THIS PLAN TO BE RETAINED AT THE CONTROL PANEL

Sub-Slab Depressurization System
Operation, Maintenance, and Monitoring Plan

136 Fuller Road Site
Brownfield Cleanup Program
NYSDEC Site No. C401055

City of Albany and Town of Guilderland
Albany County, New York

February 2012

Chazen Project No. 90618.00

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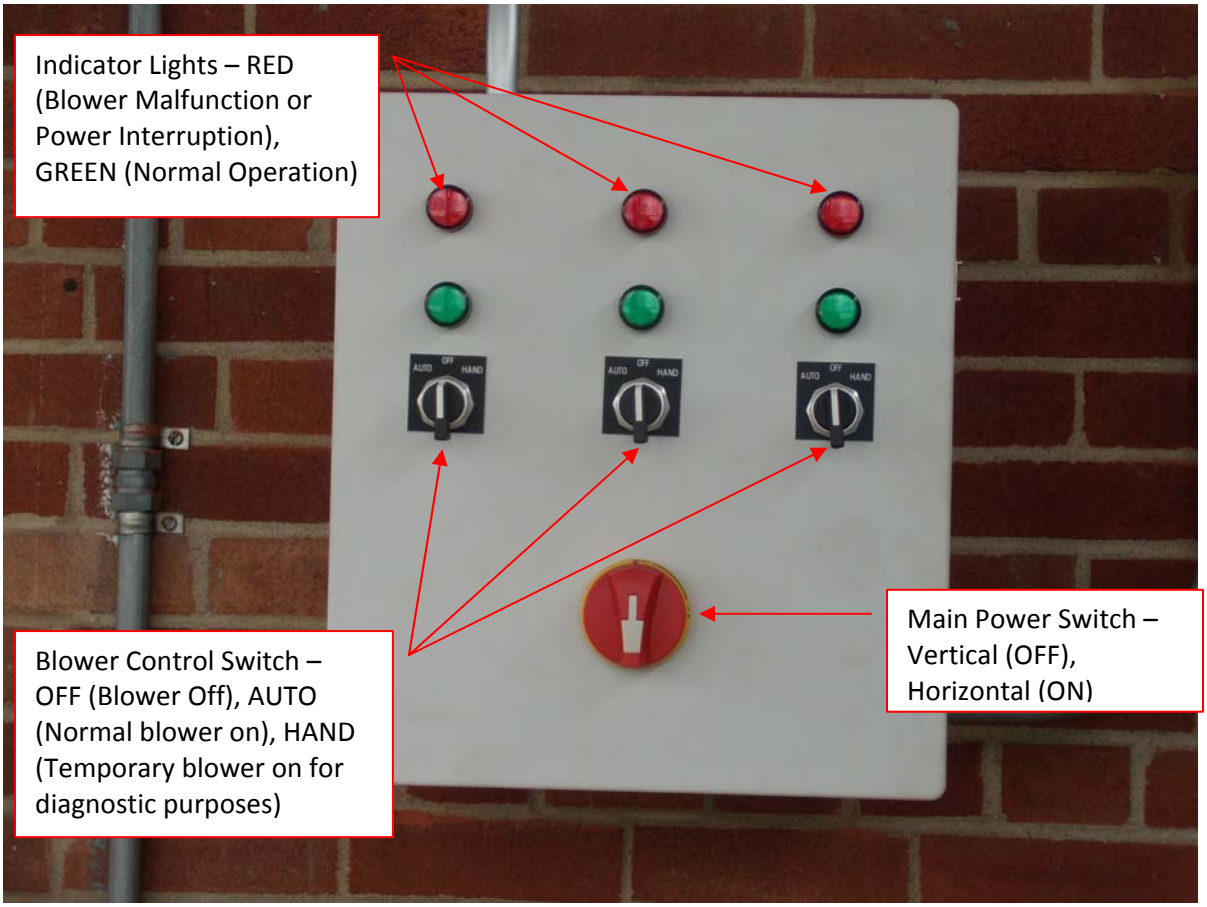
Figure 1: Pipe and Manifold Routing Plan
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APPENDICES

Appendix A: Blower Cut Sheet
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Quick Reference Guide

SSDS Control Panel Diagram/Photograph



Note: This picture shows the control panel with switches in the OFF positions.
On three-phase control panels, the "Hand" position is typically used to override a remote relay to turn on the blower. Since no remote relay is present on this system, the "Hand" position has no practical use.
For ease of use, this photograph shows the control panel before the locking metal cage was installed. A picture showing the current control panel with the locking cage is in Section 2.1.

Troubleshooting Guide for the Sub-Slab Depressurization System (SSDS)

Problem:	Action:
Blower is not running:	The most probable cause of a system shutdown is an interruption to the electrical service. Each blower is powered by a three-phase electric motor. When power is interrupted, the blowers will shut down. After the power is restored, the red indicator lights on the control panel should be illuminated until the blowers are restarted. Turn each blower control switch to the "OFF" position, and then return the switch to the "AUTO" position to restart the blower. The red indicator light should go out and the green indicator light should illuminate. If the blower does not start, refer to "Blower will not start" below.
Blower will not start:	Check that main power switch is in the "ON" position (horizontal). Check for open circuit breaker. The breaker box is located in a locked electrical closet within the central building tenant space. Enter through the door to the left of the control panel. The closet is in the room on the left as you enter the door. Each blower is equipped with overload protection. If a blower cannot be restarted, it may indicate that shutdown was due to an overload/overheating condition. Turn the blower control switch to the "OFF" position, and wait for the blower to cool (two to three hours) which will reset its internal overload protection. After the blower has cooled, return the switch to the "AUTO" position to restart the blower. The red indicator light should go out and the green indicator light should illuminate. Do not continue to operate the blower without first checking the current draw to determine the cause of the overload condition. Starting at the VEWs, check the vacuum pressure readings for normal pressures (about 35 in W.C.) and for gauge needles that do not bounce. If vacuum pressures are normal, check the discharge stack for strong, smooth airflow (no pressure gauges are present on the discharge piping). Do not operate blower if vacuum pressure or airflow discrepancy cannot be resolved. See Influent Blockage and Effluent Blockage below. If the blower does not start or continue to operate normally, contact The Chazen Companies Environmental Services Division (518) 273-0055.

The blower feels very hot to the touch:	Air flowing through a blower has a cooling effect. A hot blower indicates a restriction to the airflow. Check vacuum pressure at each vapor extraction well for irregularities to determine the source of the restriction. See Influent Blockage and Effluent Blockage below.
Influent blockage (indicated by a low discharge pressure at blower exhaust and low airflow):	Reduced airflow could occur from a dirty air filter element. To correct this, turn the blower off by turning the control panel's blower control switch to the "OFF" position and inspect the filter elements. Clean or replace dirty elements and then restart the system and recheck pressure gauges for normal pressure readings. If the problem is not solved, shut down the blower by returning the blower control switch to the "OFF" position and contact The Chazen Companies Environmental Services Division (518) 273-0055. Reduced airflow could occur from the accumulation of groundwater in the system. To correct this, turn the blower off using the control panel's main power switch, and allow the system to rest for three hours. This will allow accumulated water to drain from the influent piping. After three hours, restart the blower and recheck the pressure gauges for normal pressure readings (about 35 in W.C.). If the problem is not solved, return the blower control switch to the "OFF" position and contact The Chazen Companies Environmental Services Division (518) 273-0055.
Effluent blockage (indicated by a high discharge pressure at blower exhaust and low airflow):	Check for a break or blockage in the discharge pipe. If line is blocked, turn off the blower, disconnect the pipe from the threaded fitting on the blower and remove the blockage. If problem is not solved, shut down the unit and contact The Chazen Companies Environmental Services Division (518) 273-0055.
Vacuum pressure irregularity (indicated by a high gauge pressure at the vapor extraction well)	If the vacuum gauge pressure measured at the extraction well is inconsistent and higher than previous measurements, it indicates a system malfunction. Check the ball valve positions for each vapor extraction well to ensure they are all in the full open position. If the gauge needle appears to be bouncing, it may indicate water in the extraction well. To correct this, turn the blower off using the control panel's main power switch, and allow the system to rest for three hours. This will allow accumulated water to drain from the influent piping. After three hours, restart the blower and recheck the pressure for a normal reading. If the problem is not solved, shut down the blower by turning the blower control panel switches to the "OFF" position and contact The Chazen Companies Environmental Services Division (518) 273-0055.

Vacuum pressure irregularity (indicated by a low gauge pressure at the vapor extraction well)	If the vacuum gauge pressure measured at each extraction well is inconsistent and lower than previous measurements, it indicates a system malfunction. Examine the piping system for leaks or breaks. If a line break or leak is observed, stop the application of vacuum pressure to the affected line by either closing the ball valve at the extraction well, or if the break is above the valve, turn off the blower to the affected zone at the control panel. Replace broken or leaking section of PVC pipe, minimizing the use of rubber fittings, if possible. Restart the system and check the pressure. Reduced airflow could occur from a dirty air filter element. To correct this, turn the blower off by turning the blower control panel switch to the "OFF" position and inspect the filter element. Clean or replace dirty elements and then restart the system and recheck the pressure in the effluent stack by checking the airflow. If the problem is not solved, shut down the blower by turning the control panel switch to the "OFF" position and contact The Chazen Companies Environmental Services Division (518) 273-0055.
System appears to be running normally, but the control panel light is not on.	If the blowers are operating normally, the green indicator lights will be illuminated, otherwise the red indicator lights should be illuminated. If neither light is illuminated, there may be a power outage, or a control panel light bulb may need to be replaced. Temporarily swap a known functioning light bulb with the one that is not operating. If swapped bulb functions, purchase a replacement for the burned-out bulb. If no lights are operating, it is most likely a power outage to the system. Check that the main power switch is in the "ON" position. Check for tripped breakers in the electrical closet. If the cause of the power outage is known, restart the blowers when power is restored. If the cause of non-functioning lights is still unknown, contact The Chazen Companies Environmental Services Division (518) 273-0055.
System appears to be operating normally, but the vacuum pressure gauge has a sticky needle or the gauge has been broken	Replace vacuum pressure gauge. Grainger Item No. 5MLJ6.

1.0 Introduction

This Operation, Maintenance and Monitoring (OM&M) Plan describes the measures necessary to operate, monitor, and maintain the mechanical components of the sub-slab depressurization system (SSDS) for this site.

This OM&M Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to operate and maintain the SSDS,
- Includes an OM&M contingency plan, and
- Will be updated as needed to reflect changes in site conditions or the manner in which the SSDS is operated and maintained.

A copy of this OM&M Plan will be kept in the locked SSDS control panel cage at the site.

2.0 Engineering Control System Operation and Maintenance

In response to elevated sub-slab air concentrations of perchloroethylene (PCE) and other volatile organic compounds (VOCs) beneath the site building at the 136 Fuller Road Brownfield Cleanup Program (BCP) site, an SSDS was designed and installed in 2010 and 2011. The system includes six operating sub-slab vapor extraction wells (VEWs) located above an area of known groundwater impacts. The wells are piped to three vacuum blower units positioned above an overhang along the north-central side of the site building (Figure 1). System components are shown in Figure 2, and a typical VEW detail is shown in Figure 3. A troubleshooting guide is present in the Quick Reference Guide located at the beginning of this document.

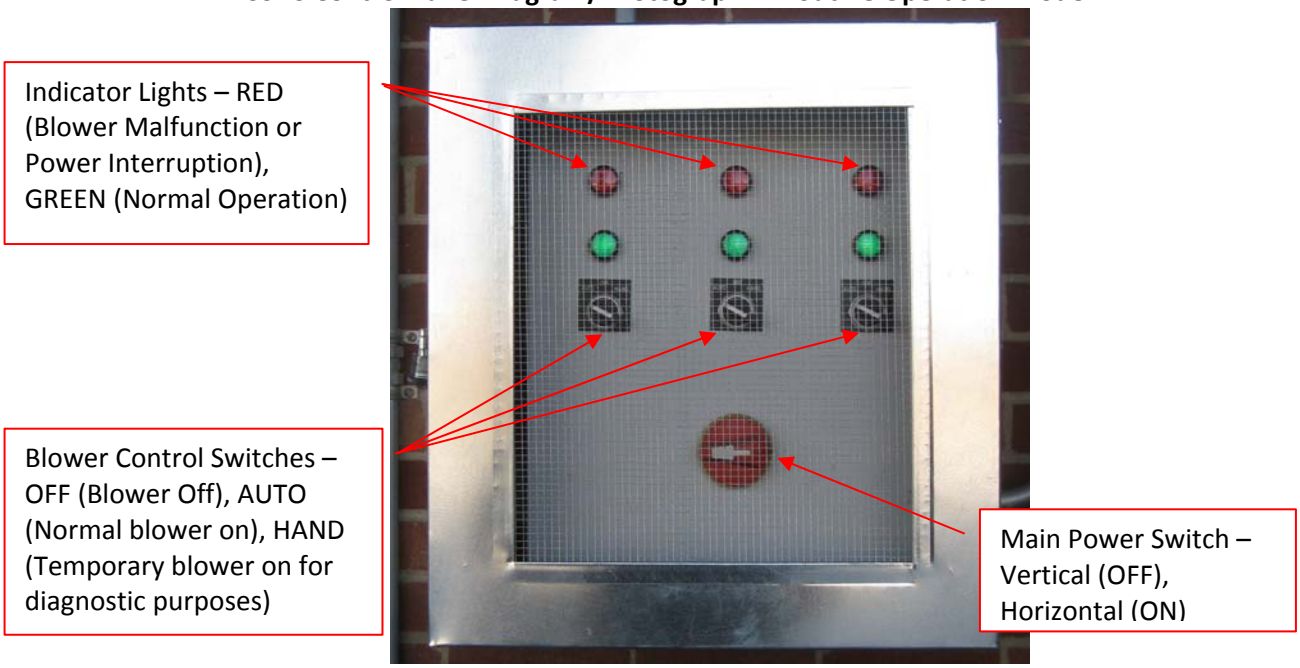
The SSDS is planned for continual operation during active site interim remedial measures and/or remedial actions. SSDS operation may be terminated following approval by NYSDEC and NYSDOH.

2.1 System Operation: Routine Operation Procedures

The SSDS contains three EG&G Rotron explosion-proof regenerative blowers Model DR454R72M. The blower cut sheet is included as Appendix A. Operation of the blower units requires ensuring that a continuous power source is applied to the blower motor. The operator must also ensure that SSDS piping does not leak and that there are no blockages. Blockages and leaks may be diagnosed by assessing line pressure at the vapor extraction wells and the blower exhaust lines. Vacuum pressure gauges are installed at each vapor extraction well.

The control panel is used to assess whether power is being supplied to the blowers (see control panel diagram/photograph below). Power is supplied when the main power switch is in the ON position (horizontal), the three blower control switches are on AUTO (the left-most setting), and the green indicator lights are illuminated.

SSDS Control Panel Diagram/Photograph in Routine Operation Mode



Should irregularities be detected in the line pressures, or the system becomes non-functional, a troubleshooting guide is provided prior to Section 1.0 to assist in diagnosing and restarting the system. Repairs and adjustments should be performed by a qualified service technician.

2.2 System Operation: Routine Equipment Maintenance

This system is designed to require minimal routine equipment maintenance, limited to the three in-line vacuum filtration units. A cut sheet for the filtration units is attached as Appendix B.

During periodic site inspections (quarterly at a minimum), the site owner/operator (as the case may be) or consultant will ensure that the system is operating appropriately and will visually inspect the air filters. The filter elements should be cleaned according to manufacturer's instructions or replaced annually (at a minimum) with Solberg Element No. 849. According to the manufacturer, the recommended filters utilize a polyester filtration material which may be cleaned and reused. The polyester element may be washed in warm soapy water, vacuumed, or gently blown out. The element should be dry before reinstallation. The element should be replaced after a maximum of three cleanings. No cleaning frequency is specified.

The in-line filters are located at ceiling level inside the building on the opposite side of the wall from the blowers. In order to access the filters, the owner/operator will need a man lift or ladder.

2.3 System Operation: Non-Routine Equipment Maintenance

Should a non-routine condition occur, the site owner/operator (as the case may be) or consultant will ensure that the system is operating appropriately. Examples of non-routine maintenance activities would be restarting the blowers after a power outage or diagnosing a 10% or greater change in line pressure.

If there is a disruption to the power supply to a blower, the red indicator light will be illuminated and the blower will not be running. The site owner/operator (as the case may be) will restart the blower following the instructions in the troubleshooting guide.

Pressure irregularities of more than 10% at the vapor extraction well gauges would be evidence of some other type of system failure. In this instance, the site owner/operator (as the case may be) will refer to the troubleshooting guide as the starting point to assess the problem. If the pressure irregularity cannot be rectified, or if the system cannot be restarted and run continuously, the owner/operator work with their SSDS design engineer to remedy the failure and discuss the scenario with NYSDEC.

Some diagnostic measures may require that the PVC piping, blowers, or exhaust stacks be physically examined. The PVC piping extends up from ground level up to the ceiling level (about 20 feet above the floor) and then horizontally towards the blowers. It is reasonable to assume that most damage to the piping would occur within 10 feet of the floor, affecting the vertical pipes which are visible from the ground level and accessible with a ladder. Should a significant vacuum pressure change indicate pipe damage that is not visible from the ground level, a more intensive inspection may be needed. A man lift or ladder will be required to access the piping.

The blowers and exhaust stacks are located on an entry roof overhang (see Figure 2). To access this location, a ladder or man lift is required. The exhaust stacks extend above the roofline of the main

building, and it is recommended for safety, that the stacks not be examined by standing on the main building but instead accessed via a ladder/lift from the ground or roof overhang.

3.0 Engineering Control System Performance Monitoring

3.1 SSDS Effectiveness Monitoring

A pilot test was performed to assess system effectiveness during the design phase by measuring the capture radius via a network of vacuum monitoring points installed through the floor slab. Results of the pilot test are included in the SSDS Design Report.

Per USEPA, NYSDOH, and NYSDEC vapor intrusion guidance, the SSDS's radius of influence (ROI) is defined as "Acceptable" for areas experiencing a pressure drop of at least 0.004 inches water column (inWC) at the most distant monitoring points with respect to the location of the extraction well. ROI pressure testing results indicated a ROI range between 75 and 200 feet beyond the EWs at this site. EWs were tested during the pilot study and have been incorporated into the final system design; therefore, ROI testing is not scheduled to be repeated.

System effectiveness can be indirectly assessed routinely by assuring that the gauge vacuum readings are normal (within 10% of normal ranges).

3.2 Monitoring Schedule

Monitoring will be performed periodically according to the schedule in Table 1. Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or non-routine maintenance may take place when a suspected power disruption or failure of the SSDS has been reported or some condition occurs within the building that is deemed likely to affect the operation of the system.

Table 1 Monitoring Schedule for the SSDS

Action	Frequency
Routine inspection and system readings (extraction well pressure)	Quarterly during active site interim remedial measures and/or remedial actions. Annually after active remedial activities are terminated.

3.3 General Equipment Monitoring

A visual inspection of the complete system will be conducted during periodic monitoring events. SSDS components to be monitored include, but are not limited to, the following:

- vacuum blower,
- in-line filters
- controls, and
- general system piping.

A complete list of components to be checked is provided in the Inspection Checklist presented in Appendix C. If any equipment readings are not within their typical range, equipment is observed to be malfunctioning, or the system is not performing within specifications, then maintenance and repair as

per this OM&M Plan are required immediately. Following maintenance or repair, the SSDS will be restarted.

3.4 System Monitoring Devices and Alarms

The SSDS control panel contains red and green indicator lights (see photograph in the Quick Reference Guide). A green "System On" light for each blower is illuminated during normal operation. If a red indicator light is on, it indicates that a blower is not operating. If any red lights are illuminated or no lights are illuminated, the contingency response plan is that the site owner/operator (as the case may be) will check and inspect the SSDS to determine if it is functioning and/or if any light bulbs need replaced. If no lights are illuminated, it potentially means that the main power switch is off at the control panel or power is not reaching the control panel.

If the system is non-functional, the site owner/operator (as the case may be) will refer to the troubleshooting guide at the beginning of this document to attempt to diagnose and restart the system. If the system remains non-functional, the site owner/operator will work with their SSDS design engineer to assess and repair the system. Operational problems will be noted in the subsequent BCP progress report or Periodic Review Report, as appropriate.

There are no audible alarms on this SSDS system. If a blower is not functioning in the AUTO position, the red indicator light will illuminate on the control panel. The control panel must be visually inspected and pressure readings manually taken at the vapor extraction wells to determine if the system is functioning properly.

3.5 Sampling Event Protocol

Extraction wells will be checked to confirm that pressure readings are 35± inWC at each well. Readings that deviate greater than 10% from 35 inWC should be compared to historical data to verify consistent operational pressures and to identify possible maintenance issues (e.g. dirty filter).

4.0 Maintenance and Performance Monitoring Reporting Requirements

Maintenance reports and any other information generated during regular operations at the site will be kept on-file on site. Table 2 presents a maintenance schedule for the SSDS. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC.

Table 2 Maintenance Schedule for the SSDS

Action	Frequency
Clean Exhaust Stack	As Needed
Replace Indicator Light Bulb	As Needed
Clean/Service Blower	As Needed
Clean or Replace Air Filter Elements	As needed, Annually

4.1 Routine Maintenance Reports

Checklists or forms will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form).

4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak repair;

- Other repairs or adjustments made to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Figures

CONTROL PANEL ACCESSIBLE FROM GROUND LEVEL.

BLOWERS B1,B2,B3 ON ROOF

IN-LINE FILTERS

VE-1

VE-2

4-INCH DIAMETER PVC MANIFOLD PIPE.

VE-3

4-INCH DIAMETER PVC MANIFOLD PIPE.

VE-4

VE-5

VE-6

VE-7

VE-8

VE-9

4-INCH DIAMETER PVC MANIFOLD PIPE.

LEGEND

Vapor Extraction Well

Unused Vapor Extraction Well

CONC. STEPS

AREA OF BROKEN CONC., BLACKTOP & CRUSHED STONE

6' HIGH CHAIN LINK FENCE

LIQUID CARBON DIOXIDE TANK

TRANSFORMER

CONC. PAD

Blacktop

CONC. FILLED GUARD POST

Existing Permanent Easement granted to N.M.P.C. for tree & brush cutting (L)2021/P 129)

Grass

Temp. Const.

0 40 80 120

ORIGINAL SCALE IN FEET

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North Country Office:
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Glens Falls, New York 12801
Phone: (518) 812-0513

136 FULLER ROAD PROPERTY

SSDS PIPE AND MANIFOLD ROUTING PLAN

CITY OF ALBANY, ALBANY CO. NEW YORK

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date	scale
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FIGURE 1	

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NOTES:

- BLOWER CONTROL PANEL INCLUDES "ON" / "OFF" / "AUTO" CONTROLS.
- FAULT LIGHTS LOCATED ON THE BLOWER CONTROL PANEL ARE WIRED TO ILLUMINATE IF FAULT OCCURS.
- ← AIRFLOW DIRECTION

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136 FULLER ROAD PROPERTY

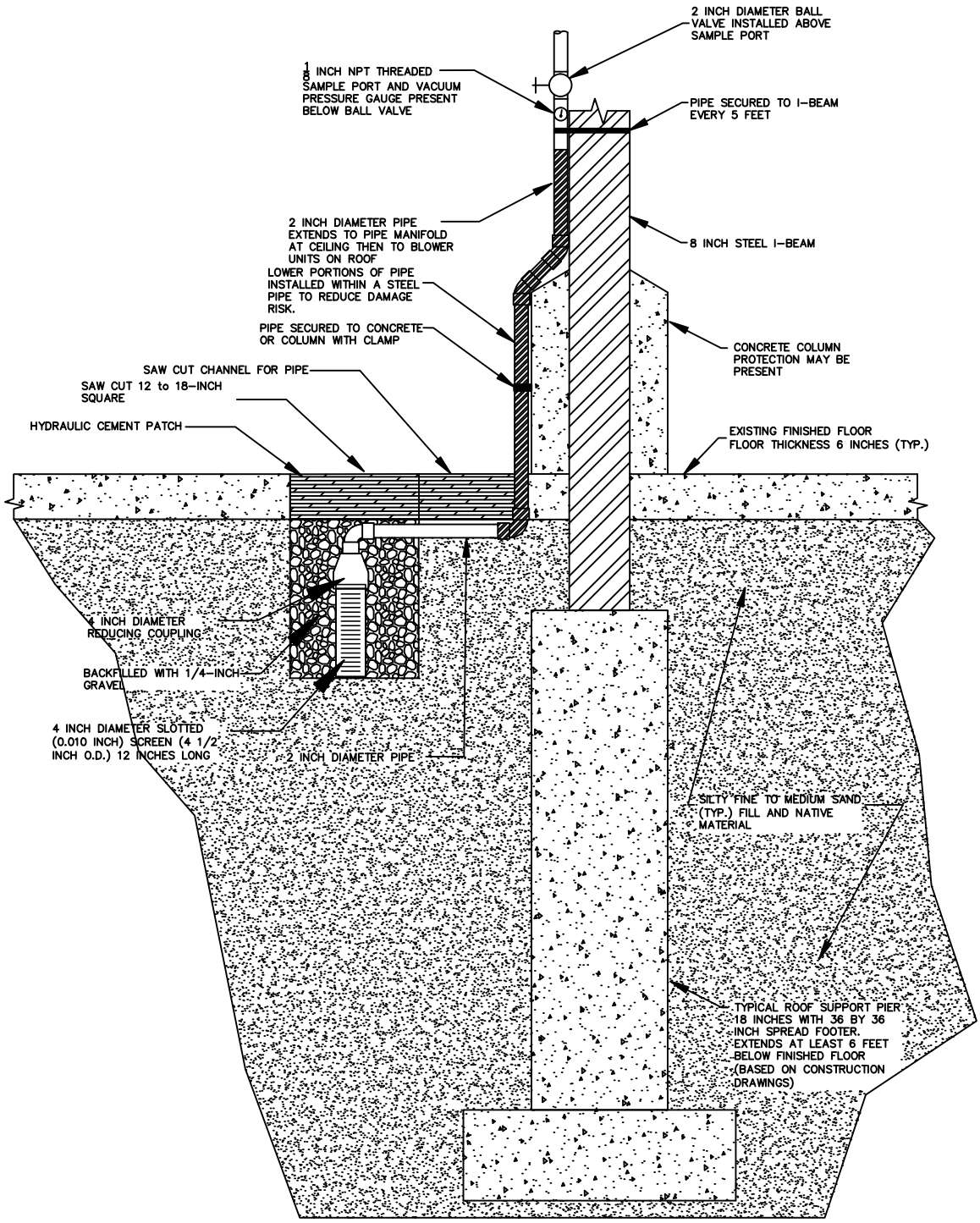
BLOWER AND CONTROLS SCHEMATIC

CITY OF ALBANY, ALBANY COUNTY, NEW YORK

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CSD	ASM
date	scale
2/20/12	N.T.S
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FIGURE 2	

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Drawing Name: S:\9\90600–90699\90618_00\ENV\RI Work Plan\Draft RI AAR Work Plan\HASP and IRM Backup files\FIG04_90618–00_As Built piping.dwg Date Printed:



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136 FULLER ROAD PROPERTY

TYPICAL VAPOR EXTRACTION POINT CONSTRUCTION DETAIL

CITY OF ALBANY, ALBANY CO., NY

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sheet no.	
FIGURE 3	

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Drawing Name: S:\9\90600-90699\90618_00\ENV\RI Work Plan\Draft RI AAR Work Plan\HASP and IRM Backup files\FIG02-VAPOR WELL DETAIL as built.dwg Date Printed:

Appendix A:

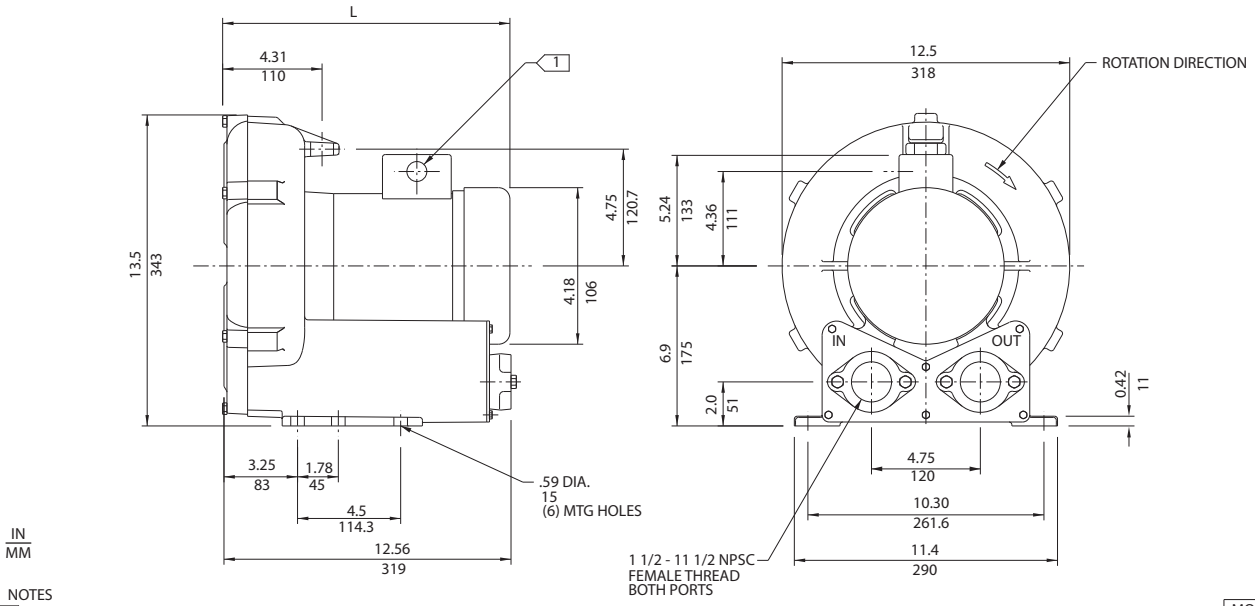
Ametek Rotron 1.5-HP Blower Cut Sheet

Industrial / Chemical Processing Blowers

ROTRON®

DR 454 & CP 454

1.5 HP Regenerative Blower



NOTES
1. TERMINAL BOX CONNECTOR HOLE .88 (22) DIA.
2. DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3. CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

MODEL	L (IN/MM)
DR454R58M	14.47/367
DR454R72M	13.31/338

		Part/Model Number			
		DR454R58M	DR454R72M	DR454R86M	CP454EZ72MLR
Specification	**Units**	**080481**	**080480**	**080482**	**080491**
Motor Enclosure - Shaft Mtl.	-	TEFC - CS	TEFC - CS	TEFC - CS	Chem TEFC -SS
Horsepower	-	1.5	1.5	1.5	1.5
Voltage	AC	115/230	230/460	575	230/460
Phase - Frequency	-	Single - 50/60 Hz	Three - 50/60 Hz	Three - 50/60 Hz	Three - 50/60 Hz
Insulation Class	-		F		
NEMA Rated Motor Amps	Amps (A)	15.6/7.8	4.6/2.3	1.8	4.6/2.3
Service Factor	-	1.15	1.15	1.15	1.15
Max. Blower Amps	Amps (A)	18/9	5.2/2.6	2.1	5.2/2.6
Locked Rotor Amps	Amps (A)	84/42	32/16	12.8	32/16
NEMA Starter Size	-	1/0	00/00	00	00/00
Shipping Weight	Lbs	73	60	60	60
	Kg	33.1	27.2	27.2	27.2

Voltage - ROTRON motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

Operating Temperatures - Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

Maximum Blower Amps - Corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The performance data on this page depicts typical performance under controlled laboratory conditions. AMETEK is not responsible for blowers driven beyond factory specified speed, temperature, pressure, flow or without proper alignment. Actual performance will vary depending on the operating environment and application. AMETEK products are not designed for and should not be used in medical life support applications. AMETEK reserves the right to revise its products without notification. The above characteristics represent standard products. For product designed to meet specific applications, contact AMETEK Technical & Industrial Products Sales department.

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AMETEK® TECHNICAL & INDUSTRIAL PRODUCTS

Industrial / Chemical Processing Blowers

DR 454 & CP 454

ROTRON®

1.5 HP Regenerative Blower

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- CE compliant - Declaration of Conformity on file
- Maximum flow: 120 SCFM
- Maximum pressure: 65 IWG
- Maximum vacuum: 60 IWG
- Standard motor: 1.5 HP, TEFC
- Cast aluminum blower housing, impeller & cover; cast iron flanges (threaded)
- UL & CSA approved motor with permanently sealed ball bearings
- Inlet & outlet internal muffling
- Quiet operation within OSHA standards



MOTOR OPTIONS

- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS

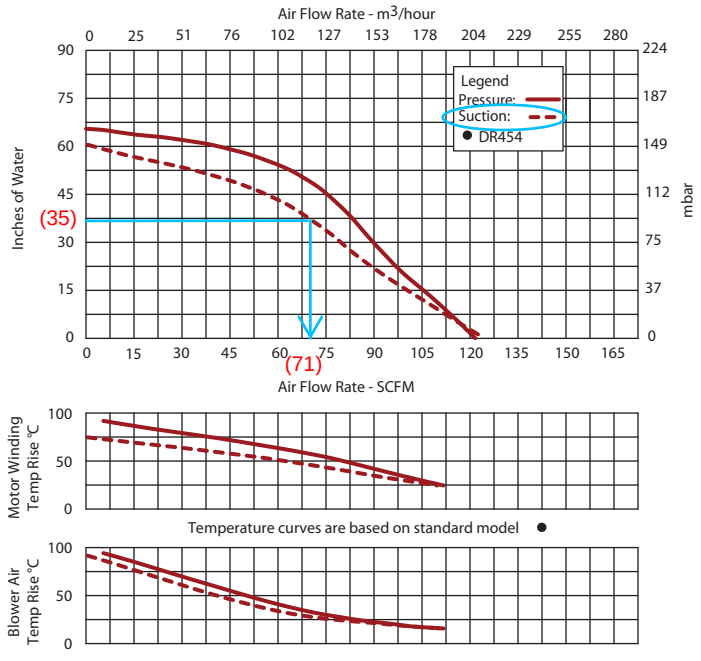
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES

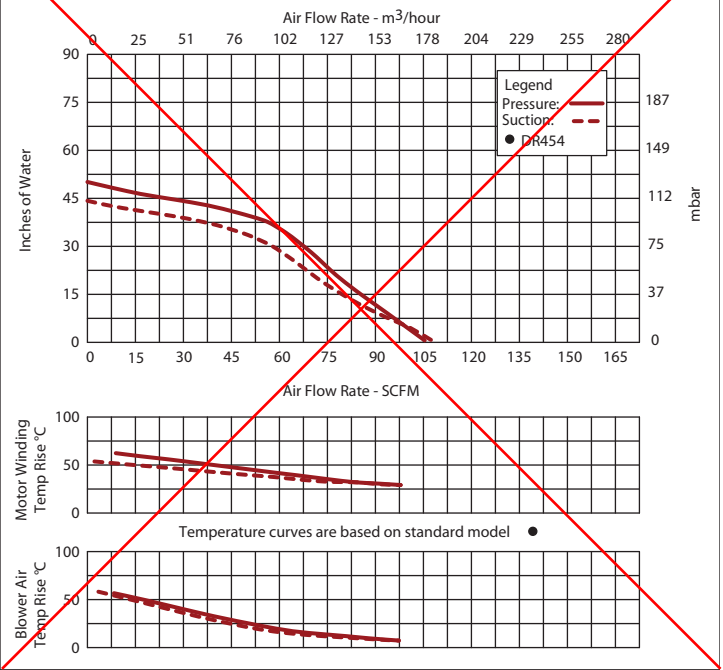
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

Blower Performance at Standard Conditions

60 Hz



50 Hz



This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The performance data on this page depicts typical performance under controlled laboratory conditions. AMETEK is not responsible for blowers driven beyond factory specified speed, temperature, pressure, flow or without proper alignment. Actual performance will vary depending on the operating environment and application. AMETEK products are not designed for and should not be used in medical life support applications. AMETEK reserves the right to revise its products without notification. The above characteristics represent standard products. For product designed to meet specific applications, contact AMETEK Technical & Industrial Products Sales department.

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AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS

Appendix B:

Solberg Inlet Vacuum Filter Cut Sheet

Small Compact Inlet Vacuum Filters

"CSL" Series 3/8" - 3" FPT

APPLICATIONS & EQUIPMENT

- Vacuum Pumps & Systems – P.D., Side Channel, Rotary Vane, Screw, Piston
- Vacuum Packaging Equipment
- Vacuum Lifters
- Blowers - Side Channel & P.D.
- Intake Suction Filters
- Pneumatic Conveying Systems
- Soil Venting/Remediation
- Remote Installations for Piston & Screw Compressors
- Printing Industry
- Factory Automation Equip
- Leak Detection Systems
- Woodworking
- Medical Industry

FEATURES & SPECIFICATIONS

- **Vacuum level**: Typically $1x10^{-3}$ mmHg ($1.3x10^{-3}$ mbar)
- Polyester: 99%+ removal efficiency standard to 5 micron
- Paper: 99%+ removal efficiency standard to 2 micron
- Brazed fittings for **High** vacuum duty
- Stainless steel torsion clips for durability
- Low pressure drop
- Positive engagement O-ring seal system
- Seamless drawn housings
- **Large** dirt holding capacity and **Easy** field cleaning, especially when mounted horizontally or inverted
- Rugged all steel construction w/baked enamel finish
- Various media
- Temp (continuous): min -15°F (-26°C) max 220°F (104°C)
- Filter change out differential: 10" - 15" H_2O over initial delta P
- Pressure drop graphs available upon request

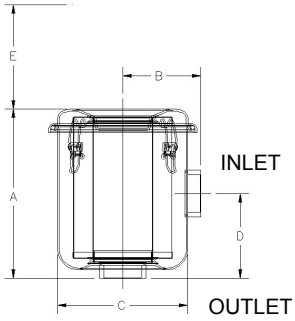
OPTIONS (Inquiries Encouraged)

- Vacuum gauge available
- Dome hood for high holding capacity
- Available in ***Stainless Steel***
- Epoxy coated housings
- Activated carbon prefilter for odor
- Support brackets
- Alternate top-to-canister fastening system for low pressure or pulsating systems

CONFIGURATION



DRAWING



Dimension tolerance ± 1/4"

I = Industrial Duty S = Severe Duty

	with Polyester Element	with Paper Element	FPT Inlet & Outlet	DIMENSIONS - inches A	B	C	D	E	Rated Flow SCFM Nominal Rating	Element Rating	Approx. Wt. lbs
I	CSL-825-039HC	CSL-824-039HC	3/8"	3 5/8	2 1/4	3 3/4	1 7/8	3	18	25	0.88
I	CSL-825-050HC	CSL-824-050HC	1/2"	3 5/8	2 1/4	3 3/4	1 7/8	3	18	25	0.88
I	CSL-843-050HC	CSL-842-050HC	1/2"	4 3/8	3	5 7/8	2 1/2	3 1/4	20	55	3
I	CSL-825-075HC	CSL-824-075HC	3/4"	3 3/4	2 1/4	3 3/4	1 7/8	3	24	25	0.88
S	CSL-843-075HC	CSL-842-075HC	3/4"	4 3/8	3	5 7/8	2 1/2	3 1/4	25	55	3
I	CSL-843-100HC	CSL-842-100HC	1"	4 3/8	3 1/4	5 7/8	2 5/8	3 1/4	35	55	3
S	CSL-849-100HC	CSL-848-100HC	1"	6 3/4	4 1/8	7 5/16	4 1/2	5 1/4	40	115	5
I	CSL-843-125HC	CSL-842-125HC	1 1/4"	4 3/8	3 1/4	5 7/8	2 5/8	3 1/4	55	55	3
S	CSL-849-125HC	CSL-848-125HC	1 1/4"	6 3/4	4 1/8	7 5/16	4 1/2	5 1/4	60	115	5
I	CSL-849-150HC	CSL-848-150HC	1 1/2"	6 3/4	4 1/8	7 5/16	4 1/2	5 1/4	80	115	5
I	CSL-851-200HC	CSL-850-200HC	2"	10 1/4	4 9/16	8 3/4	5	9 1/4	175	290	15
I	CSL-851-250HC	CSL-850-250HC	2 1/2"	10 1/2	5 1/8	8 3/4	5 1/2	9 1/4	210	290	15
I	CSL-239-300C*	CSL-238-300C*	3"	15 3/4	8 7/8	13 1/4	8 3/4	11	300	570	33

*1/4" taps standard on inlet and outlet

Note: Model offerings and design parameters may change without notice.

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Appendix C:

SSDS Inspection Checklist

136 Fuller Road BCP Site
SSDS Inspection Worksheet

Date:	**Inspector:**		
Company:	**Title:**		
	Yes	**No**	**General Comments/Notes**
Is the system running normally?			
Is the indicator light functioning?			
Is the electrical/ control panel secure (locked)?			
Do the inlet pipes feel cool/cold to the touch?			
Do the outlet pipes feel warm but not hot?			
Are the stacks clear and evenly discharging air?			
Is there any water being exhausted from the stacks?			
Does the effluent air have any noticeable odor?			
Do the blowers feel warm but not hot?			
Do the blowers sound as if they are running smoothly?			
Is there any damage to the PVC piping visible from ground level?			

System Readings

	Blower 1			***Blower 2***			***Blower 3***		
	VE-3	VE-5	Blower 1	VE-4	VE-9	Blower 2	VE-7	VE-8	Blower 3
Time									
Pressure (inWC)			--			--			--
Within 10% of 35 inWC (31.5 - 38.5)?			--			--			--
Change in pressure from previous monitoring event			--			--			--
In-line filter element condition									

List and describe any maintenance activities performed (note any system repairs, modifications):

Attach, where appropriate, photographs and/or sketches showing the approximate location of any problems or incidents noted.

Attach, where appropriate, other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc.

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