Keystone Material Testing

PROPOSED REMEDIAL WORK PLAN
FOR SOIL VAPOR REMEDIATION

At

Champion Products Facility
200 North Main Street
Perry, NY 14530

Prepared for:

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% Antea Group
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April 2011

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1.0 Introduction and Background

Keystone Material Testing (KMT) (formerly ENVIRO TESTING) was retained by Antea Group (formerly Delta Env.) to determine the feasibility of installing Active Soil Depressurization (ASD) systems to preemptively mitigate soil vapor intrusion at the former Champion Product Facility, now occupied by American Classic Outfitters (ACO) at 200 North Main Street, Perry, New York.

KMT's services include remedial diagnostics investigation and development of written plans and specifications for the installation of the three ASD systems. The proposed ASD systems have been preliminarily designed to create a negative pressure field (relative to typical building pressures at the time of diagnostic testing) under the slab of three separate building footprint areas so that any sub-slab vapors in these areas will be unlikely to migrate upwards into the building under reasonably anticipated building conditions. Once up and running, these ASD's will be evaluated to determine the level of success.

The reasons to mitigate this structure were based on the results of previous indoor air and sub-slab vapor tests conducted by Antea Group. Identified on site were chlorinated and non-chlorinated solvents. Vapors were identified which exceed New York State Department of Health (NYSDOH) decision matrix recommended action levels for monitoring and/or mitigation.

KMT's ASD design consists of the following specifications and diagrams that provide details for construction of the proposed ASD systems. If installed, operated and maintained per specifications, the ASD systems should be able to maintain negative sub-slab pressure under reasonably anticipated conditions and prevent upward migration of any possible sub-slab vapors in the preemptively mitigated areas of the building.

2.0 Building Features

The building in question is a one-story industrial facility with an open floor plan production area (with mezzanine areas) and an attached office area. The structure is estimated to be approximately 50 years old and total approximately 120,000 sq. ft. of occupied/in use floor slab area.

3.0 Diagnostic Findings

In order to determine blower requirements and suction point spacing for depressurizing the soil, sub-slab soil permeability tests were performed on February 4, 2011. Diagnostic testing was performed in three separate slab areas of the structure which are being impacted by soil vapors. Three slab areas were identified by Mark Schumacher, Senior Project Manager with Antea Group. The mitigation areas are identified in Appendix A, Figures 1-4 "Mitigation Areas SS-3, SS-4 and SS-5" and total approximately 12, 000 sq. ft. of floor space.

The diagnostic testing required drilling suction holes through the slab areas in the general vicinity of proposed suction point locations. A performance evaluated 6.5 hp shop vacuum was used to draw air from the suction holes. Smaller test holes were drilled through the slabs at various locations around the suction holes (See Appendix A – Figures 2-4). Vacuum levels/measurements were conducted at each test hole location and are shown in Appendix B, Table 1.

4.0 General System Design Information

4.1 Pressure Field Extension Determination

Pressure fields were determined by evaluating the results of the pressure field testing. The objective of the ASD systems is to create a vacuum field of at least -.0.004 inches of water column (W.C.) under the slab in all areas being mitigated. The three mitigation areas provided the following information:

Mitigation Area SS-3

At the two suction hole locations installed in mitigation Area SS-3, the sub-slab fill material appeared to be settled, loose dirt material which resulted in a low vacuum high air volume pressure field. Based on the results of the vacuum pressure tests, the radius of influence of mitigation system suction points using low vacuum high volume blower fans is estimated to be up to 40 Lf and greater. (i.e., the distance over which a negative pressure of at least 0.004 in W. C. is expected). (See Appendix A-Figures 1-4 and Appendix B-Table 1 for results of all mitigation areas). Area SS-3 was filled with stored items which would have to be moved before the ASD system is installed. An additional suction point will be added adjacent to the Compactor Room to allow for drainage and proper exterior fan mounting.

Mitigation Area SS-4

Communication results in Area SS-4 were non-existent at three diagnostic test hole locations due to presumed tight soils and large open slab expansion joints. Expansion joints were spaced at 15’ x 20’ intervals (300 sq. ft.) and smoke testing verified loss of vacuum pressure at most all joints. Storage shelving in this area will need to be removed so slab sealing can be performed prior to installing the ASD. Due to the square foot size of Area SS-4, we estimate two vacuum points will be needed. A high suction fan may be needed for this area.

Mitigation Area SS-5

At the three vacuum test hole locations installed in Area SS-5, the sub-slab soils appeared to be a combination of wet sand/clay material which resulted in moderate vacuum readings out to a distance of approximately 20’ to 25’. Leaking wall/floor joints and an open pit will need to be addressed as part of the ASD install.

4.2 Blower Selection and Suction Point Locations

The blowers (i.e., suction fans) and suction point locations for this diagnostic study have been selected and specified based on mitigation areas selected by Antea Group's previous June 8, 2007 "Baseline Soil Vapor Intrusion Report" for the facility. The design objective is to create a negative pressure field below slab with a minimum performance of -0.004" W.C. Pressure field predictions are on the conservative side and will be adjusted to accommodate anticipated field installation conditions. For example, when removing one cubic foot of soil under the slab the pressure can drop 20% to 40% and the volume of air movement may also increase 20% to 40%. The blower fans selected for this work plan are the FanTech HP220, capable of moving 344 cfm of air at 0" of W.C. and the Radon Away GP501, capable of moving air under tight soil conditions. Please note that vacuum test results are unknown in mitigation area SS-4 and tight soils in this area may require a specialized Radon Away high suction fan (HS-5000). (See Appendix D, Blower Specifications).

5.0 General Installation Requirements

All mitigation system components will be installed to facilitate servicing, maintenance and repair or replacement of other equipment components in or outside the building. Where mounting heights are not detailed or dimensions not given, system materials and equipment are to be installed to provide the maximum headroom or side clearance as is possible. All systems, materials and equipment will be installed, level, plumb, parallel or perpendicular to other building systems and components unless otherwise specified.

Some horizontal piping runs will be installed with minimal slope back to suction points, for moisture drainage.

KMT will take every reasonable precaution to avoid any damage to existing utilities located anywhere in the building or those located in or below the slab floor. Detailed blueprints indicating utility piping in or under the slab are not available. Undocumented sub-slab utilities may alter the scope of work.

KMT will seal all penetrations through the floor and walls which are impacted by the ASD. There will be no placement of piping or conduit that would inhibit intended use of any areas. There will be no roof penetrations.

KMT will ensure that any foreign materials are not left or drawn into the vapor system piping or fans which might at a later period interfere with or in any way impair the vapor system performance.

The entire system will have UL or equivalent ratings for both individual components and the entire system as applicable.

6.0 System Materials

Vapor Vent Piping
- 3” PVC schedule 40 pipe and fittings (ASTM D-2665)
- PVC cement primer will comply with ASTM F-656
- PVC cement adhesive will comply with ASTM D-2564

Piping Supports
- 3” Hanging Pipe Supports
- Swivel ring or standard bolt type clevis
- Adjustable band hanger
- Double Drop in Anchors
- ½” threaded rod
- Assorted bolts, nuts & washers
- 3” Pipe Secured to Concrete Floor or Wall
- Slotted Conduit Channel
- Conduit Clamps
- ½” Wedge Anchors
- Assorted bolts, nuts and washers
    - Hilti is a suggested manufacture of fastening products.

Vapor Blowers
- FanTech HP220
- Radon Away GP501
- Radon Away HS5000

- 3” to 6” black rubber boots with stainless steel hose clamps
- 3” to 3” black rubber boots with stainless steel hose clamps

Sealing Materials
- Urethane sealant will comply with Federal Specification TT-S-00230C, subject to compliance with Contract requirements.
    - Mameco, Inc. (Vulkem)

Fire Protection
- Mineral Wool
- 3” Fire Collars
- Fire stopping Caulk (Hilti)

Visual Pressure Indicator Light Indicator Panel

- U-Tube Manometers

7.0 Suction Hole Installation

A total of eight suction points are proposed with this work plan. See Appendix A, Figures 2-4 for the locations of suction points and mitigation piping.

To enhance the vacuum field distribution and limit any disruption to building use, each of the eight (8) suction points will be located near foundation walls, partition walls and/or columns. The specific location of each suction hole will be agreed upon by KMT and the building Owner's representative prior to installation. Each suction hole will be cut approximately five inches in diameter. KMT will follow the procedures listed in Section 5.0 to minimize damaging any sub slab utilities.

KMT will remove a minimum of one cubic foot of sub slab material from each suction hole. Soil removed by KMT will be staged in an agreed upon area on site, for off-site disposal by the owner. Primary suction points will consist of 3" PVC Schedule 40 pipe and will be installed so that they are flush with the bottom of the concrete slab in each suction hole. The pipe will be secured above the suction hole with a pipe clamp attached to an adjacent wall or overhead ceiling/truss to ensure the pipe cannot slip down into the suction pit. The pipe will be sealed into each suction hole by inserting backer rod material of sufficient size to compress between the pipe and the concrete floor. Gun-grade urethane caulking or mortar mix will be installed on top of the backer rod.

Suction points that are near foundation walls or columns will be installed just off the foundation/column pad. The edge of the foundation column pad can be located by drilling a 5/8" hole through the floor slab in fixed intervals until it is determined that the drill bit is not impacting the foundation/column pad.

8.0 PVC Pipe Installation

All horizontal pipe runs between the fans and the first suction holes will be installed with 1 inch slope back to a suction hole for each ten feet of horizontal pipe run. All vertical pipe runs will be installed plumb. All horizontal runs after the first suction hole may be run level. However, in no case will the piping be installed so as to create a possible water trap in the piping.

The PVC pipe will be supported at least every six feet of horizontal run and at least every eight feet of vertical run. All horizontal pipe runs will have a support with an appropriate device within two feet of each fitting and a maximum distance between supports of eight feet as per BOCA National Plumbing Code. The ceiling supporting devices will be a ½-inch all thread rod to structural members capable of providing the necessary support. Conduit channel with pipe clamps can also be used to support pipe routed along the ceiling or walls. Pipe cannot be supported by other building piping or ducts. Swivel ring or standard bolt-type clevis will be used to support pipe.

There may be a need to balance air flow and equalize the distribution vacuum throughout multiple suction points from a single blower. Inline three-inch gate valves will be installed in each riser pipe of the multiple suction point-single blower system. To minimize tampering they should be installed as high as possible. The exact location is at the discretion of KMT. KMT will work with the building owner to ensure that pipe runs do not interfere with current or anticipated future building operations.

Locations of suction pits will be as close as possible to their designed locations indicated by diagnostic and performance testing; otherwise, it may not be possible to meet the differential pressure criterion at all locations over the slabs to be mitigated.

9.0 Blower Installation and Start Up

There will be three exterior wall mounted blowers as part of this proposal. Mounting configuration for the blowers will be determined in the field by KMT.

It is the responsibility of the owner to provide access to all work areas for pipe routing and blower fan mounting.

The blowers were specified based on diagnostic vacuum testing and presumed air flow. When soil is removed from the suction points, solution channels that were not detected during the diagnostic phase are sometimes discovered. This can result in greater than expected airflow and decreased static vacuum. After the suction points have been sealed and the riser pipes have been joined together into the ASD systems, KMT will field test the systems using the specified blowers. If the systems are yielding a greater than anticipated volume of soil gas, the blowers will be changed to a different blower with a different RPM in an appropriate performance range.

Blower exhausts will meet all USEPA technical guidance documents for active soil depressurization systems.

10.0 Roof Penetrations

Building penetration pipe routing has been preliminarily proposed at this time and is shown in Appendix A, Figures 2-4. PVC pipe runs throughout the structure will be installed in the least obtrusive areas possible. It is anticipated that upper exterior wall areas will be used for blower fan mounting and discharge pipe routing. No roof penetrations will be required with this project.

11.0 Sealing

Most of the visible floor slabs are concrete with expansion joints, cracking and utility penetrations. Any slab areas which will short circuit sub-slab vacuum must be sealed. Mitigation Area SS-4 expansion joints must be sealed and will require dismantling of existing storage shelving to allow access to all joints. It is the responsibility of the owner to provide access for sealing.

11.1 Slab Cracks and Joint Sealing

Sealing slab openings is an important component of the mitigation. Any visible expansion joints or slab cracks in the areas being mitigated that have a 1/16 inch or greater opening will be sealed as needed. Any cracks to be sealed will first be cleaned and vacuumed to prepare them for the installation of gun-grade or flowable urethane caulk sealant. Cracks or open expansion joints in the concrete floor will be sealed by applying a bead of urethane caulk on top of the joint. If gun-grade caulk is utilized, it will be mechanically pressed down into the crack in order to maximize its seal. Any openings into the slab, such as may occur around conduit pipe penetrations through the slab will be cleaned and sealed with gun-grade or flowable urethane caulk. These include any perimeter expansion joints, the control joints around the column supports and the saw cut control joints between the columns themselves. Larger openings may require the use of backer rod foam to provide support for urethane sealants. Urethane sealants should be permitted seventy-two hours to cure before resuming foot traffic.

12.0 Blower Wiring

There appears to be adequate electrical panel capacity in the various electrical panels for the blowers specified in this ASD plan. A dedicated breaker should be used for the ASD blowers. This will prevent the blowers from being shut off when a circuit is powered down for an unrelated function. Based on the blower amperage requirements, an Electrical Contractor will be able to determine the load for each circuit. The breaker will be labeled with the blower number that corresponds with the blower number on the print.

The Owner's Electrical Contractor will be responsible for obtaining all electrical permits and final hook-up of the blowers to interior electrical panels. KMT will provide electrical hook up of the fan and provide conduit and wiring to the nearest electrical panel. When wiring the blowers, KMT will use properly rated flexible conduit from each switch box to the blowers. Wiring from the switch box to the blower will be approved individual 12 gauge wire. Wiring specifications can be found in Appendix D, Blower Fan Specifications.

13.0 Static Vacuum Indicator

U-tube manometers will be installed on each suction point to indicate the static vacuum generated by the ASD systems. The U-tubes for the ASD systems will be attached directly to riser pipes no higher than eye level. If Mitigation Area SS-4 requires an HS-5000 high suction fan, high vacuum magnehelic's will be used as vacuum gauges.

14.0 Fire Protection

PVC Pipes that penetrate non-compromised fire-rated walls or ceilings (and that are not completely enclosed behind a 5/8 inch sheetrock) will be protected using intumescent fire collars and fire-rated caulk.

15.0 System Labeling

Labels will be installed at the disconnect switch next to each fan that says “Soil Gas Reduction System, Do Not Alter.” The electrical circuit at the panel that is used to control each fan will be labeled as “Active Soil Depressurization System”. At least every 20 feet of exposed contaminant vent pipe length will have a label that reads “Soil Gas Flow” attached to the pipe. All labels will be readable from three feet away.

KMT’s name and telephone number will be affixed on each vapor mitigation system.

16.0 Permits

It is the responsibility of the owner’s electrical contractor to secure any electrical permits related to the installation of the vapor mitigation system. KMT will assume responsibility for investigating the need of any additional municipal permits.

The building owner will be responsible for building access for the municipal building inspectors or any other jurisdictional authority to inspect the relevant components of the ASD systems if required.

17.0 Warranties

KMT will Warranty all system components and workmanship for a period of one year from the date of system commissioning. The owner will not incur any cost for warranty work done during this period.

Repairing system damage done by others is not included in the warranty.

18.0 Final Project Report

KMT will measure the pressure field extensions beneath the sub-slab areas created by the ASD systems with a digital micro-manometer capable of reading down to 0.0001 inches water column. Additional test holes will be drilled as needed to verify vacuum levels at varying distances from suction points in each proposed mitigation slab area providing the footing or utilities do not interfere with the hole and the area can be accessed. KMT will adjust the gate valves in the systems riser pipes to facilitate maximum vacuum distribution. Static vacuum measurements for the system will be recorded. All vacuum measurements will be measured in inches of water column. This will verify the design objective of creating a 0.004” W.C. negative field.

KMT will prepare a final report summarizing remedial activities. The report will include a summary of remedial activities, as-built drawings, blower and system performance tables, photo-documentation and equipment warranties.

The as-built drawing will include: the specific locations of the blowers, including manufacture, model and amperage draw, and the locations of piping and connected suction points. The electrical panel location and breaker number will also be noted for the blowers. The location of all low pressure gauges will also be on the drawing. The title block will include the name of the vapor mitigation contractor and final system installation date.

Photo documentation will include at least one example of each blower type, the U-tube manometer, system labels, suction points, relevant sealing, fire stopping, roof penetrations, post-mitigation vacuum testing and pictures thought to be important by the Owner or the mitigation contractor.

Warranties and Submittals will include: all blower warranties, performance and wiring information.

A copy of the final report will be maintained by KMT and the Owner.

19.0 Submittals

The Contract will provide 3 copies of submittals to Owner or designated representative.

Pre Work Submittals	Copy of N.E.H.A. Radon Proficiency Radon Mitigation Certification Blower Fan Cut Sheets
Post Work Submittals	As-built drawings Final project report

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Figure 1
Antea Group Proposed Remediation Areas

Former Champion Products Company
Perry, NY

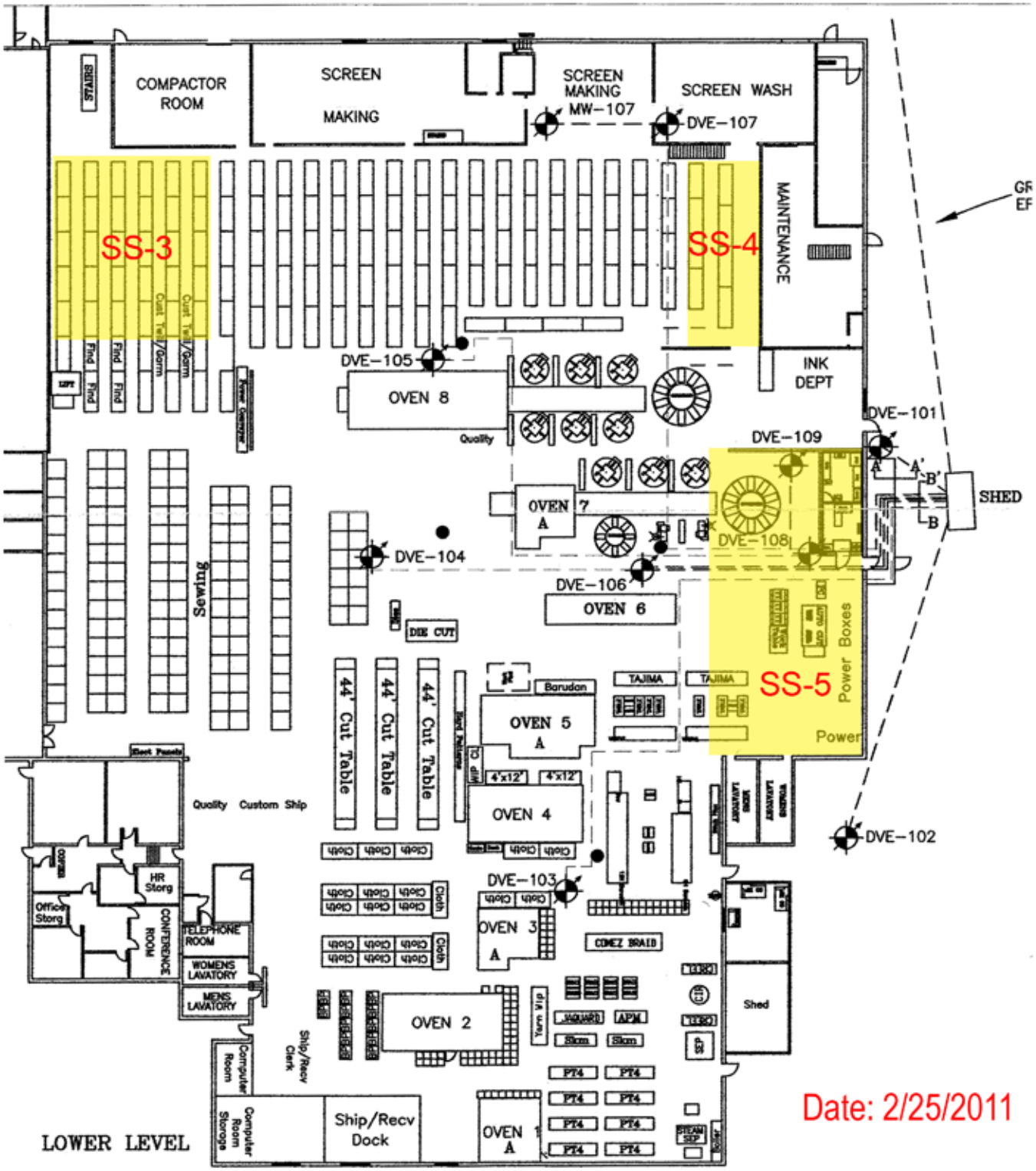

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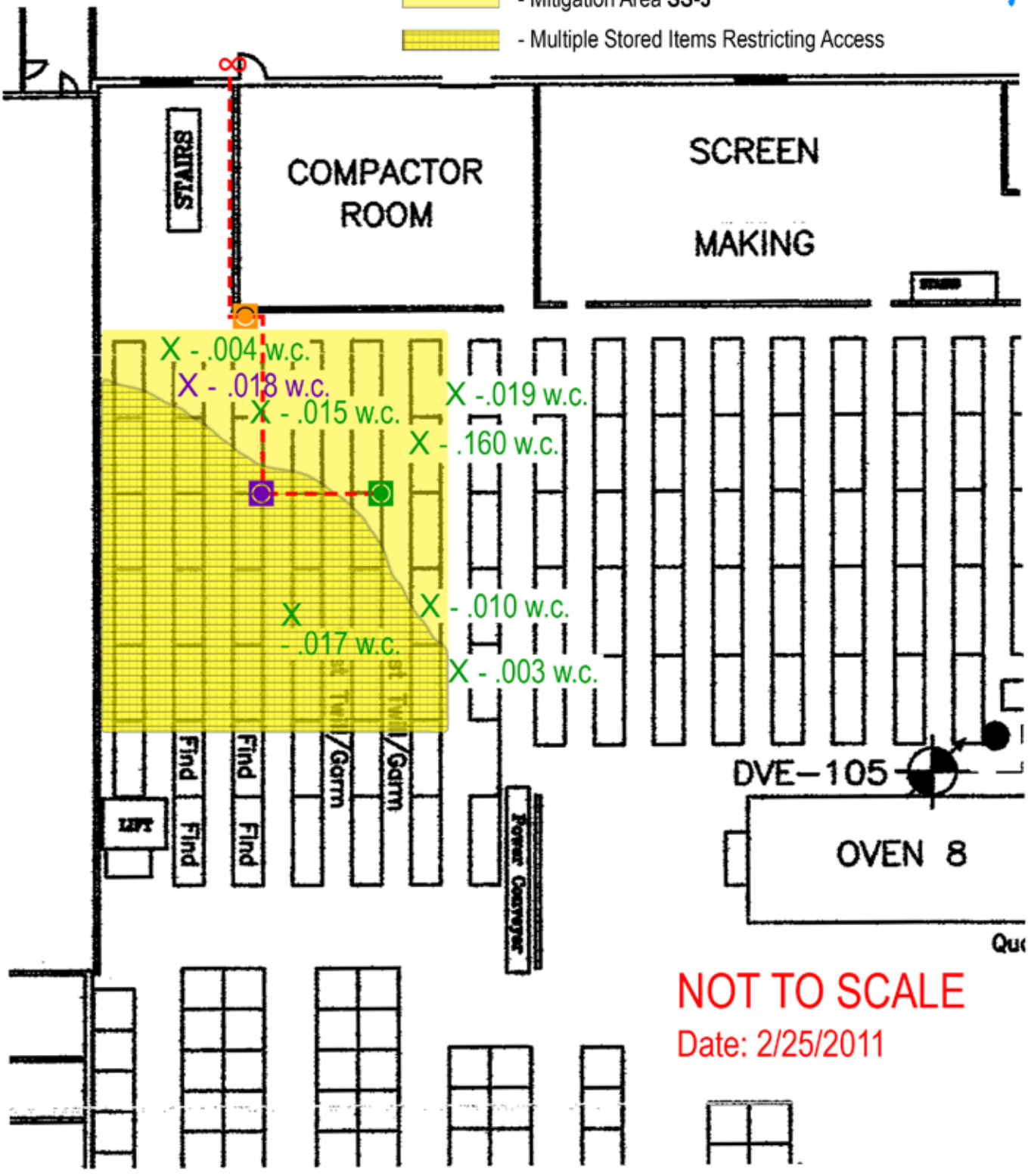
FIGURE #2 - LEGEND

- ◯ / X - Suction Point Test Hole #1 / Diagnostic Test Hole
- ◯ / X - Suction Point Test Hole #2 / Diagnostic Test Hole
- ◯ - Proposed 3rd Suction Point for Drain
- – – – / ∞ - Proposed Pipe Route / Exterior Fan Placement
- ▭ - Mitigation Area **SS-3**
- ▭ - Multiple Stored Items Restricting Access



NOT TO SCALE

Date: 2/25/2011

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FIGURE #3 - LEGEND

- ○ / X - Suction Point Test Hole #1 / Diagnostic Test Hole
- ○ / X - Suction Point Test Hole #2 / Diagnostic Test Hole
- ○ / X - Suction Point Test Hole #3 / Diagnostic Test Hole
- ○ - Proposed Vacuum Suction Points
- – – – / ∞ - Proposed Pipe Route / Exterior Fan Placement
- ▭ - Mitigation Area **SS-4**

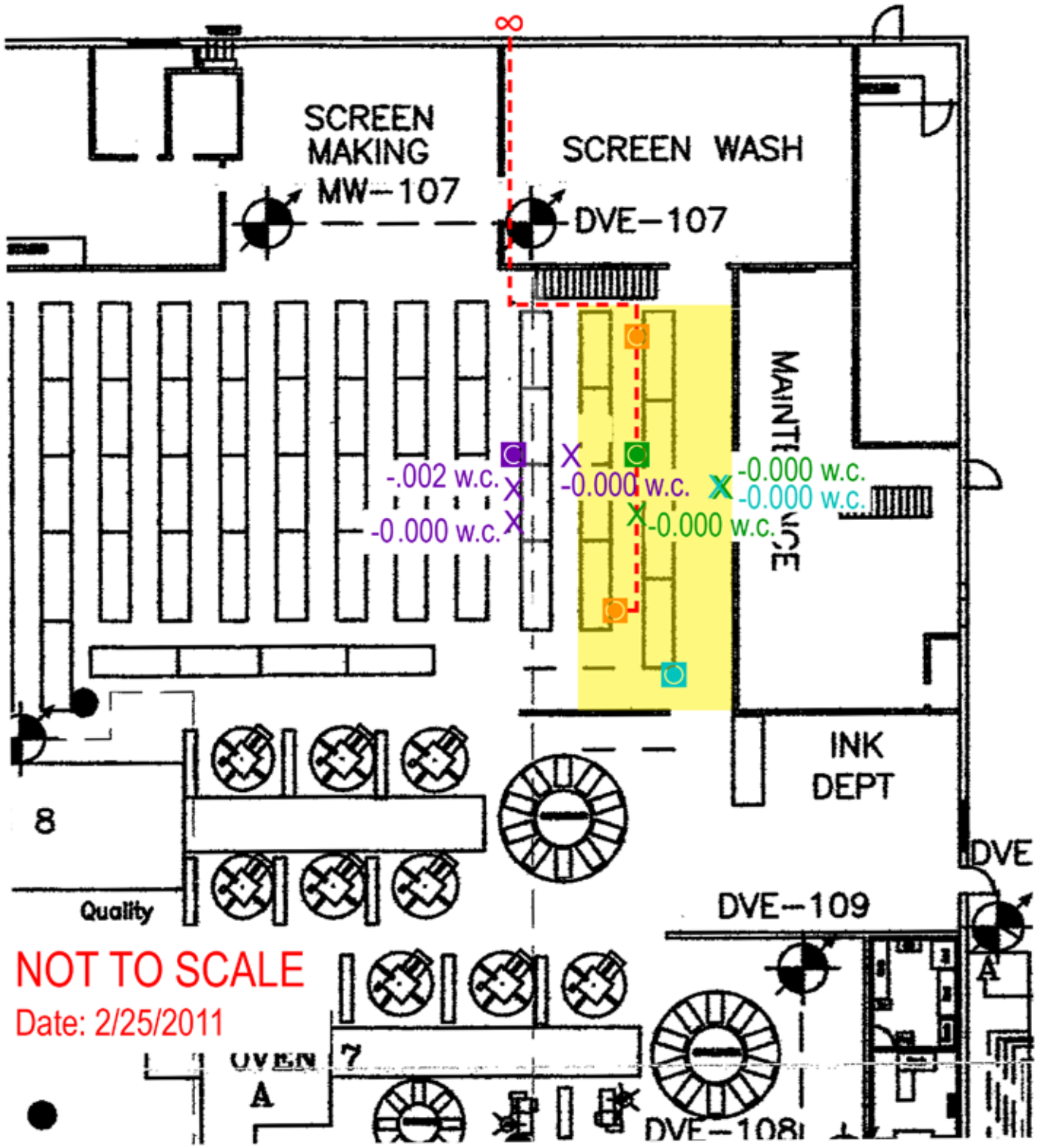

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FIGURE #4 - LEGEND

- ○ / X - Suction Point Test Hole #1 / Diagnostic Test Hole
- ○ / X - Suction Point Test Hole #2 / Diagnostic Test Hole
- ○ / X - Suction Point Test Hole #3 / Diagnostic Test Hole
- – – – / ∞ - Proposed Pipe Route / Exterior Fan Placement
- ▭ - Mitigation Area **SS-5**

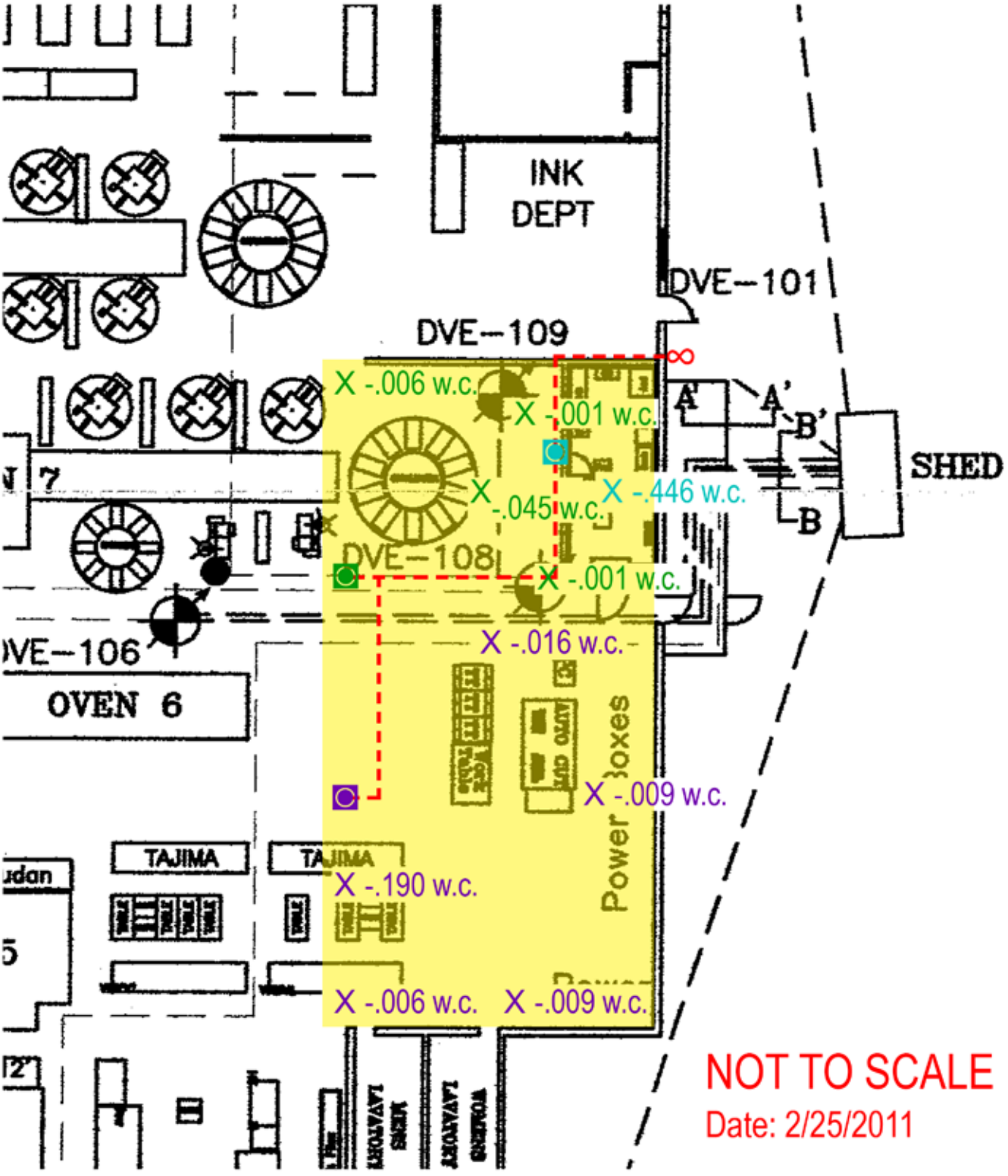

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Table 1
Sub-Slab Diagnostic Test Data
February 4, 2011
200 N. Main Street, Perry, NY

Mitigation Area	Suction Device	Suction Point Test Hole #	Static Vacuum Inches W. C.	Distance/Direction to Test Hole	Vacuum Reading Inches W. C.	Comments
SS-3						
	Shop Vac	#1	15	10’ SSW	-0.160	• Settled soils • Excellent communication over entire mitigation area • 3rd Suction point to be added as drain hole to accommodate fan location
		#1		20’ SSW	-0.019	
		#1		20’ NNW	-0.010	
		#1		33’ NNW	-0.003	
		#1		25’ NNE	-0.017	
		#1		25’ ESE	-0.015	
		#1		40’ ESE	-0.004	
		#2	15	20’ ESE	-0.018	
SS-4						
	Shop Vac	#1	31	10’ NNW	-0.000	• Expansion joint every 15’ by 20’ • All expansion joints leaking vacuum air • Shelving will need to be dismantled to seal all joints • Tight soils expected and may require high suction fan
		#1		10’ N	-0.000	
		#2	30	3’ N	-0.002	
		#2		10’ N	-0.000	
		#2		10’ W	-0.000	
		#3	30	25’ SSW	-0.000	
SS-5						
	Shop Vac	#1	24	28’ S	-0.006	• Wet sandy clay soils encountered leaking joint along rest rooms • 3rd point needed to put office area under vacuum • Open sump pit leaking air and needs sealing
		#1		15’ SSW	-0.045	
		#1		28’ SSW	-0.001	
		#1		30’ W	-0.001	
		#2	20	15’ N	-0.190	
		#2		25’ N	-0.006	
		#2		29’ NNW	-0.009	
		#2		37’ W	-0.009	
		#2		29’ SSW	-0.016	
		#3	36	8’ W	-0.446	

KEYSTONE MATERIAL TESTING, LLC

INSPECTION PHOTOS

Property Address: Champion Products Facility, 200 North Main Street, Perry, NY 14530
Inspection Date: February 2011

Photo 1 is a typical view of the interior production area of the Champion Products Facility.

Photo 2 is a typical view of an installation of a vacuum diagnostic test hole.

Photo 3 is a typical view of vacuum testing with a shop vac and magnahelic pressure gauge.

Photo 4 is a typical view of performance of diagnostic vacuum measurement utilizing a digital micro-manometer.

Photo 5 shows typical floor slab expansion joints which need sealing.

Photo 6 shows an existing exterior point sump pit that needs sealing.

Photo 7 is a typical view of mitigation area 4 showing shelving which needs to be dismantled for floor slab sealing.

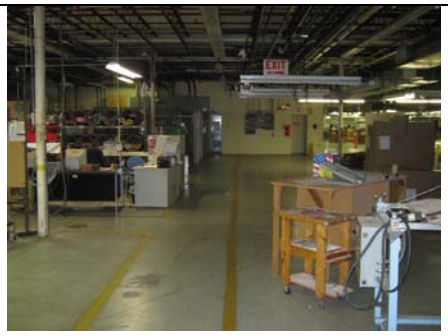


Photo 8 is a typical view of mitigation area 5.

Photo 9 is a typical view of mitigation area 3 showing stored materials which need to be moved prior to ASD install.

INSPECTION PHOTOS (continued)

Property Address: Champion Products Facility, 200 North Main Street, Perry, NY 14530
Inspection Date: February 2011

Photo 10 is a typical exterior wall view where ASD blowers will be installed.

Fantech

Installation Instructions for Radon Fans Model HP/FR

READ & SAVE THESE INSTRUCTIONS!

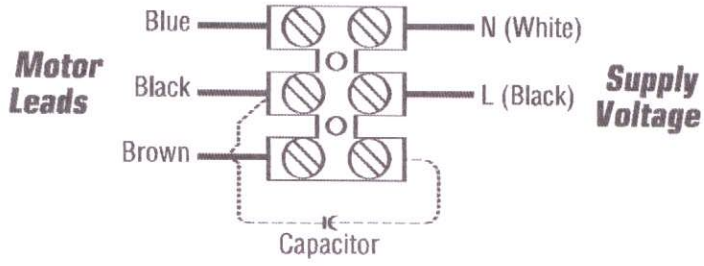
Warnings

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED, MAKE SURE ELECTRICAL SERVICE TO THE FAN IS LOCKED IN "OFF: POSITION.

1. Suitable for use with solid-state speed control.
2. This unit has rotating parts and safety precautions should be exercised during installation, operation and maintenance.
3. CAUTION: "For General Ventilation Use Only. Do Not Use To Exhaust Hazardous Or Explosives Materials and Vapors."
4. **WARNING: TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS-OBSERVE THE FOLLOWING:**
   a. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the factory.
   b. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
   c. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
   d. The combustion airflow needed for safe operation of fuel burning equipment may be affected by this unit's operation. Follow the heating equipment manufacturer's guidelines and safety standards such as those published by the National Fire Protection Association (NFPA), the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) and the local code authorities.
   e. When cutting or drilling into wall or ceiling, do not damage electrical wires or other hidden utilities.
   f. Ducted fans must always be vented to the outdoors.
   g. If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application.
   h. NEVER place a switch where it can be reached from a tub or shower.
5. WARNING! Check voltage at the fan to see if it corresponds to the motor nameplate.

GUARDS MUST BE INSTALLED WHEN FAN IS WITHIN REACH OF PERSONNEL OR WITHIN SEVEN (7) FEET OF WORKING LEVEL OR WHEN DEEMED ADVISABLE FOR SAFETY.

Wiring Diagram



Five (5) Year Warranty

This warranty supersedes all prior warranties

Installation that will result in condensate forming in the outlet ducting should have a condensate bypass installed to route the condensate outside of the fan housing. Conditions that are likely to produce condensate include but are not limited to: outdoor installations in cold climates, long lengths of outlet duction, high moisture content in soil and thin wall or aluminum outlet ducting. Failure to install a proper condensate bypass may void any warranty claims.

DURING ENTIRE WARRANTY PERIOD:

FANTECH will repair or replace any part which has a factory defect in workmanship or material. Product may need to be returned to the fantech factory, together with a copy of the bill of sale and identified with RMA number.

FOR FACTORY RETURN YOU MUST:

- Have a Return Materials Authorization (RMA) number. This may be obtained by calling FANTECH either in the USA at 1.800.747.1762 or in CANADA at 1.800.565.3548. Please have bill of sale available.
- The RMA number must be clearly written on the outside of the carton, or the carton will be refused.
- All parts and/or product will be repaired/replaced and shipped back to buyer; no credit will be issued.

OR

The Distributor may place an order for the warranty part and/or product and is invoiced. The Distributor will receive a credit equal to the invoice only after product is returned prepaid and verified to be defective.

FANTECH WARRANTY TERMS DO NOT PROVIDE FOR REPLACEMENT WITHOUT CHARGE PRIOR TO INSPECTION FOR A DEFECT. REPLACEMENTS ISSUED IN ADVANCE OF DEFECT INSPECTION ARE INVOICED, AND CREDIT IS PENDING INSPECTION OF RETURNED MATERIAL. DEFECTIVE MATERIAL RETURNED BY END USERS SHOULD NOT BE REPLACED BY THE DISTRIBUTOR WITHOUT CHARGE TO THE END USER, AS CREDIT TO DISTRIBUTOR'S ACCOUNT WILL BE PENDING INSPECTION AND VERIFICATION OF ACTUAL DEFECT BY FANTECH.

THE FOLLOWING WARRANTIES DO NOT APPLY:

- Damages from shipping, either concealed or visible. Claim must be filed with freight company.
- Damages resulting from improper wiring or installation.
- Damages or failure caused by acts of God, or resulting from improper consumer procedures, such as:
  1. Improper maintenance
  2. Misuse, abuse, abnormal use, or accident, and
  3. Incorrect electrical voltage or current.
- Removal or any alteration made on the FANTECH label control number or date of manufacture.
- Any other warranty, expressed, implied or written, and to any consequential or incidental damages, loss or property, revenues, or profit, or costs of removal, installation or reinstallation, for any breach of warranty.

WARRANTY VALIDATION

- The user must keep a copy of the bill of sale to verify purchase date.
- These warranties give you specific legal rights, and are subject to an applicable consumer protection legislation. You may have additional rights which vary from state to state.

United States
1712 Northgate Blvd.,
Sarasota, FL. 34234
Phone: 800.747.1762; 941.309.6000
Fax: 800.487.9915; 941.309.6099
www.fantech.net; info@fantech.net

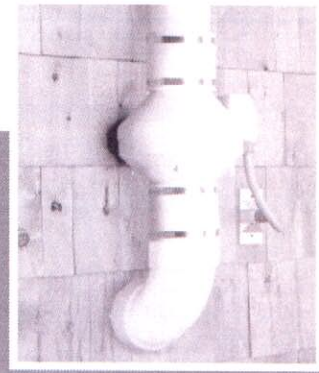
Canada
50 Kanalflakt Way,
Bouctouche, NB E4S 3M5
Phone: 800.565.3548; 506.743.9500
Fax: 877.747.8116; 506.743.9600
www.fantech.ca; info@fantech.ca

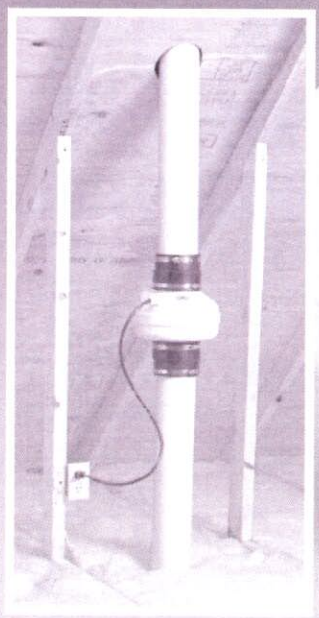
Article #: 301077
Item #: 401443
Rev Date: 010307

Fantech

HP SERIES

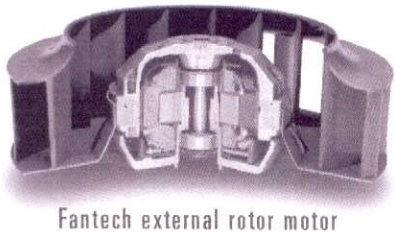
FANS FOR RADON APPLICATIONS
WITH IMPROVED UV RESISTANCE!





TRUST THE INDUSTRY STANDARD.
HERE'S WHY:

Don't put your reputation at stake by installing a fan you know won't perform like a Fantech! For nearly twenty years, Fantech has manufactured quality ventilation equipment for Radon applications. Fantech is the fan Radon contractors have turned to in over 1,000,000 successful Radon installations worldwide.



Fantech external rotor motor

FANTECH HP SERIES FANS MEET THE CHALLENGES OF RADON APPLICATIONS:

HOUSING
- UV resistant, UL Listed durable plastic
- UL Listed for use in commercial applications
- Factory sealed to prevent leakage
- Watertight electrical terminal box
- Approved for mounting in wet locations - i.e. Outdoors

MOTOR
- Totally enclosed for protection
- High efficiency EBM motorized impeller
- Automatic reset thermal overload protection
- Average life expectancy of 7-10 years under continuous load conditions

RELIABILITY
- Five Year Full Factory Warranty
- Over 1,000,000 successful radon installations worldwide

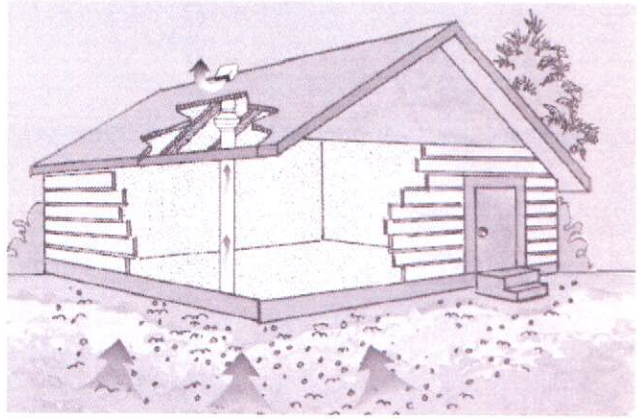
IMPROVING INDOOR AIR QUALITY THROUGH BETTER VENTILATION

www.fantech.net

Fantech

HP Series Fans are Specially Designed with Higher Pressure Capabilities for Radon Mitigation Applications

MOST RADON MITIGATORS WHO PREVIOUSLY USED THE FANTECH FR SERIES FANS HAVE SWITCHED TO THE NEW HP SERIES.



PERFORMANCE DATA

Fan Model	Volts	Wattage Range	Max. Amps	CFM vs. Static Pressure in Inches W.G.								Max. Ps
				0"	0.5"	0.75"	1.0"	1.25"	1.5"	1.75"	2.0"	
HP2133	115	14 - 20	0.17	134	68	19	-	-	-	-	-	0.84
HP2190	115	60 - 85	0.78	163	126	104	81	58	35	15	-	1.93
HP175	115	44 - 65	0.57	151	112	91	70	40	12	-	-	1.66
HP190	115	60 - 85	0.78	157	123	106	89	67	45	18	1	2.01
HP220	115	85 - 152	1.30	344	260	226	193	166	137	102	58	2.46

HVI MEMBER™

PERFORMANCE CURVES

Fantech provides you with independently tested performance specifications.

The performance curves shown in this brochure are representative of the actual test results recorded at Texas Engineering Experiment Station/Energy Systems Lab, a recognized testing authority for HVI. Testing was done in accordance with AMCA Standard 210-85 and HVI 916 Test Procedures. Performance graphs show air flow vs. static pressure.

Use of HP Series fans in low resistance applications such as bathroom venting will result in elevated sound levels. We suggest FR Series or other Fantech fans for such applications.

HP FEATURES INCLUDE

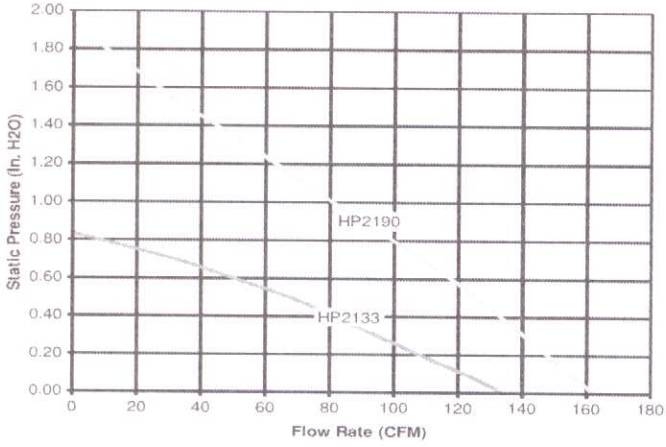
- Improved UV resistant housings approved for commercial applications.
- UL Approved for Wet Locations (Outdoors)
- Sealed housings and wiring boxes to prevent Radon leakage or water penetration
- Energy efficient permanent split capacitor motors
- External wiring box
- Full Five Year Factory Warranty

c UL us

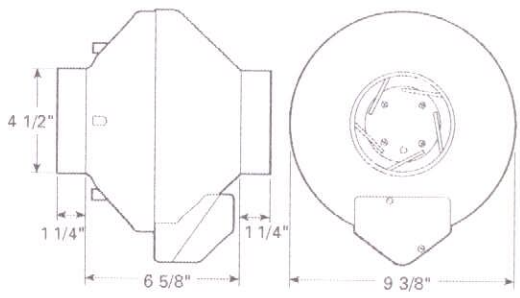
NOTE:

Installations that will result in condensate forming in the outlet ducting should have a condensate bypass installed to route the condensate outside of the fan housing. Conditions that are likely to produce condensate include but are not limited to: outdoor installations in cold climates, long lengths of outlet ducting, high moisture content in soil and thin wall or aluminum outlet ducting. Failure to install a proper condensate bypass may void any warranty claims.

HP2133 & HP2190 RADON MITIGATION FANS



Tested with 4" ID duct and standard couplings.

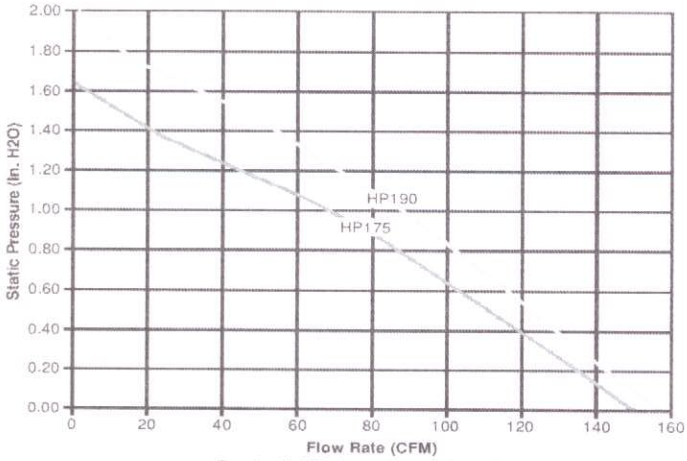


HP2133 – For applications where lower pressure and flow are needed. Record low power consumption of 14-20 watts! Often used where there is good sub slab communication and lower Radon levels.

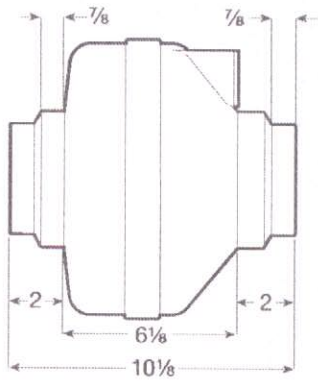
HP2190 – Performance like the HP190 but in a smaller housing. Performance suitable for the majority of installations.

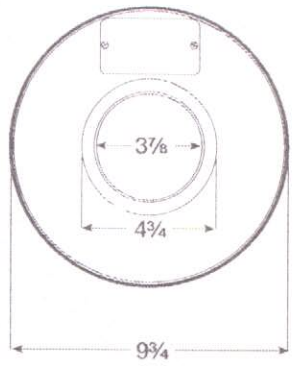
Fans are attached to PVC pipe using flexible couplings.
For 4" PVC pipe use Indiana Seals #156-44, Pipeconx PCX 56-44 or equivalent.
For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent.

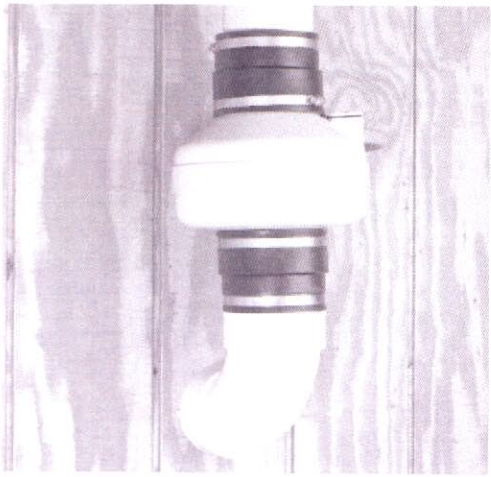
HP175 & HP190 RADON MITIGATION FANS



Tested with 4" ID duct and standard couplings.





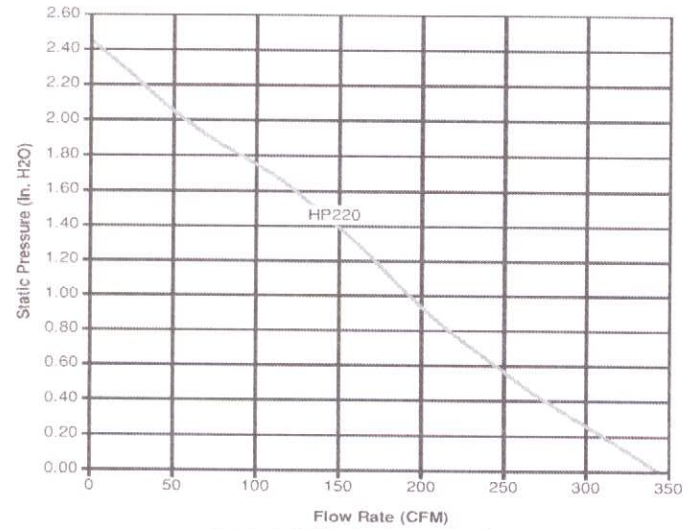


HP175 – The economical choice where slightly less air flow is needed. Often used where there is good sub slab communication and lower Radon levels.

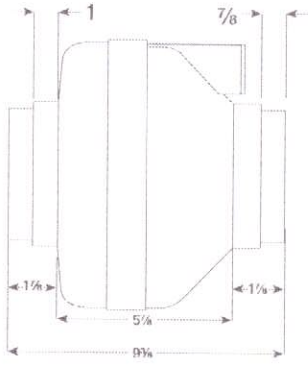
HP190 – The standard for Radon Mitigation. Ideally tailored performance curve for a vast majority of your mitigations.

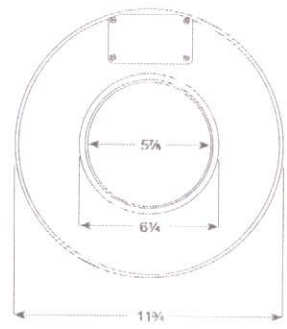
Fans are attached to PVC pipe using flexible couplings.
For 4" PVC pipe use Indiana Seals #151-44, Pipeconx PCX 51-44 or equivalent.
For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent.

HP220 RADON MITIGATION FAN



Tested with 6" ID duct and standard couplings.





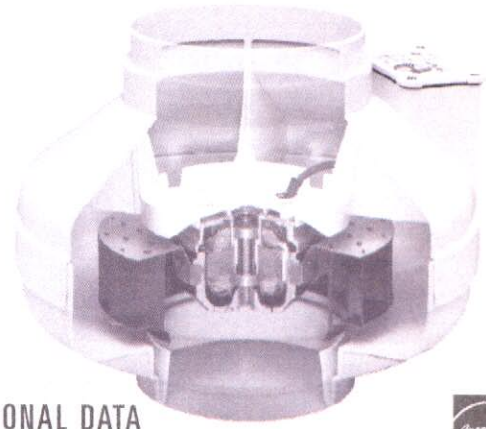
HP 220 – Excellent choice for systems with elevated radon levels, poor communication, multiple suction points and large subslab footprint. Replaces FR 175.

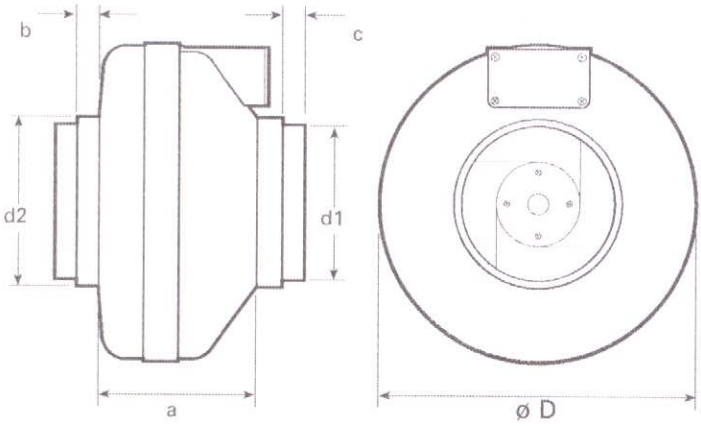
Fans are attached to PVC pipe using flexible couplings.
For 4" PVC pipe use Indiana Seals #156-64, Pipeconx PCX 56-64 or equivalent.
For 3" PVC pipe use Indiana Seals #156-63, Pipeconx PCX 56-63 or equivalent.

Fantech

FR SERIES

THE ORIGINAL MITIGATOR





DIMENSIONAL DATA

model	øD	d1	d2	a	b	c
FR100	9 1/2	3 7/8	4 7/8	6 1/8	7/8	7/8
FR110	9 1/2	3 7/8	4 7/8	6 1/8	7/8	7/8
FR125	9 1/2	–	4 7/8	6 1/8	7/8	–
FR140	11 3/4	5 7/8	6 1/4	5 7/8	1	7/8
FR150	11 3/4	5 7/8	6 1/4	5 7/8	1	7/8
FR160	11 3/4	5 7/8	6 1/4	6 3/8	1	7/8
FR200	13 1/4	7 7/8	9 7/8	6 1/4	1 1/2	1 1/2
FR225	13 1/4	7 7/8	9 7/8	6 1/4	1 1/2	1 1/2
FR250	13 1/4	–	9 7/8	6 1/4	–	1 1/2

All dimensions in inches

PERFORMANCE DATA

Fan Model	Energy Star	RPM	Volts	Rated Watts	Wattage Range	Max. Amps	CFM vs. Static Pressure in Inches W.G.							Max. Ps	Duct Dia.
							0"	.2"	.4"	.6"	.8"	1.0"	1.5"		
FR100	✓	2950	120	21.2	13 - 22	0.18	137	110	83	60	21	-	-	0.90"	4"
FR125	✓	2950	115	18	15 - 18	0.18	148	120	88	47	-	-	-	0.79"	5"
FR150	✓	2750	120	71	54 - 72	0.67	263	230	198	167	136	106	17	1.58"	6"
FR160	-	2750	115	129	103 - 130	1.14	289	260	233	206	179	154	89	2.32"	6"
FR200	✓	2750	115	122	106 - 128	1.11	408	360	308	259	213	173	72	2.14"	8"
FR225	✓	3100	115	137	111 - 152	1.35	429	400	366	332	297	260	168	2.48"	8"
FR250*	-	2850	115	241	146 - 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.
** Also available with 8" duct connection. Model FR 250-8. Special Order.*

NOTE:

Installations that will result in condensate forming in the outlet ducting should have a condensate bypass installed to route the condensate outside of the fan housing. Conditions that are likely to produce condensate include but are not limited to: outdoor installations in cold climates, long lengths of outlet ducting, high moisture content in soil and thin wall or aluminum outlet ducting. Failure to install a proper condensate bypass may void any warranty claims.

FIVE YEAR WARRANTY

DURING ENTIRE WARRANTY PERIOD:

FANTECH will replace any fan which has a factory defect in workmanship or material. Product may need to be returned to the Fantech factory, together with a copy of the bill of sale and identified with RMA number.

FOR FACTORY RETURN YOU MUST:

- Have a Return Materials Authorization (RMA) number. This may be obtained by calling FANTECH either in the USA at 1.800.747.1762 or in CANADA at 1.800.565.3548. Please have bill of sale available.
- The RMA number must be clearly written on the outside of the carton, or the carton will be refused.
- All parts and/or product will be repaired/replaced and shipped back to buyer; no credit will be issued.

OR

The Distributor may place an order for the warranty fan and is invoiced.
The Distributor will receive a credit equal to the invoice only after product is returned prepaid and verified to be defective.

FANTECH WARRANTY TERMS DO NOT PROVIDE FOR REPLACEMENT WITHOUT CHARGE PRIOR TO INSPECTION FOR A DEFECT. REPLACEMENTS ISSUED IN ADVANCE OF DEFECT INSPECTION ARE INVOICED, AND CREDIT IS PENDING INSPECTION OF RETURNED MATERIAL. DEFECTIVE MATERIAL RETURNED BY END USERS SHOULD NOT BE REPLACED BY THE DISTRIBUTOR WITHOUT CHARGE TO THE END USER, AS CREDIT TO DISTRIBUTOR'S ACCOUNT WILL BE PENDING INSPECTION AND VERIFICATION OF ACTUAL DEFECT BY FANTECH.

THE FOLLOWING WARRANTIES DO NOT APPLY:

- Damages from shipping, either concealed or visible. Claim must be filed with freight company.
- Damages resulting from improper wiring or installation.
- Damages or failure caused by acts of God, or resulting from improper consumer procedures, such as:
  1. Improper maintenance.
  2. Misuse, abuse, abnormal use, or accident, and
  3. Incorrect electrical voltage or current.
- Removal or any alteration made on the FANTECH label control number or date of manufacture.
- Any other warranty, expressed, implied or written, and to any consequential or incidental damages, loss or property, revenues, or profit, or costs of removal, installation or reinstallation, for any breach of warranty.

WARRANTY VALIDATION

- The user must keep a copy of the bill of sale to verify purchase date.
- These warranties give you specific legal rights, and are subject to an applicable consumer protection legislation. You may have additional rights which vary from state to state.

DISTRIBUTED BY:

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United States 10048 Industrial Blvd. • Lenexa, KS 66215 • 1.800.747.1762 • www.fantech.net
Canada 50 Kanalflakt Way • Bouctouche, NB E4S 3M5 • 1.800.565.3548 • www.fantech.net

Item #: 411741
Rev Date: 021010

GP Series Radon Fans

NOTE: (excludes GP500)

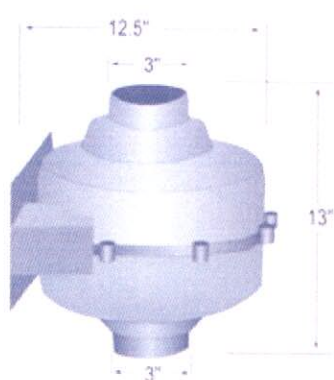
Designed to handle most radon mitigation jobs, RadonAway's GP Series fans are a popular choice for radon professionals seeking ultra-quiet radon fans and top performance. GP Series fans are ideal for most active soil depressurization (ASD) radon mitigation systems, even in tight soil. RadonAway's four GP radon models are designed to be interchangeable, so if one GP doesn't suit a particular job, another will. Choice of model is dependent on building characteristics and should be made by a radon professional.

Radon Fan Features:

- Five-year limited warranty
- Mounts on duct pipe or with integral flange
- 3" diameter ducts for use with 3" or 4" pipe
- Electrical box for hard wire or plug in
- ETL Listed - for indoor or outdoor use
- 4 interchangeable models

Additional Radon Fan Information:

- Downloadable Radon Fan Specifications/Sales Sheet (http://www.radonaway.com/pdfs/radon-fan-GPseriesSpecs.pdf) (PDF format)
- Downloadable Radon Fan Installation Instructions (http://www.radonaway.com/pdfs/radon-fan-XP-XR-GP.pdf) (PDF format)



Typical CFM vs. Static Pressure WC

Model	P/N	Fan Duct Diameter	Watts	Max Pressure	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"

					"WC						
GP201	23007-1	3"	40-60	2.0	82	58	5	-	-	-	-
GP301	23006-1	3"	55-90	2.6	92	77	45	10	-	-	-
GP401	23009-1	3"	60-110	3.4	93	82	60	40	15	-	-
GP501	23005-1	3"	70-140	4.2	95	87	80	70	57	30	10

Calculate your estimated annual electrical cost. (http://www.radonaway.com/radon-fan-operating-cost-calculator.php)

RadonAway
a Spruce company

GP Series Radon Fans

NOTE: (excludes GP500)

Designed to handle most radon mitigation jobs, RadonAway's GP Series fans are a popular choice for radon professionals seeking ultra-quiet radon fans and top performance. GP Series fans are ideal for most active soil depressurization (ASD) radon mitigation systems, even in tight soil. RadonAway's four GP radon models are designed to be interchangeable, so if one GP doesn't suit a particular job, another will. Choice of model is dependent on building characteristics and should be made by a radon professional.

Radon Fan Features:

- Five-year limited warranty
- Mounts on duct pipe or with integral flange
- 3" diameter ducts for use with 3" or 4" pipe
- Electrical box for hard wire or plug in
- ETL Listed - for indoor or outdoor use
- 4 interchangeable models

Additional Radon Fan Information:

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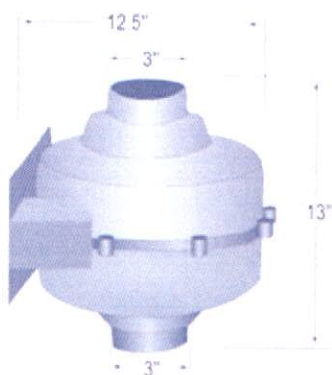
- Downloadable Radon Fan Installation Instructions (http://www.radonaway.com/pdfs/radon-fan-XP-XR-GP.pdf) (PDF format)



Typical CFM vs. Static Pressure WC

Model	P/N	Fan Duct Diameter	Watts	Max Pressure	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"

					"WC						
GP201	23007-1	3"	40-60	2.0	82	58	5	-	-	-	-
GP301	23006-1	3"	55-90	2.6	92	77	45	10	-	-	-
GP401	23009-1	3"	60-110	3.4	93	82	60	40	15	-	-
GP501	23005-1	3"	70-140	4.2	95	87	80	70	57	30	10

Calculate your estimated annual electrical cost. (http://www.radonaway.com/radon-fan-operating-cost-calculator.php)

RadonAway
a Spruce company

HS Series Radon Fan

RadonAway's HS Series fans are a proven solution to tough radon mitigations, providing up to 25 times the suction of inline tube fans to deal with sand, dirt or clay sub-slab material.

Features:

- Internal condensate bypass
- Mounts vertically indoors or outdoors
- Inlet: 3.0" PVC/Outlet: 2.0" PVC
- Weight: 18 lbs.
- Size: 15"W x 13"H x 8"D
- One-year limited warranty (3-year option available)

Radon Fan Model Selection Guidelines:

(Choice of model is dependent on building characteristics and should be made by a radon professional.)

- **HS2000** - High suction and high flow for large areas such as schools and commercial buildings
- **HS3000** - Single family homes with very tight sub-slab material
- **HS5000** - For extremely tight sub-slab material or where the number of holes is restricted; also useful for high altitudes

Additional Fan Information:

- Downloadable Fan Installation Instructions (http://www.radonaway.com/pdfs/HS-Series-Instructions.pdf) (PDF format)

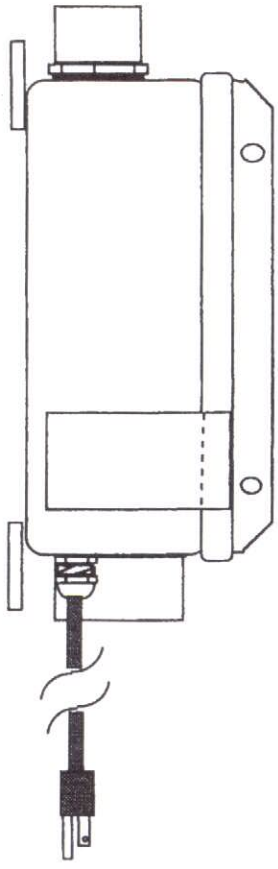
				Typical CFM vs. Static Pressure WC					
Model	P/N	Watts	Max Pressure "WC	0"	10"	15"	20"	25"	35"

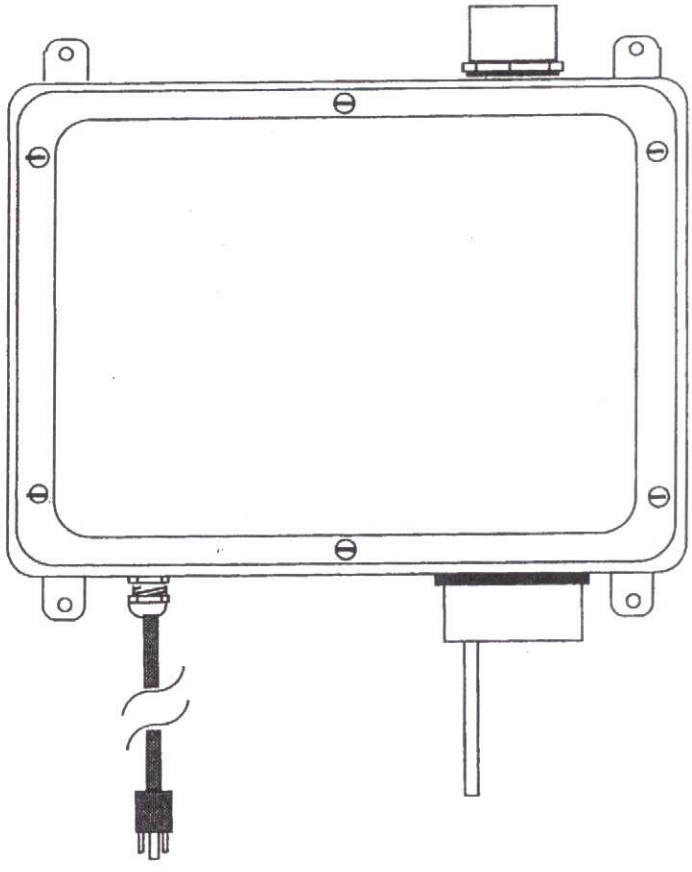
HS2000	23004-1	150-270	18	110	72	40	-	-	-
HS3000	23004-2	105-195	27	40	33	30	23	18	-
HS5000	23004-3	180-320	50	53	47	42	38	34	24

Each fan includes 6 ft. 18 ga. power cord with 3 prong plug.

HS SERIES INSTALLATION INSTRUCTIONS

BY RadonAway™





RadonAway, Inc. Ward Hill, MA.

P/N IN007 Rev F

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 performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician..

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.

9. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

INSTALLATION INSTRUCTIONS (Rev F)
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 noticable 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.

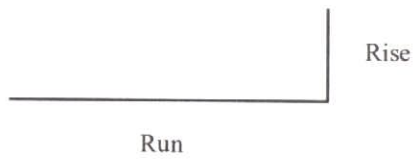
1.5 CONDENSATION & DRAINAGE

(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	20 - 40 CFM
HS2000	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

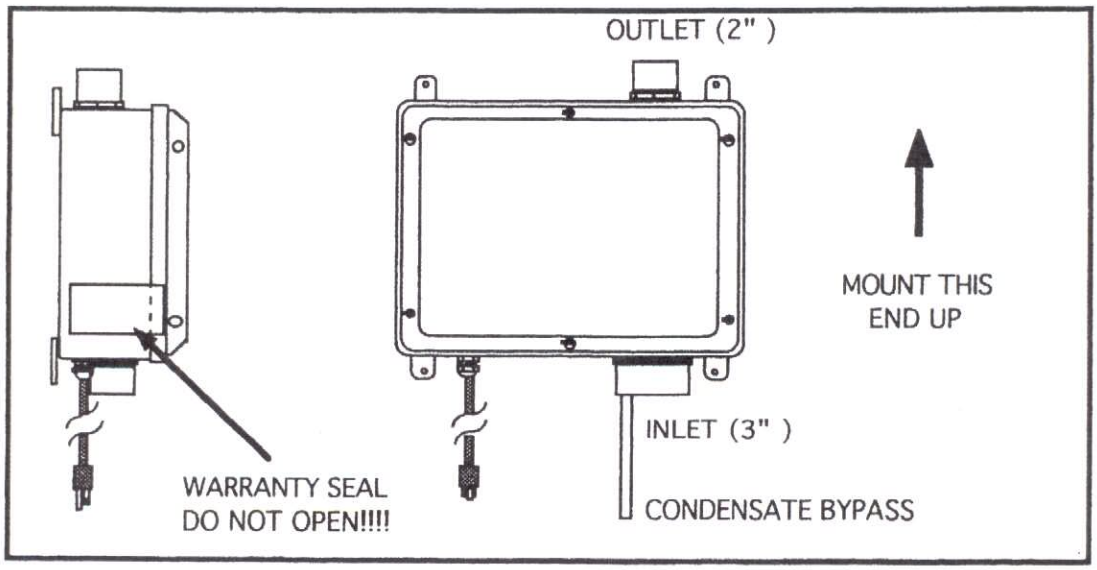
The DynaVac plugs into a standard 120V outlet. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.

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 Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed 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_____