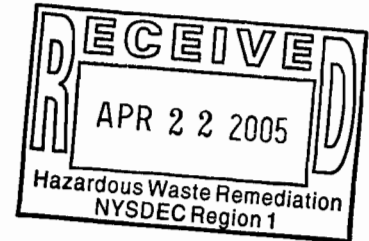


**Interim Remedial Measures Report – Part B
Operable Unit 2
The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York**

April 2005



Prepared for:

**Sal Panico
Chief Operating Officer
Citizens Development Company
111-15 Queens Blvd.
P.O. Box 10
Forest Hills, NY 11375**

Prepared by:

**CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, New York 11803**





e-mail: eweinstock@carichinc.com

April 20, 2005

New York State Department Of Environmental Conservation
Division of Environmental Remediation – Region 1
SUNY - Building 40
Stony Brook, NY 11790

Attention: Jamie Ascher
Engineering Geologist 2

**Re: Interim Remedial Measures Report – Part B
Final Engineering Report and Operations, Maintenance & Monitoring Plan
On-Site Soil Vapor Extraction System
The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York, Operable Unit 2 - Site #1-30-070**

Dear Mr. Ascher:

Enclosed please find our Interim Remedial Measures Report – Part B for the above-referenced Site. Included is our Final Engineering Report and Operations, Maintenance & Monitoring Plan for the on-site SVE system. The required "As Built" drawings are bound within this document.

Please do not hesitate to call our office if you have any questions regarding this document.

Sincerely,

CA RICH CONSULTANTS, INC.

Steve Sobstyl
Project Manager

Eric A. Weinstock
Associate

Enclosure

cc: Miriam Villani, Esq.
Sal Panico
Rosalie Rusinko
Ian Ushe, NYSDOH
F. William Schmergel

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**Interim Remedial Measures (IRM) Report – Part B
Final Engineering Report and Operations, Maintenance & Monitoring Plan
On-Site Soil Vapor Extraction System**

**The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York, Operable Unit 2 - Site #1-30-070**

1.0 INTRODUCTION

The following IRM Report – Part B has been prepared by CA RICH Consultants, Inc. (CA RICH) on behalf of The Citizens Development Corporation (CDC). The document includes a Final Engineering Report and an Operations, Maintenance & Monitoring (OM&M) Plan for the On-Site Soil Vapor Extraction (SVE) System as well as the required “As Built” drawings. This document was prepared in accordance with an Order on Consent for the site and addresses the remediation of the remaining soil contamination below the rear yard of the property. For the purposes of this document, the contaminants of concern are perchloroethene (PCE) and its degradation products.

Operable Unit 1 (OU-1) of this Site was addressed earlier and a Record of Decision (ROD) for OU-1 has been issued. The current phase of work is being addressed under Operable Unit 2 (OU-2). The IRM Report, Part-A, described the excavation and removal of contaminated soil and the application of sodium permanganate in the rear of the site. This Part-B Report addresses the installation of an on-site SVE system and the continued application of sodium permanganate.

The following is a detailed summary of previous investigations conducted at this Site by CA RICH and other consultants.

<u>Investigation</u>	<u>Date</u>
Citizens Development Company Final Remedial Investigation / Feasibility Study Report, JR Kolmer + Assoc. (Ref. 1)	February 1998
Record of Decision, Citizens Development Company Work Plan Operable Unit 1, NYSDEC (Ref. 2)	March 1998
Citizens Development Company Remedial Investigation Work Plan Operable Unit 2, JR Kolmer + Assoc. (Ref. 3)	June 1999
Citizens Development Company Operable Unit 2 Remedial Investigation / Feasibility Study Report, JR Kolmer + Assoc. (Ref. 4)	December 2001
Citizens Development Company Supplemental Remedial Investigation Work Plan, JR Kolmer + Assoc. (Ref. 5)	June 2002
Groundwater Quality Data for the Flower Fashion Site, Civil & Environmental Consultants, Inc. (Ref. 6)	October 2002

Annual Report: Groundwater Sample Results The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York, CA RICH (Ref. 7)	March 2003
Supplemental Investigation Work Plan The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York, CA RICH (Ref. 8)	April 2003
Supplemental Investigation Summary Report Operable Unit 2 - Site #1-30-070 The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York, CA RICH (Ref. 9)	March 2004
Operable Unit 2 – Interim Remedial Measures Work Plan The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York Site Number: 1-30-070	May 2004
Interim Remedial Measures Report – Part A The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York Operable Unit 2 - Site #1-30-070	January 2005

2.0 BACKGROUND

The CDC-Flower Fashion Site previously operated as a dry cleaner, a florist and is currently used as a “Cingular” Wireless Services store (Figure 1). During the 1980’s and 1990’s, a series of remediation activities including soil excavation, soil vapor extraction and groundwater pump and treat systems were employed at the Site to address the dry cleaning chemical perchloroethene and its degradation products. Historical plots of the concentration of PCE in the Site groundwater monitoring wells indicate that the levels have generally been decreasing with time. However one of the wells, MW-4, has displayed upward and downward fluctuations in PCE concentrations during recent sampling events (Ref. 9).

The reported detection of PCE during the 2003 annual sampling round (Ref. 7) in upgradient well “MW-1A” and at one of the Site wells “MW-3” is an indication that PCE is entering the Site from an upgradient source. Several active and former dry cleaning facilities exist in close proximity to the CDC/FF Site and include Little Neck Cleaners, DryClean USA and Mayflower Cleaners. Additional detail regarding these facilities is included in Ref. 9.

A soil vapor survey performed during the October 2003 Supplemental Investigation revealed elevated levels of PCE in the soil behind the Cingular store. A series of borings were performed which delineated an area of PCE impacted soil in this area. The impacted soil was excavated and disposed as described in our IRM Part – A. This was followed by a program of sodium permanganate injections. The purpose of the IRM Part – B activities was to address the elevated levels of PCE in the soil gas behind the Cingular store through the installation of an SVE system and the elevated levels of PCE in well MW-4 through the continued application of sodium permanganate.

2.1 Site Geology

The CDC/FF site is underlain by Pleistocene-age deposits to a depth of approximately 300 feet which are referred to locally as the Upper Glacial Formation. The Upper Glacial Formation includes beds of fine to coarse sand and gravel as well as boulders, clay, till and some small shallow pond deposits. The borings installed at the Site encountered relatively sandy strata.

The Upper Glacial Formation is followed by the sands, silts and clays of the Magothy Formation. This is, in turn, followed by a regional clay layer referred to as the Raritan Clay and then crystalline bedrock. Details of the local geology are described by the USGS in Stumm, 2001 (Ref. 11).

3.0 SUMMARY OF RECENT INVESTIGATION AND REMEDIATION ACTIVITIES

A series of soil and groundwater investigations were performed at this Site during the 1980s and 1990s. This was followed by a limited soil excavation program; a limited Soil Vapor Extraction Program; and the operation of a groundwater pump and treat system. Details of these activities are included in the reports outlined in the reference section of this document. The following is a summary of recent activities performed at this Site.

3.1 Supplemental Investigation

As mentioned above, a Supplemental Investigation (Ref. 9) was performed in October 2003 to evaluate potential upgradient sources of PCE, investigate the potential for a residual source of PCE to exist at the CDC/FF Site, and to implement a program of post-remediation monitoring. This investigation included the following work items:

- Identified and evaluated other potential sources of PCE in the area;
- Inventoried, sampled and analyzed area storm drain sediments for the presence of PCE;
- Performed a soil vapor survey on the CDC/FF Site to identify the existence of a residual source of PCE at the Site;
- Evaluated the capacity of the existing SVE blower;
- Implemented a program of post-remediation groundwater monitoring for the Site; and
- Initiated a program of periodic indoor air sampling.

A summary of the Supplemental Investigation is presented below.

- There appeared to be additional sources of PCE in the general area of the Site as observed in upgradient groundwater monitoring wells, on-site storm drain sediment samples and the results of the neighborhood survey. However, these sources did not appear, and in fact, as noted below, are not solely responsible for the concentrations of PCE currently being observed in monitoring well MW-4.
- The results of the soil gas survey indicated the presence of PCE in shallow soil gas at elevated levels beneath the basement foundation of the subject building and in the yard area behind the Cingular building. Specifically, the highest reported detection of PCE was observed in shallow soil gas collected from the outside area at the northwest corner of the Site ("SVP-5"). The results of the soil vapor survey indicated that there was residual PCE in the soil beneath the CDC/FF building and in the area of the former dry well behind the building.

- Currently, the existing Fantech™ low pressure SVE blower exhausts extracted soil vapor at a rate of approximately 150 cfm. Due to the extensive length of the perforated subsurface drain line which is connected to the existing system, it was determined during a vacuum pilot test that increasing the size of the SVE blower will not increase the subsurface vacuum or radius of influence of the present soil vapor extraction system. However, the current system appears to be effectively controlling the vapors and addressing the indoor air quality of the Cingular store.
- The groundwater sampling results of December 2003 and June 2004 identified the presence of PCE in both upgradient and downgradient monitoring points on the Site. The highest reported concentration was observed at well MW-4 at a concentration of 544 ug/l. Based upon a recent groundwater elevation contour map, there appears to be a connection with elevated PCE concentrations in soil gas sample below area SVP-5 and monitoring well MW-4.
- The results of the indoor air sampling for PCE did not identify the presence of PCE in the air at concentrations exceeding the New York State Department of Health action level of 100 ug/m³ during the December 2003 or June 2004 sampling rounds.

3.2 Summary of Interim Remedial Measures (IRM) Part – A

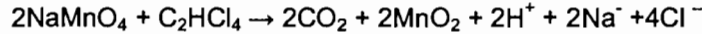
Part A of the IRM was performed during the Summer and Fall of 2004. This consisted of the following tasks, which are described in detail in Reference 10.

- Pre-Installation Soil Boring and Analysis - A series of 10 soil borings were installed to determine the natural oxidant demand of the native soil at the Site and to delineate the area of soil containing elevated concentrations of PCE.
- Additional Excavation & Disposal of PCE Impacted Soil - On August 17 and 18, 2004, the pavement covering the eastern half of the rear yard was removed. On August 23rd approximately 77 tons of PCE contaminated soil was excavated from the rear of the building. The soil was temporarily staged on plastic sheeting in the parking lot behind the Site and then transported as a hazardous waste to Stablex in Quebec, Canada. Copies of the waste disposal manifests are included in Reference 10.

A series excavation end-point soil samples were collected from the bottom of the excavation and sidewalls. These results, which are summarized in Reference 10, ranged in concentration from 53 ug/kg to 27,000 ug/kg.

The excavation was backfilled with clean fill material and covered with new concrete pavement. A layer of orange plastic barrier fence was placed at the bottom of the excavation as a marker. The clean backfill was tested and confirmed to be free of VOCs before placement at the Site. During the backfilling, three horizontally-oriented SVE lines were installed. The lines were constructed of 2-inch diameter schedule 40 PVC pipe and 0.020-inch slotted (20 slot) SVE screens. These lines were buried approximately one foot below grade and were incorporated into the current SVE system.

- Permanganate Injection System - Permanganate is a strong oxidizer that has a long history of application for the control of odors at wastewater treatment plants. The application of permanganate directly to subsurface soils and groundwater has been proven successful for the remediation of PCE. Once in contact with PCE, the permanganate converts the contaminant to harmless by-products as shown below:



(Permanganate + Perchloroethene → Carbon Dioxide Gas + Manganese Dioxide + Hydrogen ions + Sodium ions + Chlorine ions)

On October 13 and 14, a total of 27 permanganate injection points were installed at the locations shown in Reference 10 using the Geoprobe™ probing system. Each of the injection points consists of a 1-inch diameter, flush-threaded, schedule 40 PVC pipe with 0.030-inch slots (30 slot) screens. The two outer rows of injection points were installed with the slotted section set from two to five feet below grade. The middle row of injection points was installed with the slotted section set from 7 to 12 feet below grade. One deep injection point, screened from 35 to 45 feet, was also installed. An existing on-site remediation well was also used in the permanganate injection system.

Between October 21 and November 5, 2004, approximately 1,400 gallons of 5% sodium permanganate was applied to these points. Additional applications of sodium permanganate were applied to the deep injection point. Several of the shallow injection points were incorporated into the on-site SVE system.

4.0 SUMMARY OF INTERIM REMEDIAL MEASURES (IRM) PART – B

Part – B of the IRM includes the continued application of permanganate to the deep, on-site injection point along with the installation and operation of an on-site SVE system.

4.1 Permanganate Application to Deep, On-Site Injection Point

The following is a log of the application of permanganate to the deep on-site injection point:

<u>Date</u>	<u>Quantity</u>
December 16, 2004	10-gallons of 5% Sodium Permanganate Solution
January 12, 2005	10-gallons of 5% Sodium Permanganate Solution
January 27, 2005	10-gallons of 5% Sodium Permanganate Solution
February 9, 2005	10-gallons of 5% Sodium Permanganate Solution
February 24, 2005	10-gallons of 5% Sodium Permanganate Solution
March 11, 2005	10-gallons of 5% Sodium Permanganate Solution
March 25, 2005	10-gallons of 5% Sodium Permanganate Solution

The application of permanganate will continue twice a month through the next scheduled groundwater sampling ground in June.

4.2 SVE System

A Soil Vapor Extraction (SVE) unit was installed to collect and treat the remaining PCE and its degradation products from the vadose zone behind the rear of the Site building. The following describes the SVE system in detail.

4.3 Pilot Test

On December 16, 2004, a pilot test of one horizontal SVE well and one vertical SVE well was performed. A portable, 3-horsepower vacuum blower was connected to horizontal well H-2 and the well was pilot tested at 77 and 102 cubic feet per minute (cfm). As shown on Figures 2 through 5, a radius of influence of 30 to 40 feet was achieved. This extends beyond the area of impacted soil excavated in Part A of the IRM.

A pilot test of former injection point M-6 was also performed. Using the portable vacuum blower, M-6 was pilot tested at 36 cfm. A radius of influence in excess of 40 feet was achieved during this test. The results of this test are plotted on Figures 6 and 7. Based on the results of this pilot test, a vacuum blower capable of achieving at total of 165 cfm at 30 inches of water vacuum was selected.

4.4 Soil Vapor Extraction Well Design

The SVE system for this site includes three shallow horizontal SVE wells installed in the backfilled excavation area described in the IRM Part A report. In addition to this, five of the permanganate injection points were converted in SVE wells. An "As-Built" drawing illustrating the wells included in this system is presented on Figure 8. A description of the SVE well construction is presented below.

Horizontal SVE Wells – Three horizontal wells constructed of 2-inch diameter PVC pipe were installed in the backfilled material placed in the rear yard at a depth of approximately 1 foot below grade. Each horizontal well contains 10 feet of 0.020-inch slotted (20 slot) PVC well screens.

Vertical SVE Wells – Five of the middle or "M" designated injection points were converted to vertical SVE wells. These each consist of 1-inch diameter PVC pipe set to a depth of 12 feet below grade. The bottom 5 feet of these include 0.020-inch slotted (20 slot) PVC well screens.

4.5 Soil Vapor Extraction System Design

Each of the SVE wells was completed at grade with a regulating valve arranged such that each SVE screened section can be operated independently. The wells were connected to a 2-inch diameter PVC header line that was extended to an equipment shed as shown on Figure 8.

The soil vapor is extracted using a Fuji Model VFC600A, 4½-horsepower blower located in the equipment shed. The soil vapor passes through a moisture knock-out drum, into the blower and flows through a series of 2 vapor-phase 150-pound carbon units provided by General Carbon. A 2-inch diameter PVC discharge stack was attached to the side of the building with the discharge point above the existing building elevation. An electrical connection was made directly from the blower to a utility panel inside the shed. The system is currently operating at a flow rate of 160 cfm and a vacuum of 30 inches of water. A performance curve for this blower is included in Appendix B.

5.0 REMEDIATION SYSTEM MONITORING AND EQUIPMENT TERMINATION CRITERIA

The following monitoring schedule has been developed for the operation of the SVE system. Evaluation of historical plots of the data generated during the operation of this equipment will be used to determine when it is appropriate to shut of the remediation equipment.

5.1 SVE Unit Monitoring and Termination Criteria

An initial "base line" soil vapor sample was collected of the untreated vapor stream between the exhaust side of the blower and the inlet side of the carbon canisters using absorbent tubes on January 31, 2004. The tubes were sent to ELAP-approved EcoTest Laboratories, for analysis of halogenated volatile organics including PCE and its degradation products using GC methodologies. In addition, a MiniRae® 2000 organic vapor detector was used to screen the amount of VOCs in the untreated vapor stream. A summary of these data will be included in the quarterly monitoring reports.

Total VOC measurements using the MiniRae® 2000, as well as laboratory-analyzed absorbent tube samples will be collected on a quarterly basis. As the operation of the SVE unit progresses, the total organic vapor readings and absorbent tube sample data will be plotted versus time of operation on graphs. Once the levels of total VOCs in the SVE wells decreases to a near constant or asymptotic concentration, operation of the system will be suspended. Graphs of the concentration of total VOCs versus time will be compiled after each round of quarterly monitoring.

Three soil borings will then be placed in the rear yard. Soil samples will be collected at 3 to 4 feet below grade in the native soil below the imported fill and analyzed for halogenated volatile organics. If the concentration of PCE and its degradation products in these samples do not exceed the NYSDEC TAGM (Ref. 6) Cleanup Objectives, the system will remain off and the cleanup of the unsaturated zone will be deemed complete. If the levels exceed the Cleanup Objectives, the SVE system will be restarted and the monitoring program will continue. The same criteria will be used to determine when additional soil samples should be collected.

6.0 MAINTENANCE AND MONITORING SCHEDULE

6.1 Introduction

This Operations, Maintenance & Monitoring (O M&M) Plan has been prepared for the operation of the Soil Vapor Extraction system at the CDC/FF facility located at 47 Northern Boulevard in Great Neck, New York. The components of the system consist of 3 horizontal and 5 vertical soil vapor extraction wells. The soil vapor is extracted using a Fuji Model VFC600A, 4½-horsepower blower located in the equipment shed. The soil vapor passes through a moisture knock-out drum, into the blower and flows through a series of two 150 pound, vapor-phase carbon units located inside of the shed.

This O M&M Plan will address, component by component, the standard maintenance needed to operate the system as provided by the manufacturers. Copies of the owner's manuals for all new equipment purchased for this project are attached to this Manual as Appendix B.

6.2 Maintenance Procedures

SVE Blower (Ring Compressor)

Monthly

- Check vacuum gauge at inlet and record value.
- Clean the inside and outside of the cooling fan

Moisture Knock-Out Drum

- The water level in the drum should be checked once a month. Turn off the power to the blower, place a container in front of the drain valve at the bottom of the drum and open the drain valve. If water flows out of the drum, the drum should be drained and the water stored in a suitable plastic container with a water-tight lid. The system can then be restarted. Contact CA RICH to arrange for the proper disposal of the water.
- The moisture knock-out drum contains an air filter to prevent sediment from entering the blower. The filter should be checked every 6 months or after a significant increase in the measured vacuum at the inlet to the blower. The filter element should be either cleaned or replaced depending on the condition of the element.

Vacuum Relief Valve

- There are no periodic maintenance procedures recommended by the manufacturer.

Carbon Canisters

- The sampling ports on the discharge side of the blower after the carbon filtration units should be monitored quarterly using the MiniRae® 2000 and the values recorded. Once the meter indicates breakthrough of the carbon, CA RICH should be contacted to arrange for replacement of the carbon unit(s).
- There are no periodic maintenance procedures recommended by the manufacturer.

6.3 Records, Monitoring and Sampling

Records and Monitoring

A copy of the SVE log sheets are kept in the equipment shed on a clip board. A blank log sheet is included in Appendix A. The following information should be recorded.

<u>Information</u>	<u>Frequency</u>
Vacuum of blower	Monthly
MiniRae® 2000 readings of vapor discharge	Quarterly
Any repairs, maintenance or adjustments	As needed

Sampling

There are two types of samples that have to be collected on a quarterly basis as discussed in Section 5.0 of this document.

Soil Vapor

- CA RICH will collect samples of the extracted soil vapor on a quarterly basis. The samples will be analyzed for halogenated VOCs including PCE using either EPA method 8260 or 8021.

Groundwater

- The groundwater samples require the use of portable pumps. These sample collections will be performed by CA RICH on a semi-annual basis. The samples will be analyzed for halogenated VOCs including PCE using either EPA method 8260 or 8021.

Reporting

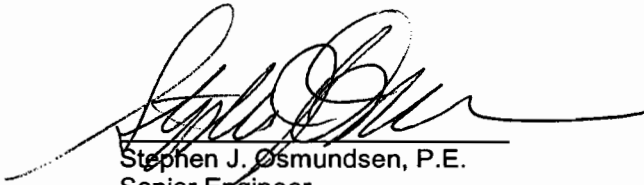
The soil vapor and groundwater laboratory data will be summarized in semi-annual reports that will be submitted to the NYSDEC. The reports will include tables and/or graphs presenting the baseline concentrations measured before startup of the system and the quarterly results acquired thereafter.

7.0 CERTIFICATION

We hereby certify that the construction of the Remediation System was performed as specified herein. We also certify that all work was witnessed either by the Project's Senior Engineer or by a person working under his direct supervision. The Senior Engineer is a Registered Engineer as established under the regulations of the State of New York.

Seal:




Stephen J. Osmundsen, P.E.
Senior Engineer

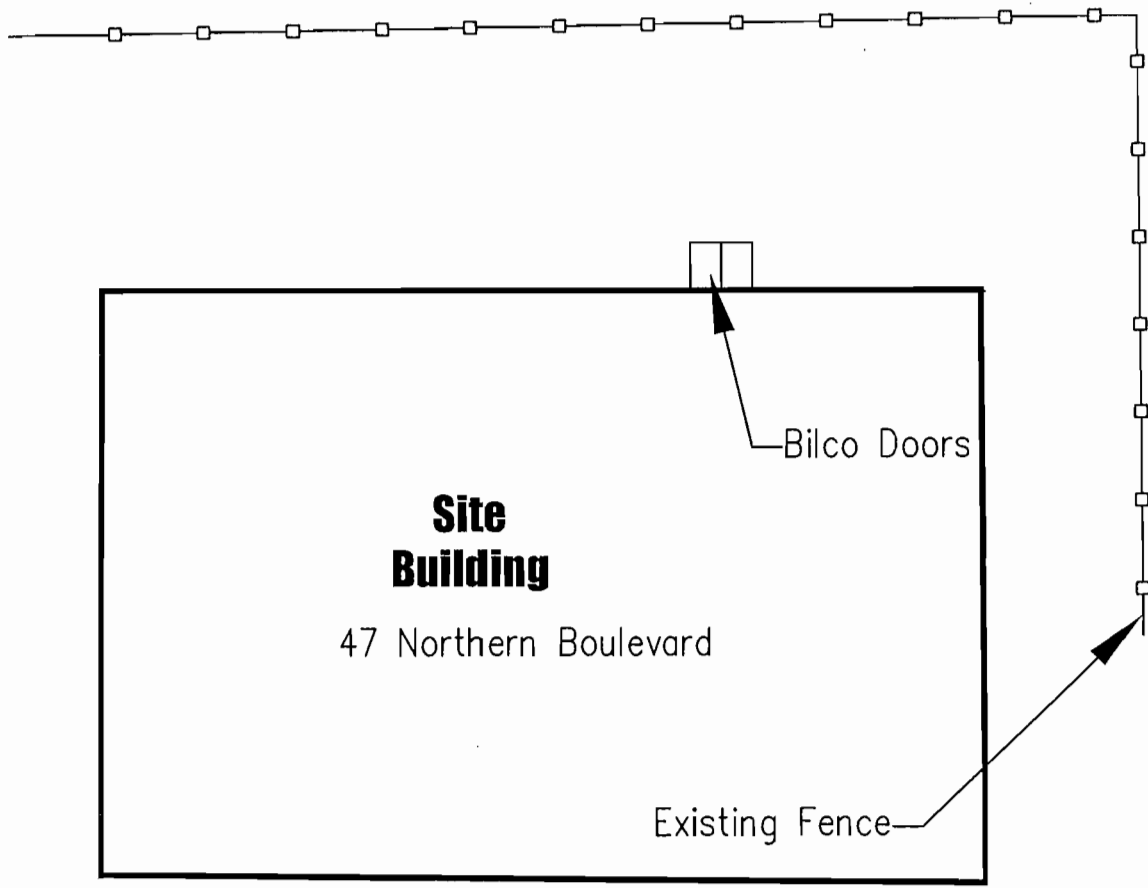
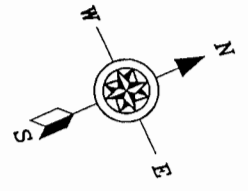
4/20/05
Date

8.0 REFERENCES

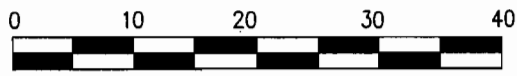
1. Citizens Development Company Final Remedial Investigation / Feasibility Study Report, JR Kolmer + Assoc. (February 1998)
2. Record of Decision, Citizens Development Company Work Plan Operable Unit 1, NYSDEC (March 1998)
3. Citizens Development Company Remedial Investigation Work Plan Operable Unit 2, JR Kolmer + Assoc. (June 1999)
4. Citizens Development Company Operable Unit 2 Remedial Investigation/Feasibility Study Report, JR Kolmer + Assoc. (December 2001)
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7. Annual Report: Groundwater Sample Results The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York, CA RICH (March 2003)
8. Supplemental Investigation Work Plan The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York (April 2003)
9. Supplemental Investigation Summary Report Operable Unit 2 - Site #1-30-070 The Citizens Development Company / Flower Fashion Site, 47 Northern Blvd., Great Neck, New York, CA RICH (March 2004)
10. Interim Remedial Measure Report Part A, Operable Unit 2 - Site #1-30-070 The Citizens Development Company / Flower Fashion Site, 47 Northern Blvd., Great Neck, New York, CA RICH (January 2005)
11. Stumm, Frederick, Hydrogeology and Extent of Saltwater Intrusion of the Great Neck Peninsula, Great Neck, Long Island, New York, USGS-WRI Report 99-4280 (2001).

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Figures

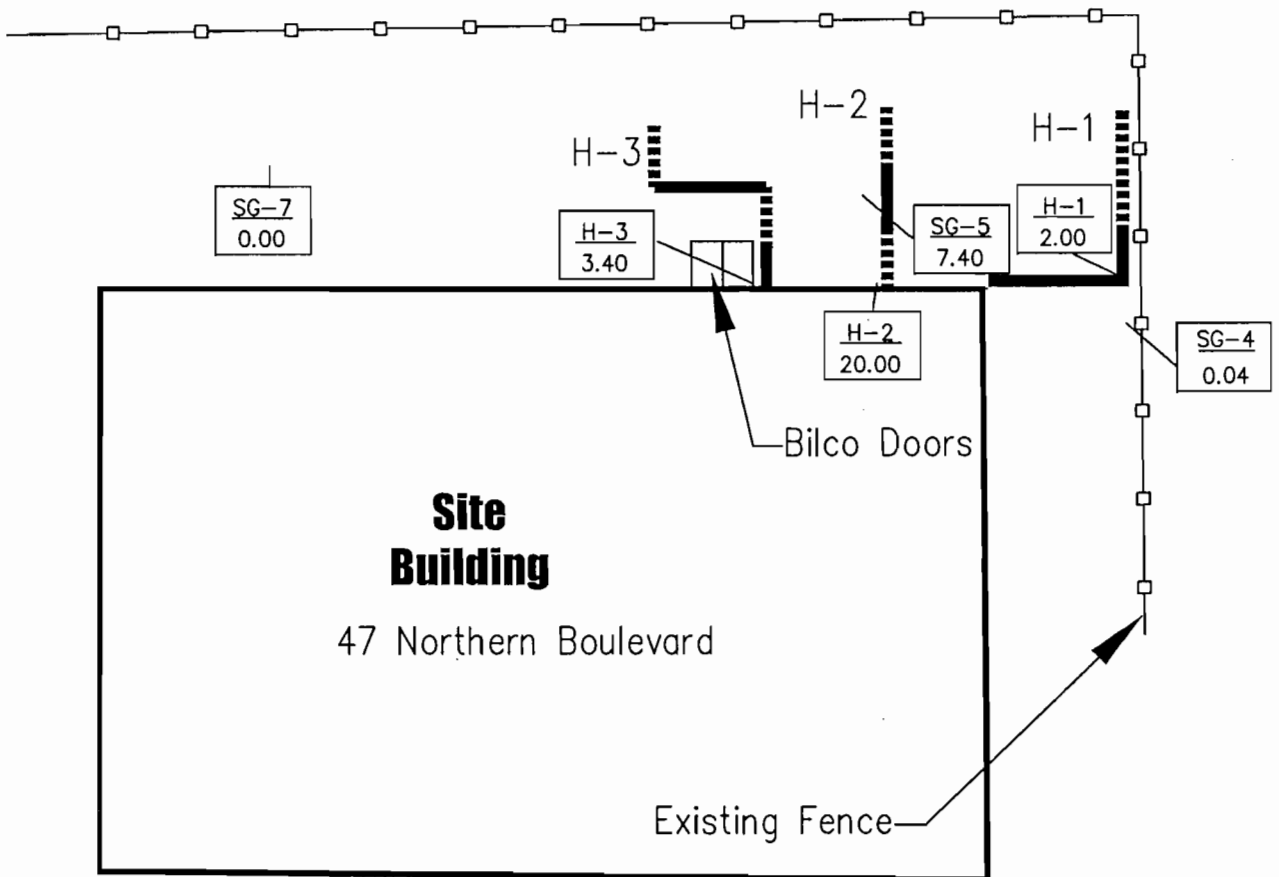
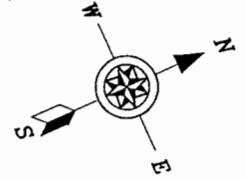


Parking






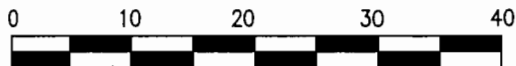
GRAPHIC SCALE IN FEET

CA RICH CONSULTANTS, INC. Certified Groundwater and Environmental Specialists 17 Dupont Street, Plainview, New York 11803	
Stephen J. Osmundsen, P.E. Professional Engineer 513 Centre Island Road, Oyster Bay, New York 11771	
TITLE: DATE: 3/28/05	
SITE PLAN	
SCALE: As Shown	DRAWN BY: D.S.
FIGURE: 1	CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020
DRAWING NO: 2004-26A.05	APPR. BY: S.J.O.



Legend

-  GROUNDWATER MONITORING WELL
-  2-INCH DIAMETER 20 SLOT PVC PIPE
-  2-INCH DIAMETER PVC PIPE
- SOIL GAS PROBE



GRAPHIC SCALE IN FEET

TEST #1

Point Tested: H-2
 Vacuum: 25 inches of water at blower
 Flow Rate: 77 cfm

CA RICH CONSULTANTS, INC.

Certified Groundwater and Environmental Specialists
 17 Dupont Street, Plainview, New York 11803

Stephen J. Osmundsen, P.E.

Professional Engineer
 513 Centre Island Road, Oyster Bay, New York 11771

TITLE: SVE SYSTEM PILOT TEST #1 WITH
 VACUUM IN INCHES OF WATER
 DECEMBER 16, 2004

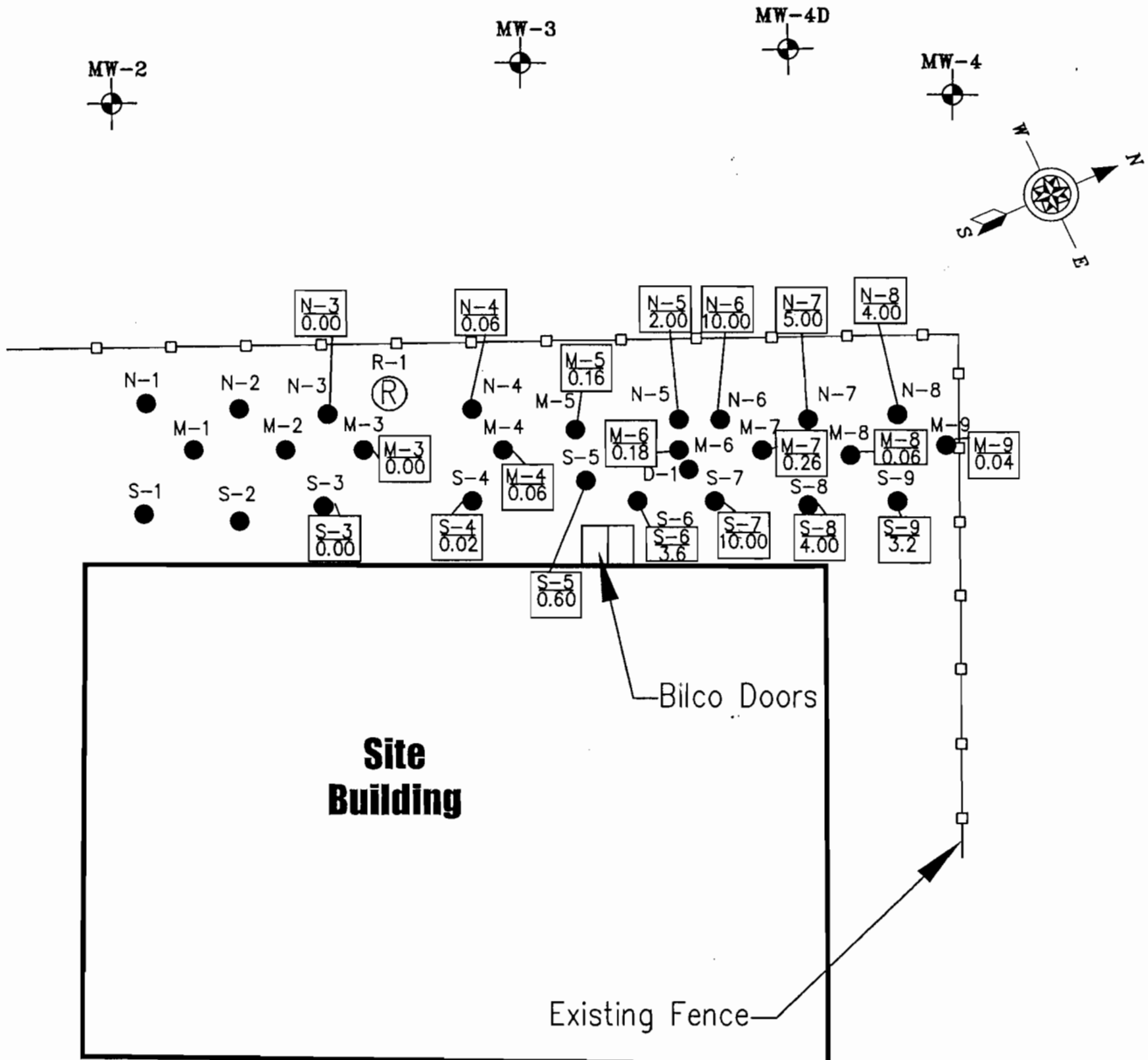
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SCALE:
 As Shown

FIGURE: 2
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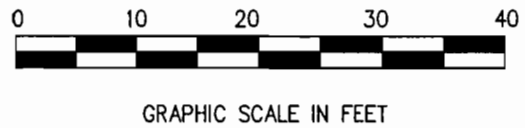
CDC/FLOWER FASHION
 47 NORTHERN BLVD.
 GREAT NECK, NY 11020

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 APPR. BY:
 S.J.O.

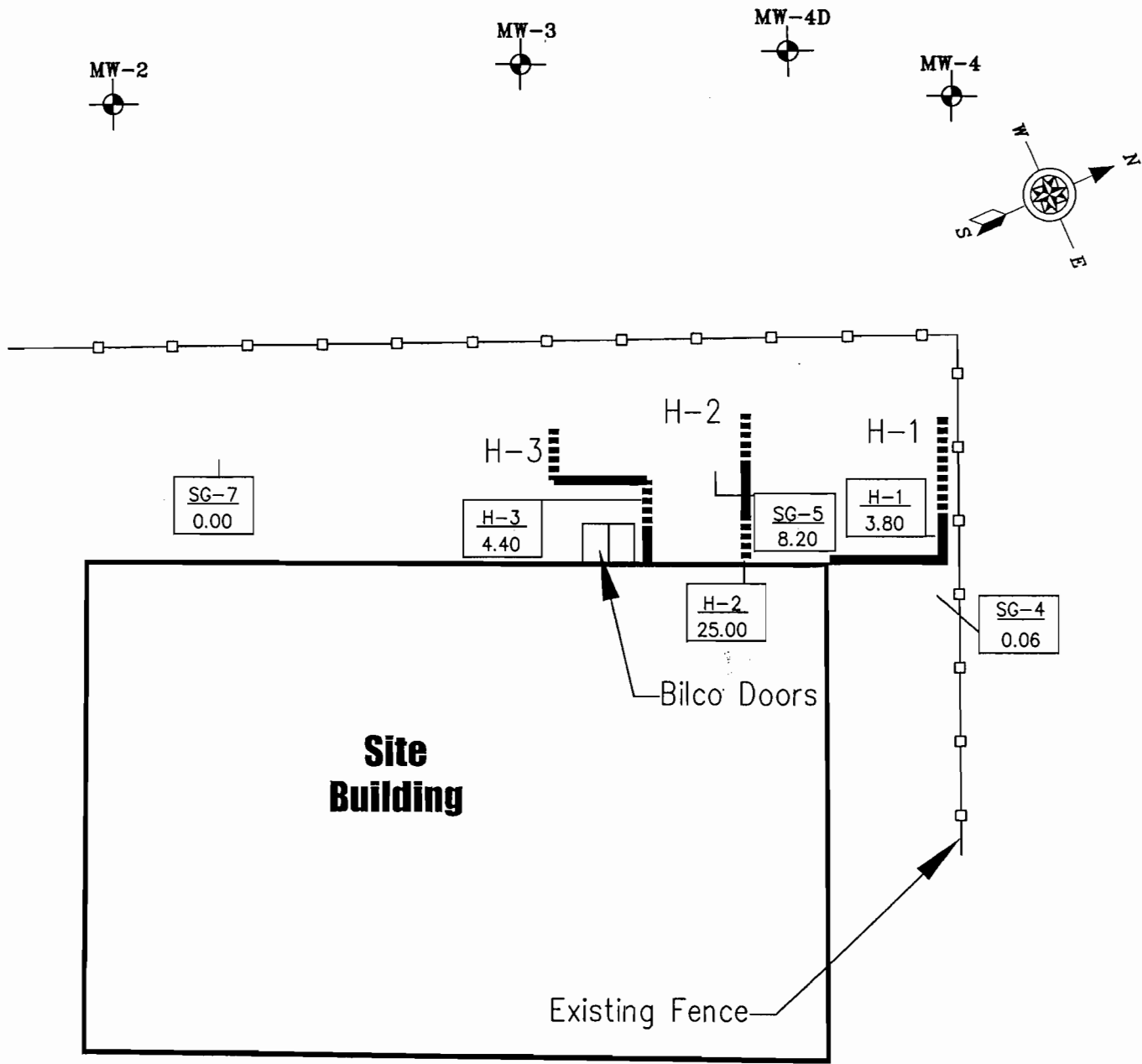


- LEGEND**
- GROUNDWATER MONITORING WELL
 - SODIUM PERMANGANATE INJECTION POINT
 - EXISTING RECOVERY WELL

Test #1
 Point Tested: H-2
 Flow Rate: 77 cfm
 Vacuum: 25 inches of water at blower



CA RICH CONSULTANTS, INC. Certified Groundwater and Environmental Specialists 17 Dupont Street, Plainview, New York 11803	
Stephen J. Osmundsen, P.E. Professional Engineer 513 Centre Island Road, Oyster Bay, New York 11771	
TITLE: SVE SYSTEM PILOT TEST #1 WITH VACUUM IN INCHES OF WATER DECEMBER 16, 2004	DATE: 1/3/05
FIGURE: 3	DRAWN BY:
DRAWING NO: 2004-26A.5	APPR. BY: S.J.O.
CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020	



SG-7
0.00

H-3
4.40

H-2
25.00

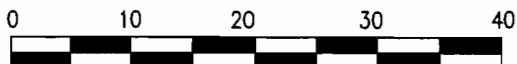
SG-5
8.20

H-1
3.80

SG-4
0.06

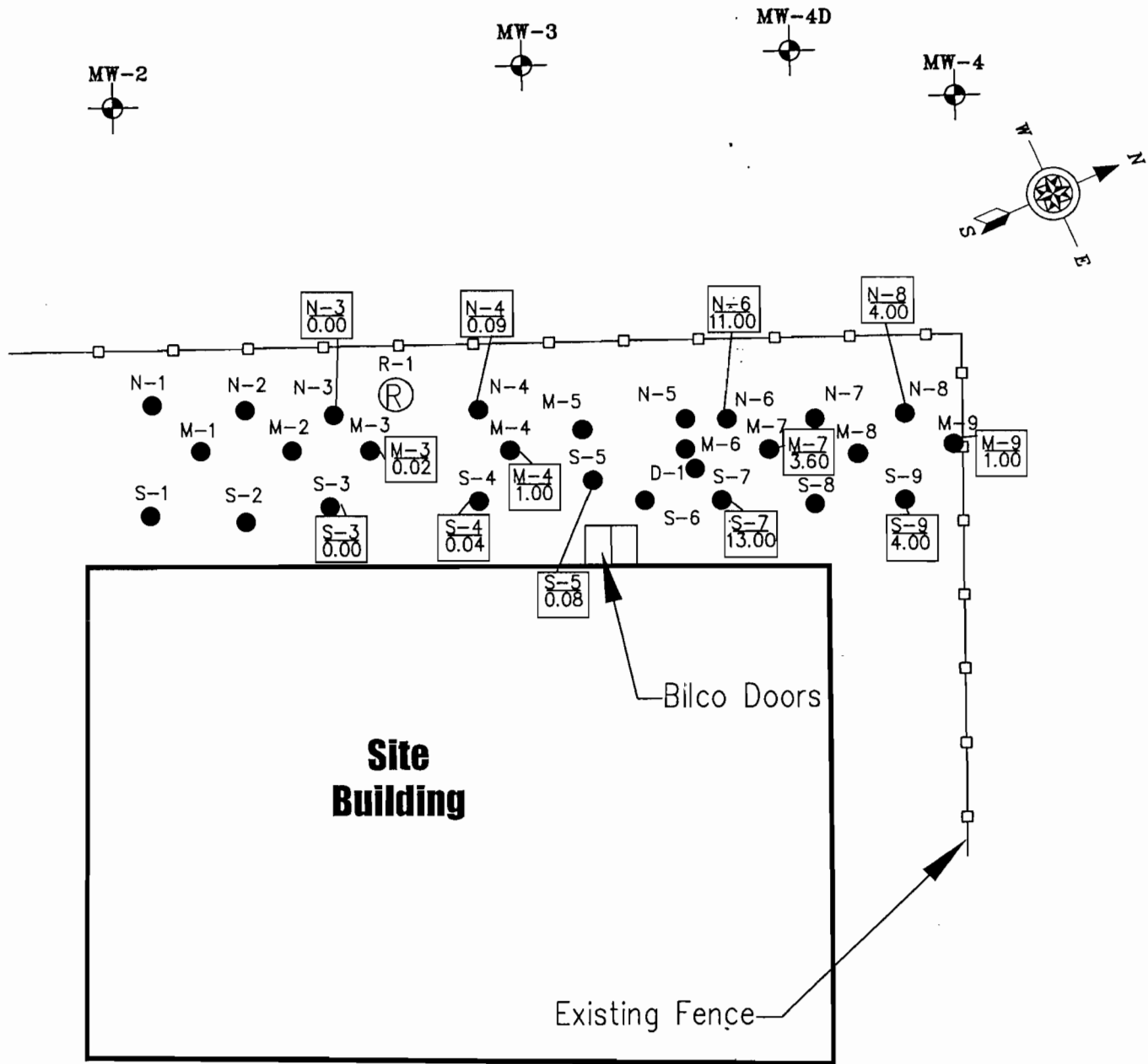
TEST #2
 Point Tested: H-2
 Vacuum: 33 inches of water at blower
 Flow Rate: 102 cfm

- LEGEND**
- GROUNDWATER MONITORING WELL
 - 2-INCH DIAMETER 20 SLOT PVC PIPE
 - 2-INCH DIAMETER PVC PIPE
 - SOIL GAS PROBE

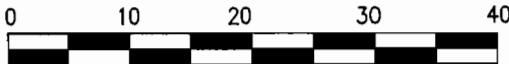


GRAPHIC SCALE IN FEET

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Stephen J. Osmundsen, P.E. Professional Engineer 513 Centre Island Road, Oyster Bay, New York 11771	
TITLE: SVE SYSTEM PILOT TEST #2 WITH VACUUM IN INCHES OF WATER DECEMBER 16, 2004	
DATE: 12/29/04	SCALE: As Shown
FIGURE: 4	DRAWN BY: D.S.
DRAWING NO: 2004-26A.6	APPR. BY: S.J.O.
CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020	



- LEGEND**
- GROUNDWATER MONITORING WELL
 - SODIUM PERMANGANATE INJECTION POINT
 - EXISTING RECOVERY WELL



GRAPHIC SCALE IN FEET

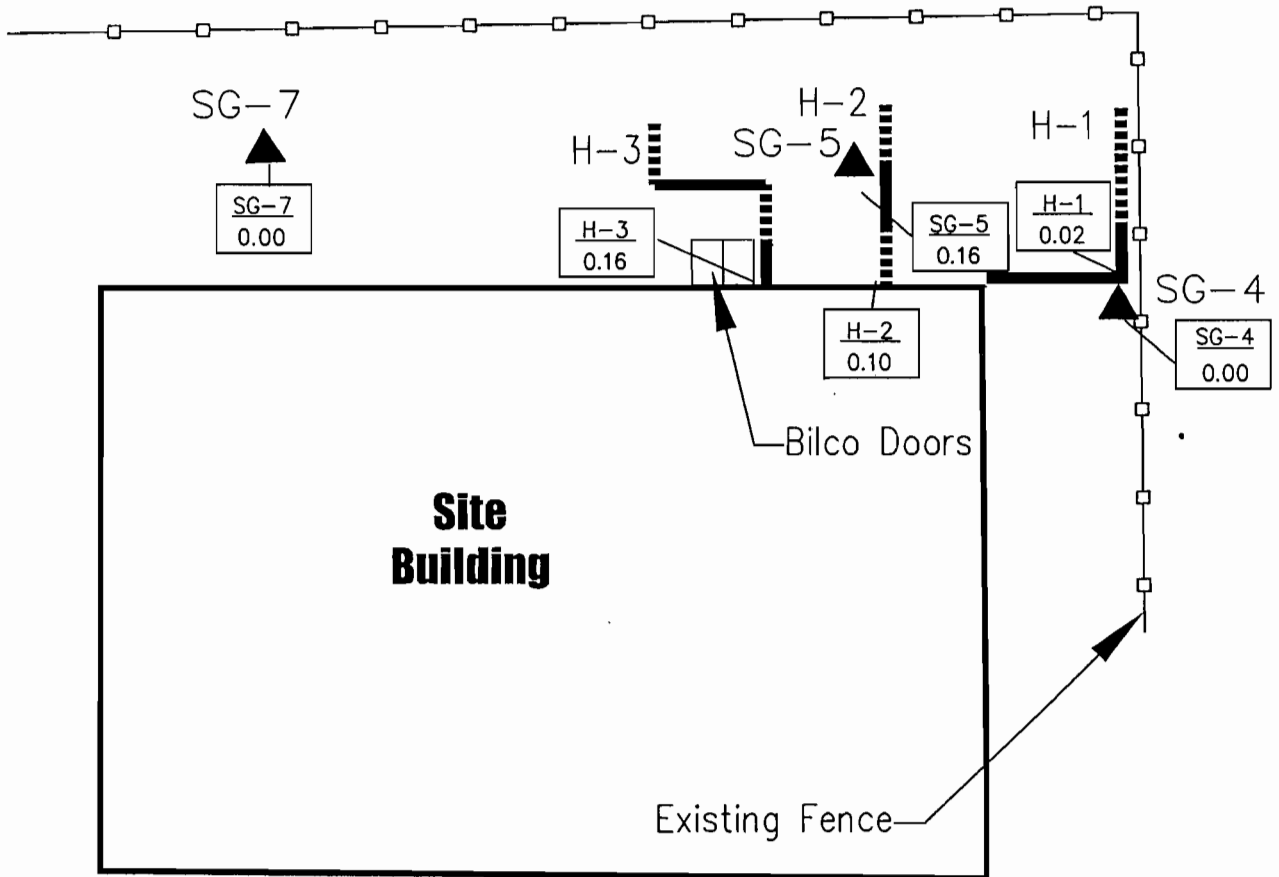
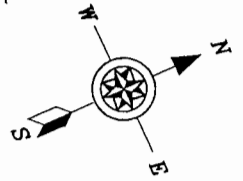
Test #2
 Point Tested: H-2
 Vacuum: 33 inches of water at blower
 Flow Rate: 102 cfm

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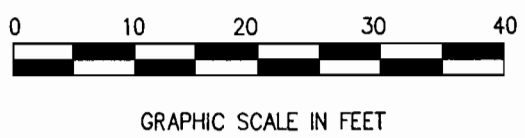
Stephen J. Osmundsen, P.E.
 Professional Engineer
 513 Centre Island Road, Oyster Bay, New York 11771

TITLE: SVE SYSTEM PILOT TEST #2 WITH VACUUM IN INCHES OF WATER DECEMBER 16, 2004	DATE: 1/3/05
	SCALE: As Shown

FIGURE: 5	CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020	DRAWN BY:
DRAWING NO: 2004-26A.7		APPR. BY: S.J.O.



- LEGEND**
- GROUNDWATER MONITORING WELL
 - 2-INCH DIAMETER 20 SLOT PVC PIPE
 - 2-INCH DIAMETER PVC PIPE
 - SOIL GAS PROBE

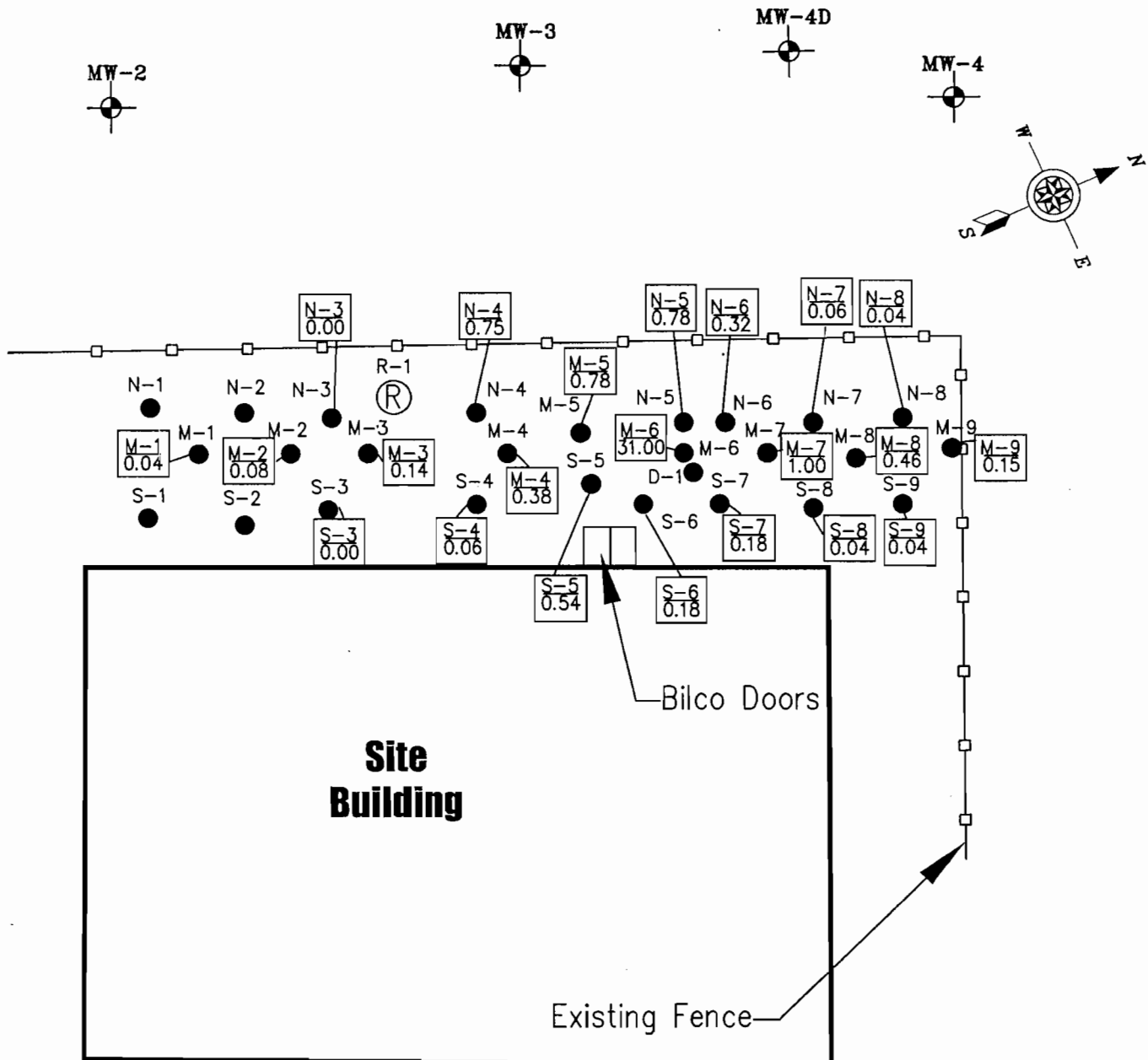


TEST #3
 Point Tested: M-6
 Vacuum: 33 inches of water at blower
 Flow Rate: 36 cfm

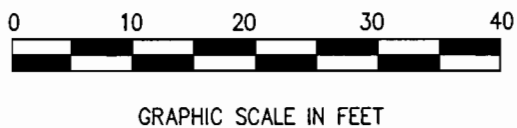
CA RICH CONSULTANTS, INC.
 Certified Groundwater and Environmental Specialists
 17 Dupont Street, Plainview, New York 11803

Stephen J. Osmundsen, P.E.
 Professional Engineer
 513 Centre Island Road, Oyster Bay, New York 11771

TITLE: SVE SYSTEM PILOT TEST #3 WITH VACUUM IN INCHES OF WATER DECEMBER 16, 2004		DATE: 1/3/05
FIGURE: 6		SCALE: As Shown
DRAWING NO: 2004-26A.8	CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020	DRAWN BY: D.S. APPR. BY: S.J.O.

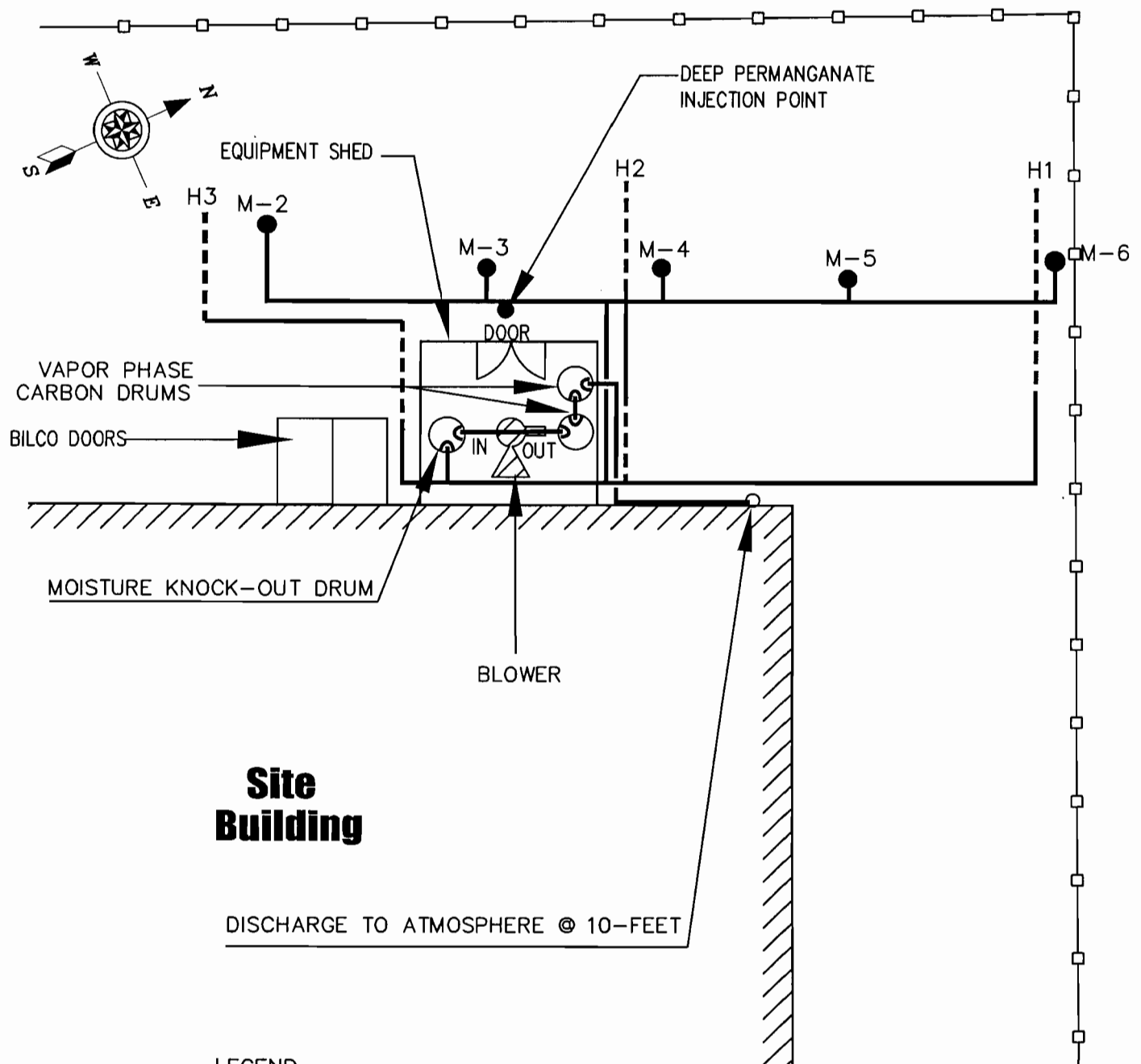


- LEGEND**
- GROUNDWATER MONITORING WELL
 - SODIUM PERMANGANATE INJECTION POINT
 - EXISTING RECOVERY WELL



Test #3
 Point Tested: M-6
 Vacuum: 33 inches of water at blower
 Flow Rate: 36 cfm

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Stephen J. Osmundsen, P.E. Professional Engineer 513 Centre Island Road, Oyster Bay, New York 11771	
TITLE: SVE SYSTEM PILOT TEST #3 WITH VACUUM IN INCHES OF WATER DECEMBER 16, 2004	DATE: 1/3/05
FIGURE: 7	DRAWN BY: S.J.O.
DRAWING NO.: 2004-26A.9	APPR. BY: S.J.O.
CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020	

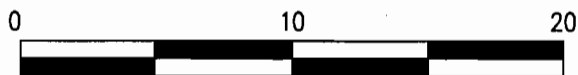


Site Building

DISCHARGE TO ATMOSPHERE @ 10- FEET

LEGEND

- VERTICAL SVE WELL
(1-INCH DIAMETER 20 SLOT PVC PIPE)
- HORIZONTAL SVE WELL
(2-INCH DIAMETER 20 SLOT PVC PIPE)
- HORIZONTAL SVE WELL
(2-INCH DIAMETER PVC PIPE)
- EXISTING FENCE



GRAPHIC SCALE IN FEET

CA RICH CONSULTANTS, INC.

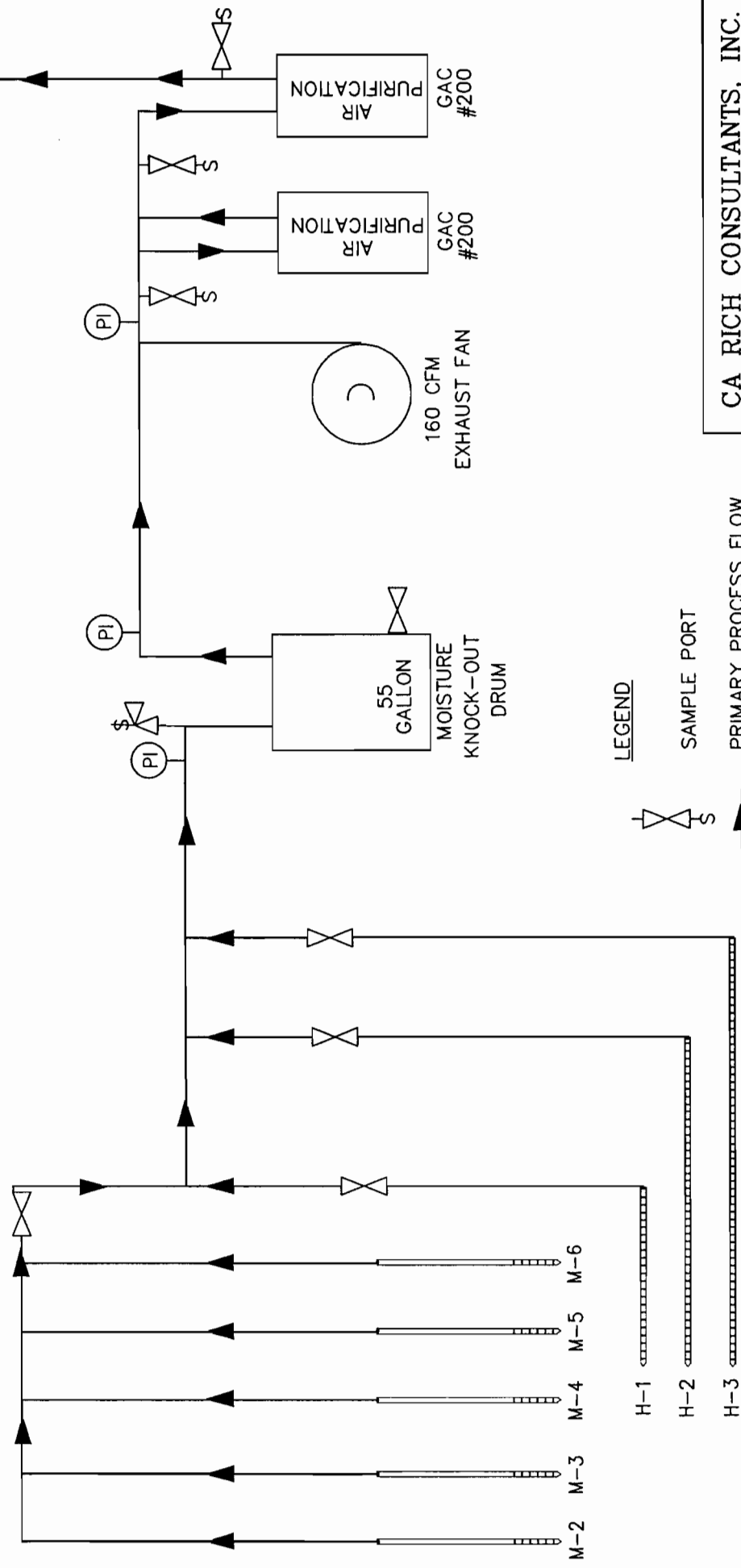
Certified Groundwater and Environmental Specialists
17 Dupont Street, Plainview, New York 11803

Stephen J. Osmundsen, P.E.








Professional Engineer
513 Centre Island Road, Oyster Bay, New York 11771

TITLE: AS-BUILT DIAGRAM FOR SOIL VAPOR EXTRACTION SYSTEM		DATE: 4/11/05
FIGURE: 8		SCALE: As Shown
DRAWING NO: 2005-12A	CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020	DRAWN BY: S.T.M. APPR. BY: S.J.O.

TO
ATMOSPHERE



LEGEND

-  SAMPLE PORT
-  PRIMARY PROCESS FLOW
-  PRESSURE INDICATOR
-  LEVEL SWITCH
-  VACUUM RELIEF VALVE
-  MANUAL VALVE
-  CHECK VALVE

CA RICH CONSULTANTS, INC.
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Stephen J. Osmundsen, P.E.
 Consulting Engineer
 513 Centre Island Road, Oyster Bay, New York 11771

TITLE		AS BUILT FLOW DIAGRAM OF SVE SYSTEM	
FIGURE	9	CDC/FF	
DRAWING NO:	2005-9A	47 NORTHERN BOULEVARD GREAT NECK, NEW YORK	
DATE:	3/30/05	DRAWN BY:	D.S.
SCALE:	Not to Scale	APPR BY:	S.J.O.

Appendix A
Summary of SVE Well Construction Details

Table 1A
Soil Vapor Extraction Well Design
CDC/FF Site in Great Neck, New York

SVE Well ID#	Well Type	Total Depth (feet)	Screen Interval (feet)	Slot Size	Date Installed	Description
H-1	Horizontal	N/A	Two (2) Five Foot Sections	0.020	10/7/2004	1 inch diameter schedule 40 PVC containing 10-feet of 0.020 slotted (20 slot) screen buried 1-foot below grade.
H-2	Horizontal	N/A	Two (2) Five Foot Sections	0.020	10/7/2004	1 inch diameter schedule 40 PVC containing 10-feet of 0.020 slotted (20 slot) screen buried 1-foot below grade.
H-3	Horizontal	N/A	Two (2) Five Foot Sections	0.020	10/7/2004	1 inch diameter schedule 40 PVC containing 10-feet of 0.020 slotted (20 slot) screen buried 1-foot below grade.
M-2	Vertical	12	7 to 12	0.020	10/14/2004	1 inch diameter schedule 40 PVC pipe set 12-feet below land surface with the bottom 5 feet consisting of 0.020-inch slotted (20 slot) screen, gravel packed with #2 morie sand and a bentonite/cement surface plug.
M-3	Vertical	12	7 to 12	0.020	10/14/2004	1 inch diameter schedule 40 PVC pipe set 12-feet below land surface with the bottom 5 feet consisting of 0.020-inch slotted (20 slot) screen, gravel packed with #2 morie sand and a bentonite/cement surface plug.
M-4	Vertical	12	7 to 12	0.020	10/14/2004	1 inch diameter schedule 40 PVC pipe set 12-feet below land surface with the bottom 5 feet consisting of 0.020-inch slotted (20 slot) screen, gravel packed with #2 morie sand and a bentonite/cement surface plug.
M-5	Vertical	12	7 to 12	0.020	10/14/2004	1 inch diameter schedule 40 PVC pipe set 12-feet below land surface with the bottom 5 feet consisting of 0.020-inch slotted (20 slot) screen, gravel packed with #2 morie sand and a bentonite/cement surface plug.
M-6	Vertical	12	7 to 12	0.020	10/14/2004	1 inch diameter schedule 40 PVC pipe set 12-feet below land surface with the bottom 5 feet consisting of 0.020-inch slotted (20 slot) screen, gravel packed with #2 morie sand and a bentonite/cement surface plug.

Date	Vacuum at Blower	Pressure	Mini-Rae or HNU before carbon	MR/Hnu between 1st & 2nd carbon unit	MR/Hnu after carbon unit	Comments
			All Points:			
			Shallow Only:	N/A	N/A	
			Deep Only:	N/A	N/A	
			All Points:			
			Shallow Only:	N/A	N/A	
			Deep Only:	N/A	N/A	
			All Points:			
			Shallow Only:	N/A	N/A	
			Deep Only:	N/A	N/A	
			All Points:			
			Shallow Only:	N/A	N/A	
			Deep Only:	N/A	N/A	
			All Points:			
			Shallow Only:	N/A	N/A	
			Deep Only:	N/A	N/A	

**Appendix B
Equipment Owner's Manuals**

FUJI
ELECTRIC

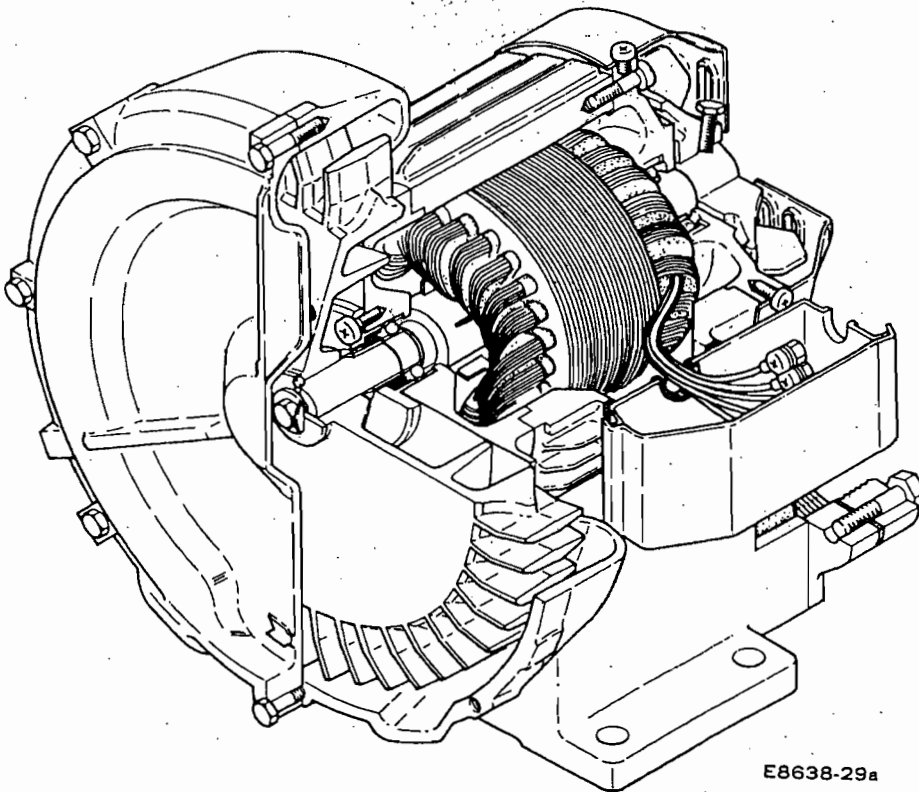


RING COMPRESSORS

OPERATION AND PARTS MANUAL

[0TH SERIES & 4TH SERIES]

Thank you for purchasing our Fuji Ring Compressor. Our product is produced with high quality materials and manufacturing processes. Our superior workmanship will give you the best product available in the air moving market place. Please read the instructions carefully prior to usage.



E8638-29a

Handling gases

The Ring Compressors are used to handle non-combustible, non-corrosive and non-explosive gases and air. The inlet and ambient air or gas temperature should be less than 104°F (40°C), and the relative humidity not to exceed 80%.

Installation

The Ring Compressors can be installed in any direction. When installed vertically, the motor side should upward. VFC704A, 804A and VFC904A should be installed horizontally.

Do not install The Ring Compressors on a base which is subject to or creates vibration. The mounting base should be rigid enough to prevent resonance. Use vibration-insulator bases or pads if necessary.

The allowable limit of vibration is shown in the figure.

Filtration

Air and gases should be filtered before entering the blower by using an intake or inline filter as recommended in The Fuji literature or by The Fuji distributor or representatives. Care should be taken not to get dirt or particles be sucked into The Ring Compressor.

Direction of rotation

The Ring Compressors should be rotated in the "Arrow" direction as noted on the casing. All units rotate in a clockwise direction as viewed from the motor side. You may observe the rotation by looking at the motor fan or shaft direction. The vacuum connection is marked "IN". The pressure connection is marked "OUT" on the flange.

The three phase units can be run in the reverse or counter-clockwise direction by reversing L1 and L3, but performance is reduced.

The single phase units operate in the clockwise direction only.

Electrical connection

A qualified electrician should make the connection and knows the local electrical codes. Connections should be made as per the nameplate and operation instruction connecting diagram on page 5.

For all three phase units a magnetic motor starter should be used with thermal overload protection. The VFC400P-5T and VFC504P-2T requires a definite purpose contactor.

Caution: Please consult your local electrical codes, through a certified electrician or electrical contractor.

Temperature rise

The temperature of the air passing through The Ring Compressors will rise as shown in the figures below.

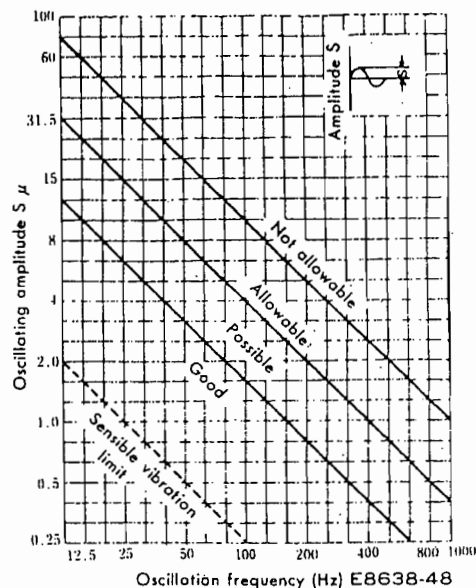
Continuous operations

The Ring Compressors pressure, vacuum and flow can be adjusted from open flow (free air) to shut-off.

The minimum flow and maximum shut-off times must be met.

The Ring Compressors must operate within the continuous operating conditions specified in the table.

We recommend our pressure and vacuum relief valves or by-pass hole to prevent shut-off for long periods of time.



Shut-off allowable time and minimum required airflow for continuous operation

EB638-30c

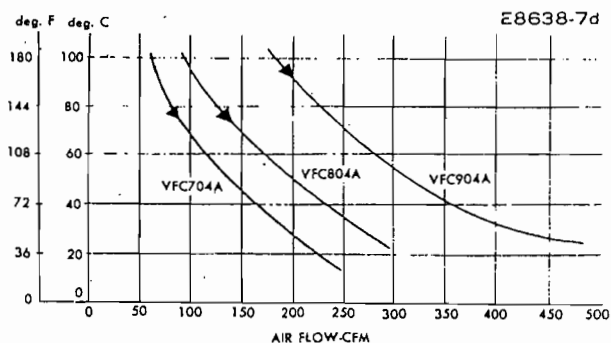
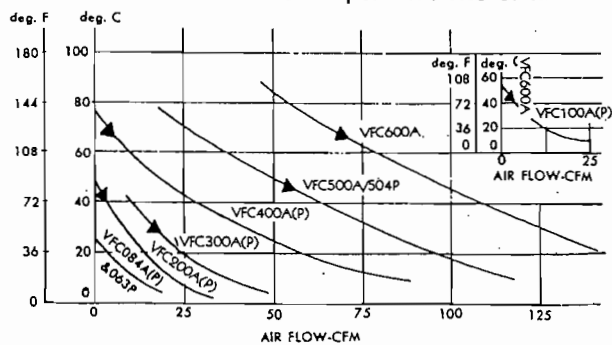
Model \ Item	Pressure		Vacuum	
	sec①	CFM②	sec①	CFM②
VFC063P	Cont.	0	Cont.	0
VFC084A, 084P	Cont.	0	Cont.	0
VFC100A, 100P	600	3.5	600	3.5
VFC200A, 200P	240	3.5	240	3.5
VFC300A, 300P	120	17	120	16
VFC400A, 400P	120	3.5	120	3.2
VFC500A, 504P	60	45	60	40
VFC600A	60	56	60	50
VFC704A	30	88	30	70
VFC804A	30	135	30	106
VFC904A	30	195	30	140

① Shut-off allowable time (sec) starting at normal temperature.

② Minimum required air flow.

③ We suggest that vacuum or pressure relief valves be installed to prevent shut-off conditions on VFC300A/P units and larger.

The temperature rise of the air passing thru The Ring Compressor (60Hz)

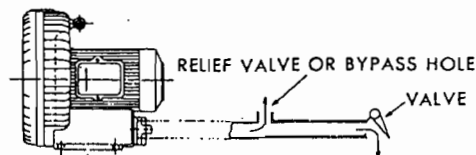


Maintenance

Clean the inside and outside (particularly the air path of the cooling fan) of The Ring Compressors to remove dirt and dust. This may result in abnormal temperature rise, loss of performance or increase of vibration.

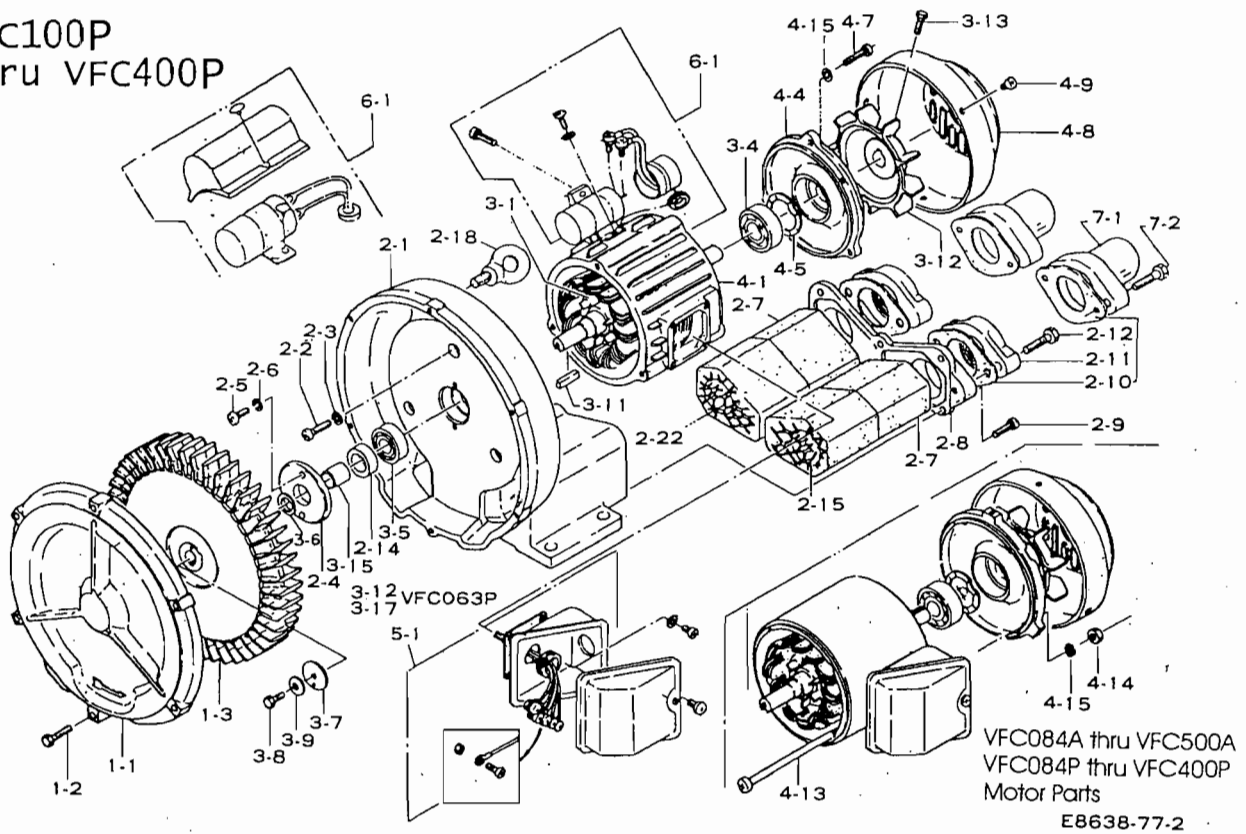
Parts

The bearings, oil-seal and silencer are subject to wear. These parts should be replaced with new ones as necessary. The impeller, casing, gasket and wire net

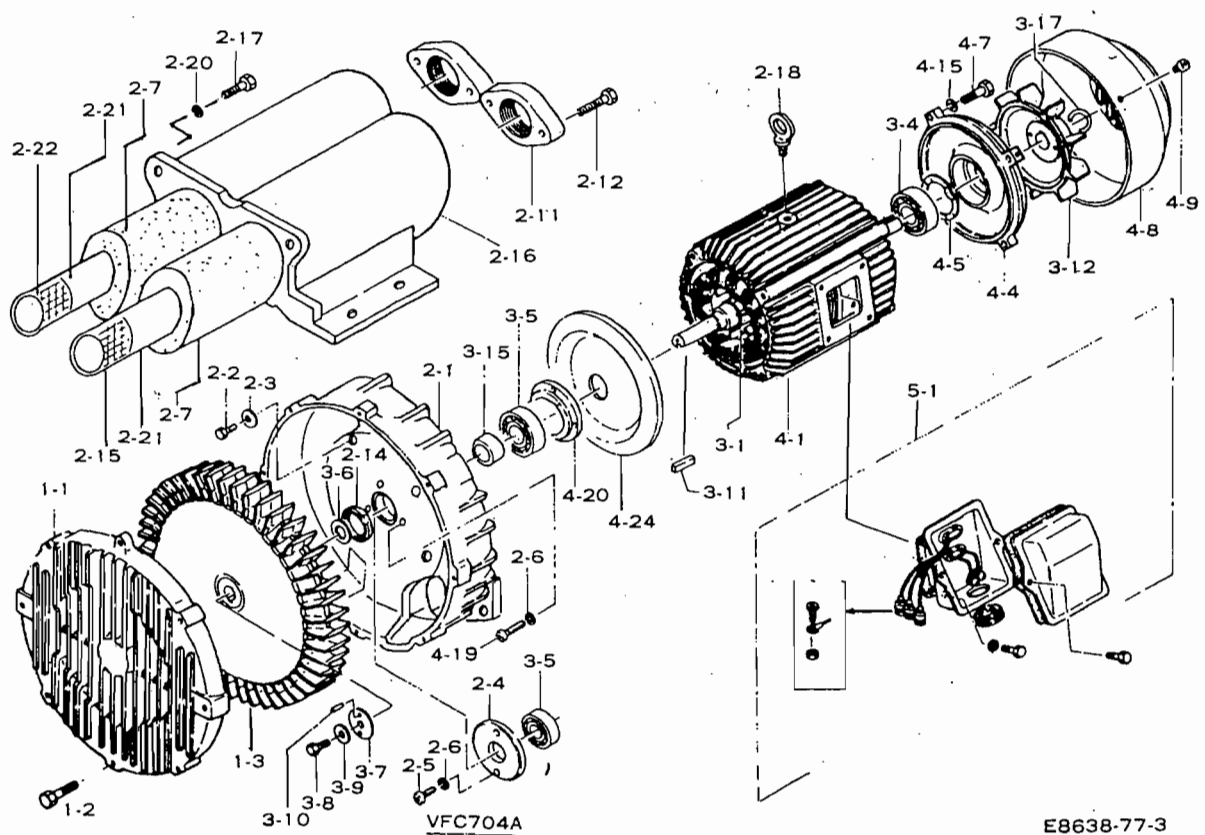


VFC084A, VFC100A thru VFC600A, VFC063P thru VFC400P and 504P assembly diagram

VFC100P
thru VFC400P



VFC704A thru VFC904A assembly diagram



TROUBLE SHOOTING

		POSSIBLE CAUSE ^{*3Phase Units} ^{**1Phase Units}	REMEDY
IMPELLER DOES NOT TURN	HUMMING SOUND	<ol style="list-style-type: none"> *One phase of power line not connected. *One phase of stator winding open Bearings defective Impeller jammed by foreign material Impeller jammed against housing or cover **Capacitor open 	<ol style="list-style-type: none"> Connect Contact Factory Change bearings Clean Adjust Change capacitor
	NO SOUND	<ol style="list-style-type: none"> *Two phases of power line not connected. *Two phases of stator winding open 	<ol style="list-style-type: none"> Connect Contact factory
IMPELLER TURNS	BLOWN FUSE	<ol style="list-style-type: none"> Insufficient fuse capacity Short circuit 	<ol style="list-style-type: none"> Use fuse of proper rating Repair
	MOTOR OVERHEATED OR PROTECTOR TRIPS	<ol style="list-style-type: none"> High or low voltage *Operating in single phase condition Bearings defective Impeller rubbing against housing or cover Impeller or air passage clogged by foreign material Unit operating beyond performance range Capacitor shorted *One phase of stator winding short circuited 	<ol style="list-style-type: none"> Check input voltage Check connections Change bearings Adjust Clean Contact factory Change capacitor Contact factory
	ABNORMAL SOUND	<ol style="list-style-type: none"> Impeller rubbing against housing or cover Impeller or air passages clogged by foreign material Bearings defective 	<ol style="list-style-type: none"> Adjust Clean Change bearings
	PERFORMANCE BELOW STANDARD	<ol style="list-style-type: none"> Leak in piping Piping and air passages clogged Impeller rotation reversed Leak in Compressor Low voltage 	<ol style="list-style-type: none"> Tighten Clean Check wiring Tighten cover, flange Check input voltage

CONNECTIONS

Wiring diagrams 1 ϕ high and low voltage		Wiring diagrams 3 ϕ high and low voltage	
<p>VFC084P-5T VFC100P-5T thru 300P-5T</p> <p>HIGH VOLTAGE LOW VOLTAGE</p>		<p>* VFC084A-2T, 4W & 5W VFC100A-2T, 4W & 5W thru 600A-2T, 4W & 5W</p>	
<p>* VFC400P-5T</p> <p>HIGH VOLTAGE LOW VOLTAGE</p>		<p>* VFC100A-7W thru VFC600A-7W</p> <p>HIGH VOLTAGE LOW VOLTAGE</p>	
<p>VFC063P-1T&2T VFC084P-1T&2T thru VFC200P-1T & 2T</p>		<p>* VFC504P-2T</p>	
<p>Recommended protector connection RELAY COMPRESSOR</p> <p>Pilot duty thermal protector</p>			



WARNING!

This blower is designed to operate indoors, and is an environment that is a water-free and dust-free.

This blower is only a component, it must be installed in a machine or part of a machinery which meets the terms of the Machine directive 89/392/EEC. Commission will not occur until the end product or machinery conforms with the guidelines in EN60204-1.

WARRANTY

FUJI ELECTRIC CORP. OF AMERICA warrants that FUJI RING COMPRESSOR is free from defects in material and workmanship at the time of shipment. This warranty covers the period for eighteen months from the date of shipment or one year from the date of installation, whichever comes first. Thermal protector must be connected as recommended.

The product or parts found to be defective in materials or workmanship during this period will be repaired or replaced at no charge.

This warranty does not apply to any product or parts subjected to damage in transit, accident, misuse or abuse.

Fuji Electric Co.,Ltd.

HEAD OFFICE: GATE CITY OHSAKI, EAST TOWER, 11-2,
OSAKI 1-CHOME SHINAGAWA-KU,
TOKYO 141-0032, JAPAN

TELEPHONE: TOKYO 3-5435-7139

FAX: TOKYO 3-5435-7460

FUJI ELECTRIC CORP. OF AMERICA

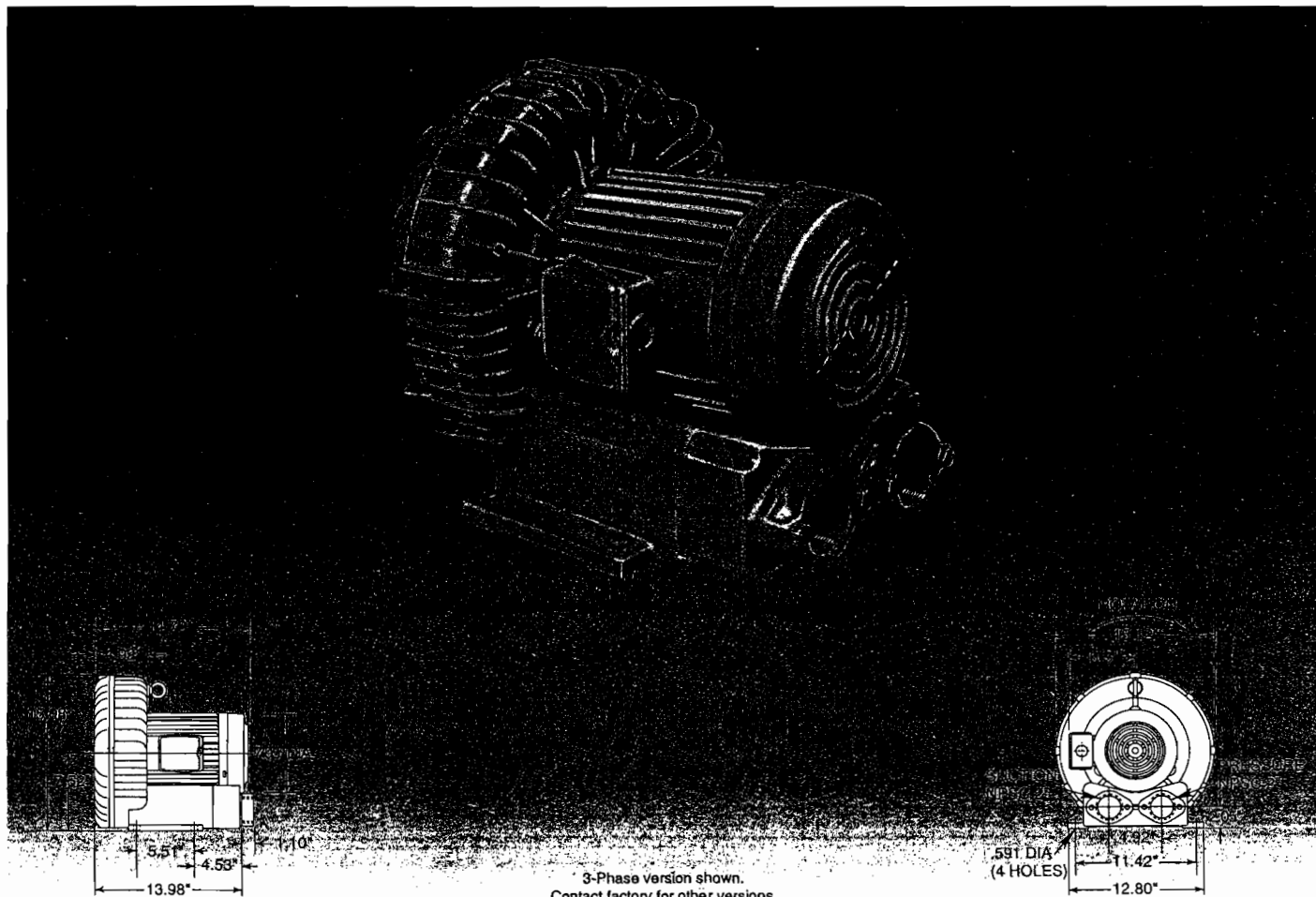
FRASSETTO INDUSTRIAL PARK, 6A FRASSETTO WAY
LINCOLN PARK, N.J. 07035

TELEPHONE:(201)633-9000

FAX:(201)790-0765

TELEX:858052

FUJI RING COMPRESSOR



The VFC604 is a single-stage ring compressor with a maximum pressure of 118 in. H₂O, a maximum vacuum of 98 in. H₂O, and a maximum capacity of 206 SCFM. It comes complete with a direct-

drive, 4.5 horsepower, TEFC motor capable of operating on a wide range of voltages, and on 50 or 60 Hz. A pilot-duty thermal protector is standard equipment on all 3-phase models. All versions have

NEMA class B insulation, are UL Recognized and CSA Certified. 575 Volt units are CSA Certified only.

SPECIFICATIONS

Model No.	Hz	Voltage		Horsepower (Max. Rated)	Horsepower (Maximum Capacity)	Max. Pressure	Max. Vacuum	Max. Capacity	Max. Temp. Rise	Weight
		Low Voltage	High Voltage							
VFC604A-7W	60	200-240/400-480	12-11/8 0-5.5	78-90/39-45	118	98	206	56	126(70)	114(52)
	50	190-230/380-460	9.2-10.5/4.6-5.2	88-102/44-51	86	72	175	28	108(65)	
VFC604A-SW	50	575	4.4	36	118	98	206	56	126(70)	114(52)

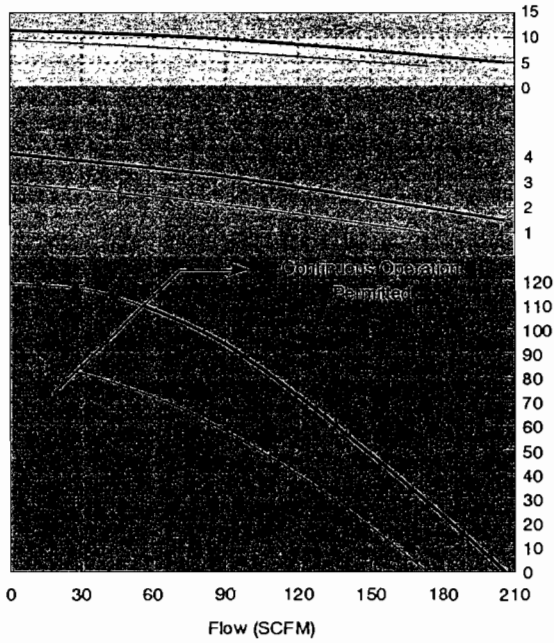
ACCESSORIES

Descriptor	Voltage Field Valve	Pressure Relief Valve	Oil Filter	Oil Free Core	Oil Filter/Receptor	Exhaust Silencer/Filter
Model No.	VV6	PV6	F-67	C-67	R30P2-0	VFY-026A

NOTE: Maximum allowable time at deadhead is 60 seconds



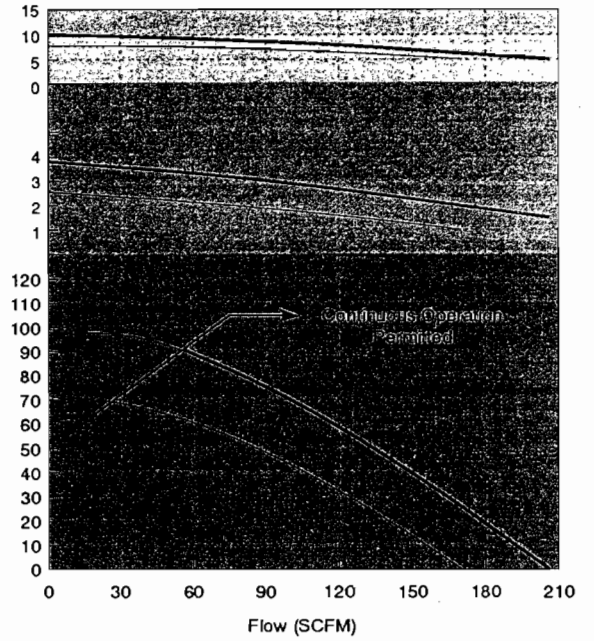
PERFORMANCE DATA



AMPS
(230 V / 3 PH)

WATTS

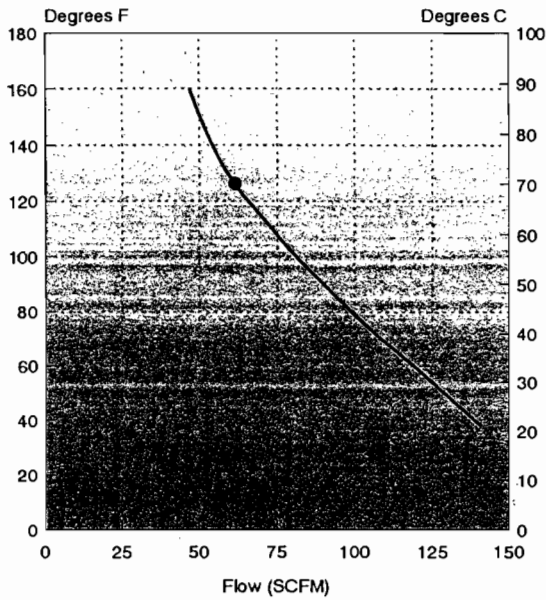
STATIC PRESSURE
(Inches of Water)



PRESSURE

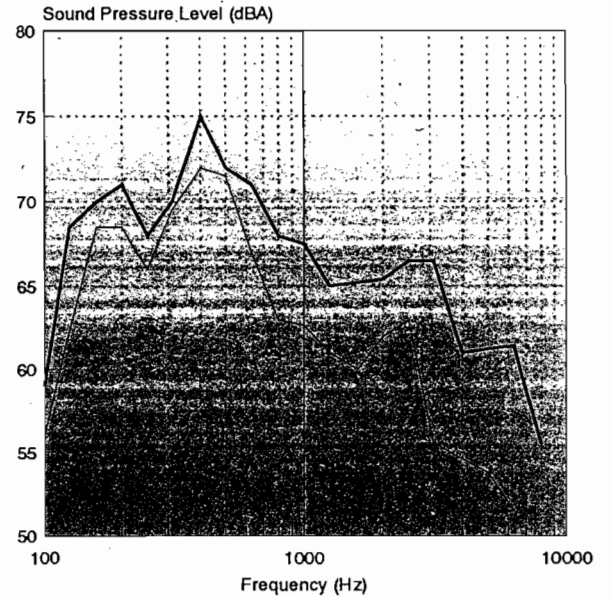
— 60 Hz
- - - 50 Hz

VACUUM



Max. Air Temperature is Value Marked ●
plus 40 Degrees C Ambient Temperature

TEMPERATURE RISE



SOUND LEVEL