

May 25, 2017

Mr. John Hnat
WDNR
2300 N Dr. Martin Luther King Jr Dr.
Milwaukee, WI 53212

**RE: Vapor System Commission Report and Indoor Air Test Results, Master Dry Cleaners
DERF Site, 6326 W. Bluemound Road, Wauwatosa, WI, BRRTS # 02-41-545142**

Dear John:

Objective

The purpose of this submittal is to present the construction details and performance test results for the subslab depressurization system (SSDS) beneath the Master Dry Cleaners site (Figure 1) referenced above. The indoor air chemistry sample results indicate no impacts are present above levels of concern in the building.

Based on this information, we believe building occupancy can be pursued by the new tenant.

Vapor Mitigation System Construction

As will be documented in the pending Remedial Action Documentation Report, soil excavation under the building was performed the week of March 20, 2017. The excavation consisted of removal of approximately 42 tons of soil that was landfilled due to the presence of tetrachloroethene (PCE) in the soil. Five additional drums of soil were removed from the area immediately beneath the former sump to a depth of eight feet. This material was handled as hazardous waste, and properly discarded by Badger Disposal.

The excavation created an approximately 40-foot long by four-foot wide by six-foot deep trench that extended east / west beneath the north part of the building. The excavation followed the pathway of the former indoor sanitary sewer line, which was entirely removed.

During backfill placement, the subslab vapor mitigation system piping network was installed in the trench. Two layers of piping were placed, one at a depth of five feet below grade, and the other at a depth of one foot below grade. The piping consists of 25 feet of factory-slotted Schedule 40 PVC pipe with 0.010 inch slots, connected to solid Schedule 40 PVC pipe. Both pipes elbow vertically through the floor along the north wall of the building, at a location approximately ten feet west of the northeast corner of the building (Figure 2).

A sewer pipe was also installed in the trench to service future floor drainage needs. The pipe is sloped to drain to the northwest and connects to the existing building sewer lateral that exits the northwest corner of the building. Connection of the new lateral to an existing indoor sink drain was also completed. The bathroom sewer lateral connection did not need replacement, and was left intact.

To help ensure a good seal for subslab vapor communication, a vertical clay plug was installed in the trench approximately 35 feet west of the east building wall. The plug is approximately one-foot thick, and was built using bentonite which was hydrated during placement. The clay plug extends from the excavation base at six feet to the Stegowrap surface, and runs the entire width of the four-foot wide trench.

Prior to resurfacing with concrete, a layer of 15 mil Stegowrap was placed over the pea gravel. Mastic was used to seal the Stegowrap at the saw-cut concrete floor edges and to seal around piping penetrations. Once the Stegowrap was placed, the concrete floor was restored to grade with three inches of fresh concrete. Penetrations include two vapor extraction pipes (1' and 5' depths) and central floor drain.

The vapor mitigation system fan and electrical connection was completed on April 18, 2017 by Radon Specialists. A RadonAway model GP-501 fan was wired for installation on the building roof. Three-inch PVC piping was used to connect both the five foot and one foot deep Schedule 40 PVC pipes to the single roof-mounted fan. An electrician wired the fan to a separate circuit in the existing electrical box.

The fan was turned on at approximately 10:30 AM on April 18, 2017, and has been operating continuously since then.

The system layout and communication test points are shown on Figure 2. The vapor mitigation system consists of one roof-mounted Radon-Away GP-501 fan that withdraws air from the two sub-floor piping runs. The system captures vapors from the subslab beneath the building and vents them to the outside.

The fan has a maximum draw of approximately 70 to 140 watts at 120 volts and is connected to a dedicated 20-amp circuit breaker in the building electric control panel. The fan meets the clearance requirements for vapor mitigation systems and exhausts the subslab vapors a minimum of two feet above openings that are within a ten-foot horizontal distance.

To monitor suction and operation, a U-Tube manometer has been installed on the vertical piping of the system, clearly visible at eye level height. Viewing the manometer for water column displacement allows a quick and easy way to verify fan operation. The fan has a five-year warranty, and should continue to operate maintenance free.

Pressure Field Extension Testing

During installation, testing was conducted on April 18, 2017 by Fehr Graham. The fan was connected and turned on, and four temporary floor-penetration monitoring points were drilled through the concrete floor near the building corners to verify the subslab pressure differential (Figure 2).

The induced vacuum in the extraction pipe measured 2.0 inches of water column. Measurements at the four subsurface monitoring points indicated sufficient connection between the operating fan and the subsurface, with levels ranging from 0.007 to 0.6 inches of water column (Figure 2). Smoke testing was also performed at all four test borings, with smoke observed to be drawn into the subsurface through the test holes.

Post-System Installation Chemical Testing

After allowing the system to operate for approximately two weeks, the chemistry of the indoor air was sampled on May 3, 2017. A 6-liter summa canister with a 24-hour regulator was deployed at the approximate center of the building, with the intake placed at the approximate breathing height (four to five feet above grade). Field measurement of the indoor air volatile gas concentration was recorded using a mini Rae photoionization detector sensitive to parts per billion (ppb) range. The field readings indicate the indoor ambient and outside building air had an estimated 75 to 90 ppb total volatiles. The measurement of the air removed by the vapor system fan was approximately 3,600 ppb.

Upon completion of sampling, the canister was shipped via private courier to the analytical laboratory (Pace Laboratory, Minneapolis, MN). Testing was completed for targeted drycleaning related compounds using the Niosh TO-15 VOC's procedures. The laboratory results were received on May 17, and are attached.

The results indicate a detection of 13.8 ug/m³ of PCE is present, far below the WDNR indoor air standard for inhalation of PCE in a small commercial building (180 ug/m³). There was no detectable TCE, cis- or trans-dichloroethene, or vinyl chloride in the indoor air sample from the Master Drycleaning building. The results of the subslab sampling and the indoor air sampling are summarized on Table A.5.

Vapor Mitigation System Operation and Maintenance Plan

Ongoing monitoring of the subslab vapor system must be performed. WDNR guidance was used to prepare a plan to monitor the system function (attached). The plan outlines system components and provides a form for recording monthly measurements of proper system operation.

The building is slated for redevelopment as a take-out and dine-in restaurant. Once the building has been occupied, daily observation of the fan function should be monitored by noting the displacement of the U-Tube manometer.

The WDNR has requested that repeat testing of the subslab communication be performed approximately six months after occupancy. This testing will be performed in a manner similar to the completed communication testing, with pressure measurements recorded from floor penetrations. In addition, a second indoor air chemistry analysis will be retained, likely using an 8-hour integrated sampler to minimize business disruption.

Project Status

A more thorough remedial action documentation report will be prepared and submitted following receipt of the next round of groundwater chemistry samples, which were obtained in mid-May 2017. The report will include information on the amount of soil excavated in March, documentation of proper disposal, and a summary of the remaining-in-place soil chemistry results. Further information will be provided on the groundwater contaminant trends since chemical injection. If the information appears suitable, the report may indicate a request for case closure is justified.

Let me know if you have any questions or comments. Feel free to call me at 920 892-2444 or e-mail me at kebbott@fehr-graham.com.

Sincerely,









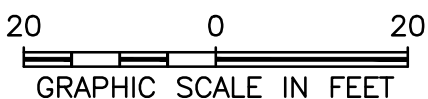
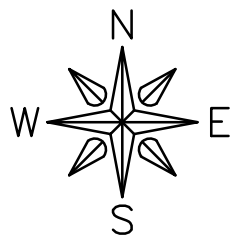
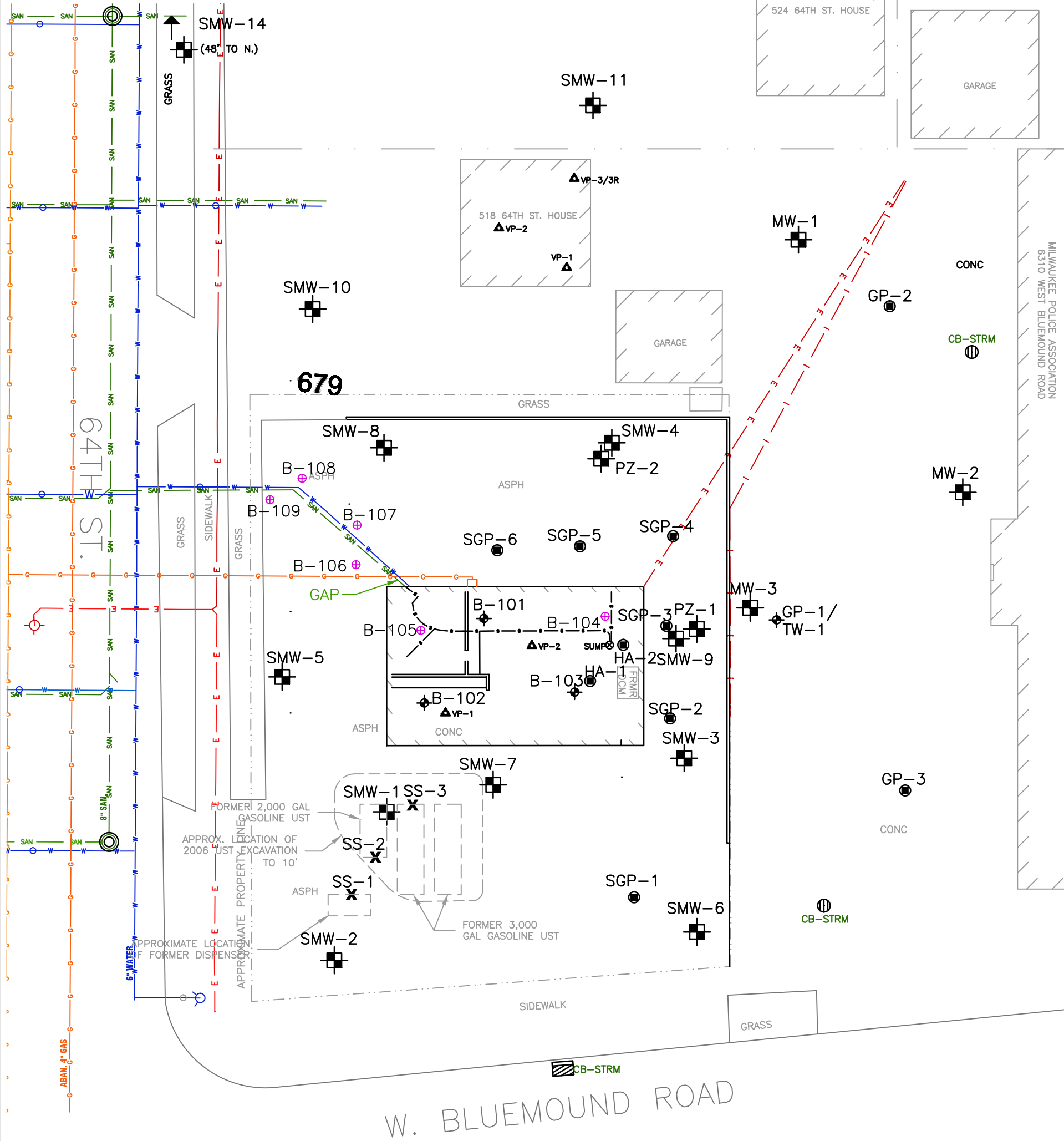
Kendrick A. Ebbott, PG

Attachment: Figure 1: Site Layout and Investigation Borings
 Figure 2: Vapor System and Communication Test Results
 Table A.5 Vapor Analytical Table
 Laboratory Analytical Report - Indoor Air
 Vapor Mitigation System Operation and Maintenance Plan

Cc: Mr. Harold Shipshock, Master Cleaners, w/ Attachments
 Mr. Don Gallo, Husch Blackwell, w/ Attachments

LEGEND

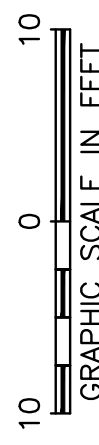
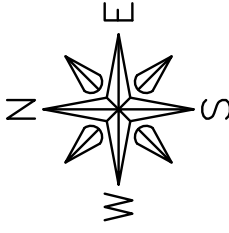
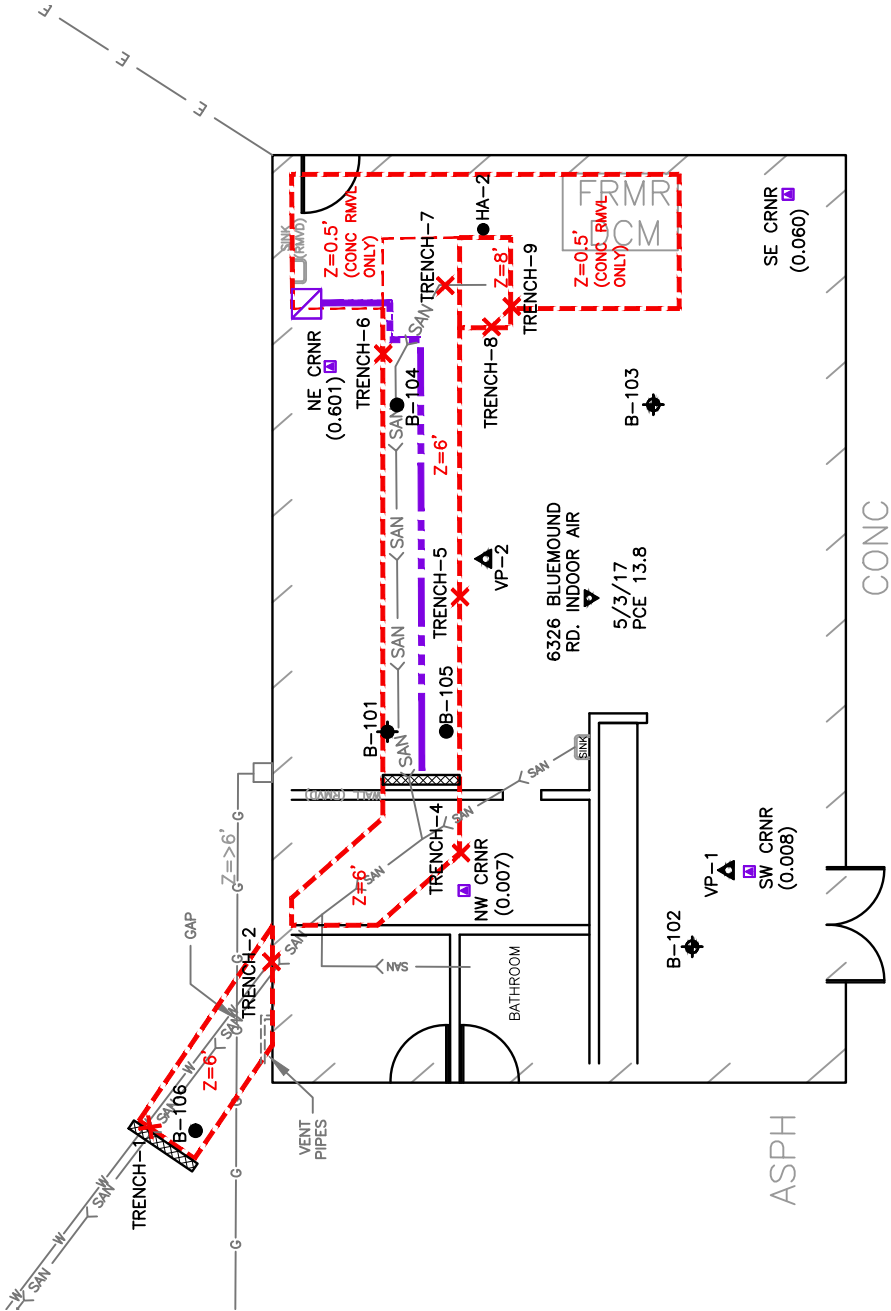
- MW-14  MONITORING WELL / PIEZOMETER
- SGP-5  SOIL BORING - SIGMA
- B-101  SOIL BORING W/ GRAB WATER
- B-101  UST REMOVAL EXCAVATION - 2006
-  VAPOR SAMPLE
- B-107  SOIL BORING



FEHR GRAHAM ENGINEERING & ENVIRONMENTAL	ILLINOIS IOWA WISCONSIN	TITLE:
	SITE LAYOUT AND INVESTIGATION BORINGS	
MASTER DRYCLEANING INC. 6326 W. BLUEMOUND RD. WAUWATOSA, WI 53213		BRRTS: 02-41-545142 JOB NO.: 15-1209 PLOT DATE: 1/13/17
DRWN: MKH DATE: 00/00/00 APPD: XXX	FIGURE: 1	

LEGEND

- EXCAVATION SAMPLE
- SOIL BORING
- TEMP WELL
- REMOVED SOIL BORING
- REMOVED TEMP WELL
- EXCAVATION LIMITS
- VAPOR SYSTEM PIPING @ 1' & 5' DEPTH
- CLAY PLUG
- VAPOR SYSTEM FAN ON ROOF
- SUBSLAB VAPOR SAMPLE POINT
- AMBIENT AIR SAMPLE POINT
- VAPOR SYSTEM ASSESSMENT POINT & READING 4/18/17 (INCHES WATER)
- 5/3/17 VAPOR SAMPLE DATE
- PCE TETRACHLOROETHENE (ug/m3)



FEHR GRAHAM ILLINOIS IOWA WISCONSIN ENGINEERING & ENVIRONMENTAL	TITLE: VAPOR SYSTEM & COMMUNICATION TEST RESULTS
	BRRTS: 02-41-545142 JOB NO.: 15-1209 PLOT DATE: 5/24/17 FIGURE: 2
MASTER DRYCLEANING INC. 6326 W. BLUEMOUND RD. WAUWATOSA, WI 53213	
DRWN: MKH DATE: 00/00/00 APPD: XXX	© 2017 FEHR GRAHAM

TABLE 1
 Vapor Analytical Table - VOC
 Master Drycleaning, Inc.
 6326 W. Bluemound Rd., Wauwatosa, WI 53213
 BRRTS# 02-41-545142

Sample ID		C-Carcinogen N-Non Carcinogen	WDNR / WDHS SMALL COMMERCIAL Subslab Air	WDNR / WDHS SMALL COMMERCIAL Indoor Air	Site : 6326 Bluemound		Site: Indoor Air 6326 Bluemound Indoor
					VP-1	VP-2	
Sample Date					2/24/2016	2/24/2016	5/3/2017
Sample Location					SE corner (6326)	ctr work area (6326)	Center Interior
Type of Sample					sub-slab	sub-slab	Ambient
Collection Method					Summa	Summa	Summa
Time Period of Collection					30 min	30 min	24 hour
Analytical Method					TO-15	TO-15	TO-15
Method/Result Leak Detection					water/shut-in; pass	water/shut-in; pass	NA
STANDARDS COMPARED TO					SMALL COMM Subslab	SMALL COMM Subslab	SMALL COMM Indoor
Benzene	µg/m ³	C	530	16	0.84	6.8	NA
Ethylbenzene	µg/m ³	C	1,600	49	2.6	4.5	NA
Toluene	µg/m ³	N	730,000	22,000	15.3	142	NA
Xylenes	µg/m ³	N	15,000	440	12.5	17.6	NA
Naphthalene	µg/m ³	C	120	3.6	6.3	5.3	NA
1,2,4-Trimethylbenzene	µg/m ³	N	1,000	31	15.0	9.2	NA
1,3,5-Trimethylbenzene	µg/m ³	N	NS	NS	2.9	2.2	NA
Tetrachloroethene (PCE)	µg/m ³	N	6,000	180	608	63,100	13.8
Trichloroethene (TCE)	µg/m ³	C	290	8.8	1.1	545	<0.40
cis-1,2 Dichloroethene	µg/m ³	N	NS	NS	<0.38	7.1	<0.35
trans-1,2 Dichloroethene	µg/m ³	N	NS	NS	<0.60	<0.53	<0.55
Vinyl Chloride	µg/m ³	C	930	28	<0.30	<0.27	<0.28
Methylene Chloride	µg/m ³	C	87,000	2,600	0.95 J	<0.75	NA
Acetone	µg/m ³	N	4,700,000	140,000	38.4	227	NA
Bromomethane	µg/m ³	N	730	22	0.77 J	<0.43	NA
2-Butanone (Methyl Ethyl Ketone)	µg/m ³	N	730,000	22,000	2.9 J	37.7	NA
Carbon Disulfide	µg/m ³	N	100,000	3,100	0.37 J	3.4	NA
Cyclohexane	µg/m ³	N	870,000	26,000	27.8	86.9	NA
Dichlorodifluoromethane	µg/m ³	N	15,000	440	3.2	3.5	NA
Ethanol	µg/m ³	N	NS	NS	73.1	96.5	NA
4-Ethyltoluene	µg/m ³		NS	NS	3.3	2.6	NA
n-Heptane	µg/m ³	N	NS	NS	20.4	16.5	NA
n-Hexane	µg/m ³	N	100,000	3,100	55.3	141	NA
Methyl Isobutyl Ketone (MIBK)	µg/m ³	N	430,000	13,000	<0.34	5.4 J	NA
2-Propanol (Isopropanol)	µg/m ³	N	29,000	880	8.0	27.6	NA
Styrene	µg/m ³	N	150,000	4,400	0.37 J	0.56 J	NA
Trichlorofluoromethane	µg/m ³	N	NS	NS	1.2 J	1.0 J	NA
1,1,2-Trichlorotrifluoroethane	µg/m ³	N	4,300,000	130,000	<0.47	0.82 J	NA

N = Noncarcinogen; C = Carcinogen

Blue and ITALICS : Exceeds Subslab Vapor Standard

BOLD Exceeds Indoor Air Standard

NA=Not Analyzed

NS : No Standards

Standards based on DNR Quick Look Up Table and EPA RSL Tables <http://www.epa.gov/reg3hwmd/risk/human/rb-concentration-table/index.htm> June 2015

Small Commercial vs. Large Commercial/Industrial determined based on WDNR Publication RR-800

May 16, 2017

Mr. Ken Ebbott
Fehr Graham
1237 Pilgrim Road
Plymouth, WI 53073

RE: Project: 15-1209 Master Drycleaning
Pace Project No.: 10387771

Dear Mr. Ebbott:

Enclosed are the analytical results for sample(s) received by the laboratory on May 06, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Sarah Platzer
sarah.platzer@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Megan Hansen, Fehr Graham



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 15-1209 Master Drycleaning

Pace Project No.: 10387771

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 15-1209 Master Drycleaning

Pace Project No.: 10387771

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10387771001	6326 Bluemound Rd Indoor Compo	Air	05/03/17 16:20	05/06/17 09:00

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SAMPLE ANALYTE COUNT

Project: 15-1209 Master Drycleaning

Pace Project No.: 10387771

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10387771001	6326 Bluemound Rd Indoor Compo	TO-15	EMC	5	PASI-M

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ANALYTICAL RESULTS

Project: 15-1209 Master Drycleaning

Pace Project No.: 10387771

Sample: 6326 Bluemound Rd Indoor Compo **Lab ID:** 10387771001 Collected: 05/03/17 16:20 Received: 05/06/17 09:00 Matrix: Air

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR									
Analytical Method: TO-15									
cis-1,2-Dichloroethene	<0.35	ug/m3	1.2	0.35	1.44		05/10/17 21:29	156-59-2	
trans-1,2-Dichloroethene	<0.55	ug/m3	1.2	0.55	1.44		05/10/17 21:29	156-60-5	
Tetrachloroethene	13.8	ug/m3	0.99	0.40	1.44		05/10/17 21:29	127-18-4	
Trichloroethene	<0.40	ug/m3	0.79	0.40	1.44		05/10/17 21:29	79-01-6	
Vinyl chloride	<0.28	ug/m3	0.37	0.28	1.44		05/10/17 21:29	75-01-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 15-1209 Master Drycleaning

Pace Project No.: 10387771

QC Batch: 472962

Analysis Method: TO-15

QC Batch Method: TO-15

Analysis Description: TO15 MSV AIR Low Level

Associated Lab Samples: 10387771001

METHOD BLANK: 2580230

Matrix: Air

Associated Lab Samples: 10387771001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/m3	<0.25	0.81	05/10/17 14:14	
Tetrachloroethene	ug/m3	<0.28	0.69	05/10/17 14:14	
trans-1,2-Dichloroethene	ug/m3	<0.38	0.81	05/10/17 14:14	
Trichloroethene	ug/m3	<0.28	0.55	05/10/17 14:14	
Vinyl chloride	ug/m3	<0.20	0.26	05/10/17 14:14	

LABORATORY CONTROL SAMPLE: 2580231

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/m3	43.9	43.8	100	70-133	
Tetrachloroethene	ug/m3	72.4	67.0	93	70-130	
trans-1,2-Dichloroethene	ug/m3	41.9	45.3	108	70-131	
Trichloroethene	ug/m3	57.9	55.0	95	70-130	
Vinyl chloride	ug/m3	27	27.2	101	70-130	

SAMPLE DUPLICATE: 2582341

Parameter	Units	10387812001 Result	Dup Result	RPD	Max RPD	Qualifiers
cis-1,2-Dichloroethene	ug/m3	ND	<0.25		25	
Tetrachloroethene	ug/m3	ND	<0.28		25	
trans-1,2-Dichloroethene	ug/m3	ND	<0.38		25	
Trichloroethene	ug/m3	ND	<0.28		25	
Vinyl chloride	ug/m3	ND	<0.20		25	

SAMPLE DUPLICATE: 2582342

Parameter	Units	10387862003 Result	Dup Result	RPD	Max RPD	Qualifiers
cis-1,2-Dichloroethene	ug/m3	ND	<0.37		25	
Tetrachloroethene	ug/m3	1.2	1.1	6	25	
trans-1,2-Dichloroethene	ug/m3	ND	<0.57		25	
Trichloroethene	ug/m3	ND	<0.41		25	
Vinyl chloride	ug/m3	ND	<0.29		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 15-1209 Master Drycleaning

Pace Project No.: 10387771

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 15-1209 Master Drycleaning
Pace Project No.: 10387771

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10387771001	6326 Bluemound Rd Indoor Compo	TO-15	472962		

REPORT OF LABORATORY ANALYSIS

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

238771

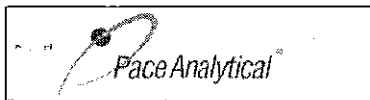
Section A Required Client Information: Company: <u>Fehr-Graham</u> Address: <u>1237 Pilgrim Rd</u> <u>Plymouth, WI 53073</u> Email for: <u>kellb@Fehr-Graham.com</u> Phone: <u>920.248.1444</u> Fax: Requested Due Date/TAT:		Section B Required Project Information: Report To: <u>Ken Ebbott</u> Copy To: Purchase Order No.: Project Name: <u>Master Drycleaning</u> Project Number: <u>15-1209</u>		Section C Invoice Information: Attention: <u>Ken Ebbott</u> Company Name: <u>Fehr-Graham</u> Address: Pace Quote Reference: Pace Project Manager/Sales Rep. Pace Profile #:		23432 Page: 1 of 1											
Section D Required Client Information AIR SAMPLE ID Sample IDs MUST BE UNIQUE		Valid Media Codes MEDIA CODE Test Bag TR 1 Liter Summa Can 1LC 6 Liter Summa Can 6LC Low Volume Purif LVP High Volume Purif HVP Other PM10		COLLECTED MEDIA CODE PID Reading (Client only)		Method: PM10 3C - Fixed Gas (%) TO-3 TO-3M (Methane) TO-4 (PCBs) TO-13 (PAH) TO-14 TO-15 TO15 Short List*											
ITEM #	6326 Bluemound Rd Indoor Composite	61C79	5/21/17	1550	5/21/17	1620	Flow Control Number	Summa Can Number	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Accepted By / Affiliation	Date	Time	Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
1							FC0404	1267	24.5-27.5	24.5-27.5	John Schuene	05/05	8:00am				
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

Comments: Testing analytes
 * PCE
 TCE
 Cis-DCE
 trans-DCE
 VC

ORIGINAL

SAMPLER NAME AND SIGNATURE
 PRINT NAME OF SAMPLER
Justin Schuene
 SIGNATURE OF SAMPLER

DATE SAMPED (MM/DD/YY)
05/03/17



Document Name:
Air Sample Condition Upon Receipt

Document No.:
F-MN-A-106-rev.11

Document Revised: 26APR2016
Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: Fehr-Graham Project #: _____

WO#: 10387771



Courier: Fed Ex UPS Speedee Client
 Commercial Pace Other: Walter

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags Foam None Tin Can Other: _____ Temp Blank rec: Yes No

Temp. (TO17 and TO13 samples only) (°C): X Corrected Temp (°C): X Thermom. Used: B88A912167504 B88A0143310098 151401163 151401164
Temp should be above freezing to 6°C Correction Factor: X Date & Initials of Person Examining Contents: 5-8-17 AA

Type of ice Received Blue Wet None

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Media: <u>Air Can</u> Airbag Filter TDT Passive		11.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Josh Barber Date: 5/8/2017

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

SUBSLAB DEPRESSURIZATION SYSTEM MAINTENANCE PLAN

May 25, 2017

Property Located at:

6326 W. Bluemound Road, Wauwatosa, WI 53213

WDNR BRRTS #: 02-41-545142

Milwaukee County, Wisconsin

Introduction

This document is the Maintenance Plan for a Subslab Depressurization System (SSDS) at the above-referenced property in accordance with the requirements of s. NR 724.13(2), Wisconsin Administrative Code.

The maintenance activities relate to the SSDS (also identified as a vapor mitigation system) addressing subslab vapor contamination.

More site-specific information about this property may be found in:

- The case file in the DNR Regional Service Center office
- BRRTS on the Web (DNR's internet-based data base of contaminated sites at <http://botw.dnr.state.wi.us/botw/SetUpBasicSearchForm.do>)
- GIS Registry PDF file for further information on the nature and extent of contamination: <http://dnrmaps.wisconsin.gov/imf/imfApplyTheme.jsp?index=1> and
- The DNR Project Manager for this site in Milwaukee County, currently Mr. John Hnat at (414) 263-8644

Description of Contamination

Soil and groundwater contamination containing tetrachloroethene (PCE) and related breakdown products is present beneath the property at levels above relevant soil and groundwater standards established by the WDNR. Soil concentrations pose a risk to potential migration to groundwater (the groundwater pathway RCL) and groundwater concentrations exceed the NR140 Enforcement Standards.

Vapor containing PCE is present in the indoor air and subslab vapors of the building. The levels in the subslab vapors exceed concentrations that the WDNR / WDHFS has indicated could pose a risk to health. The SSDS has been installed and is operating to prevent the migration of subslab vapors to the interior of the building.

Description of the SSDS to be Maintained

The SSDS is comprised of one fan connected to two sub-floor pipes, installed to intercept vapor contamination beneath the concrete floor of the building. The fan is connected to two 25-foot long perforated pipes that run beneath the floor. One pipe was placed at a depth of five feet below grade, the other at a depth of one foot below grade, and both are bedded in pea gravel. The pea gravel is covered with a 15-mil thick plastic barrier (Stegowrap) that has been joined to the adjacent concrete with mastic prior to installation of the replacement three-inch thick concrete floor.

A RadonAway Model GP 501 electric fan was installed and hard-wired to a 20-amp circuit in the electrical breaker box in the building. The two subslab pipes connect to a three-inch PVC pipe and extend through the building roof, where the fan is mounted. The fan should operate on a continual basis.

A U-Tube manometer filled with blue water has been installed to help verify proper fan operation.

Photographs of the interior piping, U-tube manometer showing the typical measurement when the fan is functioning, and the circuit box control circuit are shown on the back of the inspection form.

Monthly Inspections

Monthly inspections of the SSDS are required to verify proper operation. Post-installation testing was completed on April 18, 2017 which documented proper subslab communication, as shown by the measured pressure differentials on Figure 2.

The U-Tube manometer gauge must be visually inspected on at least a monthly basis or more frequently to verify operation. If the fan is operating properly, the liquid levels in the U-Tube limbs should not be equal. Please record the height of the elevated limb of the manometer on the U-Tube to the nearest 0.1 inches of water column on the attached Subslab Depressurization System Inspection Log. An initial record of the observed measurement has been noted on the form for your reference. It is recommended that the log be kept on a clipboard mounted on a pipe near the U-Tube.

Maintenance Activities

If problems are noted during inspections or at any other time during the year, repairs will be scheduled as soon as practical. Repairs to the SSDS may require restoration of power, replacement of the fan, resurfacing or filling of cracks or holes in the floor, and replacement or patching of any cracked or broken PVC piping.

The property owner must maintain the integrity of the SSDS and will maintain a copy of this Maintenance Plan on-site and make it available to all interested parties (i.e. on-site employees, contractors, future property owners or tenants, etc.) for viewing.

Prohibition of Activities and Notification of DNR Prior to Actions Affecting a Cap or SSDS

Per WDNR requirements, the following activities are prohibited on any portion of the property where the SSDS is required as shown on the attached map, unless prior written approval has been obtained from the Wisconsin Department of Natural Resources: 1) removal of the SSDS; 2) replacement with another SSDS; 3) excavating or grading of the land surface; 4) filling on capped or paved areas; 5) plowing for agricultural cultivation; or 6) construction or placement of a building or other structure.

Amendment or Withdrawal of Maintenance Plan

This Maintenance Plan can be amended or withdrawn by the property owner and its successors with the written approval of WDNR.

Contact Information as of May 2017

Property Owner: Mr. Harold Shipshock
Master Drycleaning Inc.
N57 W26389 Mt. Dulac Drive
Sussex, WI 53089
Phone c/o Tom Shipshock, Son, at
(414) 313-9168

Purchaser: Ms. Doris Pec
1680 Pilgrim Pkwy
Elm Grove, WI 53122-1531
414-217-6339
pelskal@hotmail.com

Consultant: Fehr Graham
1237 Pilgrim Road
Plymouth, WI 53073
(920) 892-2444

Attn: Mr. Kendrick Ebbott
kebbott@fehr-graham.com

WDNR: Wisconsin Department of Natural Resources
2300 N. Dr. Martin Luther King Jr. Dr.
Milwaukee, WI 53212
Attn: Mr. John Hnat
414 263-8644
John.Hnat@Wisconsin.gov

Attachments: Subslab Depressurization System Inspection Log and Photographs (3 copies)
Figure 1: Site Layout and Investigation Borings
Figure 2: Vapor System and Communication Test Results
Table A.5: Vapor Analytical Table
RadonAway Fan Installation and Operating Instructions

f:_pen\olde tyme cleaners\otc-2009-01\reports\vapor system commission report\vapor system maintenance plan.docx

Vapor Mitigation System Inspection Log

Site Name Former Master Drycleaners Contacts:
 Address 6326 Bluemound Road
 Wauwatosa, WI
 BRRTS# 02-41-545142

RECORD MEASUREMENTS MONTHLY

Ken Ebbott or Dillon Plamann - Fehr Graham
 920-892-2444 (Environmental Consultant)

Date	Time	Initials / Company	North Wall U-Tube Reading (inches water column)	System On?	Comments
4/18/2017	11:45 AM	JS / Fehr Graham	2.0	Yes	
NOTE: If U-Tube Levels are higher on one side than the other, system is ON					

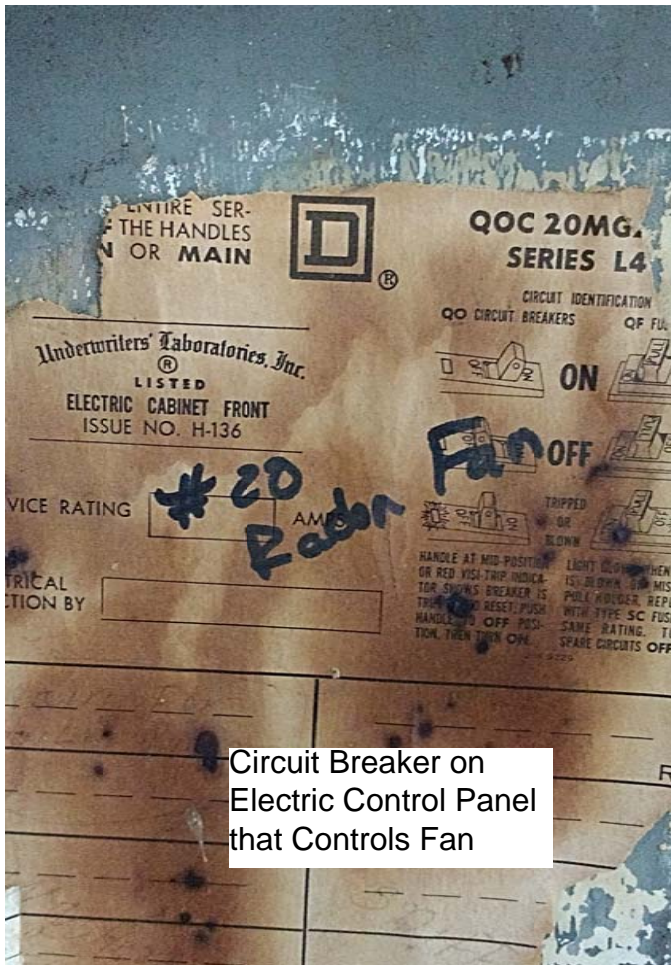
Vapor Mitigation System Inspection Log

RECORD MEASUREMENTS MONTHLY

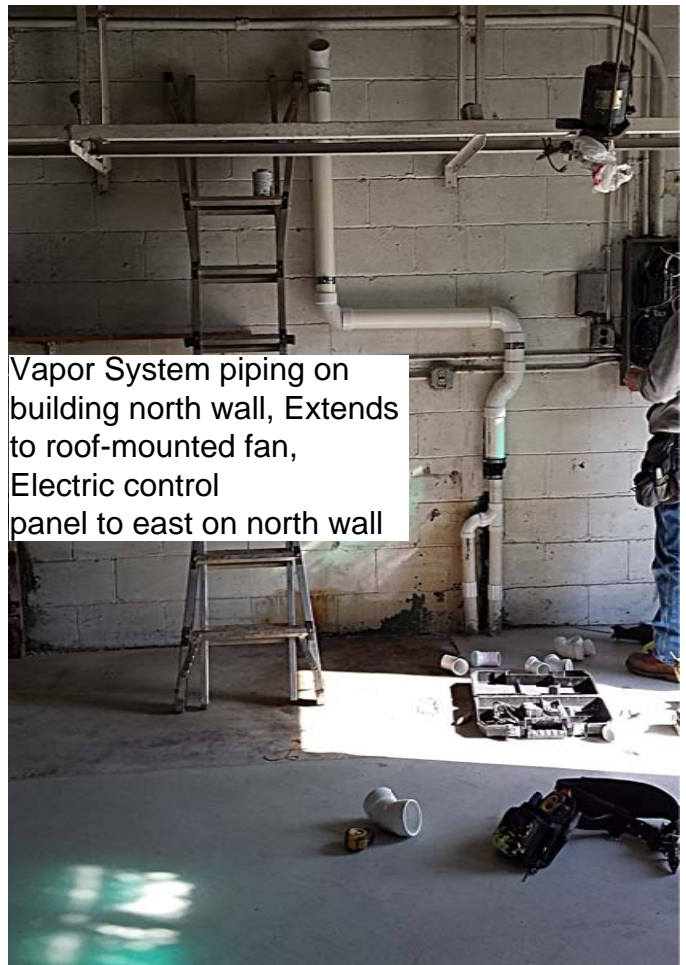
Site Name Former Master Drycleaners Contacts:
Address 6326 Bluemound Road
Wauwatosa, WI
BRRTS# 02-41-545142

Ken Ebbott or Dillon Plamann - Fehr Graham
920-892-2444 (Environmental Consultant)

Date	Time	Initials / Company	North Wall U-Tube Reading (inches water column)	System On?	Comments
4/18/2017	11:45 AM	JS / Fehr Graham	2.0	Yes	
NOTE: If U-Tube Levels are higher on one side than the other, system is ON					



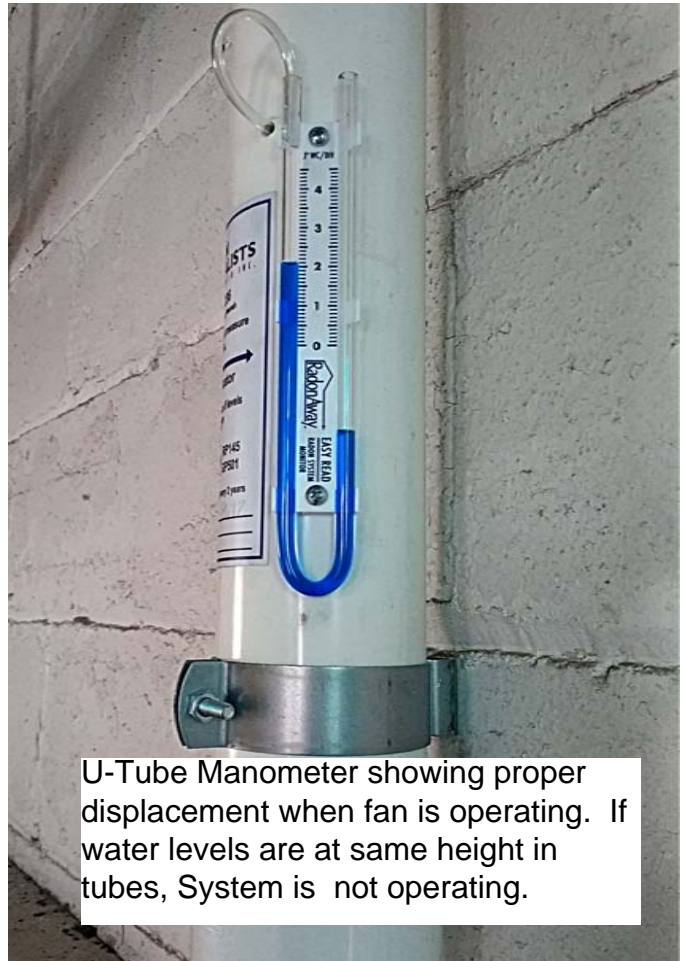
Circuit Breaker on Electric Control Panel that Controls Fan



Vapor System piping on building north wall, Extends to roof-mounted fan, Electric control panel to east on north wall









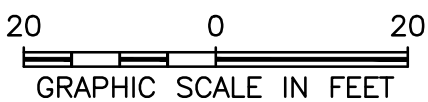
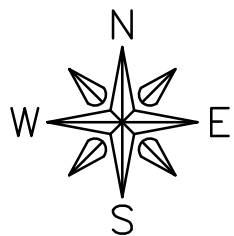
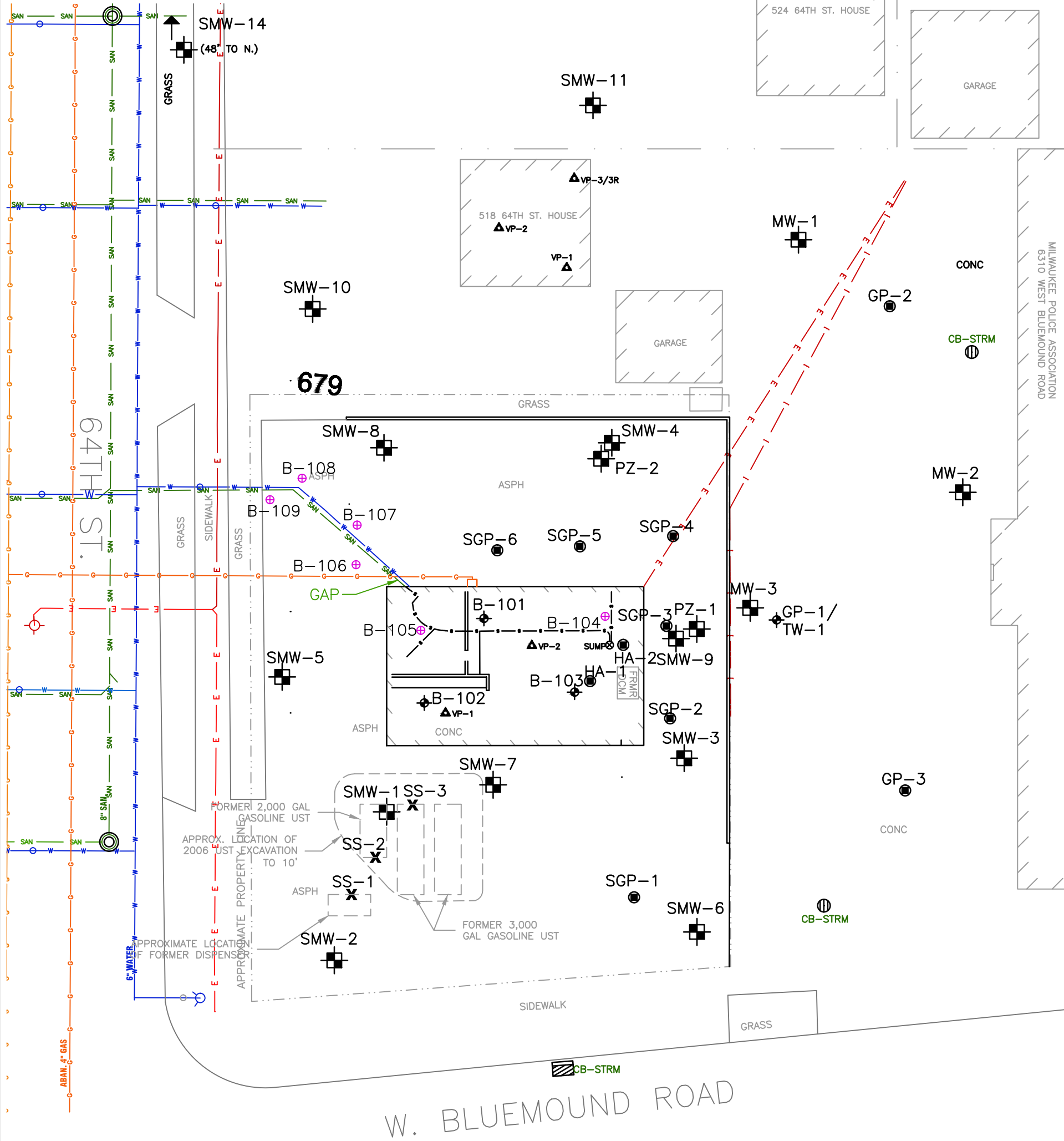
Detail of Subfloor Piping located on Building North Wall, showing connection to Piping that extends through Roof to Fan



U-Tube Manometer showing proper displacement when fan is operating. If water levels are at same height in tubes, System is not operating.

LEGEND

- MW-14  MONITORING WELL / PIEZOMETER
- SGP-5  SOIL BORING - SIGMA
- B-101  SOIL BORING W/ GRAB WATER
- B-101  UST REMOVAL EXCAVATION - 2006
-  VAPOR SAMPLE
- B-107  SOIL BORING



FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL

ILLINOIS
IOWA
WISCONSIN

TITLE: SITE LAYOUT AND INVESTIGATION BORINGS













MASTER DRYCLEANING INC.
6326 W. BLUEMOUND RD.
WAUWATOSA, WI 53213

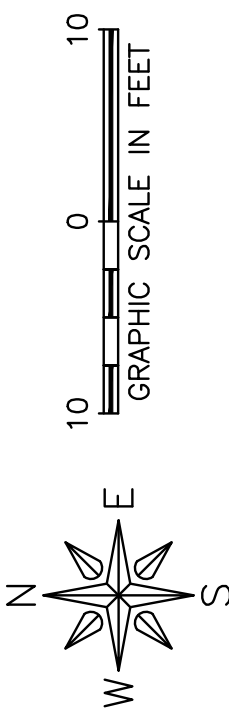
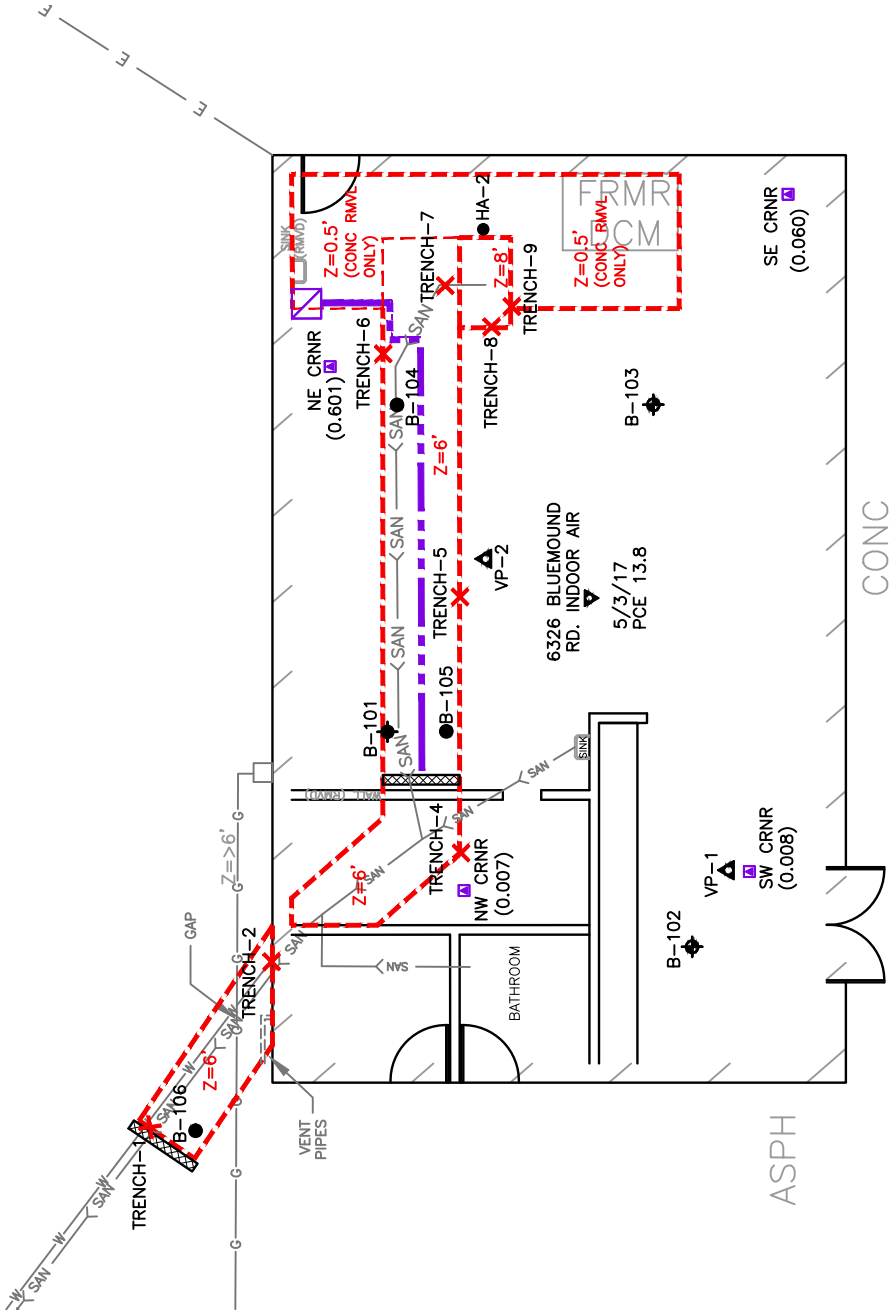
BRRTS: 02-41-545142
JOB NO.: 15-1209
PLOT DATE: 1/13/17

FIGURE:
1

DRWN: MKH DATE: 00/00/00 APPD: XXX

LEGEND

-  EXCAVATION SAMPLE
-  SOIL BORING
-  TEMP WELL
-  REMOVED SOIL BORING
-  REMOVED TEMP WELL
-  EXCAVATION LIMITS
-  VAPOR SYSTEM PIPING @ 1' & 5' DEPTH
-  CLAY PLUG
-  VAPOR SYSTEM FAN ON ROOF
-  SUBSLAB VAPOR SAMPLE POINT
-  AMBIENT AIR SAMPLE POINT
-  VAPOR SYSTEM ASSESSMENT POINT & READING 4/18/17 (INCHES WATER) (0.060)
- 5/3/17 VAPOR SAMPLE DATE
- PCE TETRACHLOROETHENE (ug/m³)



FEHR GRAHAM ILLINOIS IOWA WISCONSIN ENGINEERING & ENVIRONMENTAL	TITLE: VAPOR SYSTEM & COMMUNICATION TEST RESULTS
	DRWN: MKH DATE: 00/00/00 APPD: XXX BRRTS: 02-41-545142 FIGURE: 2 JOB NO.: 15-1209 PLOT DATE: 5/24/17
MASTER DRYCLEANING INC. 6326 W. BLUEMOUND RD. WAUWATOSA, WI 53213	

TABLE 1
 Vapor Analytical Table - VOC
 Master Drycleaning, Inc.
 6326 W. Bluemound Rd., Wauwatosa, WI 53213
 BRRTS# 02-41-545142

Sample ID		C-Carcinogen N-Non Carcinogen	WDNR / WDHS SMALL COMMERCIAL Subslab Air	WDNR / WDHS SMALL COMMERCIAL Indoor Air	Site : 6326 Bluemound		Site: Indoor Air 6326 Bluemound Indoor
					VP-1	VP-2	
Sample Date					2/24/2016	2/24/2016	5/3/2017
Sample Location					SE corner (6326)	ctr work area (6326)	Center Interior
Type of Sample					sub-slab	sub-slab	Ambient
Collection Method					Summa	Summa	Summa
Time Period of Collection					30 min	30 min	24 hour
Analytical Method					TO-15	TO-15	TO-15
Method/Result Leak Detection					water/shut-in; pass	water/shut-in; pass	NA
STANDARDS COMPARED TO					SMALL COMM Subslab	SMALL COMM Subslab	SMALL COMM Indoor
Benzene	µg/m ³	C	530	16	0.84	6.8	NA
Ethylbenzene	µg/m ³	C	1,600	49	2.6	4.5	NA
Toluene	µg/m ³	N	730,000	22,000	15.3	142	NA
Xylenes	µg/m ³	N	15,000	440	12.5	17.6	NA
Naphthalene	µg/m ³	C	120	3.6	6.3	5.3	NA
1,2,4-Trimethylbenzene	µg/m ³	N	1,000	31	15.0	9.2	NA
1,3,5-Trimethylbenzene	µg/m ³	N	NS	NS	2.9	2.2	NA
Tetrachloroethene (PCE)	µg/m ³	N	6,000	180	608	63,100	13.8
Trichloroethene (TCE)	µg/m ³	C	290	8.8	1.1	545	<0.40
cis-1,2 Dichloroethene	µg/m ³	N	NS	NS	<0.38	7.1	<0.35
trans-1,2 Dichloroethene	µg/m ³	N	NS	NS	<0.60	<0.53	<0.55
Vinyl Chloride	µg/m ³	C	930	28	<0.30	<0.27	<0.28
Methylene Chloride	µg/m ³	C	87,000	2,600	0.95 J	<0.75	NA
Acetone	µg/m ³	N	4,700,000	140,000	38.4	227	NA
Bromomethane	µg/m ³	N	730	22	0.77 J	<0.43	NA
2-Butanone (Methyl Ethyl Ketone)	µg/m ³	N	730,000	22,000	2.9 J	37.7	NA
Carbon Disulfide	µg/m ³	N	100,000	3,100	0.37 J	3.4	NA
Cyclohexane	µg/m ³	N	870,000	26,000	27.8	86.9	NA
Dichlorodifluoromethane	µg/m ³	N	15,000	440	3.2	3.5	NA
Ethanol	µg/m ³	N	NS	NS	73.1	96.5	NA
4-Ethyltoluene	µg/m ³		NS	NS	3.3	2.6	NA
n-Heptane	µg/m ³	N	NS	NS	20.4	16.5	NA
n-Hexane	µg/m ³	N	100,000	3,100	55.3	141	NA
Methyl Isobutyl Ketone (MIBK)	µg/m ³	N	430,000	13,000	<0.34	5.4 J	NA
2-Propanol (Isopropanol)	µg/m ³	N	29,000	880	8.0	27.6	NA
Styrene	µg/m ³	N	150,000	4,400	0.37 J	0.56 J	NA
Trichlorofluoromethane	µg/m ³	N	NS	NS	1.2 J	1.0 J	NA
1,1,2-Trichlorotrifluoroethane	µg/m ³	N	4,300,000	130,000	<0.47	0.82 J	NA

N = Noncarcinogen; C = Carcinogen

Blue and ITALICS : Exceeds Subslab Vapor Standard

BOLD Exceeds Indoor Air Standard

NA=Not Analyzed

NS : No Standards

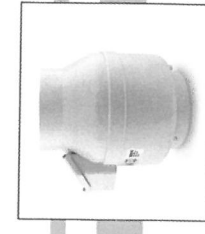
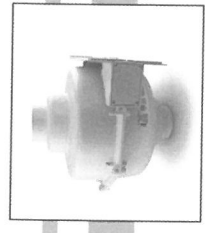
Standards based on DNR Quick Look Up Table and EPA RSL Tables <http://www.epa.gov/reg3hwmd/risk/human/rb-concentration-table/index.htm> June 2015

Small Commercial vs. Large Commercial/Industrial determined based on WDNR Publication RR-800



MAX 4' WC

The World's Leading Radon Fan Manufacturer



IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GP/XP/XR/RP/SF 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 GP/XP/XR/RP/SF Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

WARRANTY

RadonAway® warrants that the GPX01XP/XR/RP/SF Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway® will replace any Fan which fails due to defects in materials or workmanship during the Warranty Term. The Fan must be returned (at Owner's cost) to the RadonAway® factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. 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 cover damage in shipment unless the damage is due to the negligence of RadonAway®.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway® will extend the Warranty Term of the fan to five (5) years from date of purchase or sixty-three (63) months from the date of manufacture, whichever is sooner, if the Fan is installed in a professionally designed and professionally installed active soil depressurization system or installed as a replacement fan in a professionally designed and professionally installed active soil depressurization system by a qualified installer. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

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

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE GPX01XP/XR/RP 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 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 costs, including insurance, to and from factory.

RadonAway® 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-3703
FAX (978) 521-3964
Email to: Returns@RadonAway.com

Record the following information for your records:

Serial No. _____

Purchase Date _____

GP/XP/XR Series Installation & Operating 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! For General Ventilating Use Only. Do Not Use to Exhaust Hazardous, Corrosive or Explosive Materials, Gases or Vapors. See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion
- 2. NOTE: Fan is suitable for use with solid state speed controls however use of speed controls is not generally recommended.
- 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. 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.
- 7. 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 manufacturer.
- 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) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent back drafting. Follow the heating equipment manufacturers guideline and safety standards such as those published by the National Fire Protection Association, and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
- e) When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.
- f) Ducted fans must always be vented to outdoors.
- g) If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) - protected branch circuit.

68501
2" WC

RadonAway
3 Saber Way | Ward Hill, MA 01835
www.radonaway.com

XP/XR SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the XP & XR Series Fan:

	Typical CFM Vs Static Suction "W.C.								
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
XP151	180	162	140	117	78	46	10	-	-
XP201	150	130	110	93	74	57	38	20	-
XR261	250	215	185	150	115	80	50	20	-

Maximum Recommended Operating Pressure*

XP151	1.3" W.C.	(Sea Level Operation)**
XP201	1.7" W.C.	(Sea Level Operation)**
XR261	1.6" W.C.	(Sea Level Operation)**

*Reduce by 10% for High Temperature Operation
**Reduce by 4% per 1000 feet of altitude

Power Consumption @ 120 VAC

XP151	45 - 60 watts
XR201	45 - 66 watts
XR261	65 - 105 watts

XP Series Inlet/Outlet: 4.5" OD (4.0" PVC Sched 40 size compatible)

XR Series Inlet/Outlet: 5.875" OD

Mounting: Mount on the duct pipe or with optional mounting bracket.

Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Size: 9.5H" x 8.5" Dia.

Weight: 6 lbs. (XR261 - 7 lbs)

Continuous Duty
Thermally Protected
Class B Insulation
3000 RPM
Residential Use Only
Rated for Indoor or Outdoor Use

LISTED
Electric Fan



Conforms to
UL STD. 507
Certified to
CAN/CSA STD.
C22.2 No.113

GP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the GP Series Fan:

	Typical CFM Vs Static Suction "W.C.						
	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"
GP501	95	87	80	70	57	30	5
GP401	93	82	60	38	12	-	-
GP301	92	77	45	10	-	-	-
GP201	82	58	5	-	-	-	-

Maximum Recommended Operating Pressure*

GP501	3.8" W.C.	(Sea Level Operation)**
GP401	3.0" W.C.	(Sea Level Operation)**
GP301	2.4" W.C.	(Sea Level Operation)**
GP201	1.8" W.C.	(Sea Level Operation)**

*Reduce by 10% for High Temperature Operation
**Reduce by 4% per 1000 feet of altitude

Power Consumption @ 120 VAC

GP501	70 - 140 watts
GP401	60 - 110 watts
GP301	55 - 90 watts
GP201	40 - 60 watts

Inlet/Outlet: 3.5" OD (3.0" PVC Sched 40 size compatible)

Mounting: Fan may be mounted on the duct pipe or with integral flanges.

Weight: 12 lbs.

Size: 13H" x 12.5" x 12.5"

Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty
Thermally Protected
Class B Insulation
3000 RPM
Residential Use Only
Rated for Indoor or Outdoor Use

LISTED
Electric Fan



Conforms to
UL STD. 507
Certified to
CAN/CSA STD.
C22.2 No.113



INSTALLATION & OPERATING INSTRUCTION IN014 Rev M	
XP/XR Series	GP Series
XP151	P/n 23010-1
XP201	P/n 23011-1
XR261	P/n 23019-1
	GP201 P/n 23007-1
	GP301 P/n 23006-1
	GP401 P/n 23009-1
	GP501 P/n 23005-1

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The GP/XP/XR Series Radon Fans are intended for use by trained, professional certified/licensed* after professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a fan. This instruction should be considered as a supplement to EPA / radon industry 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 GP/XP/XR Series Fans are 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 fan should be stored in an area where the temperature is never less than 32° F. or more than 100° F.

1.3 ACOUSTICS

The GP/XP/XR Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the GP/XP/XR Series Fan. The lack of cooling air may result in the fan 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 fan be turned off until the water recedes allowing for return to normal operation.

1.5 SLAB COVERAGE

The GP/XP/XR Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the GP/XP/XR Series Fan best suited for the sub-slab material can improve the slab coverage. The GP & XP Series have a wide range of models to choose from to cover a wide range of subslab material. The higher static suction fans are generally used for tighter subslab materials. The XR Series is specifically designed for high flow applications such as stone/gravel and drain tile. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

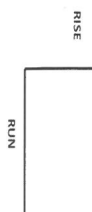
1.6 CONDENSATION & DRAINAGE

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 GP/XP/XR Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GP/XP/XR Series Fans are **NOT** suitable for underground burial.

For GP/XP/XR Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

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

*Typical GP/XP/XR Series Fan operational flow rate is 25 - 90 CFM.
(For more precision, determine flow rate by using the chart in the addendum.)

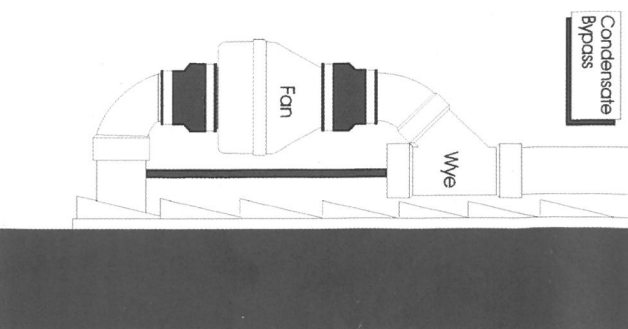


Under some circumstances in an outdoor installation a condensation bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.

The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

1.7 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2) is required to notify the occupants of a fan system malfunction. A System Label (provided with manometer P/N 50017) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.



1.8 ELECTRICAL WIRING

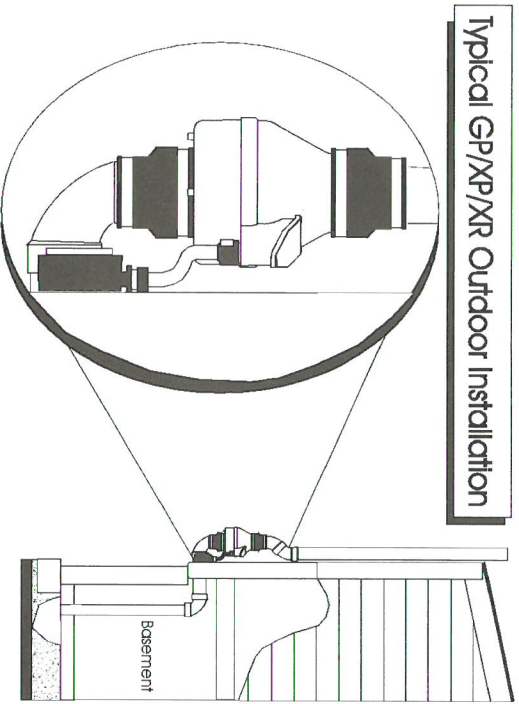
The GP/XP/XR Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA) "National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The GP/XP/XR Series Fans are rated for use with electronic speed controls however, they are generally not recommended. If used, the speed control recommended is Pass & Seymour Solid State Speed Control Cat. No. 94601-1.

2.0 INSTALLATION

The GP/XP/XR Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The GP/XP/XR Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



Typical GP/XP/XR Outdoor Installation

2.1 MOUNTING

Mount the GP/XP/XR Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping, assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)

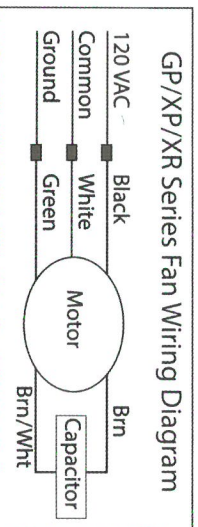
The GP/XP/XR Series Fan may be optionally secured with the integral mounting bracket on the GP Series Fan or with RadonAway P/N 25007 mounting bracket for an XP/XR Series Fan. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.8):



2.5 VENT MUFFLER (optional)

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

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

Verify all connections are tight and **leak-free**.

Insure the GP/XP/XR Series Fan and all ducting is secure and vibration-free.

Verify system vacuum pressure with manometer. Insure vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

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

(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)

See Product Specifications. If this is exceeded, increase the number of suction points.

Verify Radon levels by testing to EPA protocol.

