REMEDIAL LETTER REPORT

SUMMARY OF THE INSTALLATION OF THE SUB-SLAB DEPRESSURIZATION SYSTEM AT THE SENECA MARKET BUILDING NORTH FRANKLIN STREET SITE

WORK ASSIGNMENT D003825-09.5

NORTH FRANKLIN STREET SITE
WATKINS GLEN (V)

SITE NO. 8-49-002
SCHUYLER (C), NY

Prepared for:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 Broadway, Albany, New York

Denise M. Sheehan, Acting Commissioner

DIVISION OF ENVIRONMENTAL REMEDIATION

URS Corporation
77 Goodell Street
Buffalo, New York 14203

G2827F

January 2006

REMEDIAL LETTER REPORT
SUMMARY OF THE INSTALLATION
OF THE SUB-SLAB DEPRESSURIZATION SYSTEM
AT THE SENECA MARKET BUILDING
NORTH FRANKLIN STREET SITE
SITE #8-49-002
VILLAGE OF WATKINS GLEN, NEW YORK

Prepared For:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION
WORK ASSIGNMENT D003825-09.5

DRAFT

Prepared By:

URS CORPORATION
77 GOODELL STREET
BUFFALO, NEW YORK 14203

JANUARY 2006

January 6, 2006

Mr. David J. Chiusano, Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
12th Floor
Albany, New York 12233-7013

RE: NYSDEC Standby Contract
Active Venting System Operation and Maintenance # D003825-09.5
North Franklin Street Site, Site No. 8-49-002
Letter Report: Summary of the Installation of the Sub-Slab Depressurization System Installation at the Seneca Market Building

Dear Mr. Chiusano:

URS Corporation (URS) has prepared this letter report to summarize the installation of a sub-slab depressurization (SSD) system at the Seneca Market Building located at 2 North Franklin Street in the Village of Watkins Glen, Schyuler County, New York. The work was performed in accordance with the Project Management Work Plan/ Budget Estimate (URS, May 2005) and the NYSDEC approved Scope of Work (URS, August 2005). The contractor performed all the work in substantial compliance with the contract specifications developed by URS and NYSDEC for this project except for the installation of a moisture bypass fitting as per Section 2.3.9 of the Scope of Work (SOW). The moisture bypass fitting was not installed in the vent pipe above the suction fan to collect condensate. The vent pipe, after exiting the building through a dormer is exposed to the outside weather and is pitched back towards the suction points to drain any condensation. The current configuration will prevent the possible accumulation of condensate above the suction fan and provide adequate drainage of any condensate.

Geologic NY, Inc. of Cortland, New York (Geologic), a Women-Owned Business Enterprise (WBE), was contracted to install the SSD system in the storage room of the Seneca Market Building. The installation of the SSD system was sole sourced to Geologic due the value of the installation being less than $5,000.00.

A visit to the site was made on September 1, 2005, as per the SOW and was attended by representatives of URS, Geologic and the Krog Corporation (building owner). The purpose of the site visit was to estimate the material quantities needed to install the SSD system. A Trip Report summarizing the activities of the site visit is provided in Attachment A. The layout of the SSD system discussed during the site visit was later revised to the present configuration.

A URS representative provided oversight during the mitigation activities. This letter report is provided to summarized and document the installation of the SSD system.

Site Description

The North Franklin Street Class 2 inactive hazardous waste site is an approximately 0.3-acre parcel of land situated in the Village of Watkins Glen, Schuyler County, New York. The site is located in an urban area approximately 400 feet south of Seneca Lake, as shown on Figure 1. Two structures currently exist on site

(shown on Figure 1). The building referred to as the "Former Auto Museum" is a single-story metal building on a concrete slab. The second structure is referred to as the "Former Dry Cleaning Building." This is a two-story brick building that also includes two unoccupied single-story brick sheds to the east. Both of these buildings have housed a variety of businesses in the past, including a machine shop and dry cleaning operations. A real estate company currently occupies the site. A SSD system is currently in operation at the site.

The Seneca Market Building (2 North Franklin Street) is located approximately 150 feet north of the North Franklin Street site (Figure 1). Two tenants, Seneca Harbor Wine Center and Watkins Glen International, currently occupy the first floor of the Seneca Market Building. An indoor air investigation conducted during the spring of 2005 detected elevated concentrations of PCE in the soil vapor beneath the building slab of the 1-story eastern portion of the Seneca Market Building. The findings of that investigation may be found in the *Field Investigation Letter Report, Indoor Air Sampling At 2 North Franklin Street* (URS, June 2005). The 1-story eastern portion of the Seneca Market Building is currently used by the Seneca Harbor Wine Center as a storage room (Figure 2).

Mitigation Activities

Mitigation activities were performed at the Seneca Market Building on October 25 and 26, 2005. Geologic performed the following mitigation services in accordance with the specification found in the SOW:

- Installed two suction points through the storage room concrete slab. A six-inch deep pit was excavated below each suction point.
- Connected the suction points using 4-inch diameter Schedule 40 PVC piping. The PVC piping was run out of the building through a dormer on the roof. Gate valves were installed in the piping from each suction point to control vacuum pressure at each suction point. The PVC piping was pitched so that any condensation from below the fan would run down the piping and into the suction points.
- A Fantech model HP 220 fan was mounted on the side of the three-story portion of the building and the exhaust pipe was greater than 10 feet from any window. The fan and the exhaust piping were secured to the outside of the east side of the three-story portion of the building.
- Geologic sealed around the suction points, any slab crack and all penetrations through the dormer with silicone caulk.
- Mounted two magnehelic vacuum gauges on the outside the south end of the kitchen area in the storage room (one for each suction point) at eye level.
- Installed a vacuum switch attached to a red indicating light that will turn on if there is a system failure (no vacuum).
- A dedicated electrical circuit was installed to the fan, vacuum switch and red indicator light. A dedicated breaker was installed in the breaker box.

Following the installation of the SSD system URS performed post-mitigation testing. The post-mitigation testing consisted of turning the system on and allowing it to run for 1-hour prior to drilling two test holes to confirm that the system was producing a negative pressure beneath the concrete slab. A ¼-inch drill bit was used to drill through the concrete slab. An Engineering Solutions Omniguard III differential pressure recorder was used to check for adequate vacuum in each test hole. The vacuum readings at Test Hole #1 and Test Hole #2 were -0.010 and -0.012 inches of water respectively, which is greater than the minimum of –0.004 inches of water required in the specification found in the Scope of Work. A detailed sketch of the storage room may be found in the field notes, which are found in Attachment B.

Mr. Mike Doyle who is the owner of Seneca Harbor Wine Center was present at the completion of the post-mitigation testing. The URS representative instructed Mr. Doyle on the operation of the SSD system and showed him how to determine if the system was operating properly.

A copy of the URS representative's field notes and Daily Construction Reports may be found in Attachment B. The URS field notes documents the daily work performed, includes a detailed field sketch and includes the vacuum testing results. A photographic log of the mitigation activities may be found in Attachment C. A copy of a report provided by Geologic may be found in Attachment D. The Geologic report documents the quantities of supplies used and includes a sketch of the mitigation system layout.

Cost

The estimated budget for the installation of four SSD systems is $20,000 and may be found in the Project Management Work Plan/ Budget Estimate (URS, May 2005). The amount of the Geologic subcontract was $4,800.00. However, their actual cost was $3,500.00. There were no change orders for this work assignment.

The following tables, figures and attachments are included as part of this field investigation letter report:

Figures

Figure 1	Project Site
Figure 2	Seneca Market Building

Attachments

Attachment A	Trip Report
Attachment D	URS Field Notes
Attachment C	Photographic Log
Attachment D	Contractor Report

Should you have any questions or comments, please do not hesitate to contact me at 716-856-5636.

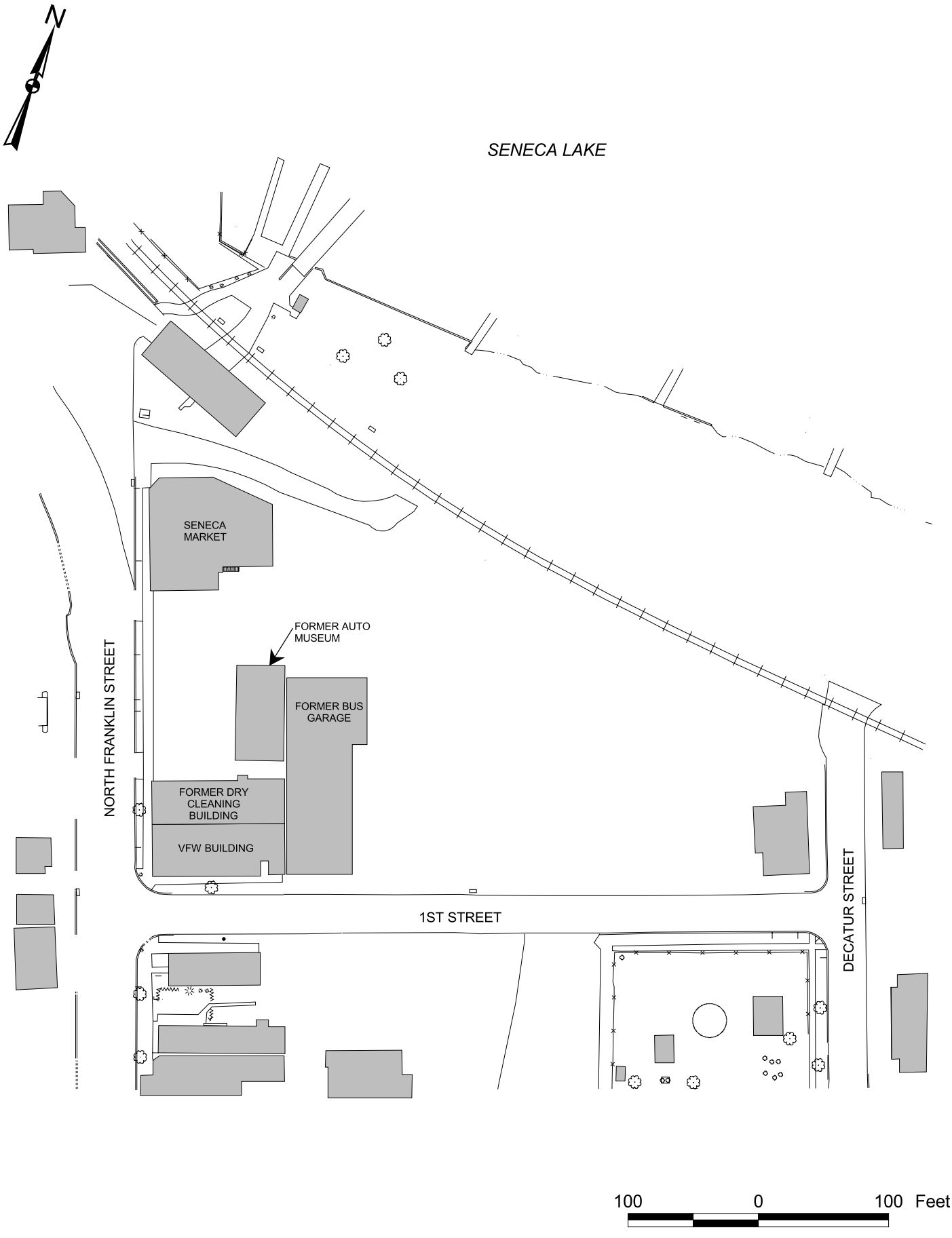
Sincerely,

URS Corporation

Charles E. Dusel, Jr.
Sr. Project Manager

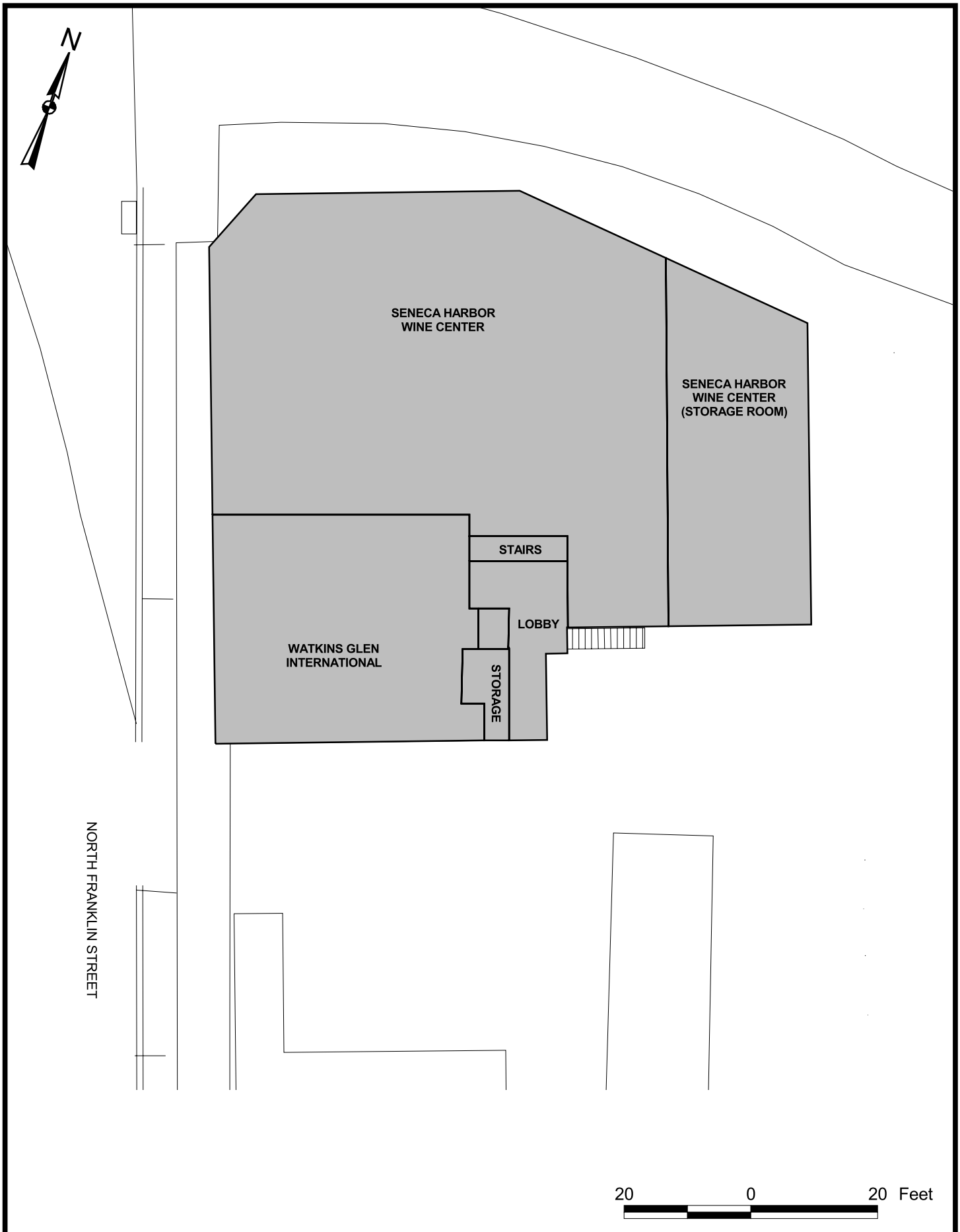
cc: File: 05.35388 (C-1) (11173258)

FIGURES



URS	NORTH FRANKLIN STREET PROJECT SITE	FIGURE 1

N:\11173258.00000\DB\GIS\DEC2000\n_franklin.apr SITEPLAN (II)
12/30/2005



URS	SENECA MARKET BUILDING 2 NORTH FRANKLIN STREET	FIGURE 2

N:\11173258.00000\DB\GIS\DEC2000\n_franklin.apr SENECA MARKET BUILDING
12/30/2005

ATTACHMENT A
TRIP REPORT

Trip Report

Location: 2 North Franklin Street
Date: September 1, 2005

I traveled to the 2 North Franklin St. site in Watkins Glen on September 1, 2005 to meet with the site representative and a potential sub slab depressurization (SSD) contractor. At 10:00 he met with Peter Conklin of the Krog Corporation, the site representative, and Joseph Menzel of Geologic, the prospective contractor. I provided an overview of the intent of SSD systems while Menzel provided details as to location and function of the components.

Based on discussions, it was decided that three vents in a triangular configuration would be employed as a starting point. Two fans would also be used, being they are relatively a low cost item, and the the sub soil conditions are unknown. One vent would be installed in the kitchen, near the door to the bar area, one in the northeast corner of the storage area, and one near the support post in the storage area. If a fourth vent was needed, it would be installed in the south east corner of the storage area. The approximate locations are shown on the attached figure.

The vents would be manifolded and travel along existing beams in the storage area, and exit the room through an existing roof top window. The pipes would travel across the roof alongside or above existing drain pipes to the west and up the existing wall. The exhaust would be located at least 10 feet from the window on the east side of the second story. The fans that would be used are similar to the one used on the dry cleaners next door, and the installation would also be similar.

The meeting was concluded, and everyone left the site by 11:15. If you should you have any questions or comments, please do not hesitate to contact me at 716-923-1301.

Sincerely,

URS Corporation

EF Dinsmore

File: 05.35388 (C-1) (11173258)

ATTACHMENT B

URS FIELD NOTES

URS Corporation

77 Goodell Street
Buffalo, New York 14203
Telephone: (716)-856-5636
Fax: (716)-856-2545

DATE 10/25/2005

DAY	S	M	T	W	TH	F	S
			X				

DAILY CONSTRUCTION REPORT

WEATHER	Bright Sun	Clear	Overcast	Rain X	Snow
TEMP	To 32	32-50 X	50-70	70-85	85 and up
WIND	Still	Moder X	High	Report No.	
HUMIDITY	Dry	Moder X	Humid		

PROJECT: Seneca Market SSD system Install
CONTRACTOR Geologic NY, Inc.
URS JOB No. 11174211
URS PROJECT MANAGER: Chuck Dusel

AVERAGE FIELD FORCE

Name of Contractor	Non-manual	Manual	Remarks
Geologic NY, Inc.		X	Joe Menzel

VISITORS

Time	Representing	Representing	Remarks

EQUIPMENT AT THE SITE:

Core drill and and hand tools

CONSTRUCTION ACTIVITIES:

Geologic cored concrete slab in two locations with 4-inch core bit for the installation of two suction points. A six-inch deep pit was excavated below the bottom of the concrete slab at each core hole. Geologic installed 4-inch diameter Schedule 40 PVC through the core hole at each suction point. The PVC was run vertically to the rafters from each suction point. Horizintal 4-inch PVC piping was installed connecting the two suction points to a central T-pipe fitting. The horizontal piping was pitched from the central T-pipe fitting back towards each of the suction points for drainage purposes. A gate valve was placed in-line of the horizontal piping from each suction point prior to the connection with the T-pipe fitting. A vertical section of pipe was run up from the T-pipe fitting into a dormer window. The PVC pipe was run horizontally out through a window in the dormer and 1 foot above the roof over to the east wall of the three story section of the building. The PVC pipe is pitched back towards the dormer window along the roof to allow for the drainage of any condensation. A Fantech blower model HP220 was mounted vertically on the east wall of the three story section of the building. The discharge pipe was erected vertically and fastened to the east wall of the three story section of the building. The discharge point is located greater than 10 feet from all windows. All cracks, slab penetrations and dormer window penetrations were sealed with silicone caulk.

Remaining work:

1. Install new breaker for the fan and the red indicator light.
2. Start up system and let it run for 1-hour.
3. Perform diagnostic test by drilling vacuum test holes after system has run for atleast 1-hour. Chech vacuum pressure at each test hole.

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BY: Scott McCabe Title: Sr. Geologist
REVIEWED BY: Chuck Dusel Project Manager: Chuck Dusel

URS Corporation

77 Goodell Street
Buffalo, New York 14203
Telephone: (716)-856-5636
Fax: (716)-856-2545

DATE 10/26/2005

DAY	S	M	T	W	TH	F	S
				X			

DAILY CONSTRUCTION REPORT

WEATHER	Bright Sun	Clear	Overcast X	Rain	Snow
TEMP	To 32	32-50 X	50-70	70-85	85 and up
WIND	Still	Moder X	High	Report No.	
HUMIDITY	Dry	Moder X	Humid		

PROJECT: Seneca Market SSD system Install
CONTRACTOR Geologic NY, Inc.
URS JOB No. 11174211
URS PROJECT MANAGER: Chuck Dusel

AVERAGE FIELD FORCE

Name of Contractor	Non-manual	Manual	Remarks
Geologic NY, Inc.		X	Joe Menzel

VISITORS

Time	Representing	Representing	Remarks
14:15	Mike Doyle	Seneca Harbor Wine	Owner of Seneca Harbor Wine

EQUIPMENT AT THE SITE:

Hand tools

CONSTRUCTION ACTIVITIES:

Geologic runs 12-3 wiring in 3/4-inch PVC conduit from the breaker box (located on the east wall of the storage room) to the suction fan. A red indicator light, hooked up to a vacuum pressure switch were also hooked up to the fan circuit. The red light will go on if there is a loss of vacuum pressure in the discharge piping. The red light and vacuum pressure switch were mounted on the south, outside wall of the kitchen area. The fan, red indicator light and vacuum pressure switch were connected to a dedicated circuit breaker installed in the breaker box. The breaker was labeled indicating that it was for the SSD system. A magnehelic guage was also attached to the suction pipe from each suction pint. The magnehelic guages were mounted below the red indicator light at eye level. The SSD systme was started an allowed to run for 1 hour and 5 minutes. After the hour and 5 minutes, two test holes were drilled through the concrete slab at the farthest location from each suction point using a 1/2-inch drill bit. An Omniguard differential pressure recorder was used to measure the vacuum pressure at each test hole. The vacumm pressure reading at test hole #1 and #2 (see site sketch in notes) was -0.010 and -0.012 inches of water respectively. The test holes were sealed with concrete and the SSD system was left running. Mr. Mike Doyle of the Seneca Harbor Wine was on-site to lock-up. URS instructed MR. Doyle ont the operation of the SSD system and the red indicator light which would signial a loss of vacuum.

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BY: Scott McCabe Title: Sr. Geologist
REVIEWED BY: Chuck Dusel Project Manager: Chuck Dusel

10/25/05

0630. S McCabe leaving Buffalo

0730 Arrive AT Ashtead Rental in Rochester, NY TO pick up micro manometer.

0900 Arrive AT Seneca Market Building

JOE Manzel - Geologic NY, Inc. onsite.

- Take pre pictures of inside area. Meet w/ Mike Doyle
- Scope out inside of Backroom. Will start w/ 2 points, vent out of cubicle on roof, run to wall of 4 story section & mount vent pipe

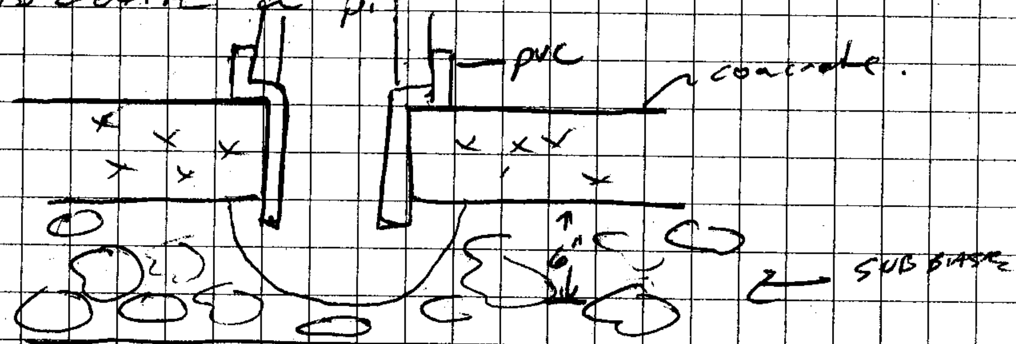
0930 Start coring floor at 1st suction point

0950 -> 4" of concrete at suction point #1, done w 4" Φ hole thru concrete (picture).

1020 -> Have cored floor at second suction point #2 in kitchen area

-> at both locations, there is coarse gravel sub base

-> JOE digs out gravel below suction points to create a pit



1100 JOE Begins TO install pvc & run piping

1700 Have plumbing (pvc) installed out to roof, Fan & discharge pipe have been hung to side of building.

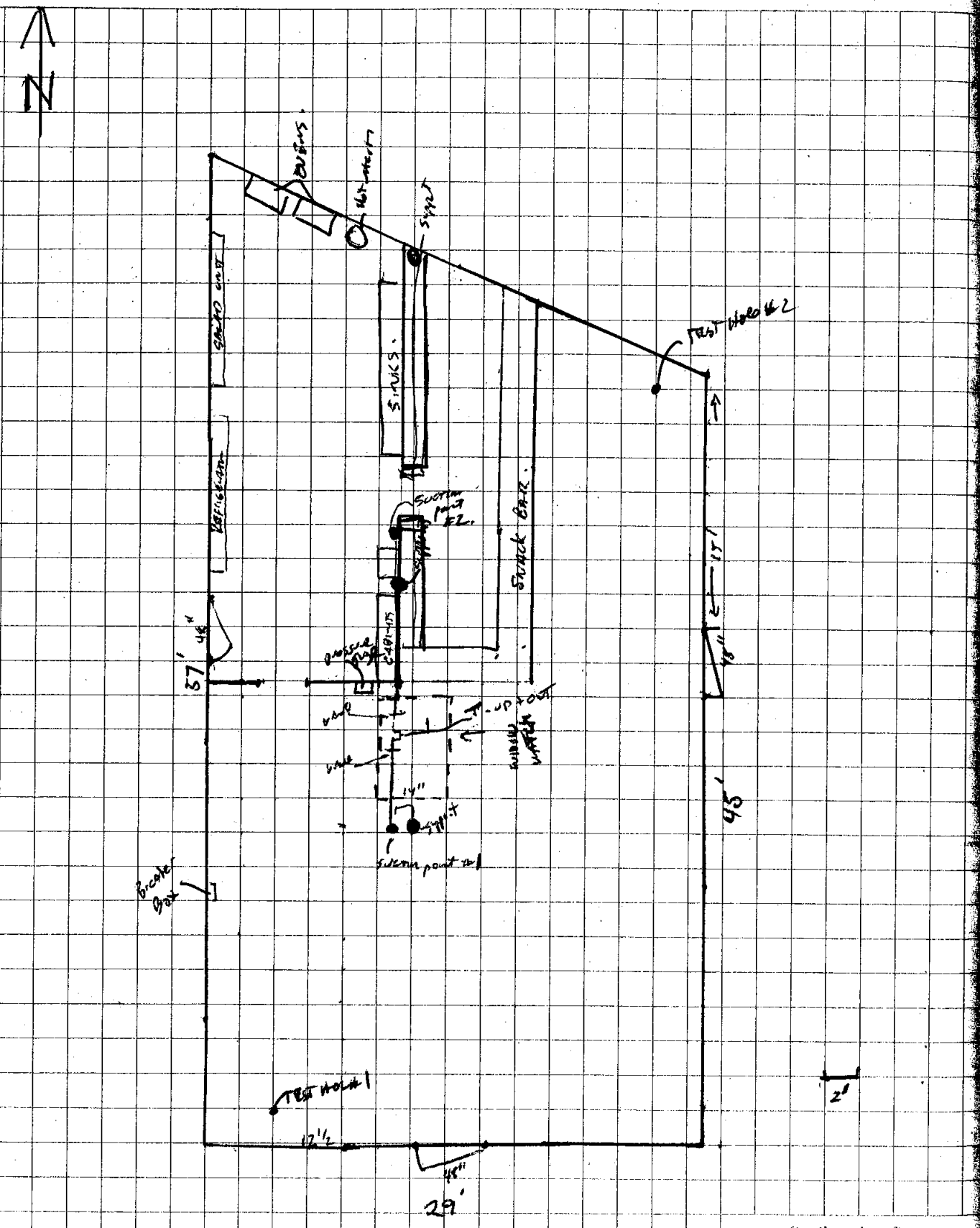
-> JOE will hook up electrical system & will test system tomorrow

- Offsite

Continued on Page

Read and Understood By

Signed [signature] Date 10/25/05 Signed ____ Date ____



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Read and Understood By

Signed _____ Date 10/25/05

Signed _____ Date _____

10/26/05

0800 Sinclair meets Joe Menzel of Envirogic NY, Inc. on site
wx: windy, cloudy, occasional light rain, 34°F
→ Joe starts to run wire to hook up to suction fans. All wiring run through conduit will hook into breaker box & install separate 15 Amp breaker.
→ Install pressure sensitive switch hooked up to a red flood light. If there is no negative pressure the diaphram will close & Red light will go on. Install on outside of south wall of Kitchen area.
→ install 2 Magnehelic pressure gauges.
1 for suction point #1 (south point) outside kitchen area to south.
1 for suction point #2 (center point) inside kitchen area.
→ Label points w/ stickers, Label each corresponding Magnehelic
→ Fan installed → Fantech model HP.

1310 Start up system, will let run 1 hour prior to performing a pressure test through the floor.
→ At start up, both control valves for flow from each point are wide open
Reading is 2.4 inches of H_2O on both gauges

→ install breaker (15 Amp) in slot #13 of breaker box, LABEL inside of breaker door accordingly
→ Joe can hear flow in suction pipes (4").
→ Joe starts to clean up, replaces circuit panel door & cuts bridging for roof pipe.
-all pipe has been pitched back to suction points and down from fans towards inside.
→ discharge pipe is ~10' off of roof w/ 90° elbow pointed South. This is 10' from closest window.

Continued on Page

Read and Understood By

Signed 10/26/05 Date

Signed Date

- will use OMNIGUARD III differential pressure Recorder to measure pressure at test holes
~~XX~~ See Layout on page 36 for test hole locations
- will drill 3/8" hole thru floor & insert TUBING from OMNIGUARD to obtain VACCUM Readings
Background Reading for OMNI Guard = ±0.003 inch of H_2O

1415 Perform VACCUM TEST
→ drill 3/8" TEST hol & insert pressure Record
TEST HOLE 1 @ -0.010 inch of H_2O
TEST HOLE 2 @ -0.012 inch of H_2O
- SUE back fills holes w/ concrete patch
- clean up & put tools on
→ Give owner of Seneca Mines The Direction to system operation, → pressure gauge
→ Red Light on if Fan dirt
→ where separate breaker is
→ call UKS if system is down.

1500 OFF SITE TO DROP OFF Equipt at Atlas in Rochester, NY, THEN TO BUFFALO

Continued on Page

Read and Understood By

Scott McC 10/26/05
Signed Date

Signed Date

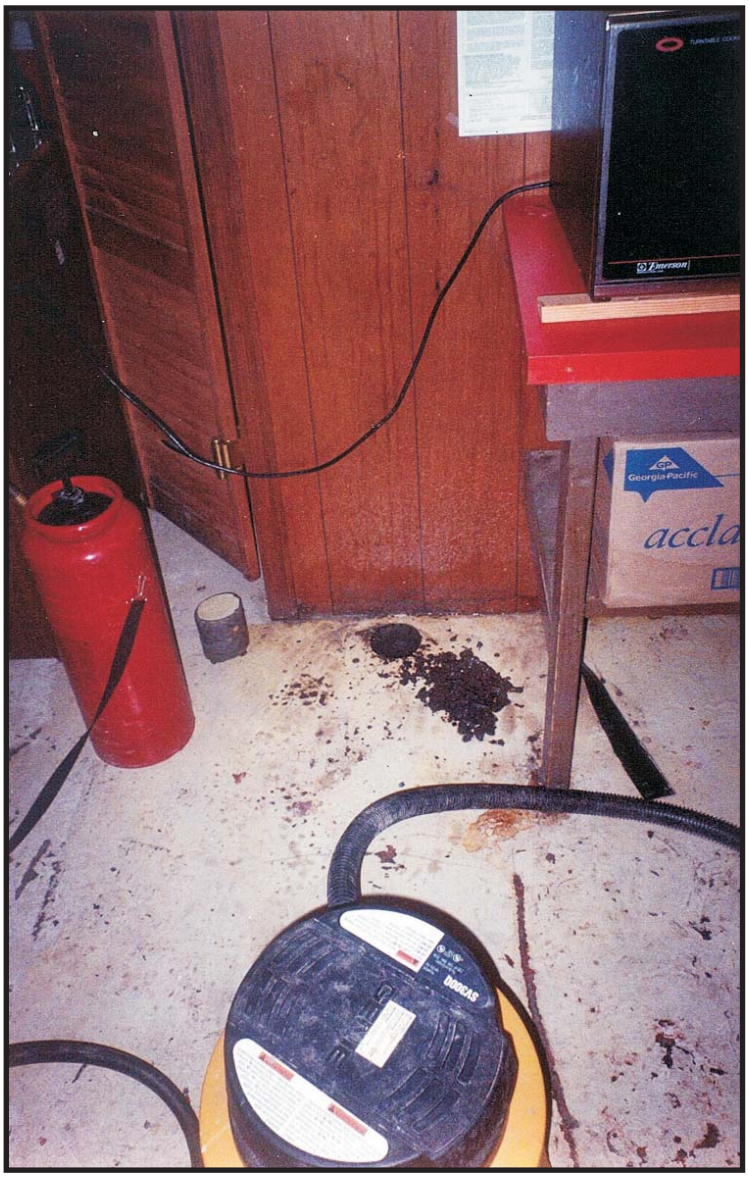
ATTACHMENT C

PHOTOGRAPHIC LOG

Seneca Market Building
Sub-Slab Depressurization System Installation

Photograph of coring slab at suction point #1.

Seneca Market Building
Sub-Slab Depressurization System Installation



Photograph of coring slab at suction point #2.

Seneca Market Building
Sub-Slab Depressurization System Installation

Suction pipe and electrical penetration of dormer.

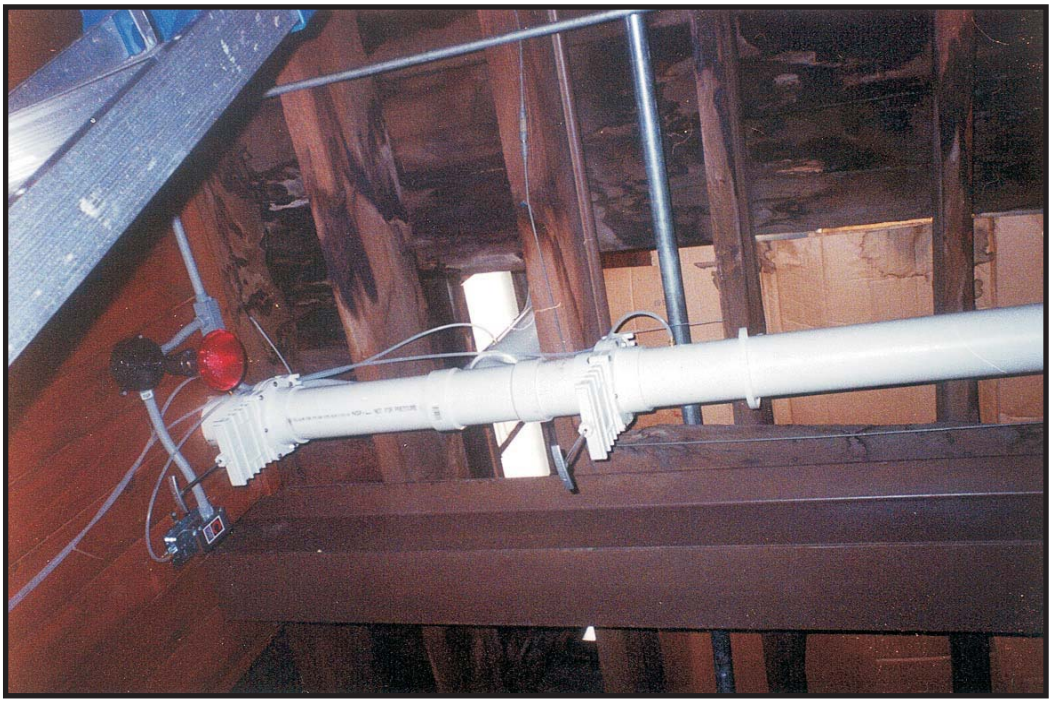
Photography of fan mounted on side of building.

Seneca Market Building
Sub-Slab Depressurization System Installation

Photograph of fan and discharge.

Seneca Market Building
Sub-Slab Depressurization System Installation

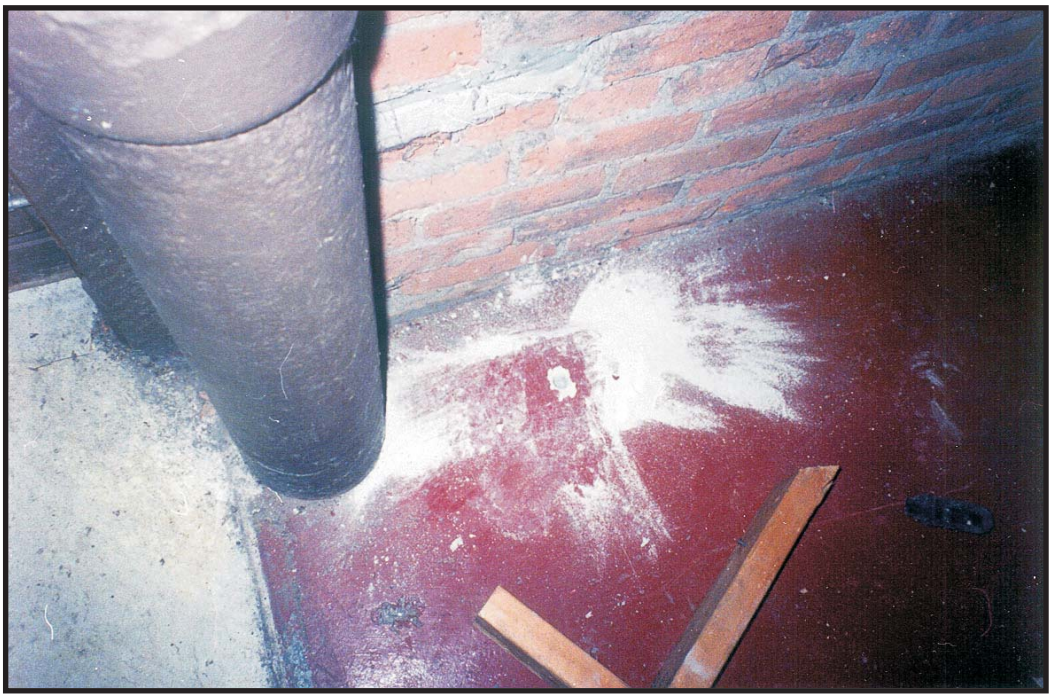
Photograph of Magnehelic gauges indicating suction at both points.



Photograph looking up at gate valves, red indicator light and dormer penetration.

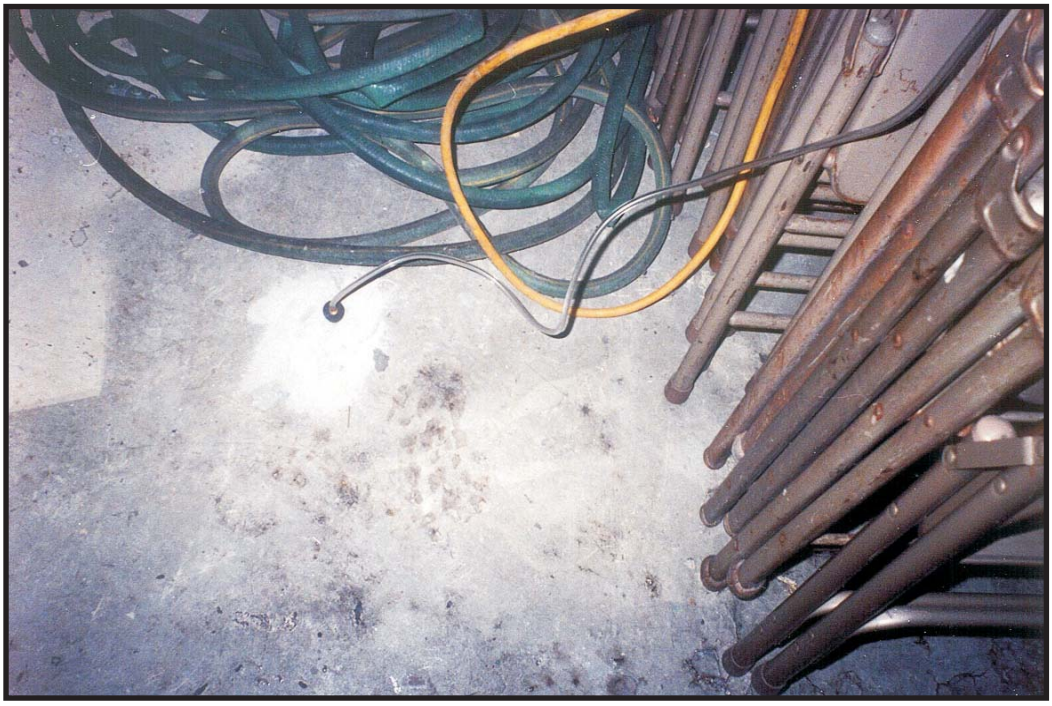
Seneca Market Building
Sub-Slab Depressurization System Installation

Picture of vacuum pressure gauge used to vacuum test.



Vacuum test hole #1.

Seneca Market Building
Sub-Slab Depressurization System Installation



Vacuum test hole #2.

Photograph of back of building showing SSD System.

ATTACHMENT D

CONTRACTOR REPORT

GeoLogic

GeoLogic NY, Inc. P.O. Box 350 • 37 Copeland Ave. • Homer, NY 13077 • 607.749.5000 • Fax: 607.749.5063

November 17, 2005

Scott McCabe
URS Greiner Woodward Clyde
77 Goodell Street
Buffalo, NY 14203

Reference: SSD System Installation
1 North Franklin St.
Watkins Glen, NY

Dear Mr. McCabe,

This letter documents the installation of an SSD system (Sub-Slab Depression) at the above referenced site.

The SSD system was installed over a two (2) day period between October 25 and 26, 2005.

System Installation

Two (2) - 4.25" diameter holes were cored through the concrete floor; see attached Drawing #1. The locations were selected by Scott McCabe (URS) and Joe Menzel (GNY). To increase the extraction point surface area, the hole was excavated to 0.5 feet below the bottom of the concrete slab.

The ventilation pipe was installed into the hole. The bottom of the pipe is recessed into the floor slab. System piping is constructed of 4-inch diameter schedule 40 PVC pipe. The pipe is sealed to the concrete floor with silicone sealant, runs vertically to the ceiling and then across the ceiling. The horizontal runs are connected to a manifold where each exaction point has a vacuum control valve (see Photo #1).

The ventilation pipe exits the roof through a dormer window. The pipe runs parallel with the roof where it is connected to a "Fantech" blower model number HP220, which is mounted vertically (see Photo #2). The discharge point is above all windows and greater than ten (10) feet away from any windows. The piping is pitched to allow condensation to drain to the extraction point.

The system has visual references to indicate proper operation (see photo #1). A magnehelic gauge, vacuum switch and a red indicating light are connected to the system piping. The magnehelic gauge reads 2 inches of water at proper operation. The vacuum switch will activate a red indicating light if there is a system failure. These system interlocks were tested and operate properly.

Communication Testing

A communication test was conducted after the SSD system was installed. Two, one-half-inch diameter holes were drilled through the concrete floor (see Drawing # 1) and fitted with a digital magnehelic gauge. A vacuum was detected at both locations.

If you have any questions please do not hesitate to call me at (607) 749-5000.

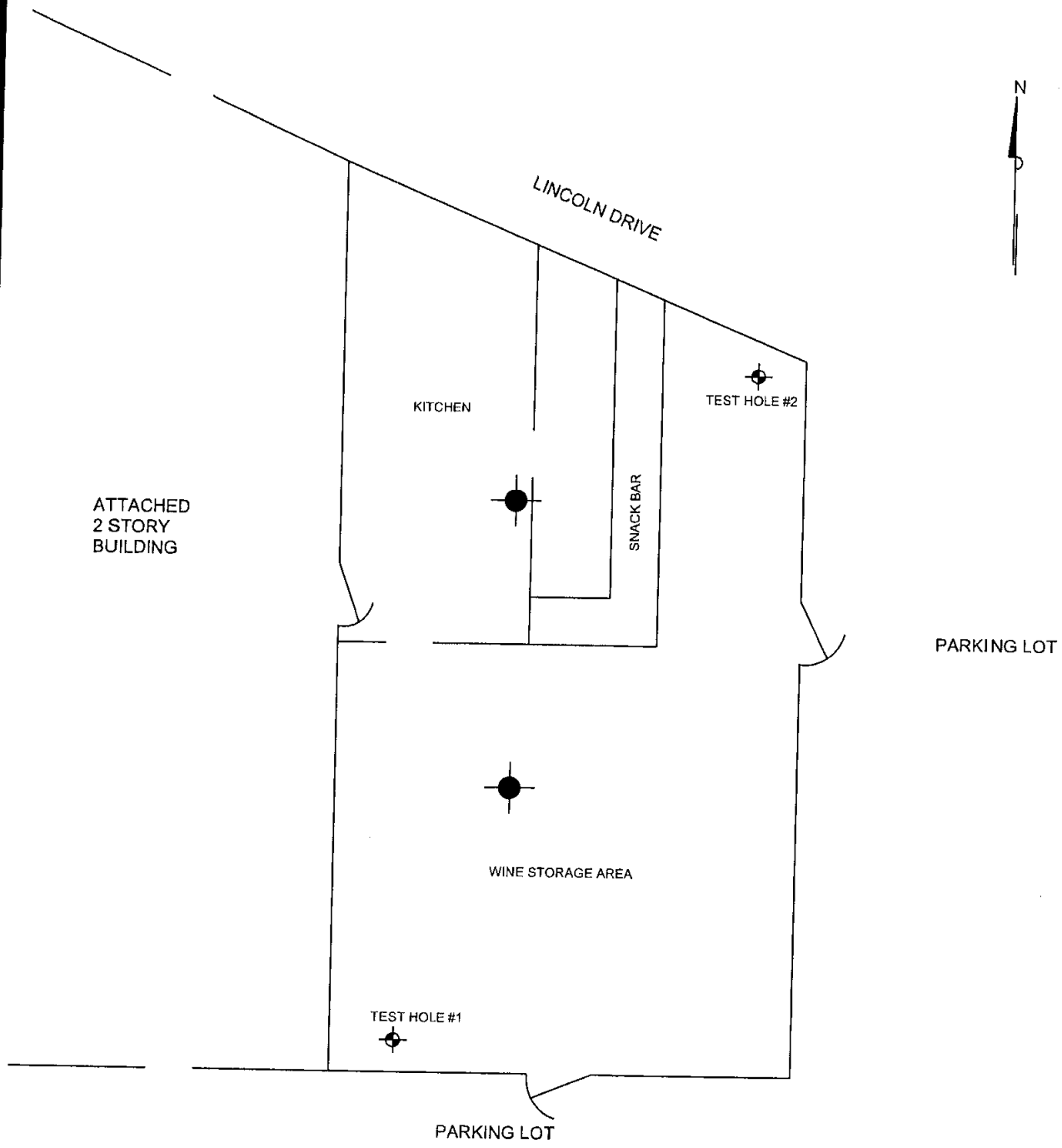
Sincerely,

GeoLogic NY, Inc.

JOSEPH MENZEL 11/20

Joseph Menzel
Geologist

Enc: Floor Plan, Photos
cc: File: F\\..205004B-D\REPORT\Asbuilt.doc



EXTRACTION POINT

TEST HOLE

GeoLogic

GeoLogic NY, Inc.

FLOOR PLAN
1 NORTH FRANKLIN STEET
WATKINS GLEN, NY

DR. BY:	SCALE:	PROJ. NO:
JAM	1" = 10'	205004B
REVD BY:	DATE:	DRWG. NO:
	NOV. 2005	1

Photo No. 1 – Magnehelic Gauges, Vacuum Switch, Red Indicating Light and Inline Valves

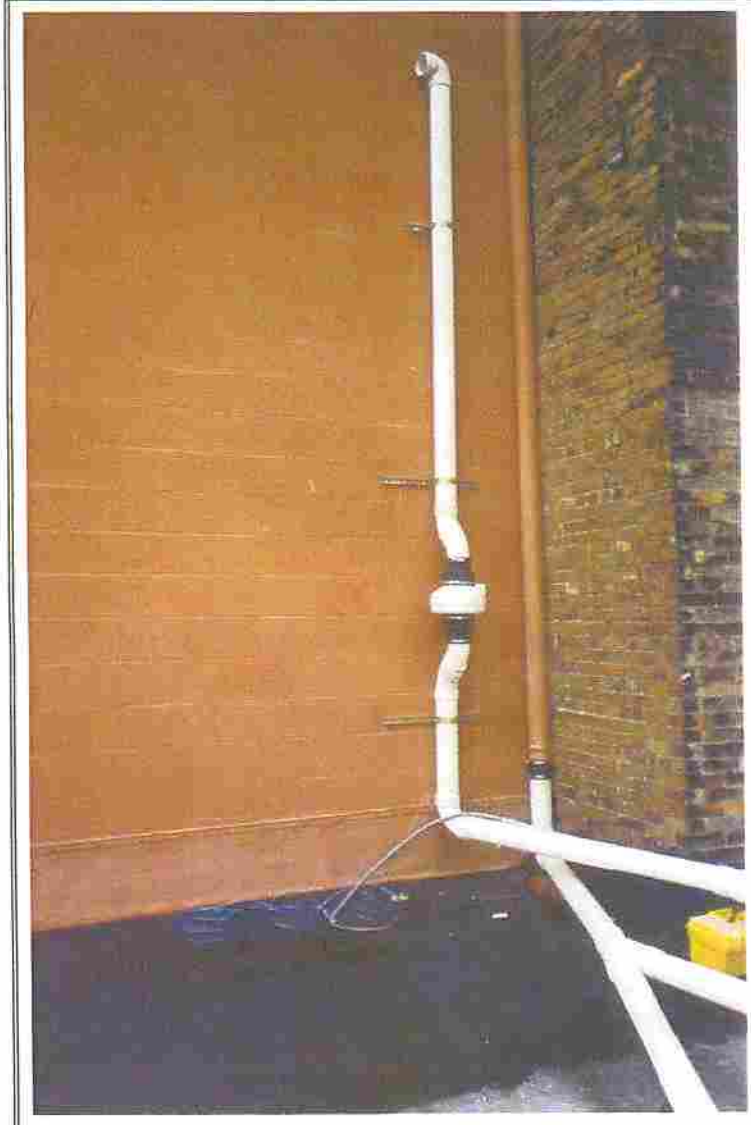
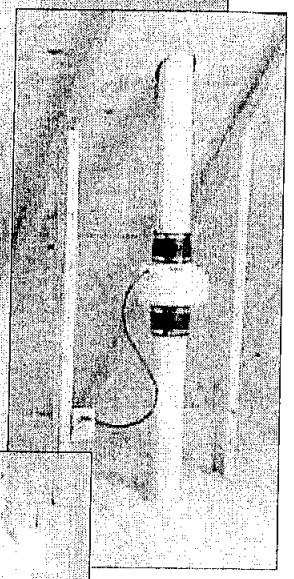


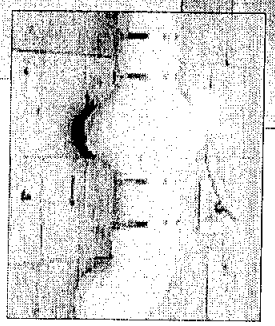
Photo No. 2 – "FANTECH" BLOWER

Fantech

Trust the Industry Standard!

Improved UV resistance!

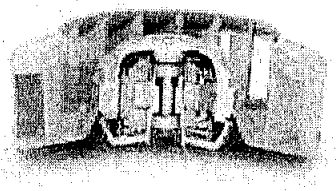




HP Series Fans for Radon Applications

Why 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 HP Series Fans Provide the Solutions to meet the challenges of Radon applications:



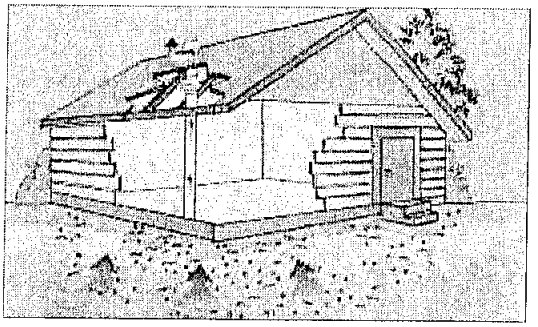
HOUSING
- UV resistant, UL listed durable plastic
- UL Listed for use in commercial applications
- Factory sealed to prevent leakage
- Watertight electrical terminal box
- Approved for mounting in wet locations - i.e. Outdoors

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

HP Series Fans are specially designed with higher pressure capabilities for Radon Mitigation applications

Fantech has developed the HP Series fans specifically to suit the higher pressure capability requirements needed in 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	Flow vs. Static Pressure (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

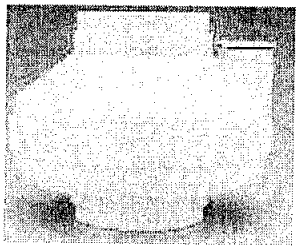
HVI MEMBER™

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 915 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.

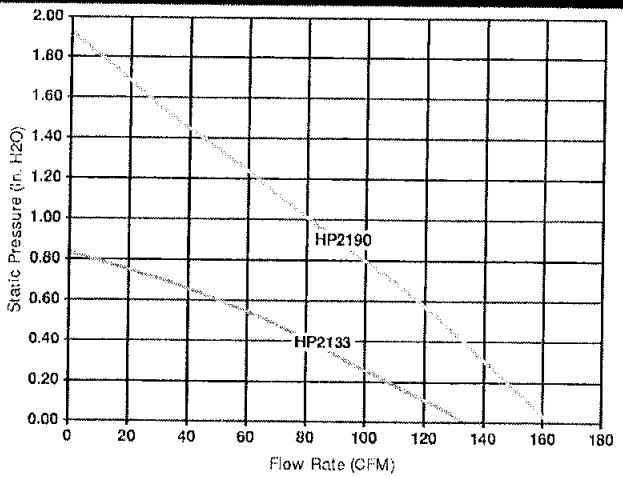


HP FEATURES INCLUDE

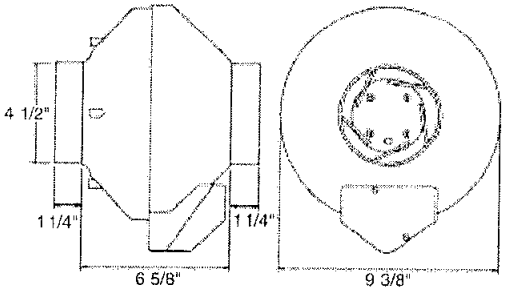
- Improved UV resistant housings approved for commercial applications.
- UL Approved for Wet Locations (Outdoors)
- Sealed housings and wiring boxes to prevent Radon leakage or water penetration
- Energy efficient permanent split capacitor motors
- External wiring box
- Full Three Year Factory Warranty

c UL us

HP2133 and 2190 Radon Mitigation Fans



Tested with 4" ID duct and standard couplings.

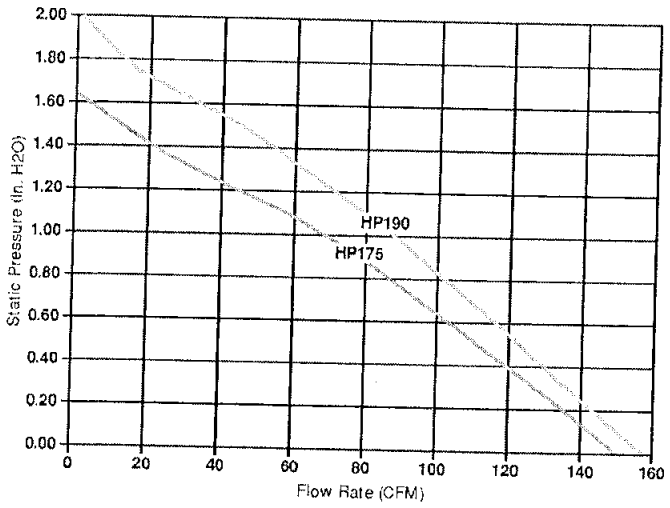


HP2133 – For applications where lower pressure and flow are needed. Record low power consumption of 14-20 watts! Often used where there is good sub slab communication and lower Radon levels.

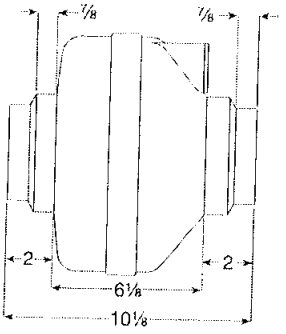
HP2190 – Performance like the HP190 but in a smaller housing. Performance suitable for the majority of installations.

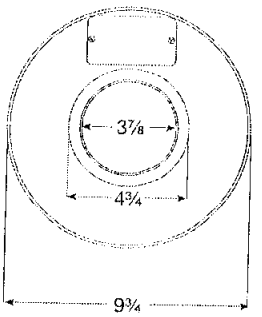
Fans are attached to PVC pipe using flexible couplings.
For 4" PVC pipe use Indiana Seals #156-44, Pipeconx PCX 56-44 or equivalent.
For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent.

HP175 and HP190 Radon Mitigation Fans



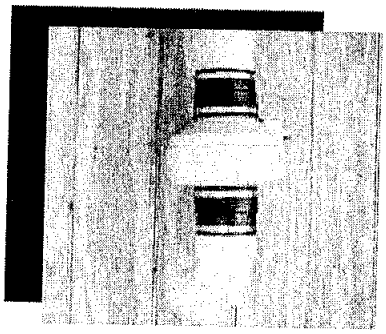
Tested with 4" ID duct and standard couplings.





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

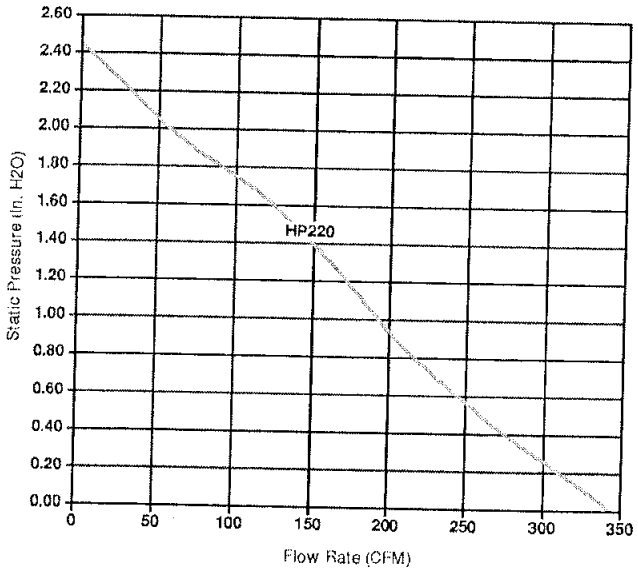
HP190 – ***The standard for Radon Mitigation.*** Ideally tailored performance curve for a vast majority of your mitigations.



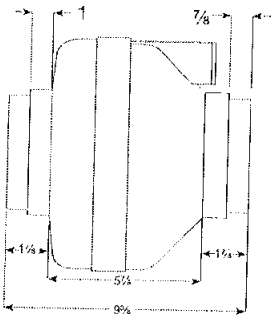
Fans are attached to PVC pipe using flexible couplings.
For 4" PVC pipe use Indiana Seals #151-44, Pipeconx PCX 51-44 or equivalent.

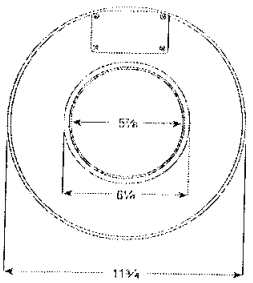
For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent.

HP220 Radon Mitigation Fan



Tested with 6" ID duct and standard couplings.



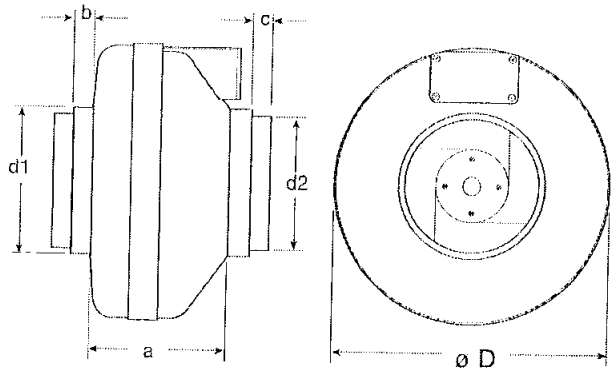


HP 220 – Excellent choice for systems with elevated radon levels, poor communication, multiple suction points and large subslab footprint. Replaces FR 175.

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.

The Original Mitigator – Fantech's FR Series Fans



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	✓	2900	115	19	13 - 19	0.18	122	100	78	55	15	-	-	0.87"	4"
FR110	-	2900	115	80	62 - 80	0.72	167	150	133	113	88	63	41	0.60"	4"
FR125	✓	2950	115	18	15 - 18	0.18	148	120	88	47	-	-	-	0.79"	5"
FR140	✓	2850	115	61	47 - 62	0.53	214	190	162	132	99	46	-	0.15"	6"
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.

Three (3) Year Warranty

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.

For more information contact:

Fantech

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Fax: 877-747-8116; 506-743-9600

Distributed by:

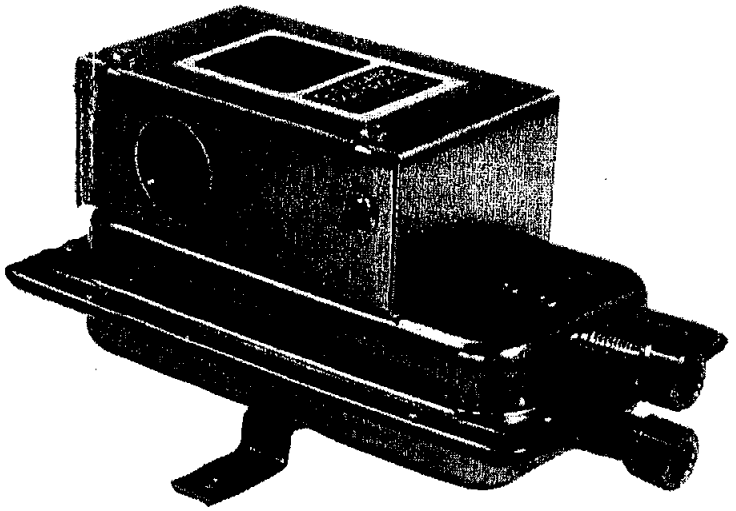
Cleveland Controls
Division of UniControl Inc.

Model AFS–222

AIR PRESSURE SENSING SWITCH WITH ADJUSTABLE SET POINT RANGE

APPLICATION

Model AFS-222 Air Pressure Sensing Switch is a general purpose proving switch designed for HVAC and Energy Management applications. It may be used to sense positive, negative, or differential air pressure.



GENERAL DESCRIPTION & OPERATION

The plated housing contains a diaphragm, a calibration spring and a snap-acting SPDT switch. The sample connections located on each side of the diaphragm accept ¼" OD metallic tubing via the integral compression ferrule and nut.

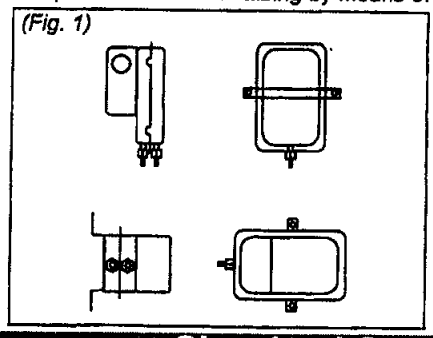
An enclosure cover guards against accidental contact with the live switch terminal screws and the set point adjusting screw. The enclosure cover will accept a ½" conduit connection.

MOUNTING (SEE FIGURE 1)

Select a mounting location which is free from vibration. The **AFS-222** must be mounted with the diaphragm in any vertical plane in order to obtain the lowest specified operating set point. Avoid mounting with the sample line connections in the "up" position. Surface mount via the two 3/16" diameter holes in the integral mounting bracket. The mounting holes are 3-7/8" apart.

The **AFS-222** is designed to accept firm-wall sample lines of ¼" OD tubing by means of ferrule and nut compression connections. For sample lines of up to 10 feet, ¼" OD tubing is acceptable. For lines up to 20 feet, use ¼" ID tubing. For lines up to 60 feet, use ½" ID tubing. A ¼" OD adapter, suitable for slip-on flexible tubing is available: order part number 18311.

(Fig. 1)



AIR SAMPLING CONNECTION (SEE FIGURE 2)

Locate the sampling probe a minimum of 1.5 duct diameters downstream from the air source. Install the sampling probe as close to the center of the airstream as possible. Refer to Figure 2 to identify the high pressure inlet (H) and the low pressure inlet (L). Select one of the five application options listed below, and connect the sample lines as recommended.

POSITIVE PRESSURE ONLY: Connect the sample line to inlet H; inlet L remains open to the atmosphere.

NEGATIVE PRESSURE ONLY: Connect the sample line to inlet L; inlet H remains open to the atmosphere.

TWO NEGATIVE SAMPLES: Connect the higher negative sample to inlet L. Connect the lower negative sample to inlet H.

TWO POSITIVE SAMPLES: Connect the higher positive sample to inlet H. Connect the lower positive sample to inlet L.

ONE POSITIVE AND ONE NEGATIVE SAMPLE: Connect the positive sample to inlet H. Connect the negative sample to inlet L.

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Fax: 216-398-8558
Email: saleshvac@unicontrolinc.com
Web page: http://www.clevelandcontrols.com

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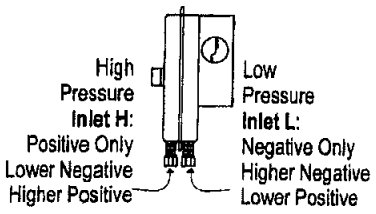
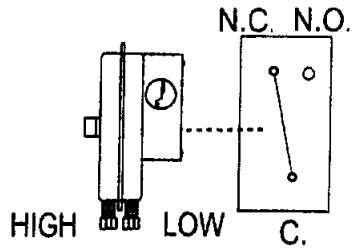
(Figure 2)

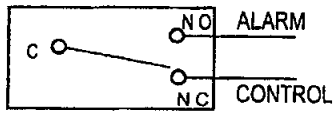


(Figure 3)

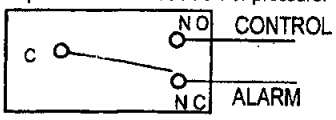


(Figure 4)

To prove excessive air flow or pressure:



To prove insufficient air flow or pressure:



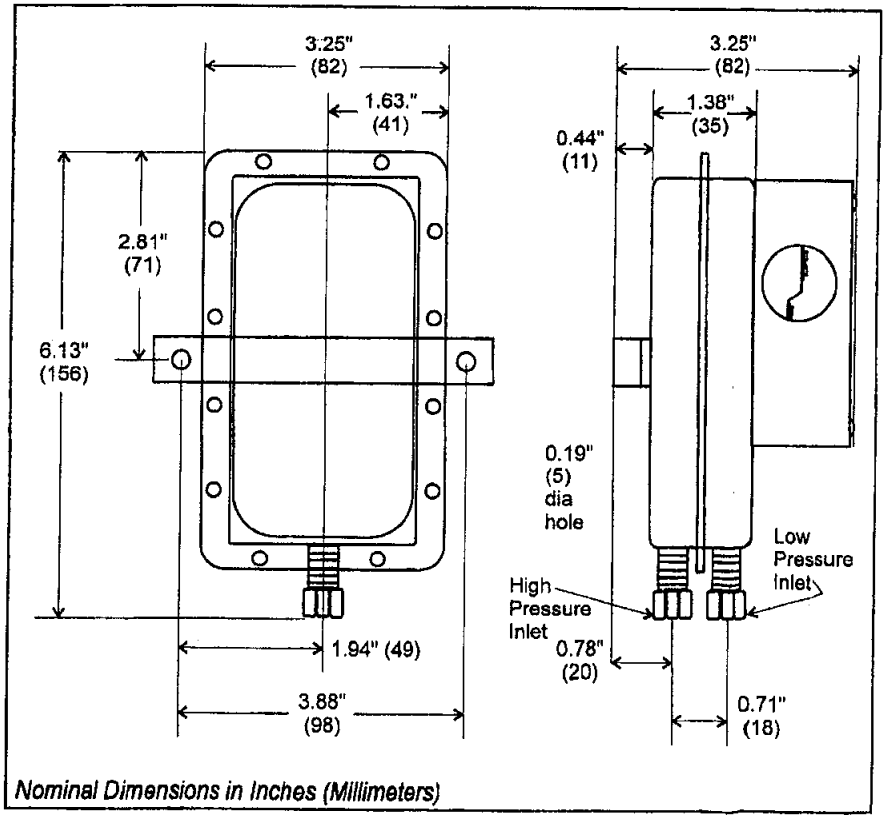
ELECTRICAL CONNECTIONS (SEE FIGURE 3)

Before pressure is applied to the diaphragm, the switch contacts will be in the normally closed (NC) position. The snap switch has screw top terminals with cup washers. Wire alarm and control applications as shown in Figure 4.

FIELD ADJUSTMENT

The adjustment range of an **AFS-222** Air Switch is 0.05±.02" w.c. to 12.0" w.c. To adjust the set point, t urn the adjusting screw counterclockwise until motion has stopped. Next, turn the adjusting screw 4 complete turns in a clockwise direction to engage the spring. From this point, the next ten turns will be used for the actual calibration. **Each full turn represents approximately 1.2" w.c.**

Please note: To properly calibrate an air switch, a digital manometer or other measuring device should be used to confirm the actual set point.



Nominal Dimensions in Inches (Millimeters)

SPECIFICATIONS

MODEL AFS-222 AIR PRESSURE SENSING SWITCH WITH ADJUSTABLE SET POINT RANGE

Mounting Position:
Mount with the diaphragm in any vertical plane.

Set Point Range:
0.05±0.02" w.c. to 12.0" w.c.

Field Adjustable "Operate Range":
0.07" w.c. to 12.0" w.c.

Field Adjustable "Release Range":
0.04" w.c. to 11.2" w.c.

Approximate Switching Differential:
Progressive, increasing from 0.02 ±.01" w.c. at minimum set point to approximately 0.81" w.c. at maximum set point.

Measured Media:
Air or combustion by-products that will not degrade silicone.

Maximum Pressure:
½ psi (0.03 bar).

Operating Temperature Range:
-40F to 180F (-40 to 82C).

Life:
100,000 cycles minimum at ½ psi maximum pressure each cycle and at maximum rated electrical load.

Electrical Rating:
300VA pilot duty at 115 to 277 VAC; 15 amps noninductive to 277 VAC, 60Hz.

Contact Arrangement: SPDT.

Electrical Connections:
Screw-type terminals with cup washers.

Conduit Opening:
7/8" diameter opening accepts ½" conduit.

Sample Line Connectors:
Male, externally threaded 7/16"-24 UNS-2A thread, complete with nuts and self-aligning ferrules.

Sample Line Connections:
Connectors will accept ¼" OD rigid or semi-rigid tubing.

Approvals: UL, FM, CSA.

Shipping Weight: 1.2 lbs.

Accessories:

- P/N 18311 Slip-on ¼" OD Tubing Adapter, suitable for slipping on flexible plastic tubing.
- Sample line probes.
- Orifice plugs (pulsation dampers).