

**SUB-SLAB DEPRESSURIZATION SYSTEM
DESIGN AND INSTALLATION**

BUILDINGS 50 AND 52

Prepared for:



US GENERAL SERVICES ADMINISTRATION
1500 East Bannister Road, Room 2101
Kansas City, Missouri, 64131-3088

Prepared by:



SES, INC.,
6750 Antioch Road, Suite 305
Merriam, Kansas 66204

Contract Number: GS-06P-10-GX-P-0020

ACT Number: PJ0F00327

SES, Inc. Project Number: 050-06

MARCH 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: NE	DESCRIPTION	SSD-52-01 & 04; Roof Penetration Location (Ext.)	Photo #: 19
	LOCATION	Building 52; Room 7 & 5	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: N	DESCRIPTION	SSD-52-01; Roof Penetration Location (Exterior)	Photo #: 20
	LOCATION	Building 52; Room 7	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: W	DESCRIPTION	50-SSD-01; Patched Communication Hole	Photo #: 21
	LOCATION	Building 50; Room 7	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: W	DESCRIPTION	50-SSD-01; Patched Communication Hole	Photo #: 22
	LOCATION	Building 50; Room 7	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



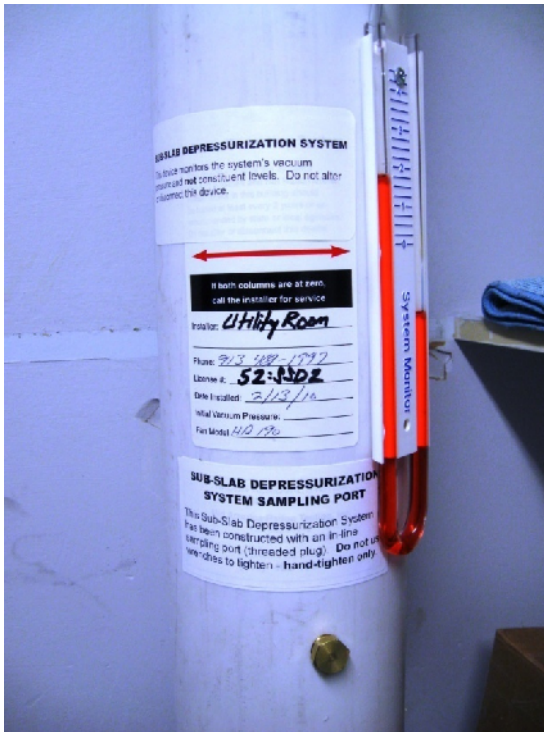
<i>Sub-Slab Depressurization System Installation</i> Direction: E	DESCRIPTION	SSD-52-02; Location Pre-Installation	Photo #: 23
	LOCATION	Building 52; Utility Room	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: NW	DESCRIPTION	SSD-52-02; Communication Hole Location	Photo #: 24
	LOCATION	Building 52; Utility Room	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



Sub-Slab Depressurization System Installation Direction: E	DESCRIPTION	SSD-52-02; Installed	Photo #: 25
	LOCATION	Building 52; Utility Room	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: E	DESCRIPTION	SSD-52-02; Installed	Photo #: 26
	LOCATION	Building 52; Utility Room	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	15 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: S	DESCRIPTION	SSD-52-02; Roof Penetration Location (Ext.)	Photo #: 27
	LOCATION	Building 52; Utility Room	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: SE	DESCRIPTION	SSD-52-02; Roof Penetration (Exterior)	Photo #: 28
	LOCATION	Building 52; Utility Room	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: NW	DESCRIPTION	SSD-52-02; Patched Communication Hole	Photo #: 29
	LOCATION	Building 52; Utility Room	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: E	DESCRIPTION	SSD-52-03; Location (Pre-Installation)	Photo #: 30
	LOCATION	Building 52; Room 3 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



Sub-Slab Depressurization System Installation Direction: E	DESCRIPTION	SSD-52-03; Communication Hole Location	Photo #: 31
	LOCATION	Building 52; Room 3 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



Sub-Slab Depressurization System Installation Direction: N	DESCRIPTION	SSD-52-03; Installed	Photo #: 32
	LOCATION	Building 52; Room 3 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	15 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: SW	DESCRIPTION	SSD-52-03; Roof Penetration Location (Ext.)	Photo #: 33
	LOCATION	Building 52; Room 3 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: SE	DESCRIPTION	SSD-52-03; Roof Penetration (Exterior)	Photo #: 34
	LOCATION	Building 52; Room 3 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: E	DESCRIPTION	SSD-52-03; Patched Communication Hole	Photo #: 35
	LOCATION	Building 52; Room 3 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: SW	DESCRIPTION	SSD-52-04; Location (Pre-Installation)	Photo #: 36
	LOCATION	Building 52; Room 5 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: W	DESCRIPTION	SSD-52-04; Communication Hole Location	Photo #: 37
	LOCATION	Building 52; Room 5 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: SW	DESCRIPTION	SSD-52-04; Installed	Photo #: 38
	LOCATION	Building 52; Room 5 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: SW	DESCRIPTION	SSD-52-04; Installed	Photo #: 39
	LOCATION	Building 52; Room 5 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	15 FEB 2010



Sub-Slab Depressurization System Installation Direction: NW	DESCRIPTION	SSD-52-04; Roof Penetration (Exterior)	Photo #: 40
	LOCATION	Building 52; Room 5 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: W	DESCRIPTION	SSD-52-04; Patched Communication Hole	Photo #: 41
	LOCATION	Building 52; Room 5 (Closet)	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



Sub-Slab Depressurization System Installation Direction: N/A	DESCRIPTION	6" Borehole (Typical)	Photo #: 42
	LOCATION	N/A	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: N/A	DESCRIPTION	CARB/VOC Compliant Sealant Used	Photo #: 43
	LOCATION	N/A	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	13 FEB 2010



<i>Sub-Slab Depressurization System Installation</i> Direction: N/A	DESCRIPTION	Fan Condensation Bypass (Typical)	Photo #: 44
	LOCATION	N/A	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010



<p><i>Sub-Slab Depressurization System Installation</i></p> <p>Direction: N/A</p>	DESCRIPTION	Fan Label (Typical)	Photo #: 45
	LOCATION	N/A	Date:
	PHOTOGRAPHER	Jeff Bunch; SES, Inc.	14 FEB 2010

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Appendix C

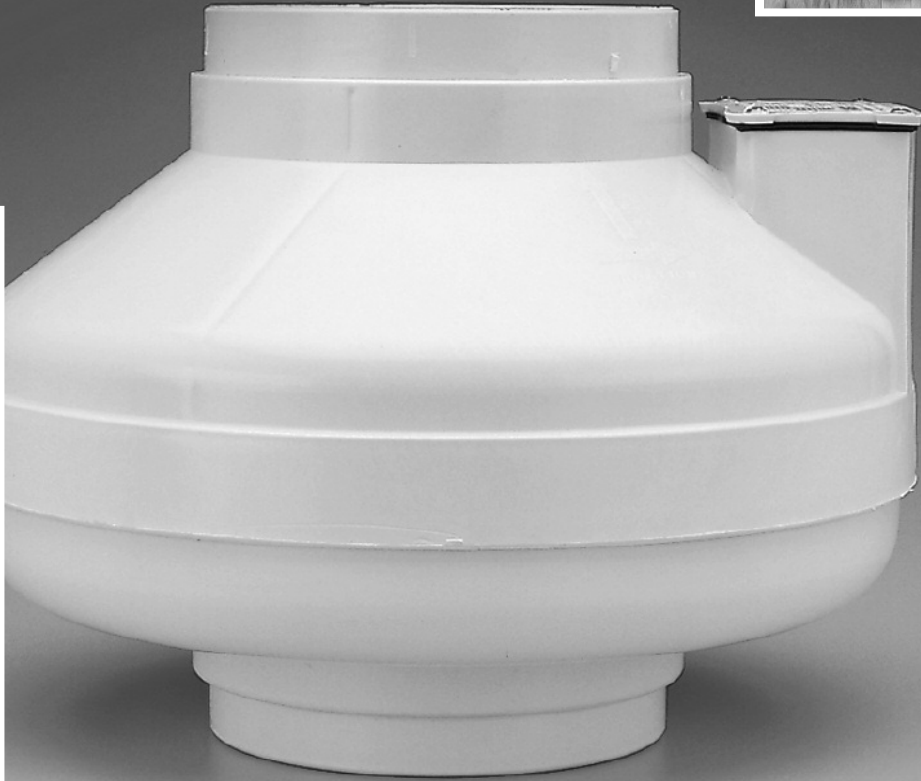
COMPONENT INFORMATION



HP SERIES

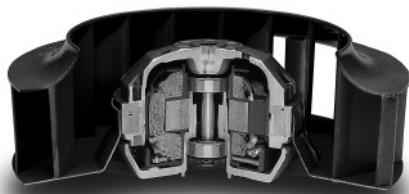
FANS FOR RADON APPLICATIONS

WITH IMPROVED UV RESISTANCE!



TRUST THE INDUSTRY STANDARD. **HERE'S WHY:**

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



Fantech external rotor motor

FANTECH HP SERIES FANS MEET THE CHALLENGES OF RADON APPLICATIONS:

HOUSING

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

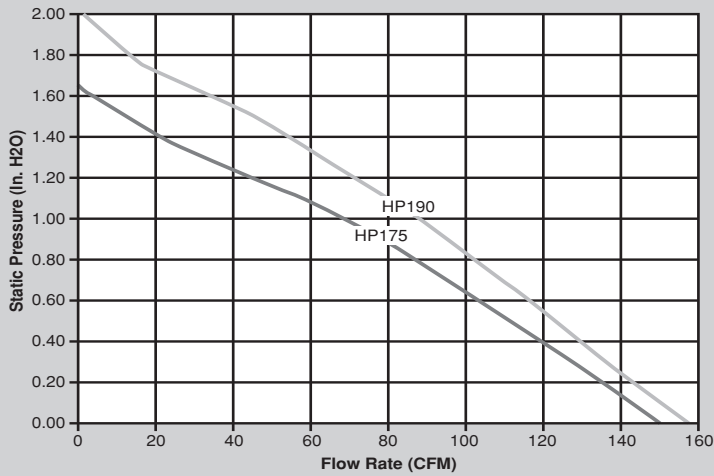
MOTOR

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

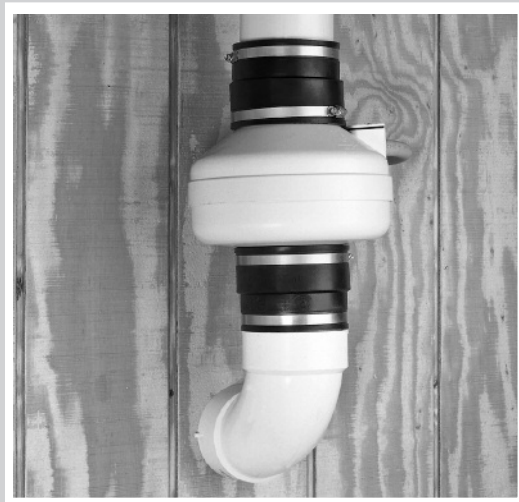
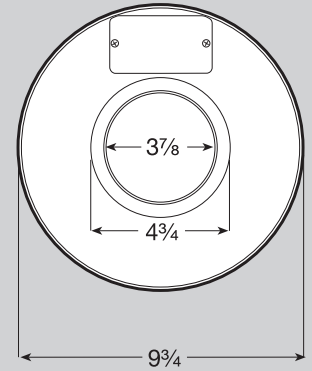
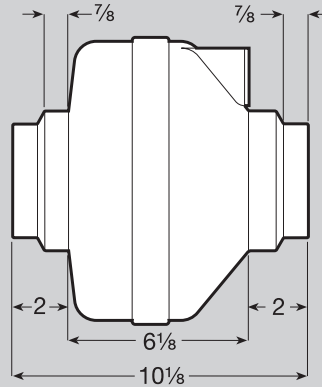
RELIABILITY

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

HP175 & HP190 RADON MITIGATION FANS



Tested with 4" ID duct and standard couplings.



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

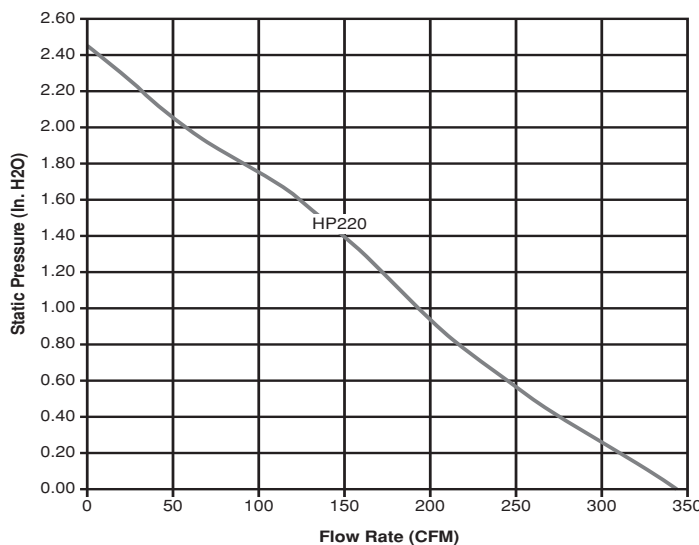
HP190 – The standard for Radon Mitigation. Ideally tailored performance curve for a vast majority of your mitigations.

Fans are attached to PVC pipe using flexible couplings.

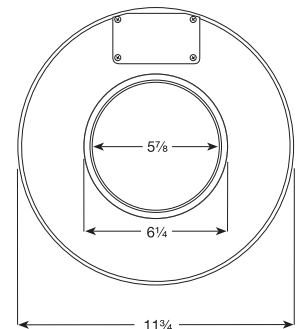
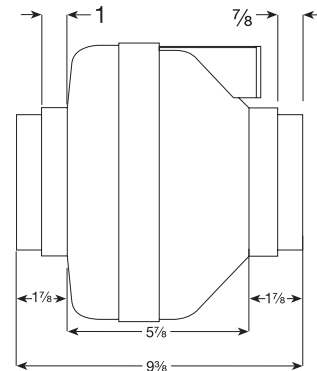
For 4" PVC pipe use Indiana Seals #151-44, Pipeconx PCX 51-44 or equivalent.

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

HP220 RADON MITIGATION FAN



Tested with 6" ID duct and standard couplings.



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

Fans are attached to PVC pipe using flexible couplings.

For 4" PVC pipe use Indiana Seals #156-64, Pipeconx PCX 56-64 or equivalent.

For 3" PVC pipe use Indiana Seals #156-63, Pipeconx PCX 56-63 or equivalent.



Fantech

Installation Instructions for Radon Fans Model HP/FR

READ & SAVE THESE INSTRUCTIONS!



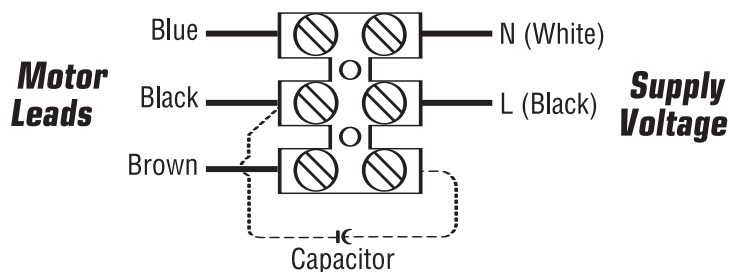
Warnings

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

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

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

Wiring Diagram



Five (5) Year Warranty

This warranty supersedes all prior warranties

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

DURING ENTIRE WARRANTY PERIOD:

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

FOR FACTORY RETURN YOU MUST:

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

OR

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

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

THE FOLLOWING WARRANTIES DO NOT APPLY:

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

WARRANTY VALIDATION

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

United States

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Fantech, reserves the right to modify, at any time and without notice, any or all of its products' features, designs, components and specifications to maintain their technological leadership position.

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

Appendix D
LOGBOOK



"Rite in the Rain"

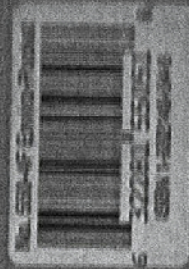
ALL-WEATHER
ENVIRONMENTAL

No. 550-4F

GVA

Bligs 50 + 52

49311
FORESTRY SUPPLERS



4

Location _____ Date _____
 Project / Client _____

Photo #	Desc	DR
1	50' 1 - pre drill	TSD
2	50' 4 - pre drill	
3	52' 2 - pre drill	
4	52' 3 - pre drill	
5	52' : EW 1 Installed	
6	52' : EW 1 Label	
7	52' : EW 1 TH 1 (EPA Adj)	
8	52' : EW 1 TH 2	
9	52' : EW 2 TH 1 (EPA Adj)	
10	52' : EW 3 TH 1 (EPA Adj)	
11	52' : EW 4 (Typical 6" diameter)	
12	52' : EW 4 TH 1	
13	50' : EW 1 TH 1	
14	Sealant used	
15	52' EW 1	
16	52' EW 2	
17	52' EW 2	
18	52' EW 3	
19	52' EW 4	
20	52' EW 4	

5

Location Bldg 50452 Date 13 FEB 80
 Project / Client GS&T

0740 Arrived on site a net w/ test Rep
 0808 Conducted safety bridge m.t.
 0815-0904 - Conducted walk through Bldg 52
 0913 - Collected PID - Fuller - Vanderhoff
 ppm: Above test to east-southwest
 0915-0934 - Took plebs 1-4 (pre-drill)
 0949 - Curved back for 1st sub-segment
 test holes & holes 2-4: PID @ 0.4 ppm
 | = 0.0 ppm Prop. of well hole
 @ 0.9 ppm TH 1 PID @ 0.4 ppm TH 1
 Check positive smoke test: TH 2 2' 7 ppm
 Holes: Curved back to hole for a well
 1032: For hole 2 (test) drilled PID @ 0.8 ppm
 TH 1 (ced) PID @ 2.4 ppm & read: Methion
 positive vac. test
 1049 Curved TH of EW 4, PID @ 0.4 ppm
 TH 1 @ 25' away PID 1.8 ppm (not possible)
 Vacuum - cut roof penetration for EW 2
 1104 Curved TH 1 @ 1.1 ppm TH 1
 @ 15' PID 1.8 ppm & read positive vacuum.
 1241-1307 Lunch

1309 - Commenced boring 6" EWZ @ root penetration for EWZ
 1310 - Finished EWZ & moved to 6" bore location for EWZ
 1311 - Drilled SP-1 EWZ Test hole pid 3:30pm
 1312 - Drilled Smoke test hole (20") for EWZ pid 2:30pm
 1313 - Finished 6" bore @ SO-1 EWZ & commenced EPZ(SO) pilot hole pid @ 1:30pm
 1314 - EWZ(SO) TH1 @ 3:30pm
 1315 - Commenced boring EWZ(6")
 1316 - Finished EWZ bore & started clean up
 1317 - Departed Project site

[Signature]
 13 FEB 10

1308 - Arrived at Project site & checked in w/ Security
 1309 - Conducted Safety Target Mtg
 1310 - Electrician commenced work on bldg SZ & installed work on SO commenced by Mike Hoff
 1311 - PID (Ambient) @ 2:00pm
 1312 - Electrical Complete on Bldg SZ & took photos of SZ's Roof structures
 1313 - photos of SO EWZ Roof penetration dilational GSA of Loose Roof across border on Bldg SZ
 1314 - PID @ 2:00pm @ EWZ Borehole before good install (possibly mislabeled)
 1315 - TH1 for EWZ @ 3:30pm
 1316 - 11:55 - 12:57 Lunch
 1317 - 12:01 - 12:57 - Commenced photos at plugged test holes
 1318 - Informed GSA regarding SO EWZ Roof penetration seal since in a low spot in flat roof - need to place -
 1319 - Return Finished

ph	Proc	req/presentation	Dir	TBD
21	50 ENZ	"		
22	50 ENZ	"		
23	52 ENZ	Close-up		
24	52 ENZ	"		
25	52 ENZ	"		
26	52 ENZ	"		
27	52 ENZ	req presentation		
28	50 ENZ	Close-up		
29	50 ENZ	Label (Fan)		
30	50 ENZ	Label (Fan Guard)		
31	50 ENZ	Req presentation		
32	50 ENZ	barcode (req) interior		
33	50 ENZ	"		
34	50 ENZ	Installed		
35	50 ENZ	Close-up (before poly table)		
36	50 ENZ	Close-up (after poly table)		
7	50 ENZ	TH Plug		
8	52 ENZ	TH Plug		
9	52 ENZ	TH Plug #1		
10	52 ENZ	TH Plug #2		
11	50 ENZ	installed		
12	50 ENZ	Close up		

if there ducts existing utilities & distance away from walls (existing)
1400 - Conducted walk thru w/ GST & Alan Parsons
52 SSD1 = RM7
52 SSD2 = Hit the OT Tank Room
52 SSD3 = RM3 closet
52 SSD4 = RM5 closet
50 SSN = Reception entrance
50 SSDL = by switchgear
1427 - finished walk thru w/ Alan & Mark and accepted by GST, GST facilities, & Alan Parsons
NO questions or comments

[Signature]
14 FEB 14

#	POC	DIR	TOD
43	50 EWL Install		
44	50 EWL Install (E roof panel)		
45	52 EWL THD played		
46	52 EWL THD played		
47	50 EWL THD played		
Feb. 15, 2010			
48	50-SSDZ	Center call	
49	50-SSDZ	table	
50	50-SSD1	table	
Manager Office			
51	52-SSD1	Room 7	
52	1"	table	
53	52-SSDZ	utility Rm.	
54	52-SSD3	Room 3	
Closet			
55	52-SSD4	Room 5	
Closet			

1100	drop-down-site for walk-thru by East Herb (Facilities) 1 hour Santee CoSt
1136	Completed site walk through at Kern Santee w/ GS. agreed all signed items were satisfied & complete
1138-1155	conducted at least measure - man B
1157	Reported Project Site

[Signature]
15 FEB 10