
T1-3	< 0.1 ppm	- 0.004
T1-4	< 0.1 ppm	- 0.004

ppm - parts per million
N/A - Not Applicable



**Alpine
Environmental
Services, Inc.**

Sub-Slab Venting System
Shop Rite Plaza, 88 North Plank Road, Newburgh, New York

System #2: Ice Cream Store
Fan Installed: RadonAway HS5000
Static Pressure in System: 3 inches of water
Air Flow In System: 51 cubic feet per minute
Number of Suction Points: 4

Test Results:

Sub-Slab Test Results		
S1-1	< 0.1 ppm	N/A
S1-2	< 0.1 ppm	N/A
S1-3	< 0.1 ppm	N/A
S1-4	< 0.1 ppm	N/A
T1 Test Results		
T1-5	< 0.1 ppm	- 0.042
T1-6	< 0.1 ppm	- 0.008
T1-7	< 0.1 ppm	- 0.016

ppm - parts per million
N/A - Not Applicable



**Alpine
Environmental
Services, Inc.**

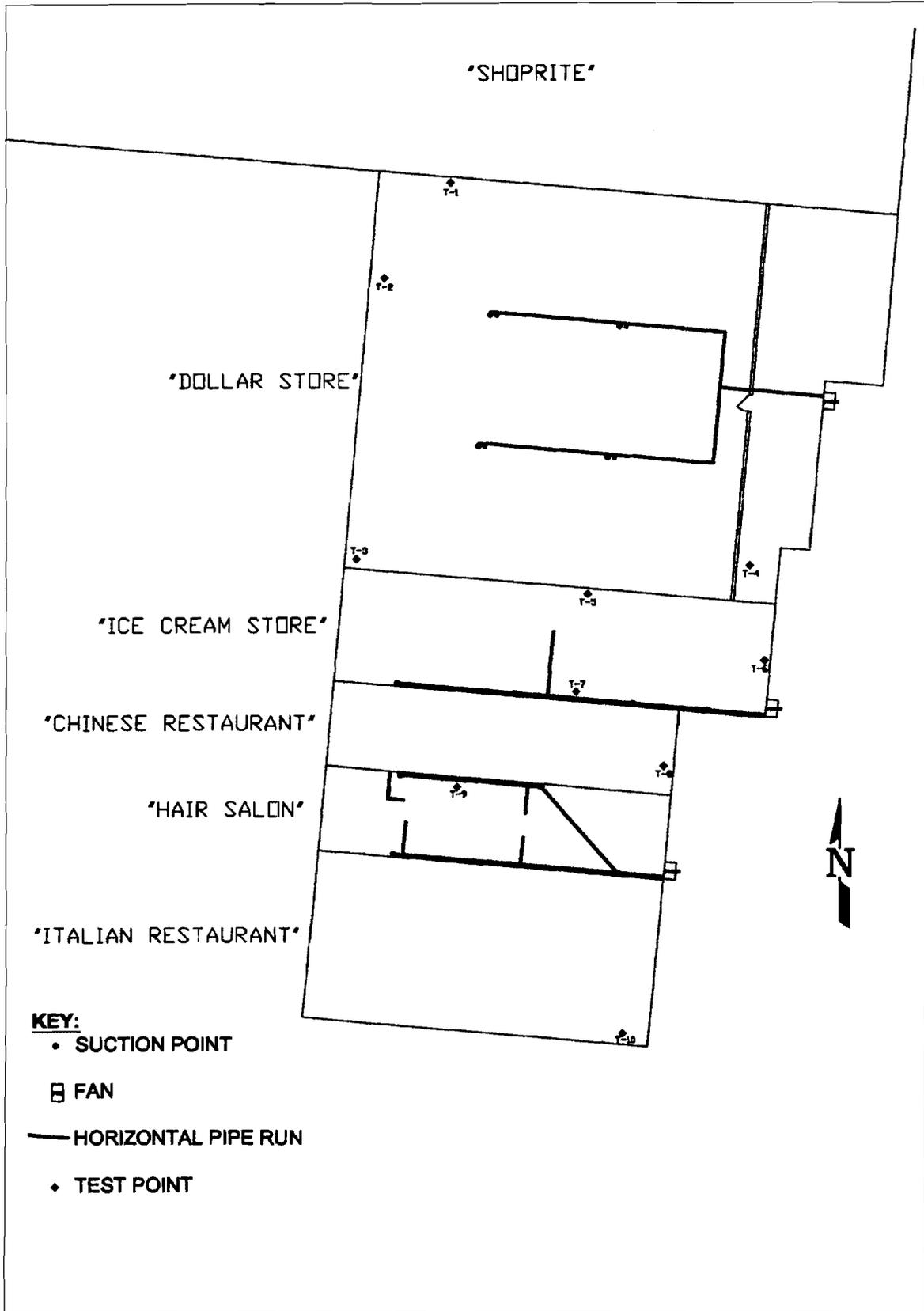
Sub-Slab Venting System
Shop Rite Plaza, 88 North Plank Road, Newburgh, New York

System #3: Hair Salon
Fan Installed: Fantech FR225
Static Pressure in System: 0.75 inches of water
Air Flow In System: 312 cubic feet per minute
Number of Suction Points: 4

Test Results:

S1-1	< 0.1 ppm	N/A
S1-2	< 0.1 ppm	N/A
S1-3	< 0.1 ppm	N/A
S1-4	< 0.1 ppm	N/A
T1-8	< 0.1 ppm	- 0.004
T1-9	< 0.1 ppm	- 0.009
T1-10	< 0.1 ppm	- 0.007

ppm - parts per million
N/A - Not Applicable



KEY:

- SUCTION POINT
- ⊠ FAN
- HORIZONTAL PIPE RUN
- ◆ TEST POINT

SUB-SLAB DEPRESSURIZATION SYSTEM

**SHOPRITE PLAZA
88 NORTH PLANK ROAD
NEWBURGH, NEW YORK 12550**

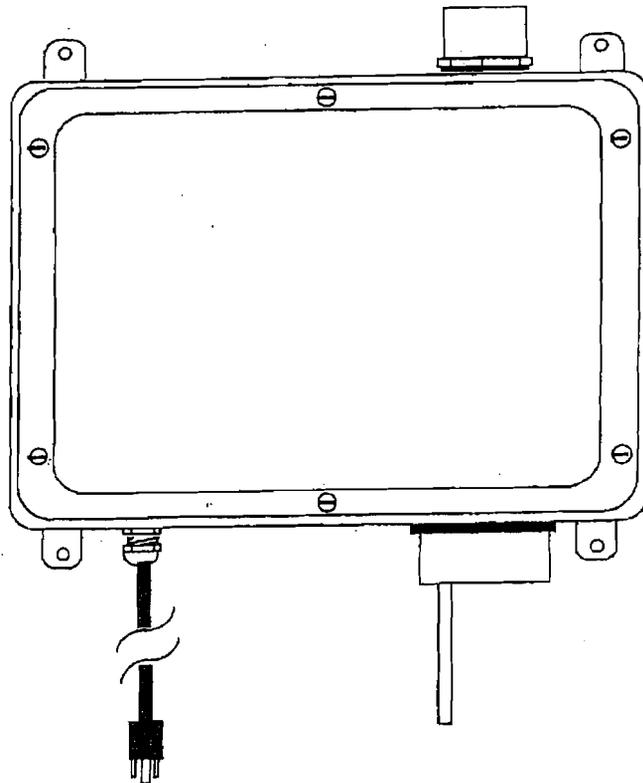
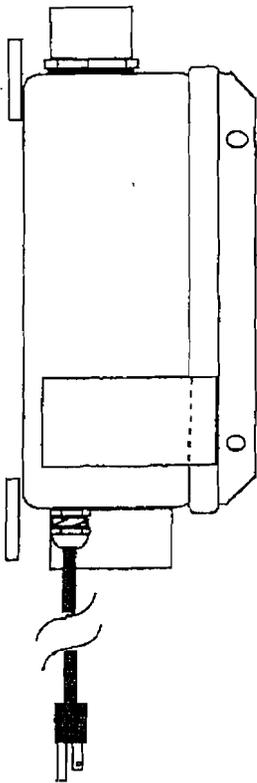


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HS SERIES INSTALLATION INSTRUCTIONS

BY

RadonAway™



RadonAway, Inc. Ward Hill, MA.

P/N IN007 Rev E



RadonAway Ward Hill, MA.

HS Series Fan Installation Instructions

Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit. Do NOT attempt to open. Return unit to the factory for service.
6. All wiring must be in accordance with local and national electrical codes.
7. **WARNING!** In the event that the fan is immersed in water, return unit to factory for service before operating.
8. **WARNING!** Do not twist or torque fan inlet or outlet piping as Leakage may result.

INSTALLATION INSTRUCTIONS (Rev D)
for DynaVac High Suction Series

HS2000 p/n 23004-1

HS3000 p/n 23004-2

HS5000 p/n 23004-3

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The DynaVac is intended for use by trained, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of the DynaVac. This instruction should be considered as a supplement to EPA standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The DynaVac is designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the DynaVac should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F. The DynaVac is thermally protected such that it will shut off when the internal temperature is above 104 degrees F. Thus if the DynaVac is idle in an area where the ambient temperature exceeds this shut off, it will not restart until the internal temperature falls below 104 degrees F.

1.3 ACOUSTICS

The DynaVac, when installed properly, operates with little or no noticeable noise to the building occupants. There are, however, some considerations to be taken into account in the system design and installation. When installing the DynaVac above sleeping areas, select a location for mounting which is as far away as possible from those areas. Avoid mounting near doors, fold-down stairs or other uninsulated structures which may transmit sound. Insure a solid mounting for the DynaVac to avoid structure-borne vibration or noise.

The velocity of the outgoing air must also be considered in the overall system design. With small diameter piping, the "rushing" sound of the outlet air can be disturbing. The system design should incorporate a means to slow and quiet the outlet air. The use of the RadonAway Exhaust Muffler, p/n 24001, is strongly recommended.

1.4 GROUND WATER

Under no circumstances should water be allowed to be drawn into the inlet of the DynaVac as this may result in damage to the unit. The DynaVac should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the DynaVac with water in installations with occasional high water tables.

In the event that a temporary high water table results in water at or above slab level, water will be drawn into the riser pipes thus blocking air flow to the DynaVac. The lack of cooling air will result in the DynaVac cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the DynaVac be disconnected until the water recedes allowing for return to normal operation.

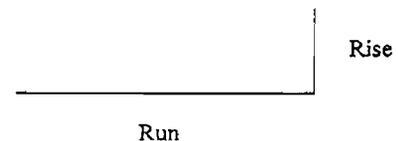
1.5 CONDENSATION & DRAINAGE

(WARNING!: Failure to provide adequate drainage for condensation can result in system failure and damage the DynaVac).

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation.

The use of small diameter piping in a system increases the speed at which the air moves. The speed of the air can pull water uphill and at sufficient velocity it can actually move water vertically up the side walls of the pipe. This has the potential of creating a problem in the negative pressure (inlet) side piping. For DynaVac inlet piping, the following table provides the minimum recommended pipe diameters as well as minimum pitch under several system condition. Use this chart to size piping for a system.

Pipe Diam.	Minimum Rise per Foot of Run*		
	@ 25 CFM	@ 50 CFM	@ 100 CFM
4"	1/32 "	3/32 "	3/8 "
3"	1/8 "	3/8 "	1 1/2 "



*Typical operational flow rates:

HS3000, or HS5000
HS2000

20 - 40 CFM
50 - 90 CFM

All exhaust piping should be 2" PVC.

1.6 "SYSTEM ON" INDICATOR

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A Magnehelic pressure gauge is recommended for this purpose. The indicator should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the gauge with water in installations with occasional high water tables.

1.7 SLAB COVERAGE

The DynaVac can provide coverage of well over 1000 sq. ft. per slab penetration. This will, of course, depend on the sub-slab aggregate in any particular installation and the diagnostic results. In general, sand and gravel are much looser aggregates than dirt and clay. Additional suction points can be added as required. It is recommended that a small pit (2 to 10 gallons in size) be created below the slab at each suction hole.

1.8 ELECTRICAL WIRING

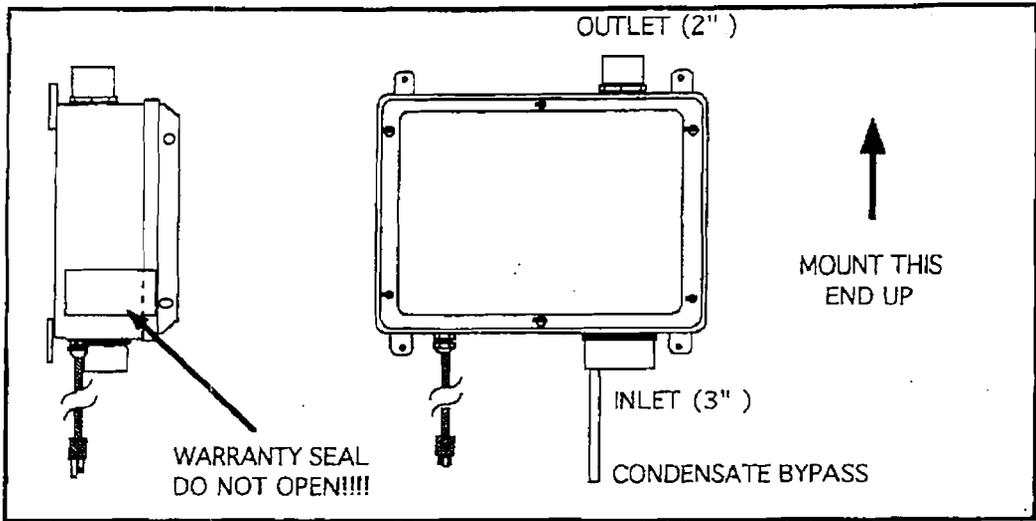
The DynaVac plugs into a standard 120V outlet. All wiring must be performed in accordance with the National Electrical Code and state and local building codes.

1.8a ELECTRICAL BOX (optional)

The optional Electrical Box (p/n 20003) provides a weathertight box with switch for outdoor hardwire connection. All wiring must be performed in accordance with the National Electrical Code and state and local building codes. All electrical work should be performed by a qualified electrician. Outdoor installations require the use of a U.L. listed watertight conduit.

1.9 SPEED CONTROLS

Electronic speed controls can NOT be used on HS series units.



2.0 INSTALLATION

2.1 MOUNTING

Mount the DynaVac to the wall studs, or similar structure, in the selected location with (4) 1/4" x 1 1/2" lag screws (not provided). Insure the DynaVac is both plumb and level.

2.2 DUCTING CONNECTIONS

Make final ducting connection to DynaVac with flexible couplings. Insure all connections are tight. Do not twist or torque inlet and outlet piping on DynaVac or leaks may result.

2.3 VENT MUFFLER INSTALLATION

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed above the roofline at the end of the vent pipe.

2.5 OPERATION CHECKS

___ Make final operation checks by verifying all connections are tight and leak-free.

___ Insure the DynaVac and all ducting is secure and vibration-free.

___ Verify system vacuum pressure with Magnehelic. Insure vacuum pressure is less than the maximum recommended as shown below:

DynaVac HS2000	14" WC
DynaVac HS3000	21" WC
DynaVac HS5000	40" WC

(Above are based on sea-level operation, at higher altitudes reduce above by about 4% per 1000 Feet.)

If these are exceeded, increase number of suction points.

___ Verify Radon levels by testing to EPA protocol.

Addendum

PRODUCT SPECIFICATIONS

Model	Maximum Static Suction	Typical CFM vs Static Suction WC (Recommended Operating Range)						Power* Watts @ 115 VAC
		0"	10"	15"	20"	25"	35"	
HS2000	18"	110	72	40	-	-	-	150-270
HS3000	27"	40	33	30	23	18	-	105-195
HS5000	50"	53	47	42	38	34	24	180-320

*Power consumption varies with actual load conditions

Inlet: 3.0" PVC

Outlet: 2.0" PVC

Mounting: Brackets for vertical mount

Weight: Approximately 18 lbs.

Size: Approximately 15"W x 13"H x 8"D

Minimum recommended inlet ducting (greater diameter may always be used):

HS3000, HS5000 --- 2.0" PVC Pipe

HS2000 --- Main feeder line of 3.0" or greater PVC Pipe

Branch lines (if 3 or more) may be 2.0" PVC Pipe

Outlet ducting: 2.0" PVC

Storage temperature range: 32 - 100 degrees F.

Thermally protected

Locked rotor protection

Internal Condensate Bypass

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the HS Series Fan for shipping damage within 15 days of receipt. Notify RadonAway of any damages immediately. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. Do not attempt to open. Return unit to factory for service.

Install the HS Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the HS Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of one (1) year from the date of manufacture (the "Warranty Term"). Outside the Continental United States and Canada the Warranty Term is one (1) year from the date of manufacture.

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at owner's cost) to the RadonAway factory. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE HS SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No. _____
Purchase Date _____



Fantech FR Series

Versatility and Value

Fantech's versatile FR Series fans feature a plastic housing constructed of UL-recognized, UV-protected thermoplastic resin. This tough protective shell allows the fan to be mounted in outdoor and wet locations.* Ideal for multiple point exhaust, dual bathroom exhaust, or new room additions, Fantech's FR Series fans are caulked at the motor screws, the wiring cables and along the seams of the fan to prevent moisture from entering the housing. Fantech's FR Series fans have long been the choice of residential builders and remodelers but now can be used for commercial projects with our recent UL commercial applications rating.

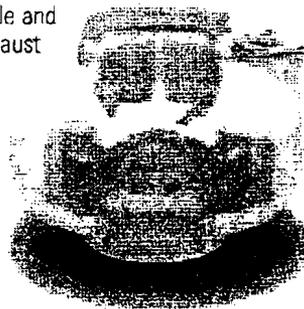
Easy to install!

Loaded with features

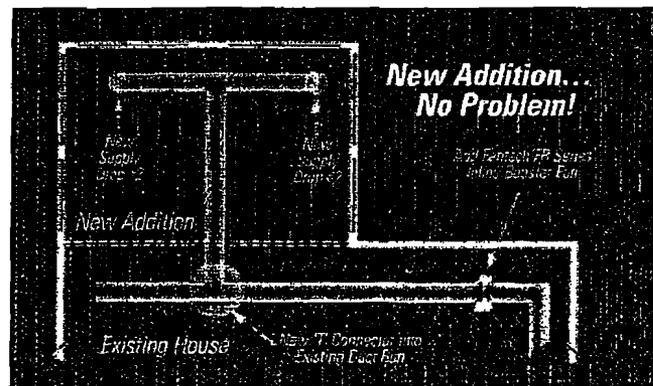
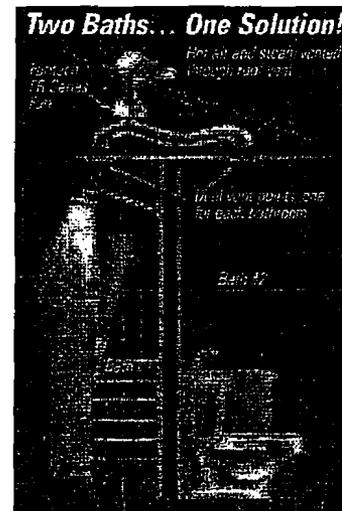
- Prewired and supplied with a mounting bracket for easy installation
- Available singularly with bracket or in a variety of kits for specific applications. Each kit includes the appropriate fan and accessories
- UL Listed; CSA Certified
- Approved for residential and commercial applications and for wet locations
- Suitable for airstream temperatures up to 140° F
- Easy connection using external wiring box with waterproof gasket
- 122-649 CFM
- 4" to 10" duct diameters
- 100% speed controllable
- Five-year factory warranty

Kits are available for the following applications:

- Regular Kits (REG 100 and REG 140) for single point exhaust applications
- Deluxe Kits (DLX 110, DLX 150, and DLX 200) designed for dual point exhaust applications
- Vent Light Kits (REG 100L, DLX 150L) for single and dual vent light exhaust applications



Typical attic installation



* The FR Series is not manufactured to operate with water running through the motor compartment, or to be used in applications where the fan would be buried underground. A UL-recognized waterproof conduit should be used for all outdoor applications to prevent moisture entry via knockout in wiring box.

FR Kits

Pictured from left to right: DLX150 – Dual Point Ventilation Kit; REG100L – Single Vent Light Kit. Additional kits (not pictured) are available.



DLX150



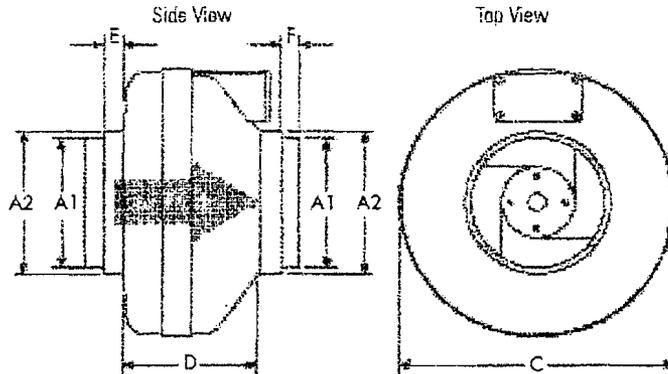
REG100L

Specifications

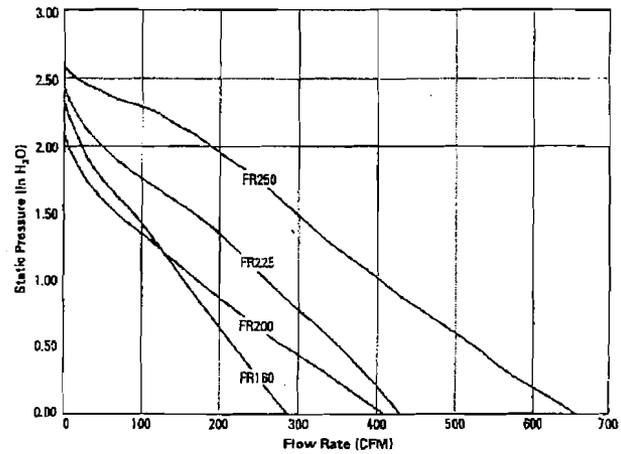
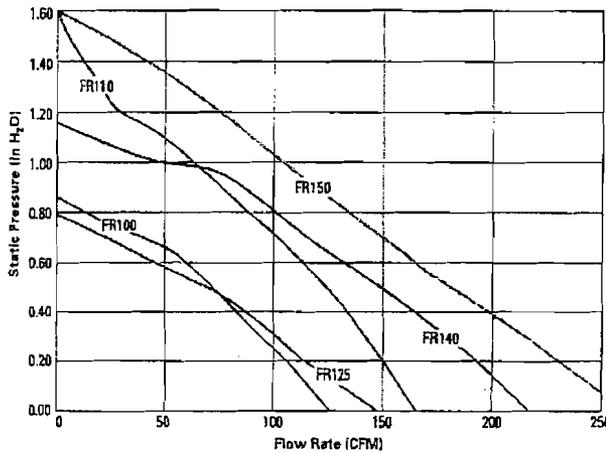
FR Series Dimensional Data

model	A1	A2	C	D	E	F
FR 110	4	5	9½	6¾	7½	7½
FR 140	6	6¼	11¼	5¾	1	7¼
FR 160	6	6¼	11¼	6¾	1	7¼
FR 225	8	10	13¼	6¾	1½	1½

All dimensions in inches. * Duct connections are 1/8" smaller than duct size.



FR Series Air Performance Graphs



FR Series Performance Data

Fan Model	Energy Star	RPM	Volts	Rated Watts	Wattage Range	Max. Amps	Static Pressure in Inches W.G.							Max. Ps	Duct Dia.
							0"	2"	4"	6"	8"	1.0"	1.5"		
FR 110	—	2900	115	80	62 - 80	0.72	167	150	133	113	88	63	4	1.60"	4"
FR 125	—	2950	115	80	62 - 80	0.72	167	150	133	113	88	63	4	1.60"	4"
FR 140	✓	2850	115	61	47 - 62	0.53	214	190	162	132	99	46	—	1.15"	6"
FR 150	—	2750	115	71	54 - 72	0.67	200	230	198	167	136	106	77	1.50"	6"
FR 160	—	2750	115	129	103 - 130	1.14	289	260	233	206	179	154	89	2.32"	6"
FR 200	✓	2750	115	122	105 - 126	1.11	400	360	308	259	213	173	72	2.14"	8"
FR 225	✓	3100	115	137	111 - 152	1.35	429	400	366	332	297	260	168	2.48"	8"
FR 250	—	2850	115	241	216 - 248	2.40	649	600	553	506	454	403	294	2.58"	10"

FR Series performance is shown with ducted outlet. Per HVI's Certified Ratings Program, charted air flow performance has been derated by a factor based on actual test results and the certified rate at .2 inches WG.



Alpine

Environmental Services, Inc.
(518) 453-0146

**Operations and Maintenance
Sub-Slab Venting System
Shop Rite Plaza, 88 North Plank Road, Newburgh, New York**

SYSTEM MAINTENANCE

The sub-slab venting system is designed to be maintenance free, for the life of the fan. All moving parts of the system are sealed in the fan-housing unit. The fan-housing unit should only be opened by the fan manufacturer. Any attempt to open the fan-housing unit will destroy the factory installed seals and void any warranty, parts and labor, on the entire venting system.

ANNUAL SYSTEM INSPECTION (INSPECT EACH TRUNK LINE INDEPENDENTLY)

- Inspect the exposed system piping for any breach or damage.
- Inspect the caulk seal at each of the suction points (a breach in the seal should produce an air leak noise). If breach is observed, caulk with polyurethane caulk.
- Disconnect power from the fan unit and verify the system alarm sounds when the static system pressure falls below the alarm set point. If alarm does not operate as designed, call for service.
- Observe the static system pressure in each system on the magnehelic manometer. Record the system pressure in the chart provided. Compare the static system pressure to the acceptable static pressure range. If static pressure is outside the acceptable range, call for service.

	2006 Initial Pressure Reading (Inches Water)	2007 Pressure Reading (Inches Water)	2008 Pressure Reading (Inches Water)	2009 Pressure Reading (Inches Water)	2010 Pressure Reading (Inches Water)	2011 Pressure Reading (Inches Water)
	Acceptable Range (+/- 25% Initial Read)					
SYSTEM #1 DOLLAR STORE	5"					
	3.75" to 6.25"					
SYSTEM #2 ICE CREAM STORE	3"					
	2.25" to 3.75"					
SYSTEM #3 HAIR SALON	0.75					
	0.50 to 1.0"					

	2006 Initial Pressure Reading (Inches Water)	2012 Pressure Reading (Inches Water)	2013 Pressure Reading (Inches Water)	2014 Pressure Reading (Inches Water)	2015 Pressure Reading (Inches Water)	2016 Pressure Reading (Inches Water)
	Acceptable Range (+/- 25% Initial Read)					
SYSTEM #1 DOLLAR STORE	5"					
	3.75" to 6.25"					
SYSTEM #2 ICE CREAM STORE	3"					
	2.25" to 3.75"					
SYSTEM #3 HAIR SALON	0.75					
	0.50 to 1.0"					