



Celia Jackson

03/28/2002 03:35 PM

To: Maura C. Desmond

cc:

Subject: O & M PLAN - MEPCO BUILDING

Please find enclosed our revised copy of the O & M Plan. Changes and updates as requested. Copy of the engineering drawings included.

Sincerely,

Celia S. Jackson
Corporate EHS Manager

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APR 01 2002

DEPT. OF ENVIRONMENTAL CONSERVATION
REGION 8

RECEIVED

MAR 29 2002

N.Y.S. DEPT. OF
ENVIRONMENTAL CONSERVATION
DIV. ENVIRONMENTAL ENFORCEMENT
BUFFALO FIELD UNIT

OPERATION AND MAINTENANCE PLAN

MEPCO PUMPING SYSTEM

RECEIVED

MAR 29 2002
N.Y.S. DEPT. OF
ENVIRONMENTAL CONSERVATION
DIV. ENVIRONMENTAL ENFORCEMENT
BUFFALO FIELD UNIT

recovery
Meridian Automotive Systems, Inc. - Canandaigua Operations is responsible to operate and maintain a ground water treatment system installed within the MEPCO building to treat ground water previously identified as containing volatile organic compounds (VOC). The ground water treatment system consists of a collection sump and a submersible pump piped to a 250-gallon equalization tank. Ground water from the equalization tank is pumped through two bag filters connected in parallel; then through two GAC filters connected in series prior to discharge to the sanitary sewer drain located inside the facility. The system was designed to operate at an average flow rate of 1 gpm to a maximum flow rate of 10gpm. Major treatment system component shop drawings and information included in Attachment B.

1.0 Equipment

- 1.1 Submersible Sump Pump
- 1.2 Equalization Tank-250 gallons
- 1.3 Submersible Pump (tank)
- 1.4 Bag Filters
- 1.5 Granular Activated Carbon(GAC) Canisters
- 1.6 Recovery Well
- 1.7 Interceptor Trench (pumps, piping & switches)

2.0 Inspection and Maintenance Procedures

- 2.1 The ground water recovery system is designed and constructed to operate to remove water from the sump. During periods of operation, flow from the submersible pump is discharged to an above ground 250-gallon equalization tank. The submersible pump in the equalization tank is designed to operate after activation of a level switch in the equalization tank. Routine maintenance includes change-out of the bag filters and GAC canisters upon high pressure alarm on the bag filters and GAC. In addition, the GAC require change-out when the absorption capacity of the GAC is exhausted. Based on the low concentration of VOC's and low flow rates, change-out of the GAC is expected to occur on a semi-annual basis. Calculations for this GAC consumption rate and break through timing estimate are included in Attachment C.
- 2.2 Inspection and maintenance of all other related equipment such as gauges, switches, piping, and indicator lights is handled through a comprehensive preventative maintenance program. A daily (Monday through Friday, excluding Holidays), weekly, monthly and annual schedule is followed to implement the required visual inspections, verification checks, filter



changes and pH adjustments. Equipment repairs and maintenance activities are controlled through work orders.

A sample will be taken to determine pH levels of the effluent in the tank prior to pumping/discharging to the sanitary sewer . A Litmus Paper kit is used to test the pH of the effluent in the tank. As needed, the pH will be adjusted by manually adding pH Adjuster Product c614 using a scoop and following the manufacturers' guidelines. Specialty Chemical Services 614: pH Adjuster is a blend of inorganic acids balanced at convenient strength for pH control.

At the same time, an additional sample is tested, to verify the pH of the effluent upon discharge to the sanitary sewer (POTW). After the effluent in the tank is tested and any needed pH adjustments are complete, a sample will be collected from the actual effluent discharge. Litmus paper is used to test the pH of the effluent being discharged, to verify the pH.

- 2.3 Personnel from Meridian Automotive Systems - Canandaigua Operations will visit the treatment system daily (Monday-Friday, excluding Holidays) to operate & review system operation; and observe the local control panel located adjacent to the bag filters for alarm activation and system monitoring.
- 2.4 Effluent samples from the GAC canisters will be collected on a quarterly basis. The samples will be collected from sample taps provided on the system and shipped using chain of custody procedures to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory; for VOC analysis using EPA Method 601/602. Results of the analysis will be reported to the City of Canandaigua WWTF.

An influent sample to the GAC canisters will be collected on an annual basis to assist in the estimate for the carbon life/breakthrough.

An average monthly pump rate will be calculated for the combined volume of RW-1 & the interceptor trench; and monthly cumulative volume treated will be monitored and recorded. A monthly depth-to-water measurement of the recovery well & of the interceptor trench sump will be taken and recorded. A spreadsheet will be used for reporting.

- 2.5 O & M data on the ground water recovery/treatment system will be included in the quarterly groundwater monitoring reports.

3.0 Malfunction Procedures

3.1 Malfunctions are corrected as soon as possible. Any malfunction of the pumps or deficiencies observe with the flow gauges & switches are recorded along with the cause and duration of the malfunction. A malfunction of a submersible pump or any of the related pieces of equipment on the system results in immediate downtime.

3.2.1 Malfunctions of our groundwater recovery & treatment system equipment will be handled in one of the following ways:

3.2.2 Timely repair

3.2.3 Use of backup unit

3.3 If a malfunction occurs during the operating time of the water recovery or treatment system; and/or operational problems occur, causing more than 48 hours of downtime, the New York Department of Environmental Conservation shall be promptly notified.

4.0 Documentation

4.1 Records of inspection and maintenance performed on the groundwater recovery system, interceptor trench and the treatment system's pumps, tank, and related equipment.

4.2 Records of occurrence, duration and cause of each malfunction of pumps and treatment equipment. Including any action taken that is not consistent with the O&M plan.

4.3 Records of monitoring data including the date and time the data was collected.

4.4 Documentation of any excess in established parameters that occur due to malfunctioning equipment or other causes.

4.5 The O&M Plan will be revised if it fails to adequately address a malfunction.

5.0 Reporting

5.1 The Quarterly Groundwater Monitoring Report will be submitted to the New York Department of Environmental Conservation.

- 5.2 O& M data on the ground water recovery/treatment system will be included in the quarterly groundwater monitoring report submitted to the New York Department of Environmental Conservation.
- 5.3 Results of the quarterly sampling conducted at the GAC effluent will be reported to the City of Canandaigua Waste Water Treatment Facility.
- 5.4 Records of occurrence, duration and cause of each malfunction of pumps and treatment equipment, causing more than 48 hours downtime; including any action taken that is not consistent with the O&M plan, will be promptly reported to the New York Department of Environmental Conservation, upon occurrence.

TPM SCHEDULE CHECKLIST

DAILY _____ WEEKLY _____ MONTHLY _____ INSPECTION(s)

Recovery/Treatment System
MEPCO-VOPLEX Building

Date _____

Inspected By: _____

SYSTEM	Items That Require Inspection:	Inspection Frequency	Inspection Result	TPM Scheduled	Corrective Action	Assignment	Comments
<u>Main Tank</u>	Float Switches Function Verification	Visual-Daily		(Adjust or Replace)			
	Flow Gauges	Visual-Monthly		Clean (If Req.)			
<u>Bag Filters</u>	Tank Check for Deficiencies	Visual-Monthly					
	Pressure Gauges	Visual- Daily		Change at 10psi			
<u>Carbon Filters</u>	Bag Integrity Check for Leaks	Visual-Daily					
	Clamp Bolts	Visual-Daily		Lubrication			
<u>Carbon Filters</u>	Discharge Flow Rate & Pressure	Visual-Daily		Change Filters if 10psi@1GPM or Less			Note Date
	Canisters Check for Leaks	Visual-Daily		Repair or Replace			
	GAC Effluent Sample	Quarterly					

INSTRUCTIONS: Inspect items as required. Record inspection date, finding and status as follow: Record the date. Record the letter that indicates inspection findings M— Maintenance service required, R— Repair or replace defective item, O— Out of service, or S— Satisfactory/Safe condition. Circle the letter code of any condition that has not been corrected when the check list has been turned in.

TPM SCHEDULE CHECKLIST				DAILY	WEEKLY	MONTHLY	INSPECTION(s)
Recovery/Treatment System							
MEPCO-VOPLEX Building				Date _____			
Inspected By: _____							
SYSTEM	Items That Require Inspection:	Insp. Frequency	Inspection Result	TPM Scheduled	Corrective	Assignment	Comments
Heat Tape	Observe "ON" Indicator Light	Visual-Weekly					
	Temperature 45 Degree F In Winter	Visual-Weekly					
	Check for Leaks	Visual-Monthly					
Electrical Panel	Connections	Annually		Connections Tighten			
Well Covers	Check Placement	Visual-Monthly		Secure if Needed			
Effluent	Check pH in Tank						
	Verify Discharge to POTW - pH 6 to 9	Visual-Daily		Chemically Adjust pH			
	Sample & Analysis	Quarterly					
Interceptor Trench	Measure Depth to Water	Monthly					
	Calculate Volume	Monthly					
Recovery Well	Measure Depth to Water	Monthly					
	Calculate Volume	Monthly					
	Check Submersible Pump for Operation	Visual-Daily		Clean as Needed/Float Cover & Inlet Screen			

PREVENTIVE MAINTENANCE SCHEDULE FOR MEPCO PUMPING SYSTEM

COMPONENT	TASK	FREQUENCY
MAIN TANK	VISUALLY INSPECT TANK FOR DEFICIENCIES	1/MO
	OBSERVE FLOW GAUGES AND CLEAN(IF REQ'D)	1/MO
	VERIFY FLOAT SWITCHES FUNCTION PROPERLY. ADJUST OR REPLACE.	DAILY
BAG FILTERS	OBSERVE PRESSURE GAUGES AND CHANGE AT 10 PSI.	DAILY
	LUBE CLAMP BOLTS	1/MO.
	INSPECT FOR LEAKS	DAILY
CARBON FILTERS	INSPECT FOR LEAKS	DAILY
	OBSERVE DISCHARGE FLOW RATE AND PRESSURE	DAILY
	CHANGE FILTERS WHEN PRESSURE REACHES 10 PSI @1GPM OR LESS.	NOTE DATE
HEAT TAPE	OBSERVE "ON" INDICATOR LIGHT AND TEMP @ 45 DEG F.IN WINTER.	1/WK
DISCHARGE PIPING	VISUALLY INSPECT FOR LEAKS	1/MO
ELECT PANEL	TIGHTEN CONNECTIONS	1/YR
WELL COVERS	OBSERVE THEY ARE IN PLACE AND SECURE	1/M
EFFLUENT	CHECK PH IN TANK. ADJUST PH WITH CHEMICAL. VERIFY DISCHARGE TO SEWER OF 6 TO 9.	DAILY

PUMPING SUMMARY (FALL 2001)
(MEPCO BLDG)

DATE	METER	DIFFERENCE (GALLONS)
10/25	875600	200
10/26	875800	300
10/29	876100	170
10/30	876270	210
10/31	876480	200
11/2	876680	190
11/5	876870	380
11/6	877250	190
11/7	877440	230
11/8	877670	210
11/9	877880	220
11/12	878100	200
11/13	878300	210
11/14	878510	180
11/15	878690	0

hrew TOTAL 3090

DWH

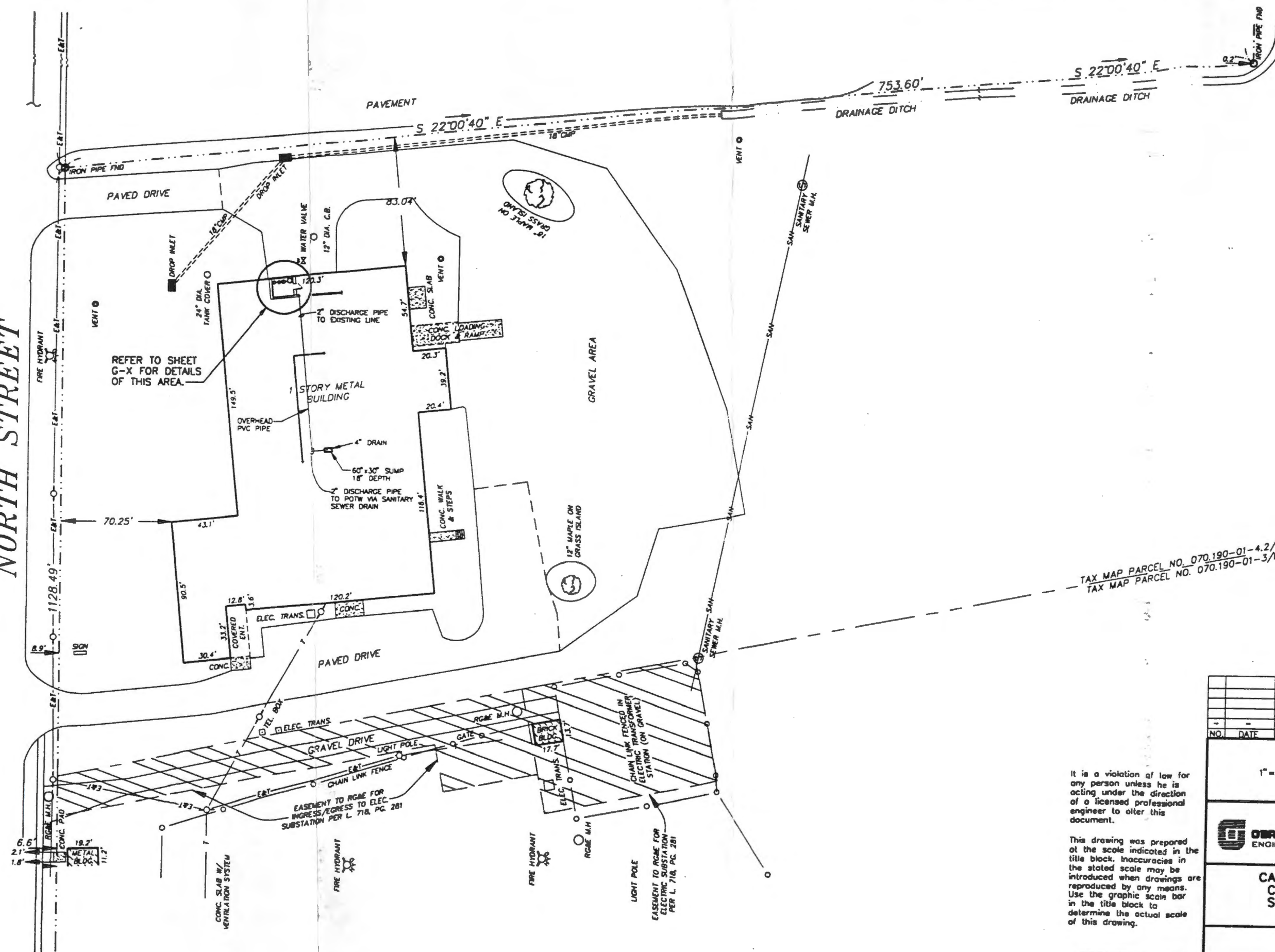
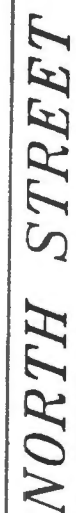
11/15/01

NOTES: 1. IN ALL CASES THE WATER IS FROM RW-1 AND REPRESENTS ALL WATER AVAILABLE ON THAT DAY. ICT WAS DRY FOR THE PERIOD.

2. FROM 9/18 TO 10/25 A TOTAL OF 5830 GALLONS WAS PUMPED. THIS ALSO WAS ALL WATER AVAILABLE FROM RW-1 WITH ICT DRY.

3. SYSTEM STARTED 9/18 AFTER OKAY FROM WILL CLARK FOR DISCHARGE OF HIGH PH. ACID TREATMENT STARTED 10/10/1

Attachment A
Preliminary Construction Drawings



— TAX MAP PARCEL NO. 070.190-01-4.2/LIBER 897, PAGE 330
TAX MAP PARCEL NO. 070.190-01-3/LIBER 673, PAGE 272

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**PRELIMINARY
NOT FOR
CONSTRUCTION**

DATE: 12/1/93

-	-	-	
NO.	DATE	REVISION	

$1'' = 30'$ 

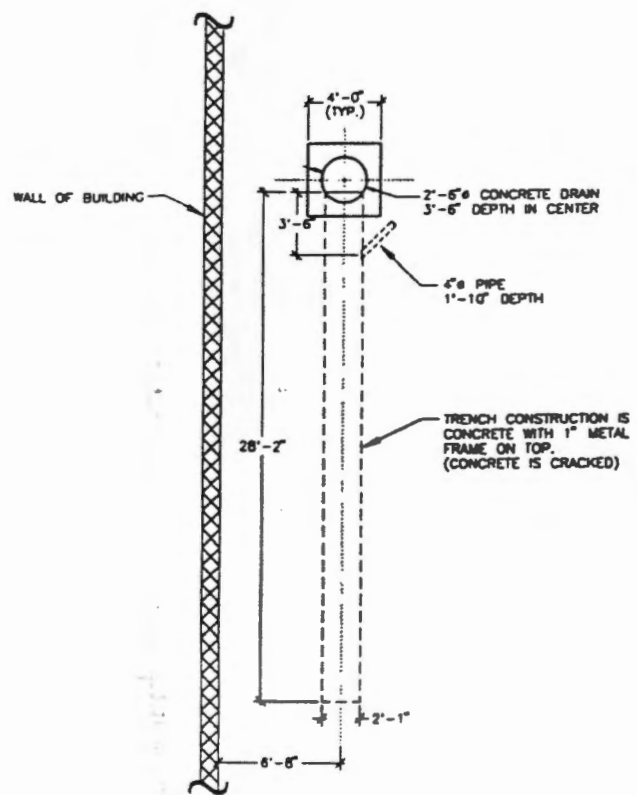
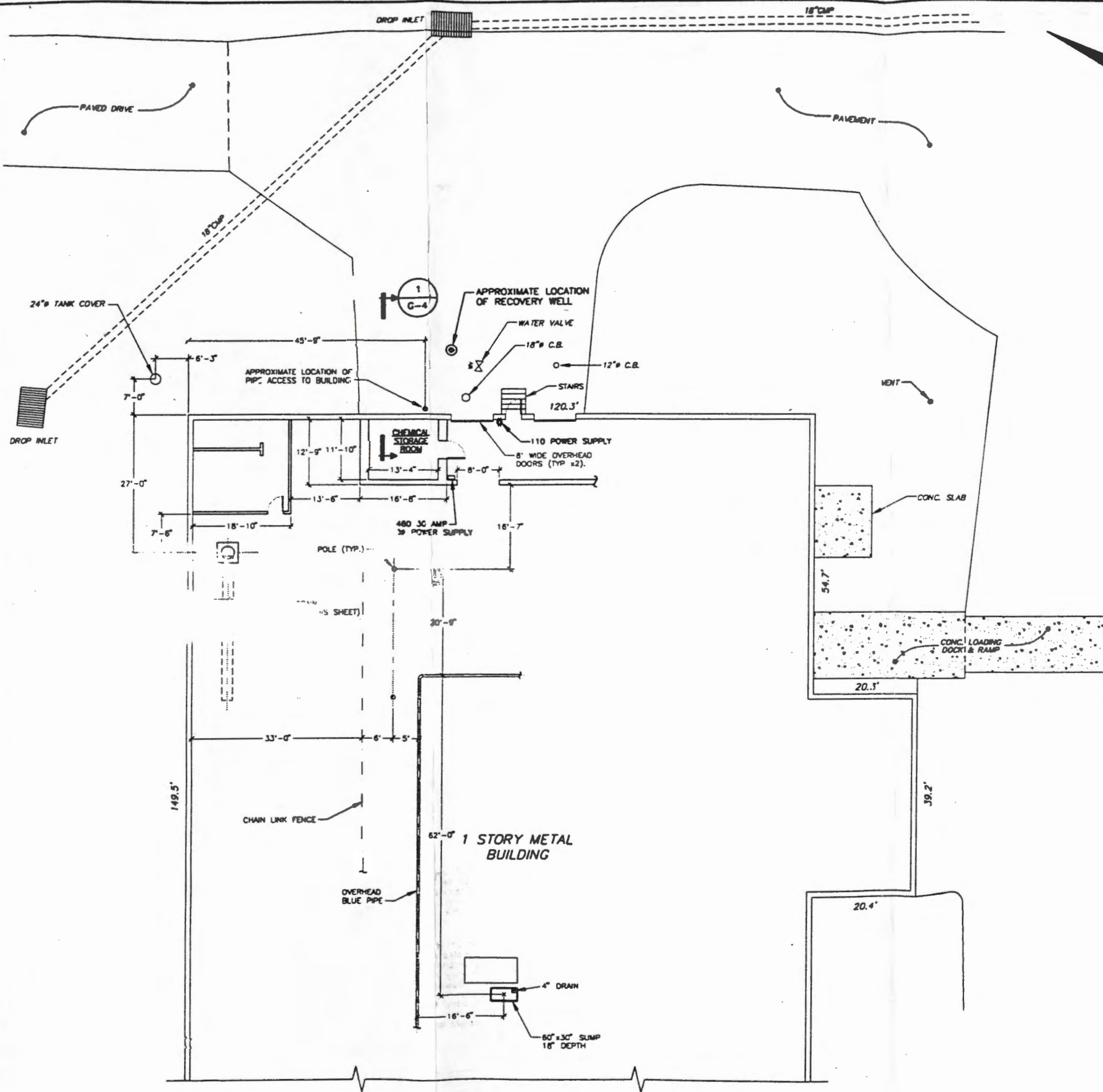

OMNI-GEN 6 GERE
ENGINEERS, INC.
OMNI-GEN & DERIVATIVES
TECHNICAL SERVICES

**CAMBRIDGE INDUSTRIES, INC.
CANANDAIGUA, NEW YORK
SOIL AND GROUND WATER
REMEDIATION PROJECT**

GENERAL

FACILITY LOCATION PLAN

In charge of.....	FILE NO. 2488.579-03F	G-2
Designed by.....Checked by.....	DATE NOVEMBER 1965	R-0
Drawn by.....		

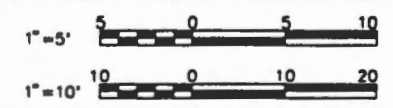


TRENCH DRAIN DETAIL
SCALE: 1" = 5'-0"

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NO.	DATE	REVISION	INIT



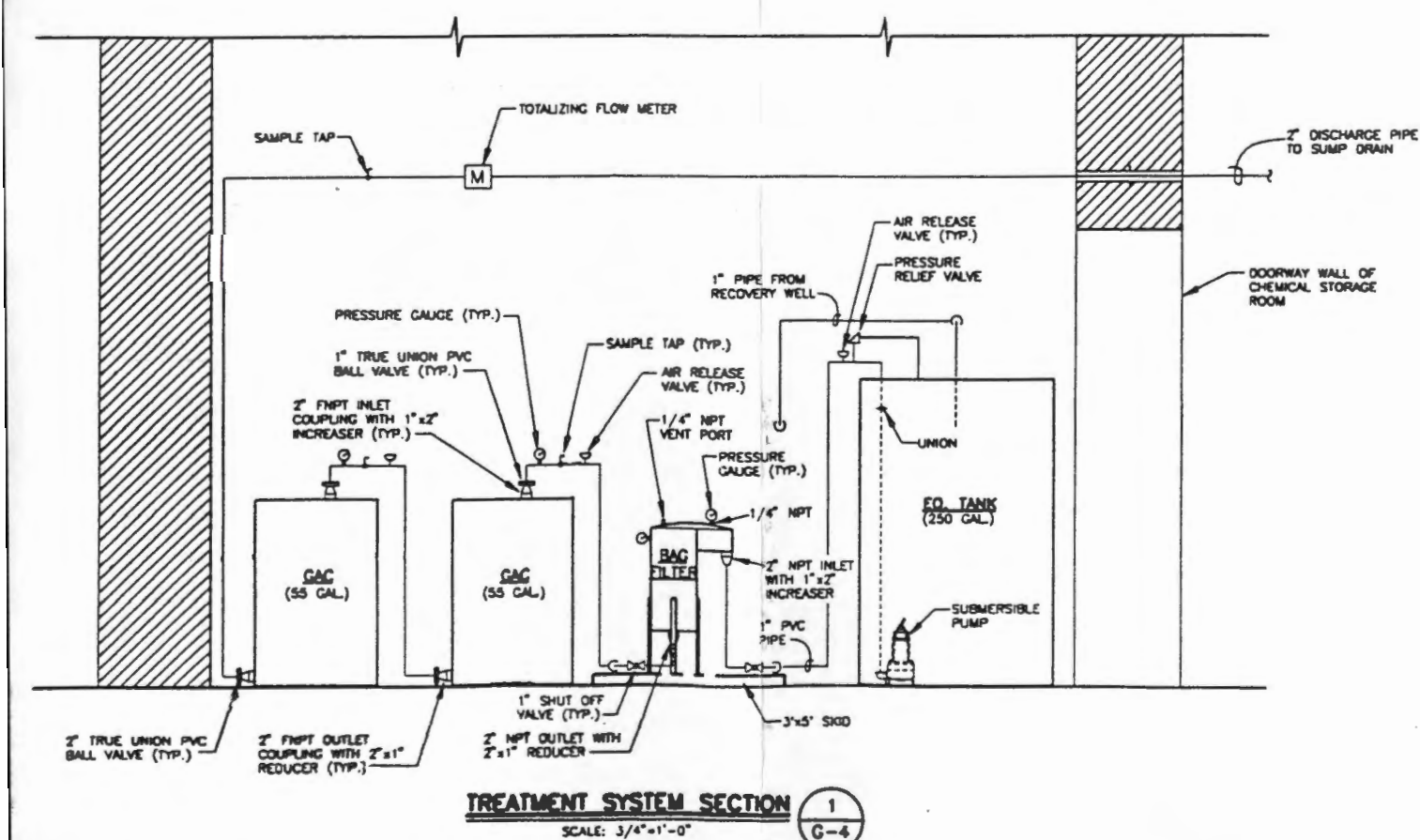
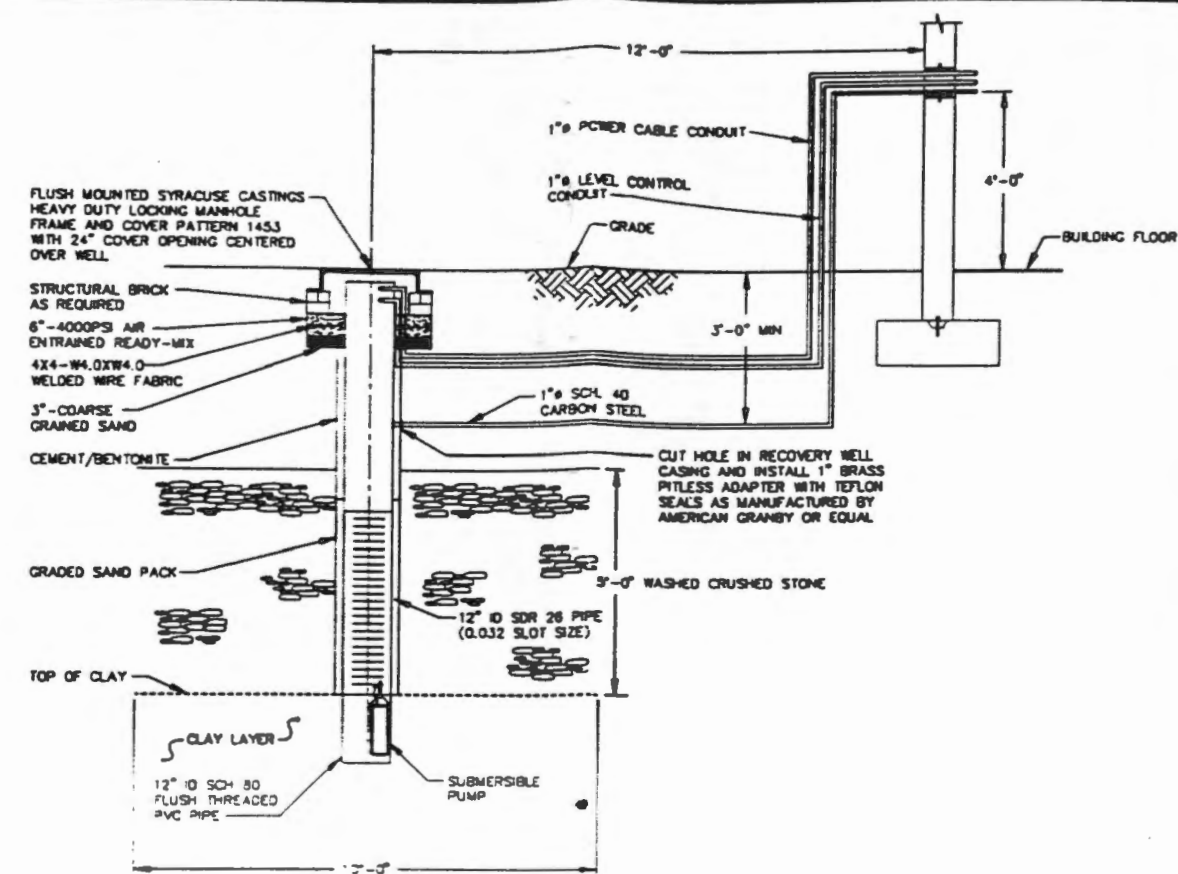
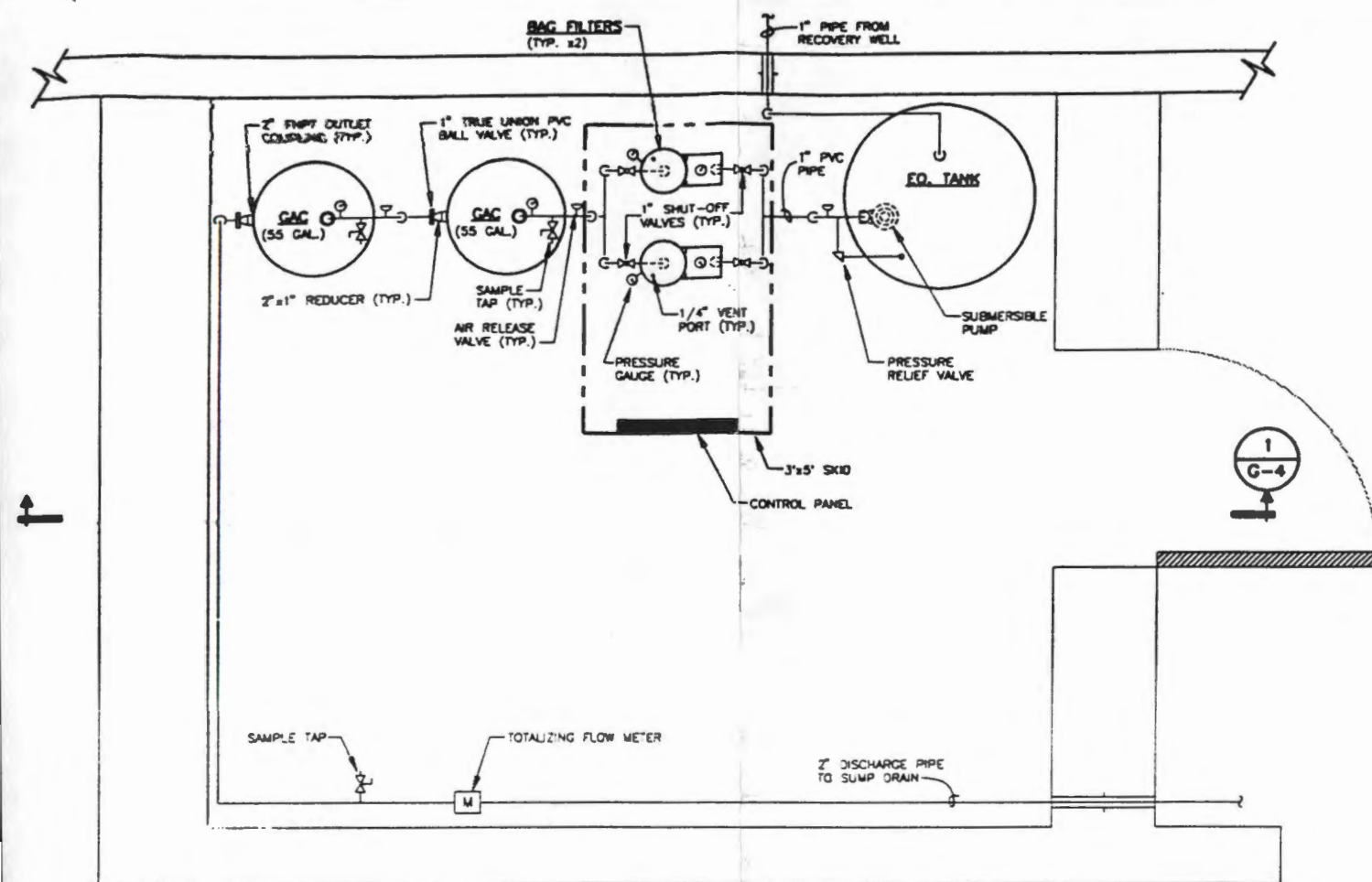
CAMBRIDGE INDUSTRIES, INC.
CANANDAIGUA, NEW YORK
SOIL AND GROUND WATER
REMEDATION PROJECT

GENERAL

FACILITY PLAN

In charge of	FILE NO.	G-3
Designed by	2488.578-04F	
Checked by	DATE	R-0
Drawn by	NOVEMBER 1995	

**PRELIMINARY
NOT FOR
CONSTRUCTION**
DATE: 12/1/95



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**PRELIMINARY
NOT FOR
CONSTRUCTION**

DATE: 12/1/95

NO.	DATE	REVISION	IN

$$1/2^{\circ} = 1^{\circ} - 0^{\circ} \begin{array}{cccccc} 2 & 0 & 1 & 2 & 3 & 4 \end{array}$$
$$\frac{3}{4} = 1 - \sigma \quad \begin{array}{cccc} 1 & 0 & 1 & 2 \end{array}$$


**CAMBRIDGE INDUSTRIES, INC.
CANANDAIGUA, NEW YORK
SOIL AND GROUND WATER
REMEDIATION PROJECT**

GENERAL

TREATMENT SYSTEM PLAN, SECTION AND DETAILS

In charge of.....	FILE NO. 2488.579-01F	G-4
Designed by.....	Checked by.....	
Drawn by.....	DATE NOVEMBER 1965	R-0

Designed by-----Checked by-----

Drum 2

[illegible]

DATE _____ P-0

FIGURE 1

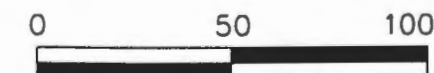


LEGEND

- MW-3S SHALLOW GROUND WATER MONITORING WELL (INSTALLED OCT. 1995)
- MW-7D DEEP GROUND WATER MONITORING WELL (INSTALLED OCT. 1995)
- ESI-3 APPROXIMATE LOCATION OF MONITORING WELL (INSTALLED IN 1991)
- SVE-1 APPROXIMATE LOCATION OF SOIL VAPOR WELL (INSTALLED OCT. 1995)
- APPROXIMATE LOCATION OF RECOVERY WELL

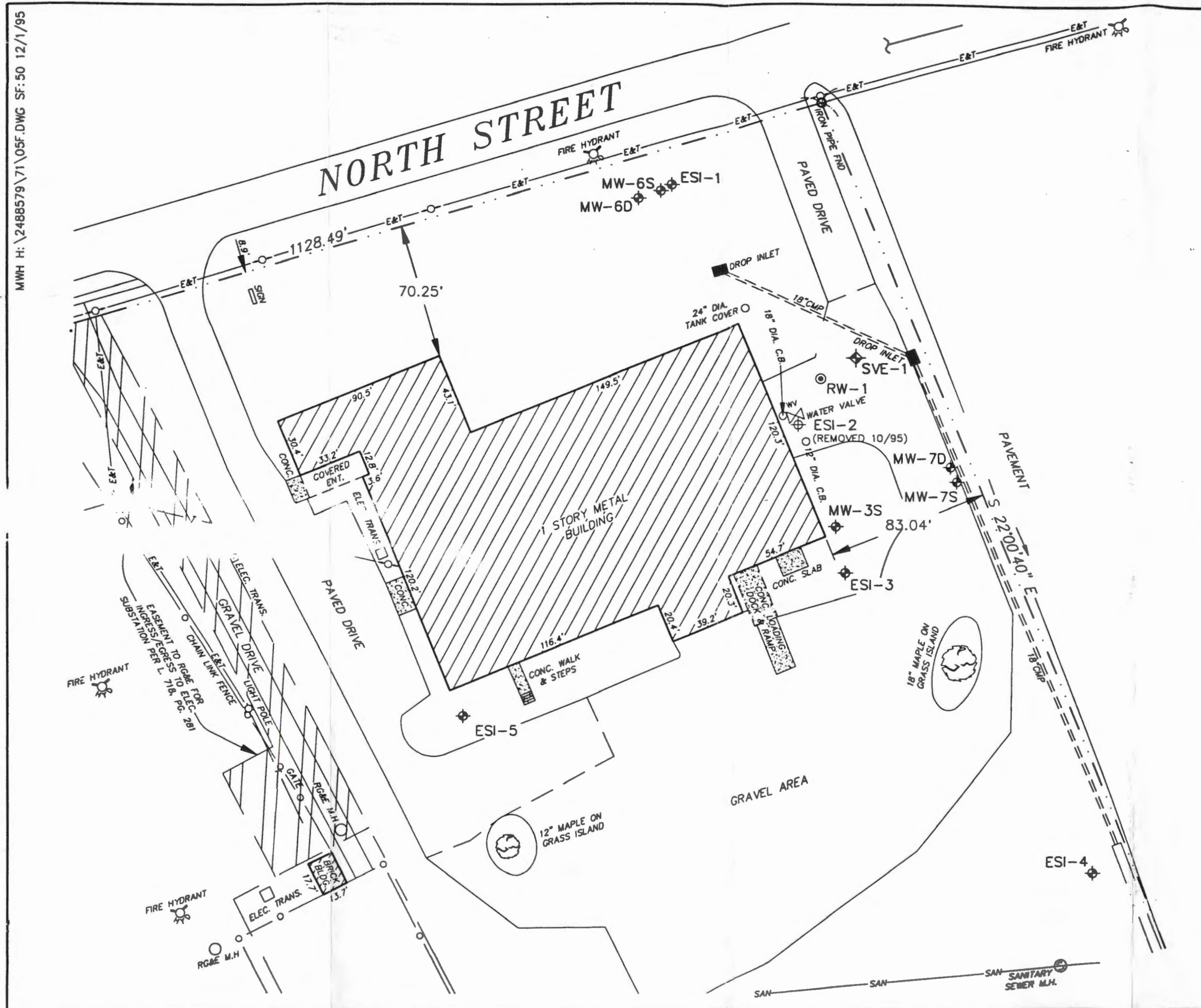
**CAMBRIDGE INDUSTRIES, INC.
CANANDAIGUA, NEW YORK
SOIL AND GROUND WATER
REMEDATION PROJECT**

WELL LOCATION PLAN

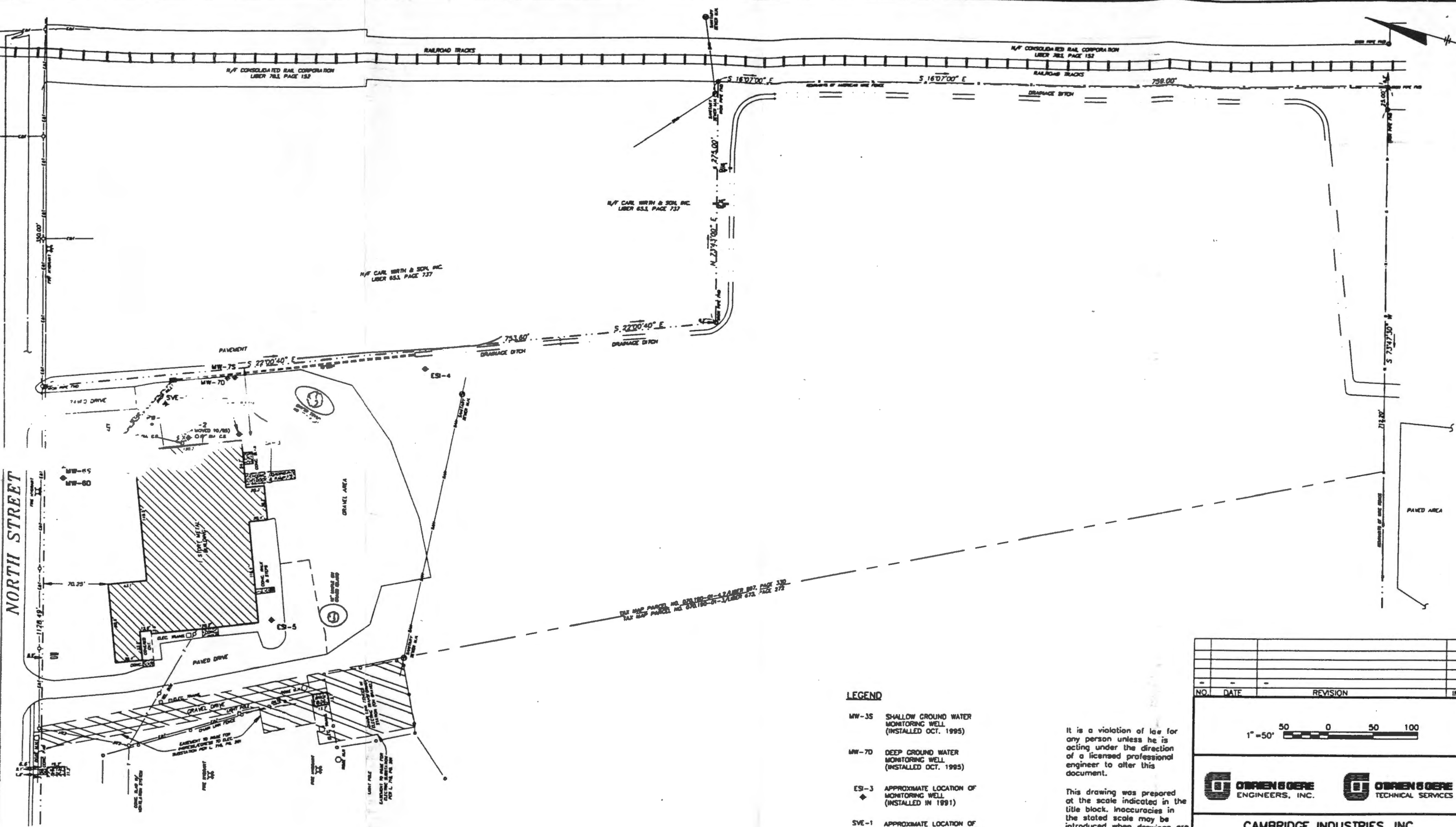


APPROX. SCALE IN FEET

FILE NO. 2488.579-05F



NW1 H:\2488579\1\02F DWG 5F:50 12/1/95



LEGEND

- MW-35 SHALLOW GROUND WATER MONITORING WELL (INSTALLED OCT. 1995)
- MW-70 DEEP GROUND WATER MONITORING WELL (INSTALLED OCT. 1995)
- ESI-3 APPROXIMATE LOCATION OF MONITORING WELL (INSTALLED IN 1991)
- SVE-1 APPROXIMATE LOCATION OF SOIL VAPOR EXTRACTION WELL (INSTALLED OCT. 1995)
- APPROXIMATE LOCATION OF RECOVERY WELL

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CONSTRUCTION
DATE: 12/1/95

NO.	DATE	REVISION	INIT

1"=50' 50 0 50 100

O'Brien & Gere ENGINEERS, INC. **O'Brien & Gere TECHNICAL SERVICES**

CAMBRIDGE INDUSTRIES, INC.
CANANDAIGUA, NEW YORK
SOIL AND GROUND WATER
REMEDATION PROJECT

GENERAL

EXISTING SITE PLAN

In charge of.....	FILE NO. 2488.579-02F	G-1
Designed by.....	Checked by.....	DATE NOVEMBER 1995
Drawn by.....		R-0

Attachment B
Major Treatment System Component Shop Drawings/Information

TYPICAL FLOWSORB OPERATING PARAMETERS

Flow Rate: 10 gpm (37.8 l/m)
 Contact Time: 4.5 minutes
 Pressure Drop: < 1 psi (clean water and carbon)
 Operating Pressures: Recommend operation at less than 5 psig, but higher pressures, up to 12 psig, possible with tight cover closure

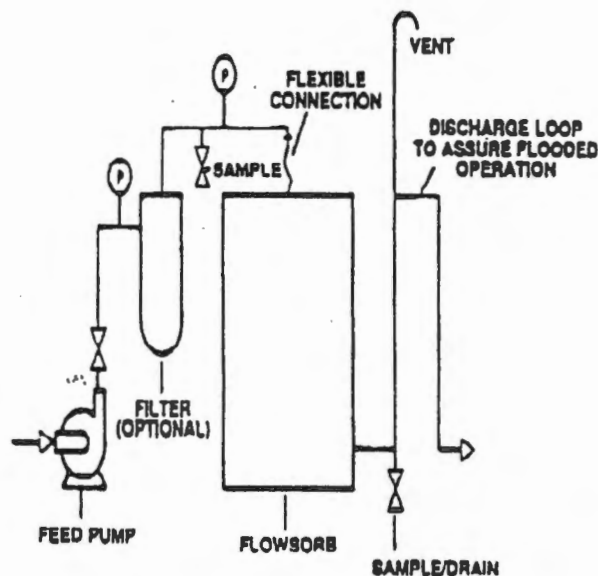
FLOWSORB INSTALLATION

FlowSorb canisters are shipped with dry activated carbon; the carbon must be wetted and degassed prior to use. This procedure displaces air from the internal structure of the carbon granule, thus assuring that the liquid to be treated is in contact with the carbon surface.

Prior to operation, each canister must be filled with clean water; the water should be introduced into the bottom outlet connection. The unit should set for approximately 48 hours — this allows most of the carbon's internal surface to become wetted, as shown on the wetting curve below.

After wetting, the carbon bed can be degassed by draining the canister and again filling the canister upflow with clean water. This procedure will eliminate any air pockets which may have formed between the carbon granules. The FlowSorb is now ready for operation.

Canisters should be set on a flat, level surface and piped as recommended in the installation illustration. The influent pipe connection should be attached to the unit by using a flexible connection, as some minor deflection of the lid may occur if pressure builds due to filtration or other flow blockage downstream.

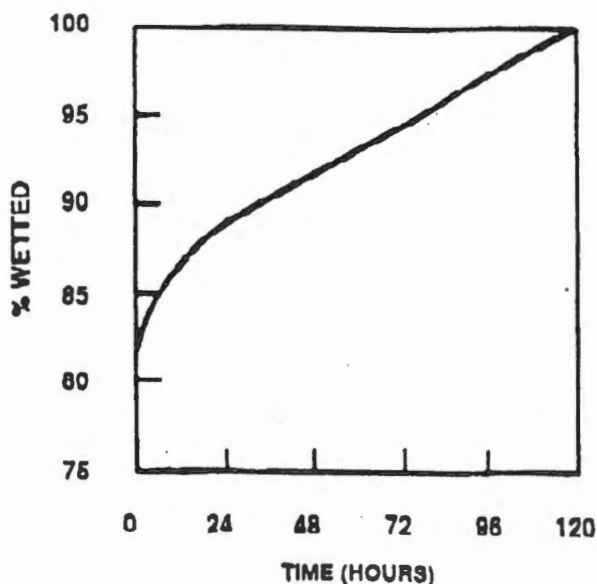


TYPICAL FLOWSORB INSTALLATION

FlowSorb discharge piping should include an elevated piping loop to assure that the canister remains flooded with water at all times. In addition to the piping loop, a drain connection is recommended on the discharge piping; this allows drainage of the unit prior to disconnection or temporary shutdown.

A filter should be installed if the liquid to be treated contains substantial amounts of suspended solids. A simple cartridge or screen filter helps prevent pressure buildup in the carbon bed.

WETTING CURVE FOR GAC
 77°F/25°C)



FLOWSORB OPERATION

FlowSorb canisters should be full of clean water before treatment begins. Flow rate to the canister should be determined based on required contact time between the liquid and the carbon media. In groundwater treatment applications, the recommended contact time is typically 6-10 minutes with a resultant flow of approximately 5 gpm. Consult your Calgon Carbon Technical Sales Representative for advice about proper contact time for your application.

FlowSorbs can be manifolded in parallel operation for higher flow rates. For series operation, two FlowSorbs can be piped together sequentially, as normal pressure drop will not exceed the recommended operating pressure.

These canisters have space for bed expansion and can be backflushed by introducing clean water or liquid at approximately 20-25 gpm to the outlet and taking backflush water from the inlet.

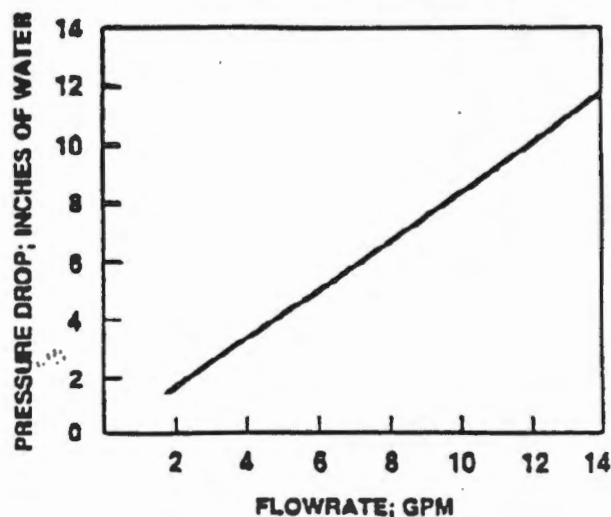
WARRANTY

There are no expressed or implied warranties, or any warranty of merchantability or fitness, for a particular purpose associated with the sale of this product.

LIMITATION OF LIABILITY

The Purchaser's exclusive remedy for any cause of action arising out of purchase and use of the FlowSorb, including but not limited to breach of warranty, negligence and/or indemnifications, is expressly limited to a maximum of the purchase price of the FlowSorb unit as sold. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. In no event shall Calgon Carbon Corporation for any reason be liable for incidental or consequential damages, damages in excess of the purchase price of the FlowSorb unit, loss of profits or fines imposed by governmental agencies.

FLOWSORB PRESSURE DROP



For more information on the product described in this bulletin, or information on other adsorption equipment, please contact one of our Regional Sales Offices located nearest to you:

SALES OFFICES



Region I
PO Box 6788
1120 Route 22 East
Bridgewater, NJ 08807
Tel (908) 620-4040
Fax (908) 628-2487

Region IA
5800 77 Center Drive
Suite 200
Charlotte, NC 28217
Tel (704) 527-7500
Fax (704) 523-3550

Region II
P.O. Box 717
Pittsburgh, PA 15230-0717
Tel (412) 787-6700
800/4-CARBON
Fax (412) 787-6676

Region III
4343 Commerce Court
Suite 400
Lisle, IL 60532
Tel (708) 505-1919
Fax (708) 505-1936

Region IV
2121 South El Camino Real
San Mateo, CA 94403
Tel (415) 572-9111
Fax (415) 574-4466

Region V
Benchmark I Building
13430 Northwest Freeway
Suite 804
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Tel (713) 690-2000
Fax (713) 690-7909

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Mississauga, Ontario
Canada L4V 1R8
Tel (416) 673-7137
Fax (416) 673-8883

Europe
Chemviron Carbon
Boulevard de la Woluwe 60
Boite 7
B-1200 Brussels, Belgium
Tel 32 2 773 02 11
Fax 32 2 770 93 94



TOTALIZERS

ters and Totalizers

shaft supports. For chemicals, pesticides, 800 psig. Aluminum housing—has nylon rotor and shaft supports. For fuel and light oils, 300 psig. Nylon housing—with nylon shaft supports. For chemicals, 150 psig. PVDF housing—with PVDF rotor and shaft supports. For chemicals, including herbicides, 150 psig. The temperature range is 14° to 140°F. Flowmeters and totalizers are powered by two field-replaceable lithium batteries for 2000 hours of operational service. **REPLACEABLE LITHIUM BATTERIES—Pkg. of two, No. 4352K95.....NET/PKG. \$18.10**

Item No.	Nylon		PVDF	
	NET EACH	No.	NET EACH	No.
\$217.13	4352K81	\$245.37	4352K81	\$343.64
\$212.58	4352K82	\$236.21	4352K82	\$338.18
\$15.70				
\$236.84	4352K83	\$272.73	4352K83	\$380.00
\$233.33	4352K84	\$267.27	4352K84	\$356.36
\$44.93				

Petroleum Products Control and Flow Totalizers

Meters motor oils, gear lube, and automatic transmission fluid up to SAE 40. Four-figure non-reset totalizer registers to 9999. Hand can be reset to zero before each delivery, but only moves forward by pumping fluid. Dial is 3 1/2" diameter. **Construction—aluminum.**

Rating—Maximum pressure: 1000 psi. Maximum temperature: 140°F. Accuracy: ±1%.

Bottom inlet and side outlet are 1/2" female NPT.

Total & Unit	Graduations	No.	NET EACH
8 pints	1/2 pint	4047K1	\$208.93
4 quarts	1/4 quart	4047K8	\$212.74
16 quarts	1/4 quart	4047K17	\$213.98

♦ Field with outlet in the 9 o'clock position at totalizer.

Petroleum Products Totalizing Meter



Positive displacement meter registers gallon flow of most petroleum products...use with elevated gravity tanks or hand pumps.

Totalizer registers up to 100,000 gallons. Individual deliveries register up to 100 gallons on the sub meter, which has manual reset control with positive zero stop.

Construction—Housing: die cast aluminum. Internal parts: aluminum, stainless steel, and Delrin. Strainer screen: Monel mesh.

Rating—Temperature range: -20° to +165°F. Maximum pressure: 50 psi. Flow rate: 3-15 gallons per minute. Accuracy: ±3%.

Interproof and has a calibration adjustment. Fittings are 1/2" NPT. Two 1" x 3/4" reducers for use with hand pumps are Do not use meter to measure liquids for resale or for other liquids into aircraft.

NET EACH \$131.21

ilizing Meters

Rating—Temperature range: -30°F to +140°F. Precision molded diaphragm assures a long and accurate meter life. Index box is isolated from gas. Bushings are self-lubricating for the life of the meter. Capacities are at base conditions of atmospheric pressure, 1/2" water column pressure differential and 1.60 specific gravity gas.

Overall Dimensions			
Width	Depth	No.	NET EACH
8 1/4"	8 1/4"	4360K21	\$176.92
10 1/4"	10"	4360K22	\$364.62
14 1/4"	13 1/4"	4360K24	\$1090.78

MASTER-CARR

LIQUID FLOW TOTALIZING METERS 1235

Cold Water Spot Flow Totalizers

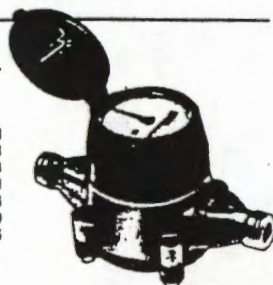
Horizontal, nonresettable totalizers register six figures. Meter measures by positive displacement principle for high dependability. Register has large numerals and glass lens. There is a low flow indicator to detect leaks. Meters run within close tolerances and have excellent low flow accuracy. For reading convenience, the register can be mounted on the meter in any of four positions. Each meter is individually tested and calibrated to prevent waste and loss of water.

Construction—Main case: cast bronze, split construction.

Rating—Temperature range: 32°-100°F. Maximum pressure: 150 psi. Connections are male NPT.

Pipe Size	Flow Range GPM	No.	NET EACH
1/2"	1/2 - 20	4041K21	\$99.88
3/4"	1/2 - 20	4041K22	104.63
1"	1 - 50	4041K23	209.73
1 1/4"	1 - 50	4041K24	222.58
1 1/2"	2 - 100	4041K25	541.49
2"	2 1/2 - 160	4041K26	784.25

♦ Female union fittings.



Cold Water Totalizers with Remote Readout

Remote register allows reading where meter itself is not accessible. Water passing through the meter drives the built-in register, which in turn generates an electric pulse for the corresponding volume of water. The pulse actuates the remote register through a 2-wire cable.

Construction—Meter housing: bronze. Pulser and remote register housings: thermoplastic.

Rating—Temperature range: 32°-100°F. Maximum pressure: 150 psi.

Wire is not included. For distances up to 300 ft., use #22 AWG cable. Water connections are male NPT.

Pipe Size	Flow Range GPM	No.	NET EACH
1/2"	1/2 - 20	42075K91	\$170.96
3/4"	1/2 - 20	42075K92	176.58
1"	1 - 50	42075K93	262.23
1 1/4"	1 - 50	42075K94	278.38
1 1/2"	2 - 100	42075K95	598.30
2"	2 1/2 - 160	42075K96	850.76

♦ Female union fittings.



Hot Water Spot Flow Totalizers

Rugged units with horizontal, nonresettable totalizers register six figures.

There is a direct shaft drive from meter to the register through the stuffing box seal. Totalizer has a gasketed glass and hinged lid.

Construction—Housing: galvanized cast iron. Measuring chamber and internal gear train: bronze.

Rating—Temperature range: 100°-225°F.

Couplings are male NPT. Units are individually calibrated—specify No., flow rate in gallons per minute, and water temperature.



Pipe Size	Flow Range GPM	Max. Pressure PSI @ 200°F	No.	NET EACH
1/2"	1 - 15	1 - 8	285	4040K11 \$775.38
3/4"	3 - 20	1 - 12	235	4040K12 878.48
1"	5 - 30	2 - 15	235	4040K14 1013.85
1 1/4"	7 - 50	2 - 35	235	4040K15 1298.82
2"	12 - 100	5 - 70	160	4040K16 1872.06

Oil and Specialty Totalizing Meters

Looking for a meter to handle special liquids? We'll custom build a unit to handle virtually any liquid that won't corrode iron and bronze. In the measuring chamber there is only one moving part, a rugged disc and ball assembly, which assures long, problem-free performance.

Choose from three styles: Horizontal nonresettable dial that totalizes to six figures; a one-hand, 6" diameter resettable vertical dial with a five-digit totalizer; and a two-hand (for finer resolution), 10" diameter resettable vertical dial with a five-digit totalizer.

Horizontal resettable vertical dial with a five-digit totalizer.

Construction—Case: galvanized cast iron. Measuring chamber, and calibration gears: bronze.

Rating—Maximum temperature: 400°. Accuracy: ±1.5% over full flow range.

Meters are furnished with NPT couplings. When ordering, specify No., liquid to be measured, pressure, temperature, approximate flow rate, and viscosity in Saybolt Seconds Universal (SSU).



Flow Range, GPM				HORIZONTAL DIAL		VERTICAL DIAL	
Pipe Size	31-450 SSU	450-1000 SSU	1000-5000 SSU	Maximum Pressure PSIG @ 300°F	No.	10" 2-Hand	6" 1-Hand
1/2"	1 - 20	1 - 15	1 - 8	285	4042K11	4042K21	4042K31
3/4"	2 - 30	3 - 20	1 - 12	215	4042K12	4042K22	4042K32
1"	3 - 50	5 - 30	2 - 15	215	4042K14	4042K24	4042K34
1 1/4"	5 - 100	7 - 50	2 - 35	215	4042K15	4042K25	4042K35
2"	8 - 160	12 - 100	5 - 70	140	4042K16	4042K26	4042K36

Liquid Flow Totalizers with Signal Switch

Factory set totalizers have SPST contacts that close a 12 VAC to 250 VAC circuit when meter reaches the number of gallons on the contact setting.

Typical uses include water softener regeneration, automatic treatment of boiler water, cooling tower water, and alarm systems. Register is calibrated in U.S. gallons and totalizes to six digits.

Construction—bronze.

Rating—Maximum operating temperature: 105°F. Maximum operating pressure: 150 psi. Maximum static pressure: 300 psi. Switch: 10 amps up to 250 VAC.

External circuit terminals are on meter pulse head. Meter mounts horizontally. Couplings are furnished.

Flow in gallons at which contacts close is

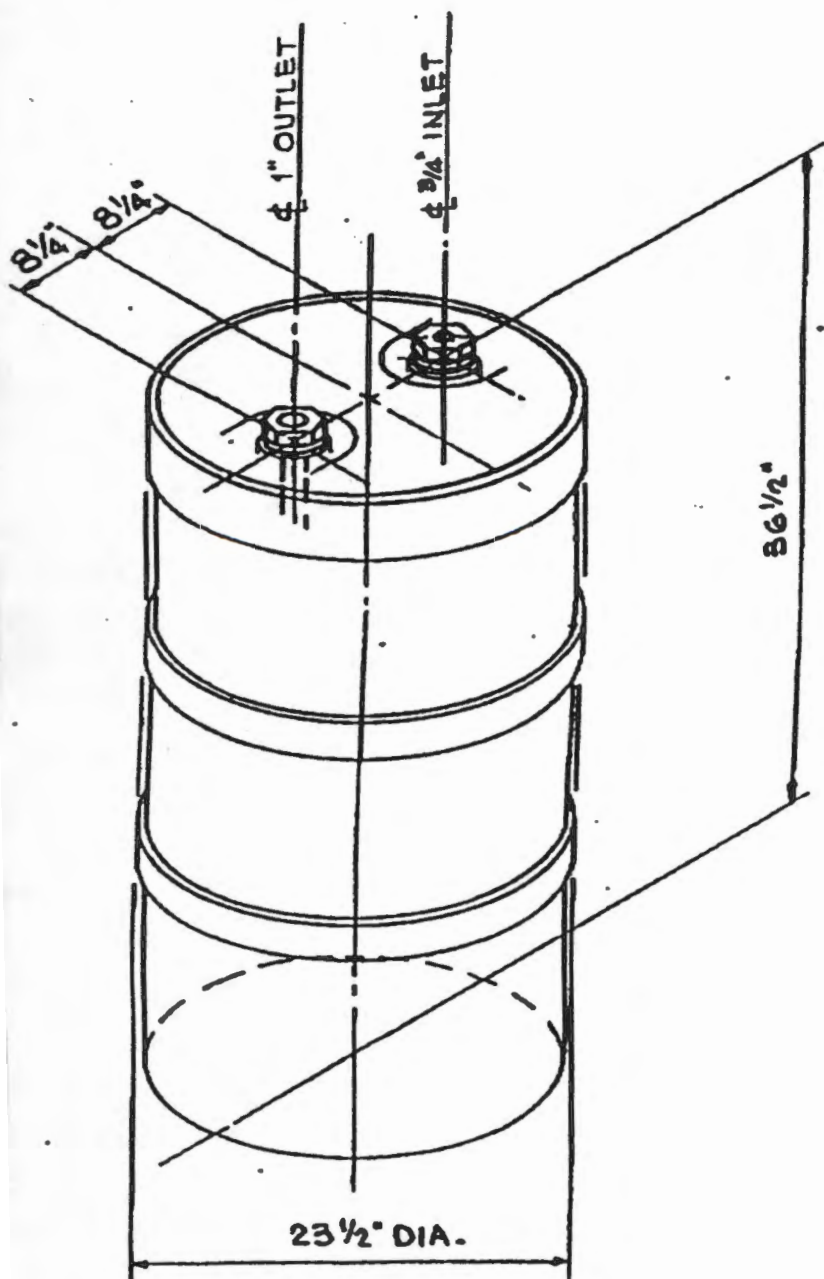
factory set at one of the following: For 1/2" up to 1" sizes — 5, 10, 20, 25, 50, 100, 200, 250, 500, and 1000. For 1 1/4" and 2" sizes — 50, 100, 200, 250, 500, 1000, 2000, 2500, 5000, and 10,000.

To order, specify No., flow range, and total flow in gallons at which contacts are to close.

Pipe Size	Flow Range GPM	No.	NET EACH
1/2"	1/2 - 20	4187K41	\$227.69
3/4"	1/2 - 20	4187K42	232.31
1"	1 - 50	4187K43	361.40
1 1/4"	1 - 50	4187K44	349.23
1 1/2"	2 - 100	4187K45	432.31
2"	2 1/2 - 160	4187K47	704.41
		4187K48	914.71

♦ Size explanation: Example—1/2" x 1/2". 1/2" is inlet and outlet size, 1/2" is coupling size.





EMPTY WEIGHT:

CAPACITY: 7.3 CU.FT.

CARBON CHARGE: 165 LBS.

KLENSORB CHARGE: 225 LBS.

SHIPPING WEIGHT:

LBS. WITH CARBON

LBS. WITH KLENSORB

ESTIMATED CARBON DEPTH ABOVE SEPTA: 21 INCHES

MAX. ALLOWABLE PRESSURE: 7 PSIG.

PRESSURE DROP - DOWNFLOW WITH F-400: 2.7 PSIG @ 10 GPM

MATERIALS OF CONSTRUCTION:

SHELL: POLYETHYLENE

PIPE: PVC

SEPTA: 316 S.S.

PROJECT
SCALE N.T.S.
DRAWN DAZ
DATE 4-15-88
CHKD
APPRVD



CALGON CARBON CORPORATION
P.O. BOX 717 PITTSBURGH, PA 15230-0717

PLANT

TITLE

DISPOSORB 55 GAL.

DWG. NO.

90-30-0434

REV.

0

GENERAL DESCRIPTION

Designed for low-flow water treatment applications, pre-fabricated 55-gallon FlowSorb™ canisters contain all the operating elements found in a full-scale adsorption system. These small, economical treatment systems hold 165 pounds of granular activated carbon for applications including:

- Small wastewater streams
- Groundwater remediation
- Underground storage tank leaks
- Well pump tests
- Product purification or decolorization
- Tank cleaning water treatment
- Batch water or product treatment
- Carbon adsorption pilot testing
- Emergency spill treatment
- Monitoring well water treatment

OBG TECHNICAL SERV.
5000 BRITTONFIELD I
P.O. BOX 5240
SYRACUSE, NY 13220

REVIEWED FOR COMPLIANCE WITH
CONTRACT DOCUMENTS

DATE _____
CONTRACT NO. _____
REVIEWED BY _____

CAUTION

FlowSorb

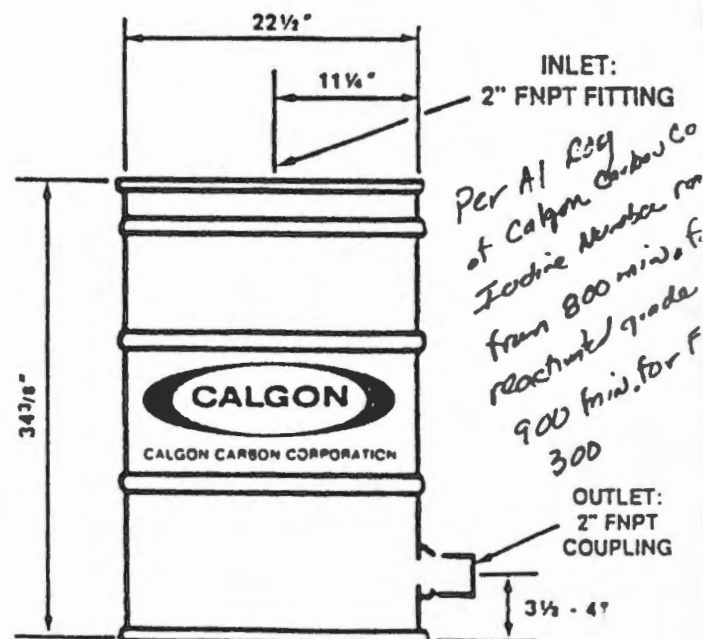
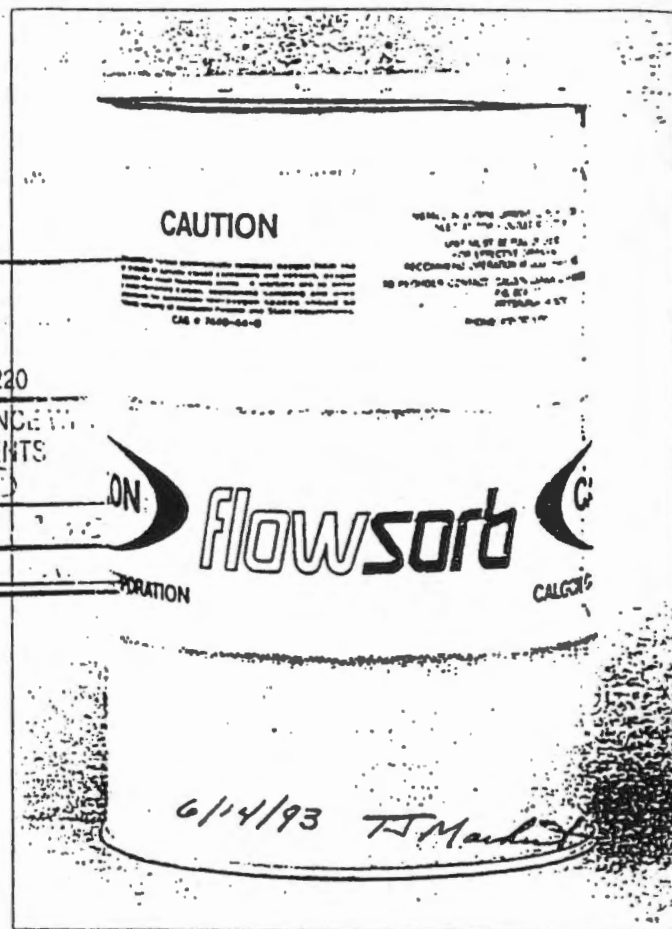
FEATURES

FlowSorb offers several features and benefits to industrial, commercial and municipal users including:

- Sturdy 16 gauge steel construction per DOT specifications
- Continuous treatment at varying flow rates and concentrations
- Simple installation and operation
- Space above carbon bed facilitates flow distribution or backflushing
- Flexibility to be used in series or parallel operation
- Supplied with virgin or reactivated carbon
- May also be supplied with Klensorb, an oil absorbent media
- Practical disposal option, as pre-approved spent carbon canisters may be returned to Calgon Carbon for safe carbon reactivation
- Low cost per unit makes carbon treatment economical

FLOWSORB SPECIFICATIONS

Vessel: Open head 16 gauge steel canister
Pressure: 15 psig per DOT 17C
Cover: Removable steel cover, 12 gauge bolt ring with butyl rubber sponge gasket
Internal Coating: Heat cured epoxy phenolic
External Coating: Baked enamel (gray)
Temperature Limit: 150° F (65.6° C) continuous
350° F (176.7° C) intermittent
Inlet: 2" FNPT
Outlet: 2" FNPT; 304 stainless steel collector
Carbon: 165 pounds granular activated carbon:
Specify Filtrasorb 300 or reactivated grade
Ship Weight: 232 pounds (105 kg)
Identification: Sequentially numbered for reference



FLOWSORB DIMENSIONS

Sherry - Pressure Temp
Mike - when high - 8"

Attachment C
Granular Activated Carbon Consumption and
Break-through Timing Estimate Calculations

**Granular Activate Carbon (GAC)
Breakthrough Timing and Consumption Rate**

Design Basis:

Flowrate: 1 gpm x 60 min/hour x 24 hour/day = 1440 gallons per day

Concentration: 9 mg/l VOC (based on highest VOC concentration in monitoring wells)

GAC Drums: Two - 165 lb. GAC canisters operated in series

Breakthrough Timing:

As shown on the attached manufacturing information for estimation of the GAC canister life; under Case 6, each GAC canister can treat 125,000 gallons of water containing 9 mg/l VOC (Trichloroethylene and Tetrachloroethylene). Therefore, it is assumed that each canister can treat up to 125,000 gallons of water containing 9 mg/l VOCs from the site.

Therefore, the breakthrough timing for each GAC canister is:

125,000 gallons/1,440 gallons per day = 86.8 days for each canister;
and 2 x 86.8 = 173.6 days for two GAC canisters

GAC Consumption Rate

Since each canister contains 165 lbs GAC, the GAC Consumption Rate is:

165 lbs. GAC/86.8 days = 1.9 lbs GAC per day

Note: Actual water quality and hydrogeologic conditions may result in a change in the GAC consumption rate and breakthrough timing. GAC consumption rate and breakthrough timing can be better established after start-up and operation of the water treatment system.

THEORETICAL FLOWSORB TREATMENT CAPACITY FOR TYPICAL CASES

	Case 1		Case 2		Case 3	
	<u>Conc.</u>	<u>Gallons</u>	<u>Conc.</u>	<u>Gallons</u>	<u>Conc.</u>	<u>Gallons</u>
Benzene	20 ppb	} 1,600,000	200 ppb	} 400,000	2 ppm	} 85,000
Toluene	40 ppb		400 ppb		4 ppm	
Xylene	40 ppb		400 ppb		4 ppm	
	Case 4		Case 5		Case 6	
	<u>Conc.</u>	<u>Gallons</u>	<u>Conc.</u>	<u>Gallons</u>	<u>Conc.</u>	<u>Gallons</u>
TCE	50 ppb	} 1,900,000	500 ppb	} 550,000	5 ppm	} 125,000
PCE	50 ppb		500 ppb		4 ppm	
	Case 7		Case 8		Case 9	
	<u>Conc.</u>	<u>Gallons</u>	<u>Conc.</u>	<u>Gallons</u>	<u>Conc.</u>	<u>Gallons</u>
Phenol	1 ppm	} 230,000	10 ppm	} 50,000	100 ppm	} 10,000
Total SOC	10 ppm		100 ppm		1,000 ppm	

Each case represents a groundwater or wastewater stream that contains the combination of contaminants listed. The treatment capacity indicates the total gallons of that particular water that may be treated before any of the specific contaminants are present in the treated water as noted. Theoretical capacity based on 5 gpm, water at 70°F or less and 165 pounds of Filtrasorb 300. Background TOC is less than 1 ppm except phenol cases as noted. Contaminants reduced to < 5 ppb, except phenol case which is for 95% phenol reduction.

HOW TO ESTIMATE FLOWSORB LIFE

The treatment table on this page lists the volume of water that can be purified by the FlowSorb for typical contamination situations. However, most applications involve a unique mixture of organic chemical contaminants including some chemicals that adsorb at different capacities or strengths. Please consult with your Calgon Carbon Technical Sales Representative for more information about carbon usage rates.

RETURN OF FLOWSORBS

Arrangements should be made at the time of purchase regarding the future return of canisters containing spent carbon. Calgon Carbon will provide instructions on how to sample the spent carbon and arrange for carbon acceptance testing. The spent carbon is reactivated by Calgon Carbon and all of the contaminants are thermally destroyed. The company will not accept FlowSorbs for landfill, incineration or other means of disposal.

No FlowSorbs can be returned to Calgon Carbon unless the carbon acceptance procedure has been completed, an acceptance number provided, and the return labels (included with the units at the time of purchase) are attached.

FlowSorbs must be drained — and inlet/outlet connections must be plugged — prior to return to Calgon Carbon.

SAFETY CONSIDERATIONS

It is unlikely that a worker would be able to physically enter a FlowSorb canister. However, the following information and precautions apply to a partially closed canister or situations where carbon is to be removed from the canister and stored elsewhere.

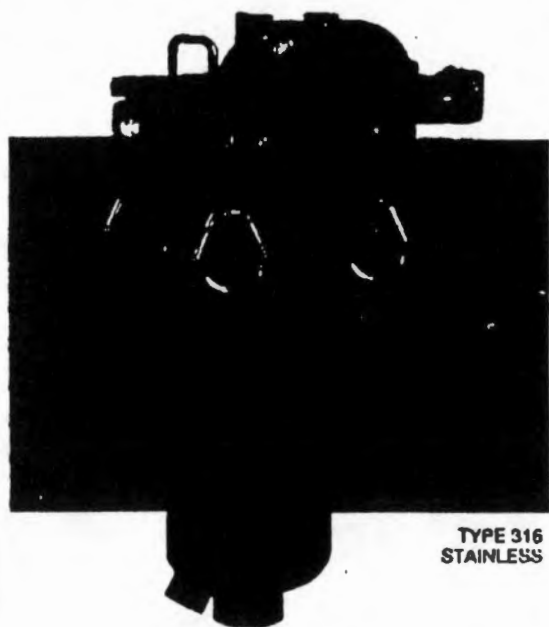
Wet or dry activated carbon preferentially removes oxygen from air. In closed or partially closed containers, oxygen depletion may reach hazardous levels. If workers must enter a vessel containing carbon, appropriate sampling and work procedures should be followed for potentially low-oxygen spaces — including all applicable federal and state requirements.

CALGON CARBON LIQUID PURIFICATION SYSTEMS

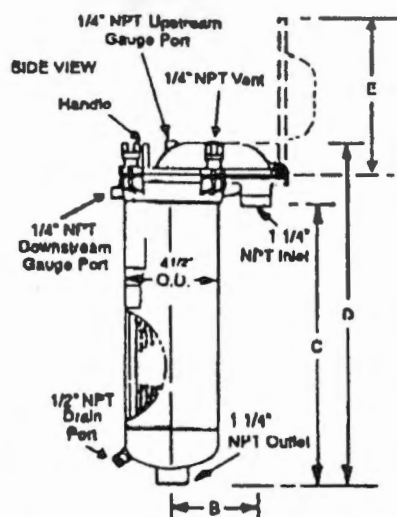
FlowSorb is a unit specifically designed for a variety of small flow applications. Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a greater range of flow rates and carbon usages to meet specific applications.

delivery time
in stock

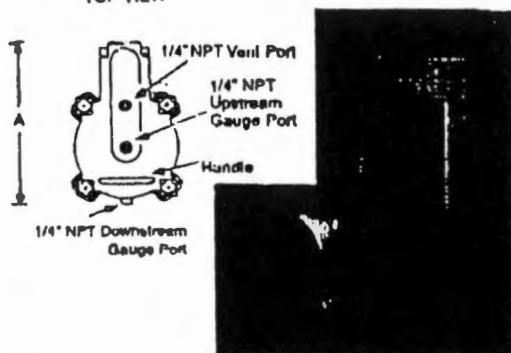
MODEL NS-141



TYPE 316
STAINLESS



TOP VIEW



MODEL NS-141	A	B	C	D	E	WT. LBS.
1 1/4\" NPT CONNECTION	9 1/4"	4 1/4"	12 1/4"	18 1/4"	9 1/4"	25

Description

Model NS-141 Bag Filter Housing in T-316 Stainless Steel at 300psi (250°F). Vessel uses a # 4 size filter bag (4" dia. x 14" long). Liquid flow is from the inside of the filter bag to the outside. The support basket and filter bag are securely locked into a recess at the top of the overflow rim, providing a 360 degree positive compression seal. Since the filter bag is locked in at the top of the vessel, all of the dirt is trapped inside the bag. The filter vessel never requires cleaning after use.

Specifications

Maximum Working Pressure 300psi
Maximum Working Temperature 250°F
Maximum Water Flow 55gpm (does not include filter bag)
Maximum Support Basket Differential Operating Pressure 75psi
Hydrostatically Tested to 450psi
Inlet & Outlet: 1 1/4" NPT
Shipping Weight: 25 lbs.

Standard Features

Model NS-141, type 316 stainless steel, glass bead finish:
exterior, interior and basket
Model NC-141, carbon steel, one coat shop primer, exterior

Over-The-Top Inlet
360° Hinged Closure with Lid Handle
Lid Safety Detents and Lid Stop
Investment Casting (Lid & Body)
Perforated T-316 S/S Support Basket with Longitudinal Taper
Gauge Ports (Upstream & Downstream) 1/4" NPT
Vent Port 1/4" NPT
Drain Port 1/2" NPT
 Buna-N O-Rings
Plated Carbon Steel Hardware - Eye Nuts

Options

Adjustable Tripod Stand (stainless & carbon steel)
Wall Bracket or Overhead Mounting Bracket
Modified Connections - Flanged, Threaded or Sanitary
Interior Grade Finishes (Including 3A Sanitary)
Electropolish Finishes - Exterior, Interior or Both
Micron-Rated Strainer Baskets
Mesh & Micron Lined Baskets
Assorted O-Ring Materials
Cartridge Contaminant Chamber (holds one 10" cartridge)
Drain Valves & Vent Valves
Pressure Gauges
Available in Carbon Steel (Model NC-141) at 300psi (250°F)

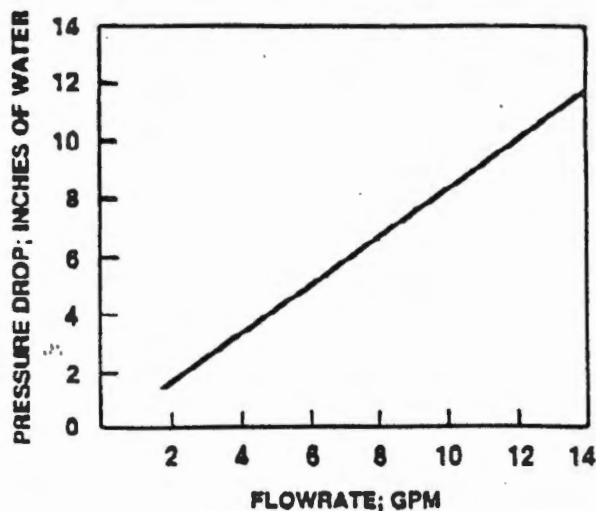
WARRANTY

There are no expressed or implied warranties, or any warranty of merchantability or fitness, for a particular purpose associated with the sale of this product.

LIMITATION OF LIABILITY

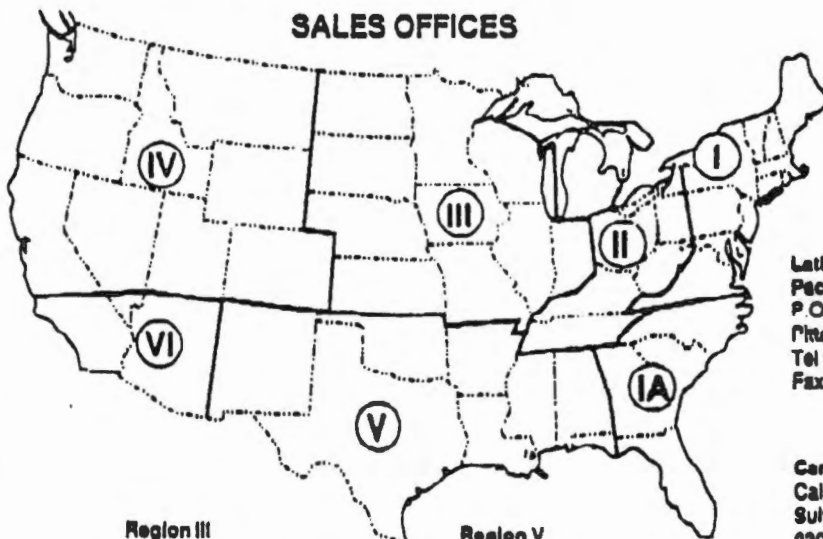
The Purchaser's exclusive remedy for any cause of action arising out of purchase and use of the FlowSorb, including but not limited to breach of warranty, negligence and/or indemnifications, is expressly limited to a maximum of the purchase price of the FlowSorb unit as sold. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. In no event shall Calgon Carbon Corporation for any reason be liable for incidental or consequential damages, damages in excess of the purchase price of the FlowSorb unit, loss of profits or fines imposed by governmental agencies.

FLOWSORB PRESSURE DROP



For more information on the product described in this bulletin, or information on other adsorption equipment, please contact one of our Regional Sales Offices located nearest to you:

SALES OFFICES



Region I
PO Box 6788
1120 Route 22 East
Bridgewater, NJ 08807
Tel (908) 620-4046
Fax (908) 626-2487

Region IA
5600 77 Center Drive
Suite 200
Charlotte, NC 28217
Tel (704) 527-7580
Fax (704) 523-3550

Region II
P.O. Box 717
Pittsburgh, PA 15230-0717
Tel (412) 787-8700
800/4-CARBON
Fax (412) 787-6676

Region III
4343 Commerce Court
Suite 400
Lisle, IL 60532
Tel (708) 505-1919
Fax (708) 505-1936

Region IV
2121 South El Camino Real
San Mateo, CA 94403
Tel (415) 572-9111
Fax (415) 574-4466

Region V
Benchmark I Building
13430 Northwest Freeway
Suite 804
Houston, TX 77040-6071
Tel (713) 690-2000
Fax (713) 690-7908

Region VI
1801 Camino Vida Roble
Suite 112
Carlsbad, CA 92009
Tel (619) 431-5550
Fax (619) 431-8169

**Latin America/Asia
Pacific**
P.O. Box 717
Pittsburgh, PA 15230-0717
Tel (412) 787-4519
Fax (412) 787-4523

Canada
Calgon Carbon Canada, Inc.
Suite 304
6303 Airport Road
Mississauga, Ontario
Canada L4V 1R8
Tel (416) 673-7137
Fax (416) 673-6863

Europe
Chemviron Carbon
Boulevard de la Woluwe 60
Boite 7
B-1200 Brussels, Belgium
Tel 32 2 773 02 11
Fax 32 2 770 93 94



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Phenol	1 ppm	} 230,000		10 ppm	} 50,000		100 ppm	} 10,000
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Celia Jackson

04/08/2002 03:55 PM

To: Jim Craft

cc:

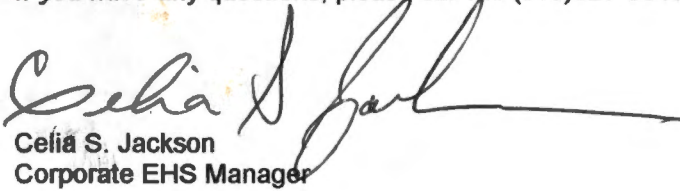
Subject: BLUEPRINTS
Voplex Plant)

O & M PLAN MERIDIAN AUTOMOTIVE (former

Jim:

Please find enclosed additional blueprints for the O & M Plan submitted for your review for the Meridian Automotive Systems, Inc. location in Canandaigua, NY (former Voplex Plant).

If you have any questions, please call me (616)527-8349.


Celia S. Jackson
Corporate EHS Manager

RECEIVED

APR 11 2002

DER/HAZ. WASTE REMED
REGION 8

1001, 1745 Beardsley Rd,
@ Meridian, 14 N. Beardsley Rd,
1001A, MI 48846. *Day.*
Durr

RECEIVED

APR 11 2002

DER/HAZ. WASTE/EMER.
REGION 8

TO: CELIA JACKSON

CC: D. VAN MANEN
J. DAY
D. LEPSCH

} THIS LETTER ONLY.

SUBJECT: DEC COMMENTS ON PROPOSED O&M PLAN

ATTACHED ARE SOME DOCUMENTS THAT MAY HELP IN MEETING THE REQUIREMENTS OF THE DEC ON EQUIPMENT/COMPONENTS USED AND THEIR ARRANGEMENT.

PRINTS:

GROUND WATER CONTOUR MAP, 12 JULY 01(ERM) 1 PAGE
GROUND WATER CONTOUR MAP, 24 JANUARY 01(ERM) 1 PAGE
TREATMENT SYSTEM PLAN, SECTIONS AND DETAILS(OB&G) MARKED
G4&R0, 1 PAGE.
EXISTING SITE PLAN MARKED G1 & R0(OBG)
FACILITY PLAN, MARKED G3-R0(OB&G)
TREATMENT SYSTEM PLAN, SECTION AND DETAILS, MARKED G4 & R0.
THIS IS THE 24IN X36 IN PRINT WHICH MORE ACCURATELY PORTRAYS
THE INSTALLATION. OF COURSE, THIS WHOLE INSTALLATION WAS
RELOCATED TO THE SOUTHWEST CORNER OF THE BUILDING.

EQUIPMENT:

COVER LETTER(OB&G) DATED 12/13/95.
ABS ROBUSTA SUMP PUMPS, 4 PGS
TEEL CENTRIFUGAL PUMP, MODEL 2P691, 5 PGS
GEMS LEVEL SWITCHES(FOR TANK), 4 PGS
ALLEN BRADLEY PRESSURE CONTROL, 2 PGS
BLUE WHITE FLOWMETER, 3 PGS
HAYWARD BALL VALVES, 2 PGS.

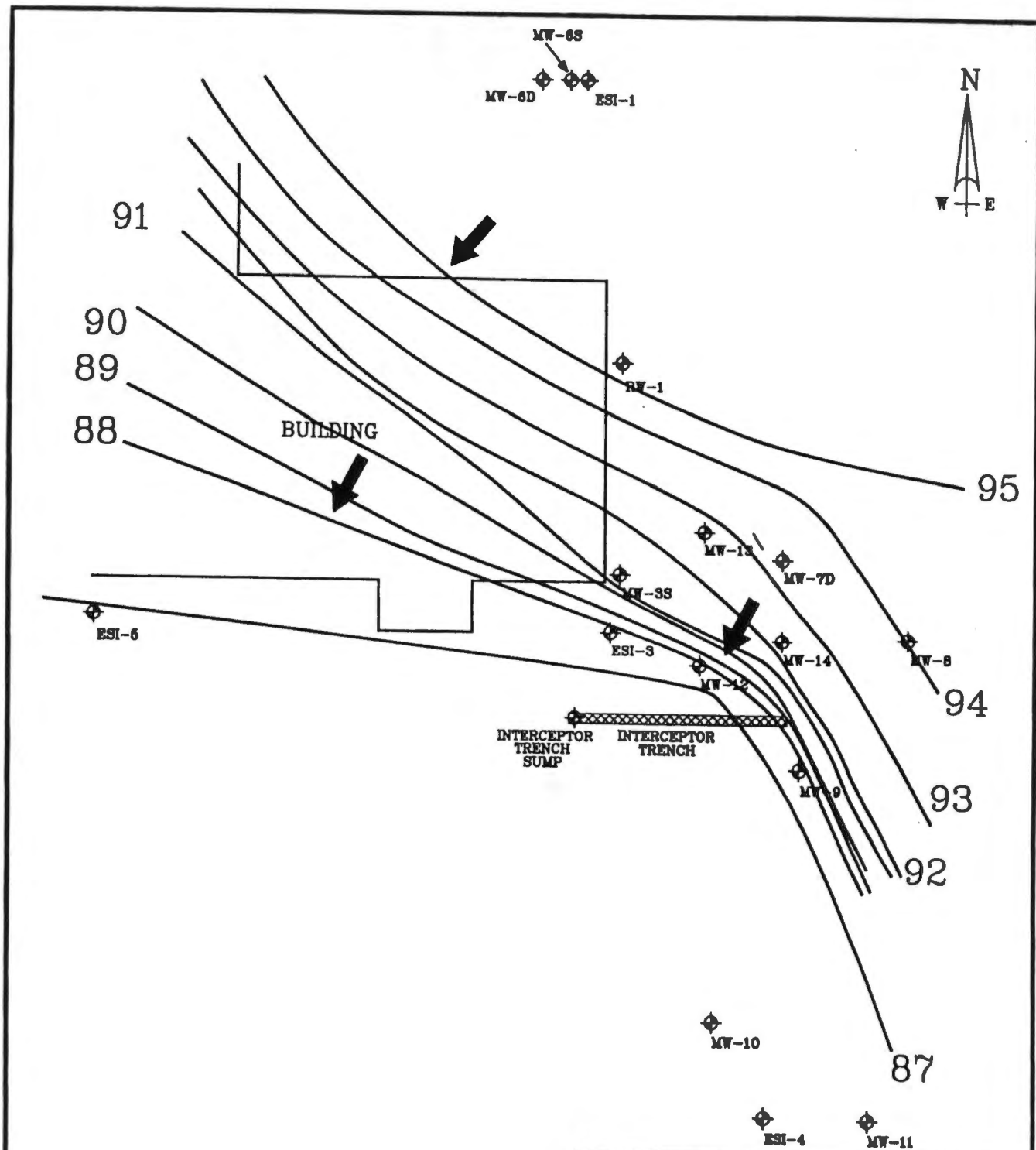
CHEMICALS:

PH ADJUSTER, PRODUCT 614. COVER LETTER, MANUFACTURER'S
DESCRIPTION(1 PAGE) AND TWO PAGES OF MSDS.

COMMENTS: THE PH ADJUSTER IS MANUALLY ADDED TO THE TANK WITH A SCOOP.
WE CHECK THE TANK FOR PH BEFORE PUMPING AND THEN ONCE AGAIN
CHECK THE PH OF THE ACTUAL DISCHARGE TO SANITARY. WE USE A
LITMUS PAPER KIT FOR PH CHECKING. WE NORMALLY ALLOW A MINIMUM
FOUR HOURS RESIDENCE TIME IN THE TANK: OF COURSE IF WE
FILL THE TANK IN THE AFTERNOON IT THEN GETS PUMPED NEXT
MORNING.

I HOPE THIS INFORMATION HELPS ADDRESS SOME OF THE DEC'S COMMENTS
OF DEC 14.

Durr
DOUG HOTCHKISS
1/7/02



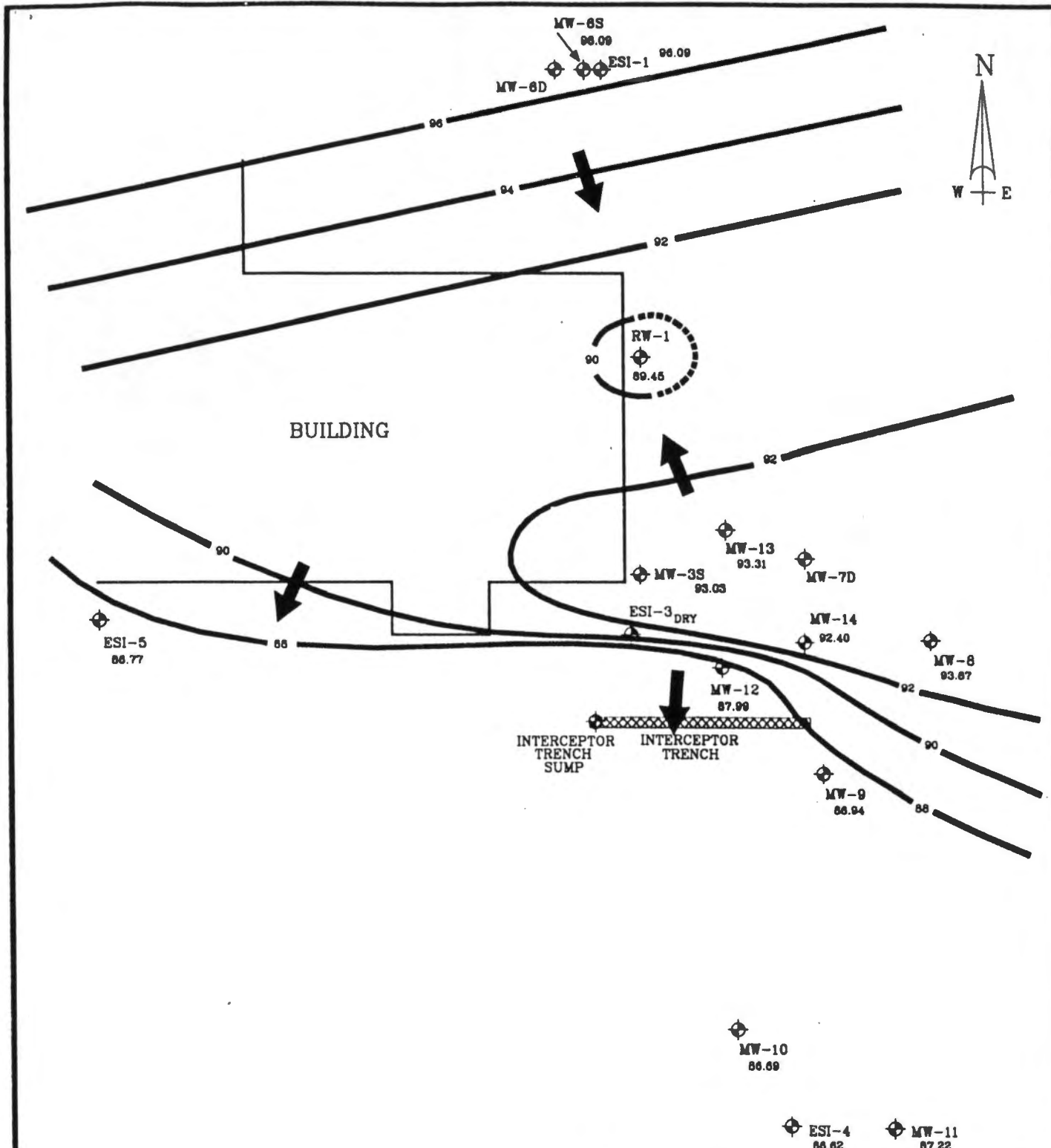
GROUND WATER CONTOUR MAP
12 JULY 2001
CANANDAIGUA, NEW YORK

PREPARED FOR
MERIDIAN AUTOMOTIVE SYSTEMS

ERM
6788 WIDEWATERS PARKWAY
DEWITT, NEW YORK 13214
ERM

SCALE
NTS
DATE
7/01

FIGURE
1



LEGEND

-  MONITORING WELL LOCATION
MW-9
-  GROUND WATER CONTOUR LINE WITH ELEVATION
92
-  GROUND WATER FLOW DIRECTION

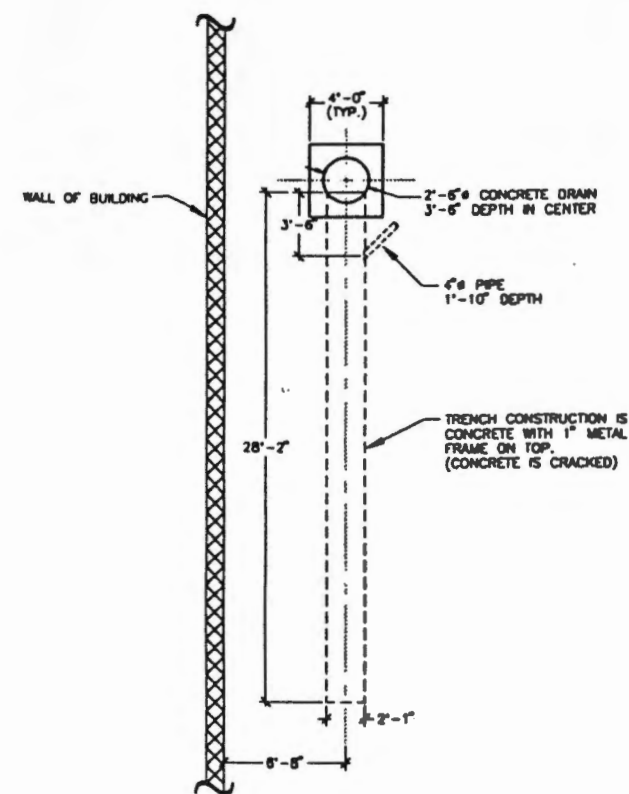
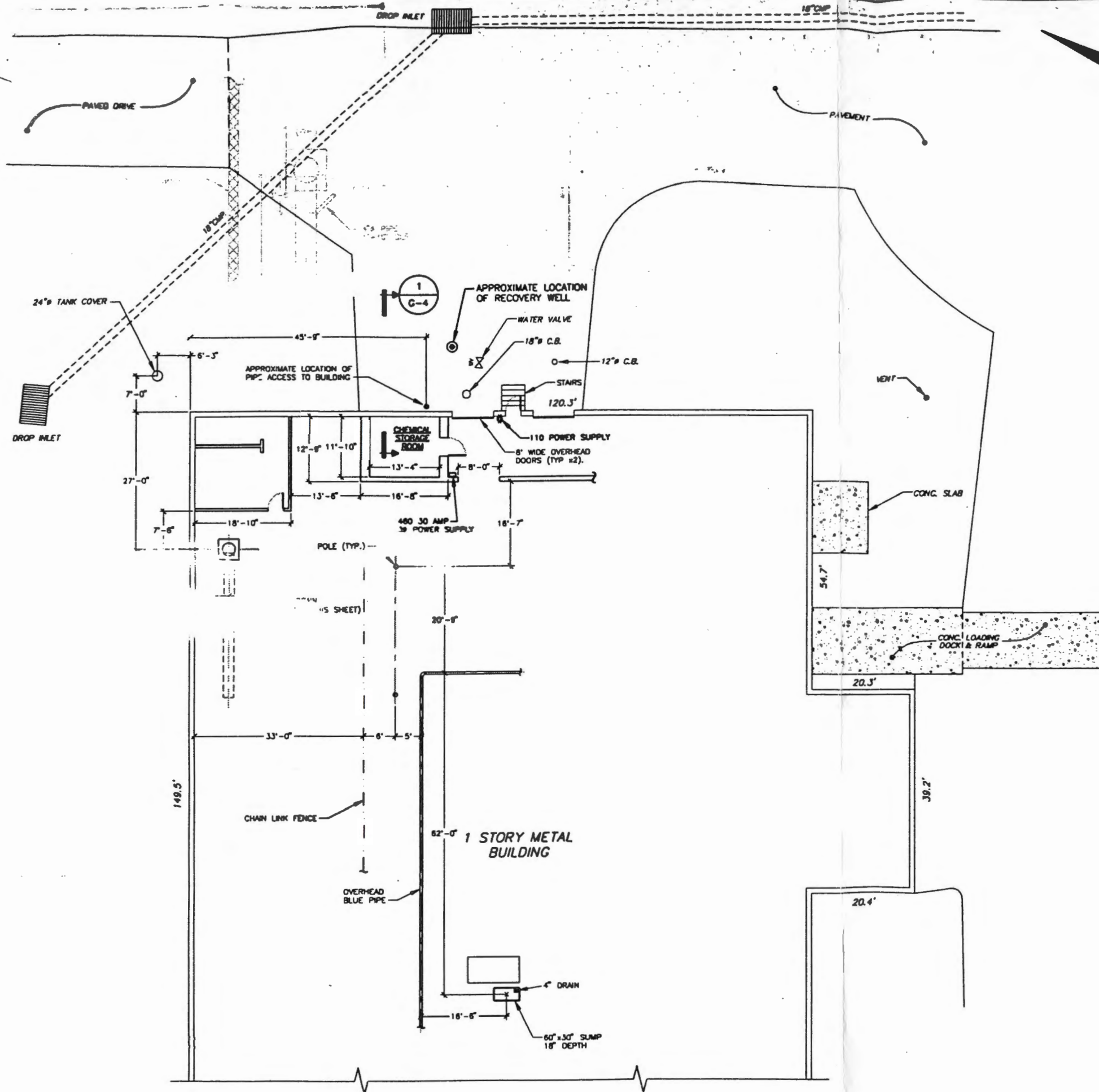
GROUND WATER CONTOUR MAP
24 JANUARY 2001
CANANDAIGUA, NEW YORK

PREPARED FOR
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ERM
ERM

SCALE NTS	FIGURE 1
DATE 01/01	



TRENCH DRAIN DETAIL
SCALE: 1" = 3'-0"

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DATE: 12/1/95

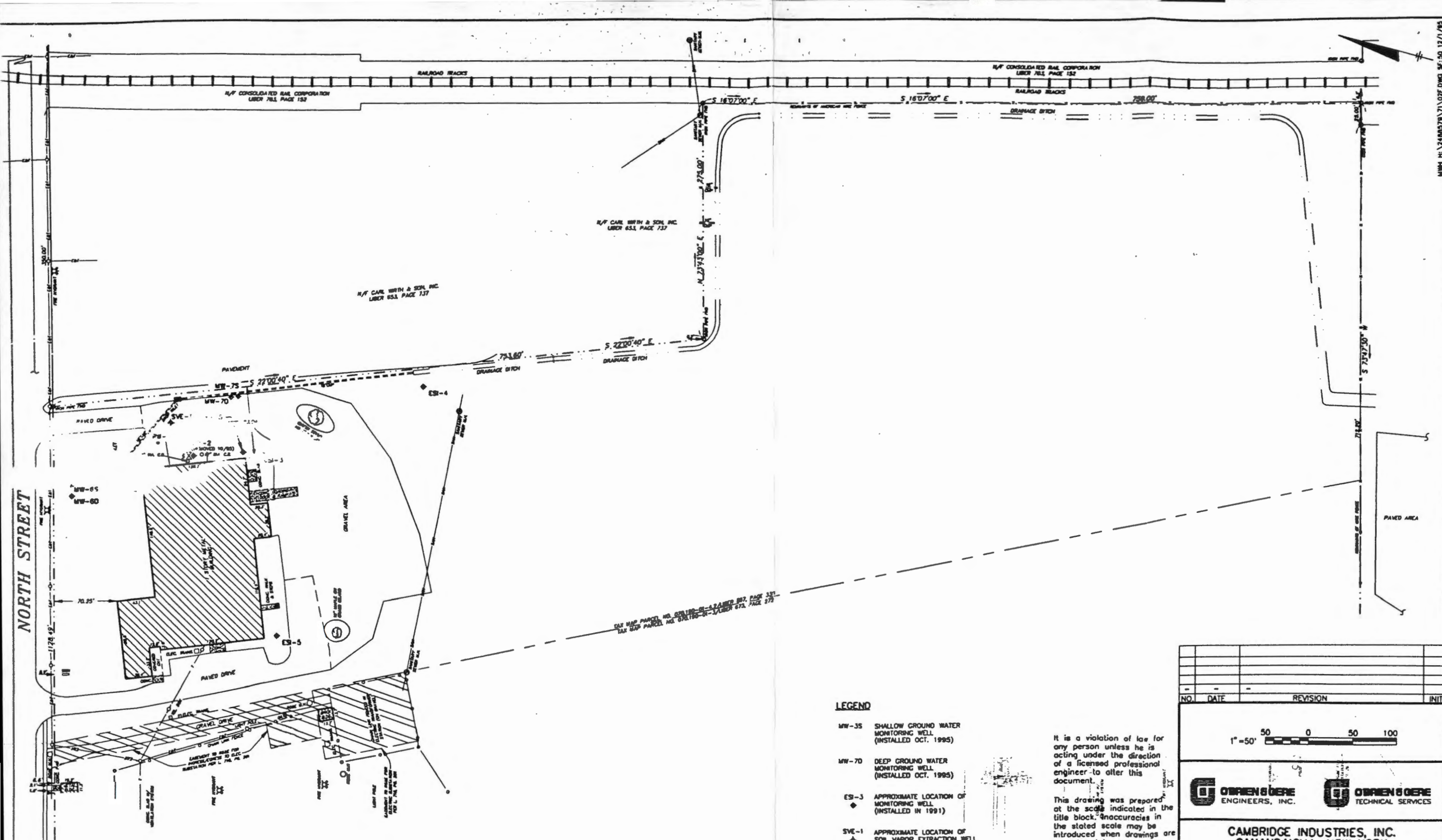
NO.	DATE	REVISION	IN
CAMBRIDGE INDUSTRIES, INC. CANANDAIGUA, NEW YORK SOIL AND GROUND WATER REMEDIAION PROJECT			
GENERAL			
FACILITY PLAN			
In charge of..... Designed by.....Checked by..... Drawn by.....		FILE NO. 2488.578-04F DATE NOVEMBER 1995	G-3 R-0

CAMBRIDGE INDUSTRIES, INC.
CANANDAIGUA, NEW YORK
SOIL AND GROUND WATER
REMEDIATION PROJECT

FACILITY PLAN

In charge of.....	FILE NO. 2488.578-04F	G-3
Designed by.....Checked by.....	DATE NOVEMBER 1995	R-0
Drawn by.....		

Designed by.....Checked by.....	DATE	R-0
Drawn by.....	NOVEMBER 1995	



LEGEND

- MW-35 SHALLOW GROUND WATER MONITORING WELL (INSTALLED OCT. 1995)
- MW-70 DEEP GROUND WATER MONITORING WELL (INSTALLED OCT. 1995)
- ESI-3 APPROXIMATE LOCATION OF MONITORING WELL (INSTALLED IN 1991)
- SVE-1 APPROXIMATE LOCATION OF SOIL VAPOR EXTRACTION WELL (INSTALLED OCT. 1995)
- APPROXIMATE LOCATION OF RECOVERY WELL

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DATE: 12/1/95

NO.	DATE	REVISION	INIT

1" = 50'

50 0 50 100

ODRIEN & ODRIEN
ENGINEERS, INC.

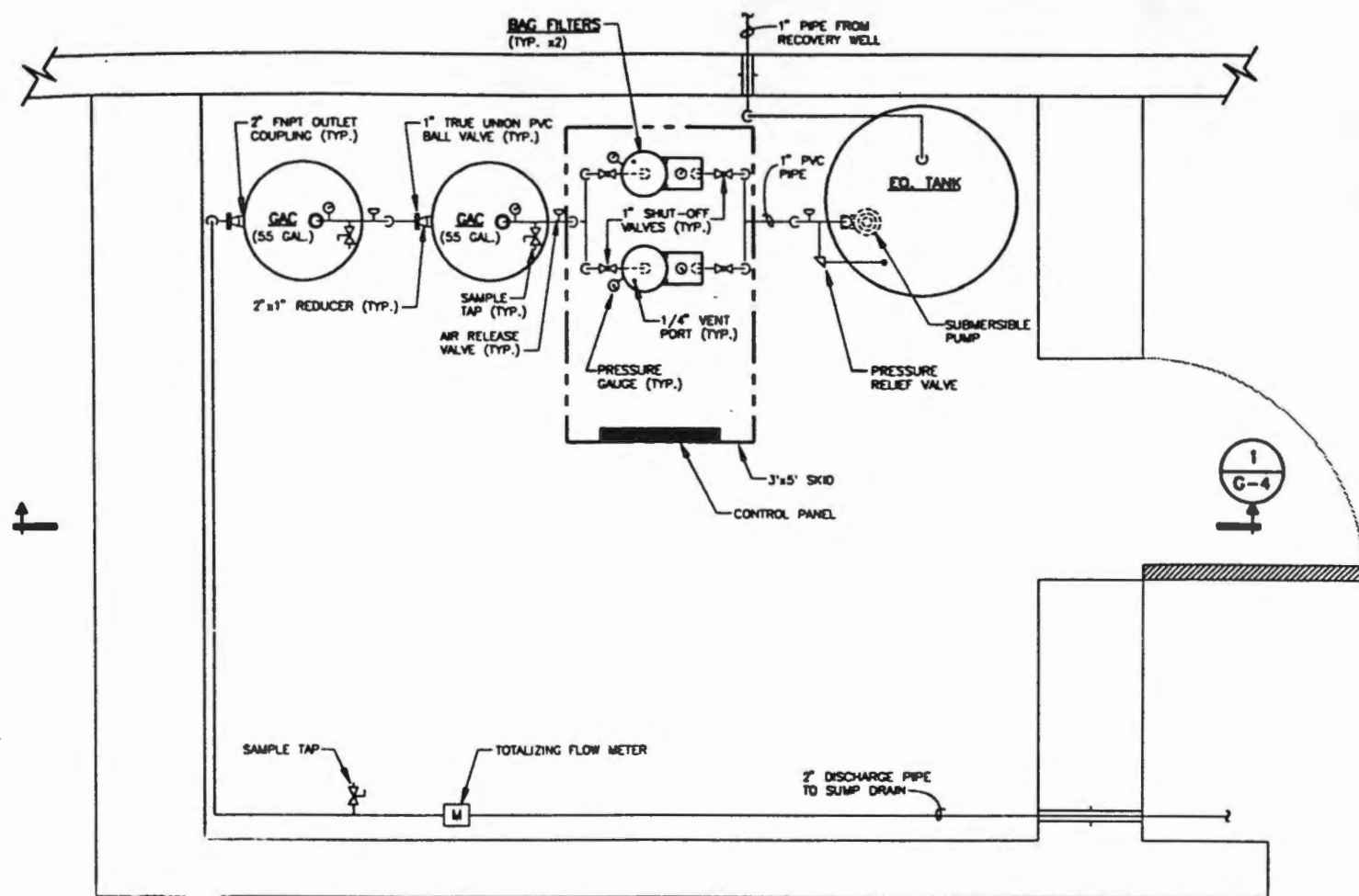
ODRIEN & ODRIEN
TECHNICAL SERVICES

CAMBRIDGE INDUSTRIES, INC.
CANANDAIGUA, NEW YORK
SOIL AND GROUND WATER
REMEDATION PROJECT

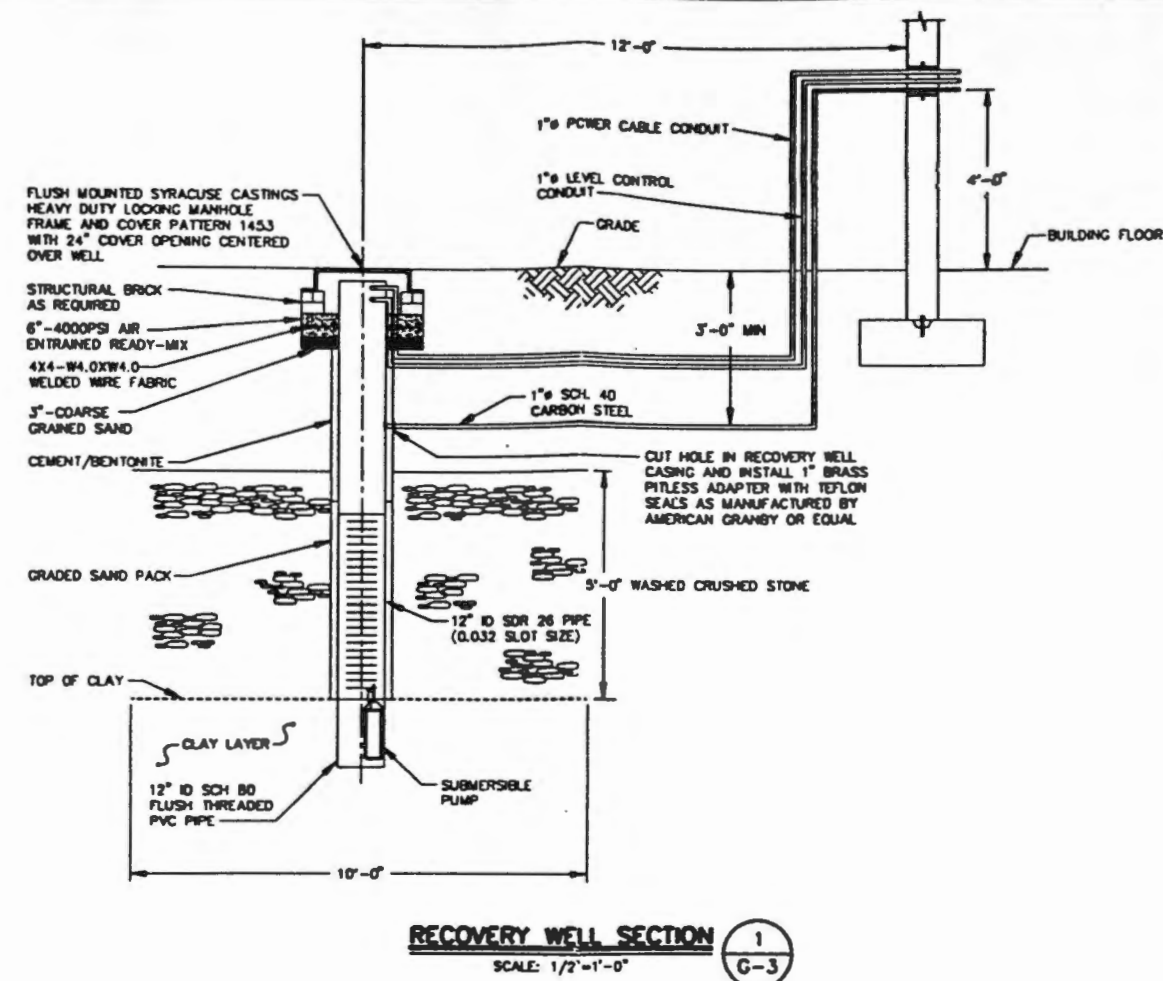
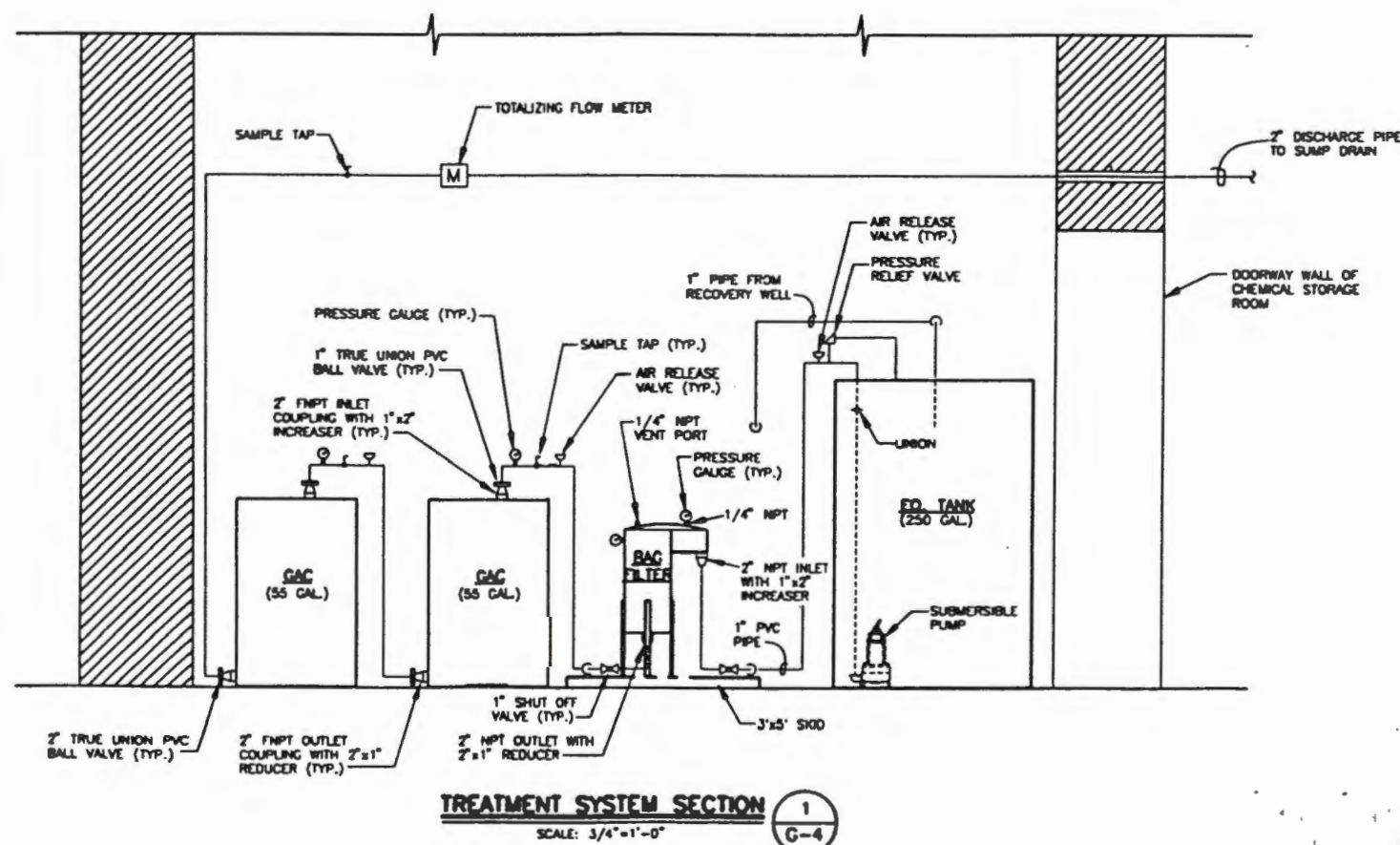
GENERAL

EXISTING SITE PLAN

In charge of.....	FILE NO. 2488.579-02F	G-1
Designed by.....	Checked by.....	DATE NOVEMBER 1995
Drawn by.....		R-0



TREATMENT SYSTEM PLAN



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NO.		DATE		REVISION					
$\frac{1}{2}'' = 1' - 0''$ 									
$\frac{3}{4}'' = 1' - 0''$ 									
 DORRICH & DERE ENGINEERS, INC.  DORRICH & DERE TECHNICAL SERVICES									
CAMBRIDGE INDUSTRIES, INC. CANANDAIGUA, NEW YORK SOIL AND GROUND WATER REMEDICATION PROJECT									
GENERAL									
TREATMENT SYSTEM PLAN, SECTION AND DETAILS									
In charge of Designed by _____ Drawn by _____					FILE NO. 1-2488-579-011 DATE NOVEMBER 1995				
Checked by _____					G-4 R-0				



O'BRIEN & GERE
ENGINEERS, INC.

December 13, 1995

Mr. Douglas Hotchkiss
Cambridge Industries
203 North Street
Canandaigua, New York 14424

*please make a
STAT AT THIS SAT.*

*DW
12/16*

*Jim - Has the Package on
MEPCO system. Chris & I found
system not sat A.M. we changed
filters, vent + it appeared to run
all right. 1K GPM into tank is
30PM + GPM to drain is 56PM
why are we hitting the tank high
level switch? See wiring
diagram + literature.*

Re: Cambridge Industries
Canandaigua, New York

File: 2488.579 #2

Dear Mr. Hotchkiss:

Enclosed please find product bulletins/manuals for various equipment utilized in the ground water treatment system recently installed at Cambridge Industries. Included are guidelines for installation, operation and maintenance instructions, and troubleshooting guidance for the major equipment installed. This equipment includes both pumps (well pump and skid-mounted system pump), bag filters, granular activated carbon (GAC) canisters, level switches, pressure control device, flow meters, and true union ball valves. Also enclosed, for your information, is the control panel wiring diagram for the system. A full and a half-size set of project drawings will be sent to you shortly.

If there is any additional information you require, please let me know.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Nancy T. Zacharek

Nancy T. Zacharek
Staff Engineer

3N235D

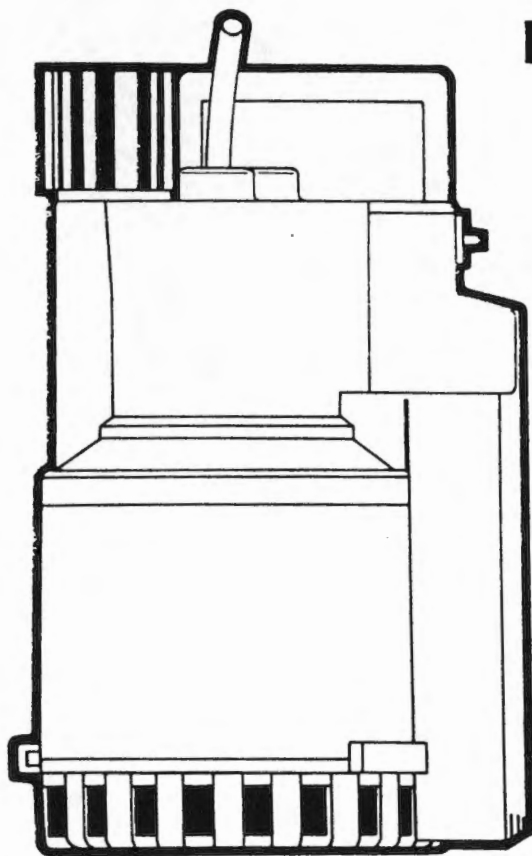
sc:CAM\18
Enclosures

cc: D. Tackman - Cambridge Industries
J. Gifford - O'Brien & Gere Manufacturing
P. Mazurkiewicz - O'Brien & Gere Technical Services
D.S. Towers - O'Brien & Gere Engineers, Inc.

Installation and Operating Instructions

ABS

Drainage Pumps – Robusta 300WTS Robusta 200WTS Robusta 120WTS



● BUILT-IN CHECK VALVE

- LIGHT WEIGHT
- ENERGY EFFICIENT
- AUTOMATIC OR MANUAL
- BUILT-IN THERMAL PROTECTION
- WATER COOLED

 Distributed By:

ABS PUMPS INC, 140 Pond View Drive, Meriden CT 06450 — 7156.

(203) 238 - 2700
Fax: (203) 238 - 0738

APPLICATION

Compact submersible drainage pumps from ABS are used where large quantities of clear, rain or dirty water must be pumped quickly and reliably.

Permanent installations of pumps include basement and industrial sumps for water removal. They are also suitable for pumping washing effluent, for the drainage of buildings and for pumping rainwater out of lower level rooms or underpasses.

They are used as portable pumps to fill or empty containers of every type, for use in drainage pits, to maintain dry conditions in ditches and to pump out flooded cellars.

HANDLING

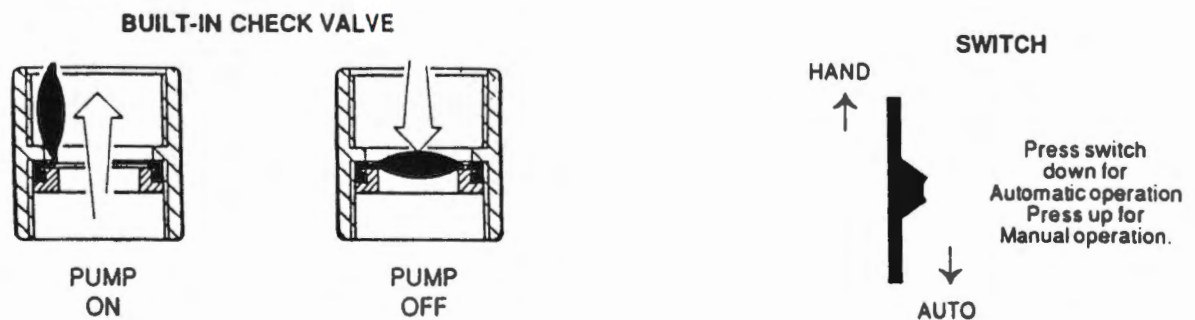
The pump is easy to transport and should always be carried by the carrying handle. It should never be suspended or raised by means of the power cable.

INSTALLATION AND OPERATION

The pumps are supplied ready for operation.

WARNING: Pumps must be installed in accordance with governing national and local electrical codes.

NOTE: PUMP DISCHARGE CONTAINS AN INTERNAL BUILT-IN CHECK VALVE.—see illustration.



FOR AUTOMATIC OPERATION of pumps, install discharge hose or pipe to pump discharge. Position the pump in the sump, switch to the automatic position by pushing the switch down, and energize with the correct voltage. The float switch will now start the pump when the water level reaches about 6"; pump shuts off at about 2". Be sure to test automatic operation after installing to make sure pump is operating properly.

FOR MANUAL OPERATION, install discharge hose or pipe to pump discharge, place the pump in the water to be pumped, switch to the manual "Hand" position by pushing the switch up and energize with the correct voltage. Switch the pump off when the water level reaches approximately 2", by pushing the switch down into the automatic position, or by unplugging the power cord.

NOTE: In portable applications, when a sump is pumped down below 1" of water, the pump may require approximately 30 seconds to purge air from the discharge when restarting.

MAINTENANCE

The pump has permanently lubricated bearings and an overload protection device to ensure maximum pump serviceability. Regular inspection and maintenance are, however, recommended in order to ensure long service life.

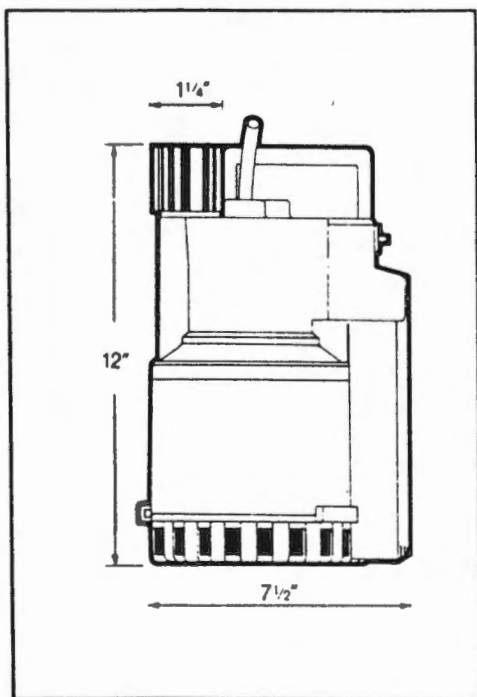
Always disconnect pump from electrical source before performing any type of maintenance. The pump (and float area) should be cleaned from time-to-time (depending on degree of dirt present), and the float cover and inlet screen cleaned and rinsed in clean water. The float cover is removed first and then the inlet screen can be removed by turning it clockwise. This also allows the removal of the lower volute, so that the impeller area may also be cleaned.

To clean the float switch area, do so after removing the inlet screen and the volute. This now exposes a large portion of the bottom area of the float switch assembly. This area can now be rinsed easily with running water.

NOTE: When replacing the bottom volute, be sure the small hole toward the outside fits over the locating pin.
When replacing float cover, be sure that float is in correct position.

Never open the motor section of the pump, as dismantling could damage the seals.

DIMENSIONS



TECHNICAL DATA:

MODEL	ROBUSTA 300WTS	ROBUSTA 200WTS	ROBUSTA 120WTS
Current	Single Phase	Single Phase	Single Phase
HP	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$
RPM	3450	3450	3450
Voltage	115	115	115
Amps	See Pump Nameplate		
Discharge	$1\frac{1}{4}$ "	$1\frac{1}{4}$ "	$1\frac{1}{4}$ "
Height	12"	12"	12"
Width	$7\frac{1}{2}$ "	$7\frac{1}{2}$ "	$7\frac{1}{2}$ "
Weight	13lbs	12.5lbs	11.5lbs
Cable	10 ft.	10 ft., U.L. listed.	10 ft., U.L. listed.

Warranty

ABS Pumps Inc. warrants its ROBUSTA Pumps to be free from defects in workmanship and material for a period of twelve (12) months from the date of sale to end customer. Pumps used in transportable (i.e. contractor dewatering) applications carry a six (6) month warranty from the date of sale to end customer. This warranty does not cover the pumping of chemically or abrasively polluted water. ABS Pumps Inc. shall not be liable for any special, indirect or consequential damages of any kind. Defective equipment will be repaired or replaced. Returns must have prior written authorization from the company and be shipped prepaid.

NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WILL APPLY.



OPERATING INSTRUCTIONS & PARTS MANUAL

CORROSION RESISTANT CENTRIFUGAL PUMPS

MODELS 2P688 THRU 2P692, 3P962 AND 3P963

FORM 5S3087

07955-1111
0394/032/5C

READ CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

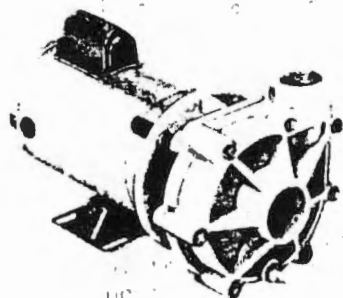


Figure 1

Description

Teel close-coupled corrosion resistant centrifugal pumps are precision molded for liquid transfer, recirculation and other applications where no suction lift is required. Pumps are for use with nonflammable liquids compatible with polypropylene pump construction with mechanical seal of carbon/ceramic seal/seat faces with viton elastomers. Liquid temperature range is 40 to 180°F. Driver: Dayton 3450 RPM, 60 Hz, single or three phase motor with sealed ball bearings. NEMA 56J frame with threaded shaft. Automatic overload protection on single phase models.

General Safety Information

1. Know the pump application, limitations, and potential hazards.

⚠ WARNING ⚠

DO NOT USE TO PUMP FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. DO NOT USE IN FLAMMABLE AND/OR EXPLOSIVE ATMOSPHERES. PUMP SHOULD ONLY

BE USED WITH LIQUIDS COMPATIBLE WITH PUMP COMPONENT MATERIALS. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

2. Make certain that the power source conforms to the requirements of your equipment.
3. Provide adequate protection and guarding around moving parts
4. Disconnect power before servicing.
5. Release all pressure within the system before servicing any components.
6. Drain all liquids from the system before servicing.
7. Secure the discharge line before starting the pump. An unsecured discharge line will whip, possibly causing personal injury and/or property damage.
8. Check hoses for weak or worn condition before each use, making certain that all connections are secure.
9. Periodically inspect pump and system components. Perform routine maintenance as required (see Maintenance section).
10. Provide a means of pressure relief for pumps whose discharge line can be shut off or obstructed.
11. Personal Safety:
 - a. Wear safety glasses at all times when working with pumps.
 - b. Wear a face shield, proper apparel, and proper respiration when pumping hazardous chemicals.
 - c. Keep work area clean, uncluttered and properly lighted, replace all unused tools and equipment.

Specifications and Performance

	MOTOR			DIMENSIONS					GALLONS OF WATER PER MINUTE								
MODEL	HP	TYPE	60 Hz VOLTS	INLET	OUTLET	H	W	L	10	20	30	40	50	60	70	80	MAX HEAD (FT)
2P688	1/3	Split Phase	115	1½	1½	7½	8¾ ₁₆	14 ⁷ / ₁₆	33	30	27	22	17	13	6	—	78
2P689	1/2	Capacitor	115/230	1½	1½	7½	8¾ ₁₆	14 ¹¹ / ₁₆	47	43	38	33	28	24	15	3	82
2P690	3/4	Capacitor	115/230	1½	1½	7½	8¾ ₁₆	15 ⁹ / ₁₆	64	61	58	53	48	40	30	17	88
3P963	3/4	3-Phase Tefc	220/440	1½	1½	7½	8¾ ₁₆	15 ⁹ / ₁₆	37	33	29	24	18	10	2	—	71
2P691	1	3-Phase Tefc	220/440	1½	1½	7½	8¾ ₁₆	15 ¹¹ / ₁₆	56	52	48	44	38	28	13	—	78
2P692	1½	3-Phase Tefc	220/440	1½	1½	7½	8¾ ₁₆	15 ⁹ / ₁₆	82	50	78	73	65	56	45	26	90
3P962	2	3-Phase Tefc	220/440	1½	1½	7½	8¾ ₁₆	15 ⁹ / ₁₆	114	112	106	99	88	76	61	33	88

(*) Shut-off: to convert to PSI, divide by 2.31. (†) Models 2P688, 2P689, and 2P690 have Automatic Thermal protection.

Installation (Continued)**Minimum Wire Sizes for Single-Phase Motors**

Motor HP	25 Feet		50 Feet		100 Feet		150 Feet		200 Feet	
	115V	230V	115V	230V	115V	230V	115V	230V	115V	230V
1/3	14	14 (18)*	10	14 (16)*	8	14	6	12	4	10
1/2	12	14 (18)*	8	14	6	12	4	10	3	8
3/4	10	14 (16)*	6	12	4	10	2	8	1	6

(*) Type S, SO, SJ, SJO, etc. flexible cable wire sizes. See NEC Article 400 for ampacity.

Minimum Wire Sizes for Three-Phase Motors

Motor HP	25 Feet to 50 Feet		100 Feet		150 to 200 Feet	
	230V	460V	230V	460V	230V	460V
3/4	14 (16)*	14 (18)*	14	14 (18)*	10	14 (16)*
1	14 (16)*	14 (18)*	12	14 (18)*	10	14 (16)*
1½	14	14 (18)*	10	14 (16)*	8	14
2	12	14 (18)*	10	14 (16)*	6	12

(*) NEC 310-5 Minimum conductor size for General Wiring at 115-440VAC is No. 14AWG.

To connect motor for proper voltage, refer to the connection diagram located on the nameplate or inside the terminal box. Proper shaft rotation for all units is CCW. Before filling three-phase a unit with water, momentarily "bump" the motor to check for proper rotation. If rotation is not CCW, interchange any two leads to reverse rotation. Rotation cannot be changed for single phase units.

⚠ CAUTION

Clockwise rotation will destroy motor. Incorrect wiring is not covered under limited warranty. Units are designed for 60 Hz operation only.

It is strongly recommended that this unit is plugged into a GFI (Ground Fault Interrupted circuit). Consult your local electrician for installation and availability.

Operation

1. Fill pump and suction piping with water. Your centrifugal pump must be satisfactorily primed before it will pump. Satisfactory priming requires that all air be removed from the pump and suction lines and that these areas be completely filled with liquid. This must be accomplished with the pump at a standstill. A priming cup installed in the discharge line just above the pump is recommended.
2. Begin pumping operation as follows:

⚠ CAUTION

Unit must be full of liquid to be pumped, in order to cool and lubricate the seal surfaces. Do not run pump dry, since permanent damage to seal will result. Never shut off discharge or restrict suction flow while unit is operating.

- a. For models 2P688, 2P689, and 2P690, activate the unit.
- b. For models 2P691 and 2P292,
FIRST: POWER SHOULD BE APPLIED MOMENTARILY TO THE PUMP, AND THE DIRECTION OF ROTATION DETERMINED. WHEN VIEWING THE UNIT FROM THE FRONT OF THE PUMP HOUSING, IMPELLER ROTATION SHOULD BE COUNTERCLOCKWISE. IF IT IS NOT, DISCONNECT POWER AND RECHECK WIRING TO MOTOR. (SEE "INSTALLATION.")

3. On initial start up, check power consumption to be sure motor is not overloaded.
4. If the motor is overloaded, a valve must be installed in the discharge line to increase the back pressure and reduce motor overloading.

Maintenance**ROUTINE****⚠ CAUTION**

Pump should be drained before servicing or if subjected to freezing temperatures. A drain plug is provided on the pump.

Clean the suction line strainer at regular intervals. Properly selected and installed electric motors are capable of operating for years with minimal maintenance. Periodically clean dirt accumulation from open-type motors, especially in and around vent openings, preferably by vacuuming (avoids imbedding dirt in windings). Pump motor is provided with sealed ball bearings. Normal relubrication of the bearings is not required. Periodically check that electrical connections are tight.

MECHANICAL SEAL

All Teel pumps are furnished with a precision mechanical seal. This seal is installed and checked at the factory and should require no adjustment at the time of installation of the pump. Running the pump without water will result in rapid seal failure.

After the pump has been in service for a long period of time, or if the pump has seen severe service on abrasive materials, it may be necessary to replace this seal (the seal may leak). Leakage can be detected by a dripping or flow of liquid from the area around the motor shaft.

⚠ CAUTION

The precision lapped faces on the mechanical seal are easily damaged. Handle your replacement seal carefully and read these instructions before attempting to replace the seal.

Pump performance check should be an ongoing maintenance procedure. If anything has changed since unit was new, unit should be removed and repaired or replaced. Only qualified electricians or servicemen should attempt to repair this unit. Improper repair and/or assembly can cause an electrical shock hazard.

DISASSEMBLY

1. Shut OFF power to motor before disconnecting any electrical wiring from the back of the motor.
2. Disassemble the body-motor assembly from the volute. (The volute may be left in-line if you wish.)
3. Unscrew impeller turning it CCW facing the impeller. NOTE: Many motors have a screwdriver slot or two flats at the rear of the motor shaft (pry off bearing cap for access) for use with an open-end 7/16" wrench. To keep the motor shaft from turning, either insert a large screwdriver blade into the slot, or use a 7/16" wrench across the flats.
4. Remove ceramic seat from impeller.
5. Detach body from motor.
6. Remove carbon-graphite seal from body by pressing out from the back (use socket or the like to press out). Do not dig out from the front!

Maintenance (Continued)**ASSEMBLY**

1. Clean and inspect all pump parts (O-ring, seal, seats, motor shaft, etc.).
2. Apply sealant (Loc-tite RC-609) in body bore hole according to sealant instructions.
3. Press carbon graphite seal into body while taking care not to damage carbon graphite face.
4. Place axial lip seal (rubber washer) over motor shaft and mount body to motor.
5. Carefully lubricate (with rubber lubricant) rubber seat cup around ceramic piece and press into impeller. (If ceramic has O-ring, the marked side goes in.)
6. Handle seal carefully. Do not touch the carbon graphite and ceramic sealing surfaces. Lubricate motor shaft and rubber seat cup of seal that slides down shaft (see Figure 3) with water and dish soap (3 drops to 1 oz. water).
7. Thread impeller onto shaft and tighten! See note in #3. Disassembly.
8. Electrically connect the motor so that the impeller with rotate CCW when facing the pump with the motor toward the rear.
9. Seat O-ring in volute slot and assemble volute to body.
10. Install drain plug in volute drain hole.

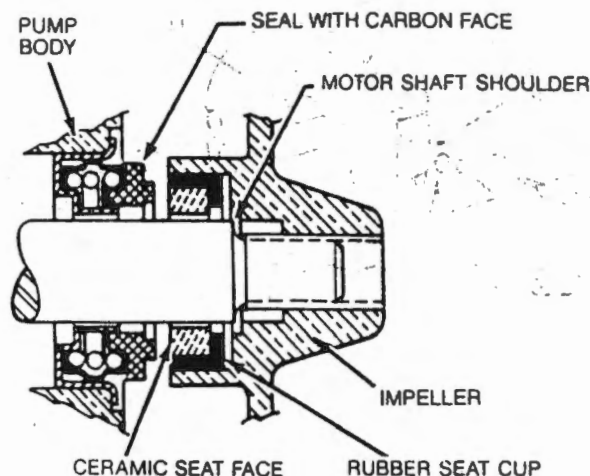


Figure 3 — Seal Arrangement

Troubleshooting Chart

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Pump will not prime or retain prime after operating	1. Air Leak in suction line 2. Clogged strainer 3. Leaky foot valve	1. Repair or replace suction line 2. Clean or replace strainer 3. Clean, repair or replace foot valve
Flow rate is low	1. Piping is fouled or damaged 2. Clogged impeller or worn impeller 3. Discharge line restricted or undersized 4. Plumbing restrictions	1. Clean or replace piping 2. Clean or replace impeller 3. Flush out piping or replace 4. Remove restrictions
Pump runs but no fluid is pumped	1. Faulty suction piping 2. Pump located too far from fluid source 3. Gate valved closed 4. Clogged Strainer 5. Fouled foot valve 6. Discharge height too great or too long	1. Replace piping 2. Relocate pump 3. Open valve 4. Clean or replace strainer 5. Clean or replace valve 6. Lower the height or shorten pipe
Liquid drips from point where shaft enters the pump casing, when pump is full of liquid	1. Damaged mechanical seal 2. Liquid not compatible with seal	1. Replace mechanical seal 2. Check compatibility, use components that are compatible
Excessive noise while pump is in operation	1. Pump not secured to firm foundation 2. Piping not supported to relieve any strain on pump assembly 3. Restricted suction line	1. Secure pump properly 2. Make necessary adjustments 3. Clean or correct suction line

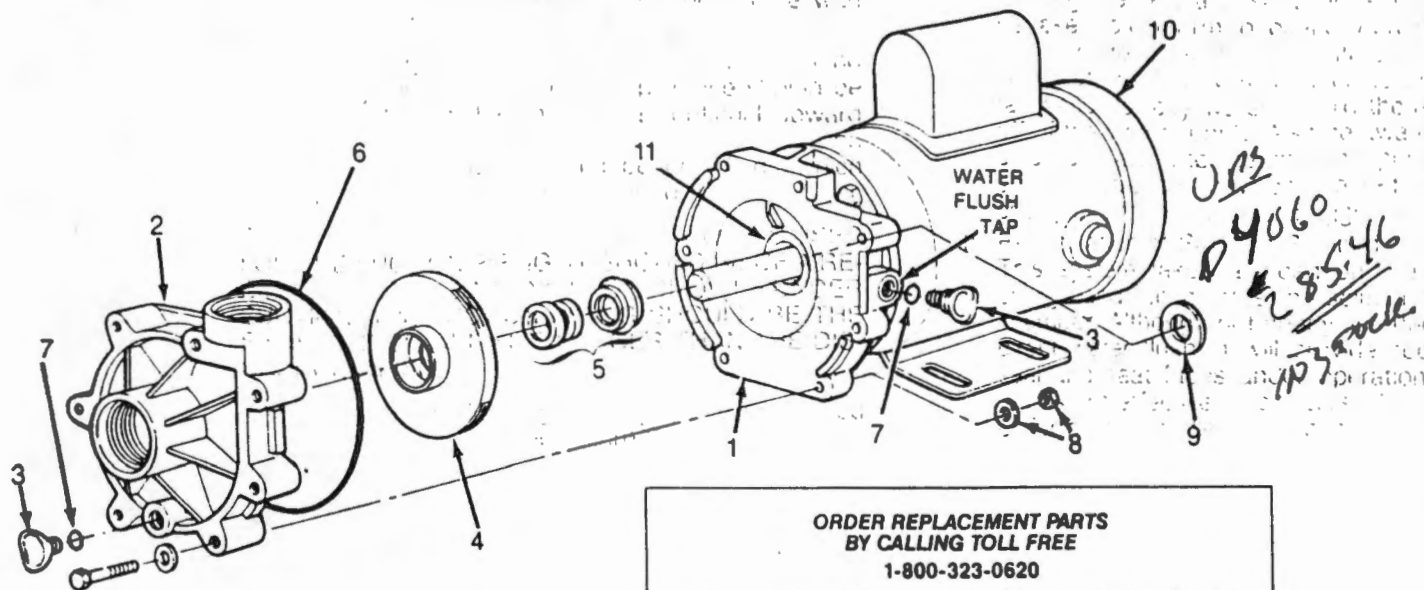


Figure 4 — Replacement Parts Illustration

Replacement Parts List

REF. NO.	DESCRIPTION	PART NUMBER FOR MODEL							QTY.
		2P688	2P689	2P690	2P691	2P692	3P962	3P963	
1	Body	18739	18739	18739	18739	18739	18739	18739	1
2	Housing	13474	13474	13474	13474	13474	13474	13474	1
3	Drain plug	18355	18355	18355	18355	18355	18355	18355	2
4	Impeller	18348	18349	18350	18349	18351	19541	19539	1
5	Seal assembly	15032	15032	15032	15032	15032	15032	15032	1
6	O-ring gasket	13259	13259	13259	13259	13259	13259	13259	1
7	Drain plug O-ring	13312	13312	13312	13312	13312	13312	13312	2
8	Fastener kit	13437	13437	13437	13437	13437	13437	13437	1
9	Axial lip seal	14990	14990	14990	14990	14990	14990	14990	1
10	Motor	6K578A	6K580A	6K581A	3N235	3N236	3N681	3N234	1
11	O-ring	18807	18807	18807	18807	18807	18807	18807	1

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY Corrosion resistant centrifugals, Models 2P688 thru 2P692, 3P962 and 3P963, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from state to state.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to, and shall not exceed, the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many states and localities have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product application, and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some states do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, IL 60714 U.S.A.

Installation (Continued)

2. Mount unit on a solid foundation and secure with appropriate fasteners.
3. Attach piping suction line to suction inlet and piping discharge outlet. The suction piping line should be positioned such that there is a continual upward slope from the fluid source to the pump. Avoid using loops or other sections of pipe or fittings which might permit air to become trapped.

IMPORTANT: IF PLASTIC OR FABRIC HOSE IS USED FOR THE SUCTION PIPING, IT SHOULD BE OF A REINFORCED TYPE SO AS NOT TO COLLAPSE UNDER SUCTION. THE SUCTION PIPING SHOULD BE THE SAME SIZE OR ONE SIZE LARGER THAN THE DISCHARGE PIPING.

4. For location of discharge piping (parts mentioned below not furnished) see Figure 2.
 - a. Install short nipple (3 to 12" long).
 - b. Install gate valve, short nipple (3") and union.
 - c. The remaining system components may be connected to this arrangement as required.

The purpose of the above piping configuration is for priming (remove tee plug and fill with water), gate valve for regulating water demand, and union for servicing.

5. Water Flushed Seals

Water flushed seals are recommended for abrasive solutions, or when pumps may be run dry or against dead head conditions. Where conditions cause the pumped liquid to form crystals, or if the pump remains idle for a period of time without adequate flushing, a water flush seal system is advised. The water flush will provide decontamination of chemicals on elastomers and seal and seat faces, while providing lubrication required for start-up.

If a water flush line is used, then a gauge and valve should control the flow of flush water to the seal face. In most cases a very low flow rate is all that is needed.

⚠ WARNING ⚠

DO NOT RUN DRY!

Two methods of water flush can be used:

- a. Direct Plumbing to City Water
This provides the best possible approach to

flushing the seal and seat faces. Caution must be taken to conform to local city ordinances that may require backflow preventers. These are a series of check valves required to prevent contamination of city water should there be a shut off of the water supply. Also be aware of the addition of water into the chemical pumped where some imbalance may be created altering the chemical's formulation and aggressiveness.

b. Recirculation of Solution Pumped

This system takes a bleed off the pump discharge and recirculates the solution to the seal chamber. Although not nearly as effective as the direct water flush, it will provide cooling to the seal and seat faces under operation. This system is not effective where crystallization occurs, or for pumps in idle conditions.

6. Wiring

Voltage, frequency, and phase of power supply must be that shown on the motor nameplate. On three-phase systems, voltage on all three lines must be balanced.

- a. Connections should be made with flexible conduit to minimize vibration transmission.
- b. Use wire of adequate size to minimize voltage drop at the motor.

Use of a motor starter, either manual or magnetic, incorporating thermal protection, is advisable and may be required by local electrical codes. Follow motor starter manufacturer's recommendation on thermal overload relay heater selection. Do not oversize heaters. On three-phase systems, three-phase systems, three heaters must be used.

Wherever possible, each motor should be powered from a separate branch circuit of adequate capacity to prevent voltage drop, during starting and running, to a minimum. Increase wire size where the motor is located a distance from the power source.

Three-phase must be wired for proper pump rotation as noted on rotation decal on top of motor.

Where extension cords are used, they should be as short as possible, for the minimum voltage drop. Long or inadequately sized cords, especially on hard starting loads, can cause motor failure. Always use grounding-type (3 conductor) extension cords in conjunction with a properly connected grounding-type receptacle.

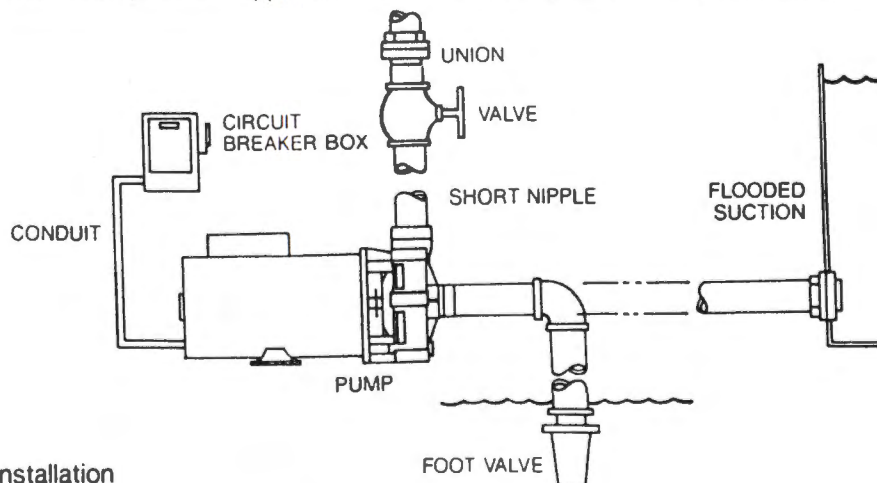


Figure 2 — Typical Installation

GEMS®

Instruction Bulletin
No. 72950

LS-2050/LS-52100 Series Side-Mounted Level Switches

Part Numbers
30288, 30290, 48068, 48069, 52100,
116971, 116972

Units are side-mounted in the tank at the point of high, low or intermediate level sensing. Ideal for tanks with "hard-to-get-at" tops or bottoms. Float-and-cam action is positive. Standard versions are U.L. Recognized - File No. E45168 and are CSA Listed. Explosion-proof units are approved for Class I, Division I, Group D hazardous areas.

Standard Versions	Explosion-Proof Versions		Switch*
	FM Approved	CSA Listed	
<u>LS-2050's</u>			
30288	—	—	SPDT, 20 VA
30290	55690	140436	SPDT, 20 VA
48068	—	—	SPST, 100 VA, N.O.**
48069	—	—	SPST, 100 VA, N.C.**
<u>LS-52100's</u>			
52100	121753	140447	SPDT, 20 VA
116971	—	—	SPST, 100 VA, N.O.**
116972	—	—	SPST, 100 VA, N.C.**

*See "Electrical Data" on next page for more information

**100 VA switches are not UL recognized.

Specifications . . .

	LS-2050		LS-52100
Stem & Mtg Material	Brass	316 SS	316 SS
Float Material	Buna N	316 SS	304 SS
Other Wetted Materials	SS, 316 SS, Beryllium, Copper, Teflon Ceramic	SS, Teflon, Ceramic	430 SS, Teflon, Ceramic
Operating Temp °F	Water: To +180°F Oil: -40° to +250°F	-40°F to +300°F	
PSIG, Max. @ 70°F	150	900	200
Mounting Attitude	Horizontal: ±15°		
Switch Differential (In Liquid)	1/2" Min.	Approx. 3/4"	
Liquid Specific Gravity	.8 Min.	.9 Min.	.85 Min.
Lead Wires	#18 AWG, 24" L., Polymeric		

Electrical Data ...

Switch Ratings - Max. Resistive Load

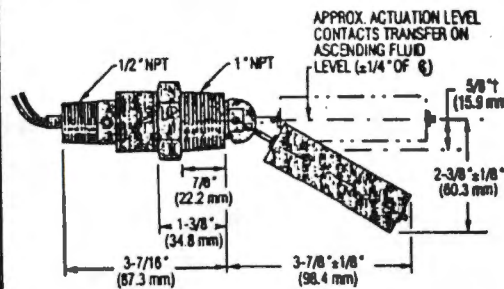
VA	Volts	Amps A.C.	Amps DC
20	0-30	.4	.3
	120	.17	.13
	240	.08	.06
100*	120	.8**	N.A.
	240	.4	N.A.

* 100 VA switches are not U.L. Recognized.

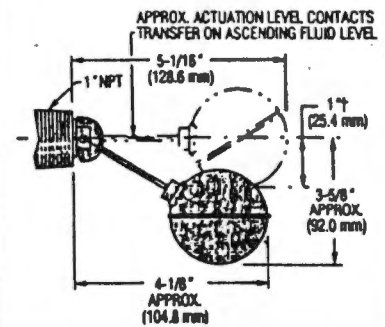
** Limited to 50,000 operations.

Dimensional Data ... LS-2050 Series

Brass/Buna N

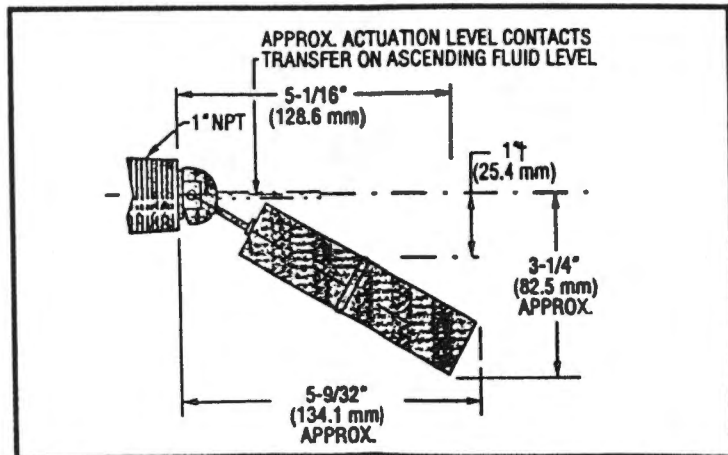


All Stainless Steel



* Approximate de-actuation level, nominal (based on a liquid specific gravity of 1.0).

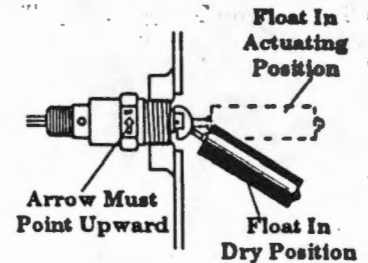
Dimensional Data ... LS-52100 Series



To Install LS-52100 Series or LS-2050 Series Units with Buna N Float ...

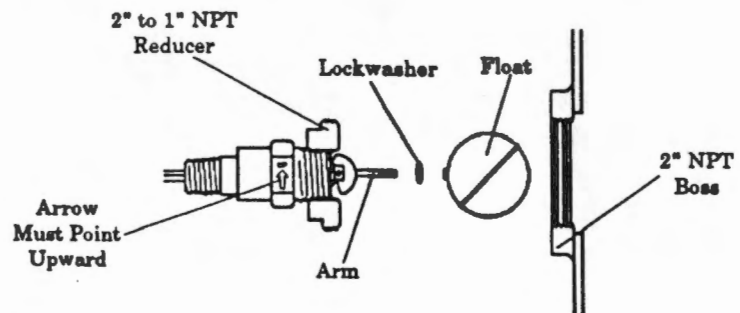
Insert unit from the outside through 1" NPT boss in the tank side and tighten so that the arrow on the unit housing is pointing upward.

IMPORTANT: Units should be installed in environments free from excessive contamination and high shock.

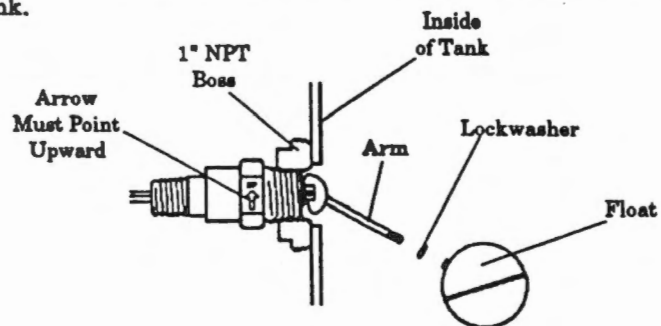


To Install LS-2050 Series Units with Stainless Steel Float ... (Use either Method A or Method B shown below)

Method A: From outside of tank. Unscrew and remove float and lockwasher from unit arm. Thread a 2" to 1" NPT reducer (by others) onto unit and reassemble float and lockwasher. Insert unit and reducer in 2" NPT boss in tank side and tighten so that arrow on unit housing points upward.

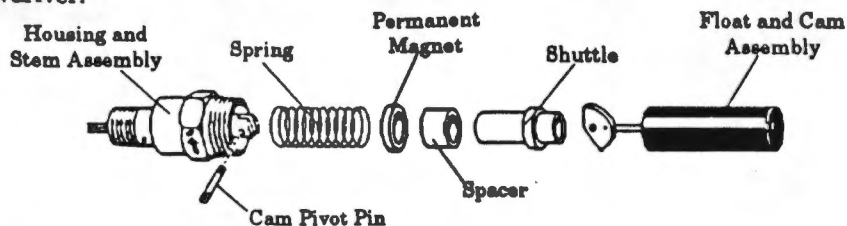


Method B: When inside of tank is accessible. Unscrew and remove float and lockwasher from unit arm. Insert unit in 1" NPT boss in tank and tighten so that arrow on housing points upward. Reassemble float and lockwasher on unit arm from inside of tank.



Maintenance...

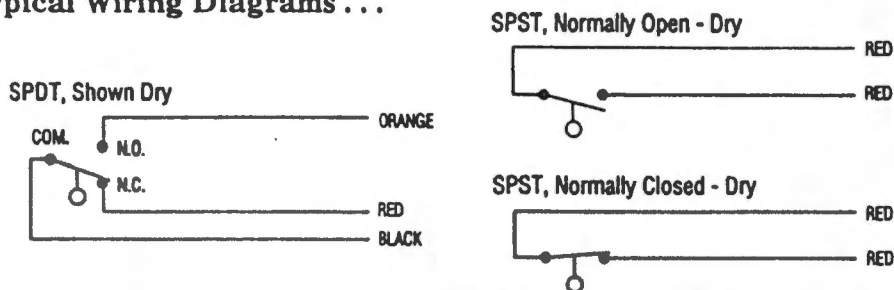
An occasional cleaning when excessive contamination is present in the liquid is all that is normally required. To clean unit: Compress split end of cam pivot pin, remove pin and disassemble unit as shown below. Wipe parts clean with hydrocarbon solvent and reassemble unit. Lock cam pivot pin by spreading split end slightly with screwdriver.



Electrical Connection...

Electrical connection is provided by wire leads with 1/2" NPT or junction box with 1/2" NPT.

Typical Wiring Diagrams...



WARNING

Product must be maintained and installed in strict accordance with the Gema technical brochure and instruction bulletin. Failure to observe this warning could result in serious injuries or damages. For hazardous area applications involving such things as (but not limited to) ignitable mixtures, combustible dust and flammables, use an appropriate explosion-proof enclosure or intrinsically safe interface device.

CAUTION

The pressure and temperature limitations shown on the individual catalog pages and drawings for the specified level switches must not be exceeded. These pressures and temperatures must take into consideration possible system surge pressures, temperatures and their frequencies.

The liquids used must be compatible with the materials of construction. Specifications of materials will be given upon request. Life expectancy of switch contacts varies with applications. Contact the Factory if life cycle testing is required.

Ambient temperature changes do affect switch set points, since specific gravities of liquids vary with temperature. Consult Factory for assistance.

Level switches have been designed to be shock and vibration resistant; however, shock and vibration should be minimized. Consult Factory for assistance.

Excessive contaminants in fluid may inhibit float operation and occasional wipe-down may be necessary. Consult Factory for assistance.

Troubleshooting and maintenance of level switches should be in strict compliance with procedures set forth in the troubleshooting and maintenance sections of the technical brochure or an instruction bulletin.

Electrical entries and mounting points require liquid/vapor sealing.

Level switches must not be field-repaired.

Physical damage to product may render product unserviceable.

Imo Industries Inc.

Gema Sensors Division

1 Cowles Road

Plainville, CT. 06062-1198 U.S.A.

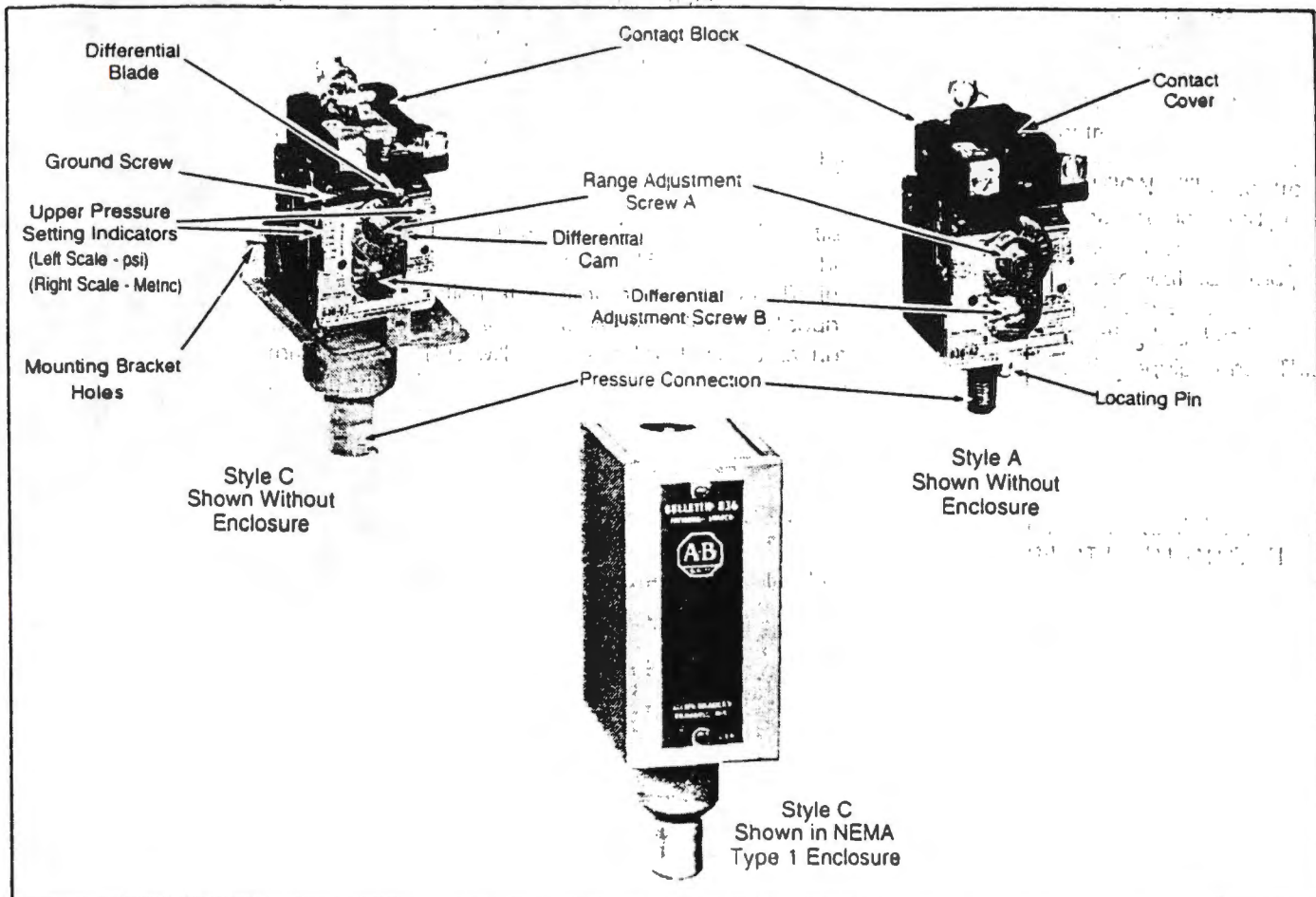
TEL: 203-747-3000 FAX: 203-747-4244

P/N 72950
(Rev.F)



860-747-
3000

PRESSURE CONTROLS



DESCRIPTION - Bulletin 836 Pressure Controls are designed for use with air, water, oil and other noncorrosive liquids, vapors, and gases. (Type 316 stainless steel bellows are available for more corrosive liquids or gases in pressure ranges to 375 psi.)

Bulletin 836 Controls are available in NEMA Type 1, 4, 4X, 7, 9, and 13 enclosures in addition to open type. The operating range pressure and differential are adjustable. Fixed differential versions are also available. Pressure ranges available from 30 in. Hg. vacuum to 900 psi.

The standard contact block is single pole, double throw and can be wired to open or close on increasing or decreasing pressure.

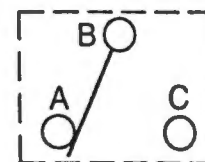
CONTACT RATINGS

Non-Inductive Ratings	Control Circuit Ratings
5 Amperes, 250 Volts	AC-125 VA 24 to 600 Volts
3 Amperes, 600 Volts	DC-57.5 VA 115 to 230 Volts

Manual reset, horsepower rated and other contact block modifications are also available on devices manufactured at the factory.

OPERATION - A low friction, straight in-line mechanism operates a snap action switch at a predetermined pressure setting. An increase in pressure causes the normally closed circuit A-B to open and normally open circuit B-C to close. This is known as the "Trip" pressure. When the pressure returns to a lower predetermined setting, the circuit A-B will close and circuit B-C will open. This is known as the "Reset" pressure. The difference between the "Trip" and "Reset" pressure is the differential.

For controls which operate in a vacuum, the following sequence occurs: 1) an increase in vacuum (lower pressure toward 30 in. Hg), causes circuit A-B to close and B-C to open. This is the "Trip" setting. 2) when the pressure returns to a predetermined lower vacuum (higher pressure toward 0 psi.), circuit A-B will open and circuit B-C will close. This is the "Reset" point. The difference between the "Trip" and "Reset" setting is the differential.



Standard Contact Arrangement
For Positive Pressure

ADJUSTMENT- Generally, unless otherwise specified, controls shipped from the factory are set at the maximum operating range pressure and minimum differential. The following procedure should be used to set the control to a particular requirement:

OPERATING RANGE ADJUSTMENT- Turn range adjustment Screw "A" counterclockwise to lower the upper and lower pressure settings. To increase the upper and lower settings, turn Screw "A" clockwise. The approximate upper pressure setting is shown by indicators on the outer edges of the nameplate.

DIFFERENTIAL ADJUSTMENT- When differential blade is at the low point of the differential cam the control will function at minimum differential. To increase the differential, turn adjustment Screw "B" counterclockwise. This will decrease the lower pressure setting only. To decrease the differential, turn differential adjustment Screw "B" clockwise. This will raise the lower setting only.

Condensed instructions are supplied with open style controls and are on the inside of the cover on enclosed devices.

NOTE: The use of a pressure gauge is desirable when setting the control.

CAUTION: The range adjustment Screw "A" should not be adjusted beyond the pressure indicated on the pressure scale as this may cause the control to malfunction.

It is recommended that a periodic inspection of gauge pressure be made and the pressure control adjusted to compensate for application variables.

BELLOWS LIFE - The pressure applied to a bellows in a normal cycle of operation should not exceed the maximum rated Range Pressure. The bellows will withstand the rated Maximum Line Pressure but should not be cycled at this pressure. The control is designed to operate within published rated Range Pressure. For general applications a control used within 30% to 80% of Range Pressure will provide optimum bellows life and repeatability.

IMPORTANT: Bulletin 836 Style A pressure controls are normally supplied with a built in pulsation snubber. Bulletin 836 Style C devices are supplied with a removable snubber. The snubber can be removed for inspection, cleaning, or when using the control with high viscosity fluids. The snubber can be removed with a 1/4 inch nut wrench, or equivalent.

The pulsation snubber is designed to help reduce pressure transients. Transients can vary in amplitude, frequency, and duration and if not controlled with a snubber can reduce bellows life.

Pressure systems and lines must be maintained and kept free of foreign particles in air lines and sludge in

fluid lines. A restricted or clogged pulsation snubber can cause the pressure control to become inoperative.

MOUNTING- The pressure control should be mounted securely to a firm base using two mounting screws. The mounting holes are provided either in the base of the enclosure or in a convenient mounting bracket which is provided as part of the open Style C control. Mounting brackets are available for the open type Style A control.

CAUTION: The control should not be supported by the electrical and pressure connections only. A support wrench should be used when tightening the electrical hub and pressure connections. The enclosed device or open type control using a mounting bracket is not intended to support connecting equipment. This equipment must be secured to support weight and to reduce vibration.

CAUTION: If a liquid thread sealant is used on the pressure connection, care must be taken to avoid excess sealant from getting into bellows orifice.

PILOT LIGHT OPTION - A high intensity neon glow pilot light is available for 120 volt, 60 hertz applications. A 24 volt DC LED pilot light is also available. The pilot light is factory wired across the N.C. contacts, circuit A-B, and can easily be converted to the N.O. contacts, circuit B-C, on the standard contact block.

Unless a third wire is made available, the pilot light is connected across the load contacts which can be either the N.O. or N.C. contacts. The pilot light is on until the load is energized.

Current rating:

120 VAC high intensity neon glow --- 4 mA
24 VDC high intensity LED ---- 22 mA

WARNING: To prevent electrical shock, disconnect from power source before installing or servicing.

CAUTION: For 24 VDC LED pilot lights, polarity must be observed. Red (+) lead of pilot light should always be connected to rear terminal (B).

To order pilot light version add X9 (120VAC) or X15 (24VDC) to catalog number of the selected control.

REPAIRS - Due to the integral construction of the Bulletin 836 Pressure Control, only limited repairs can be made in the field. If returned to the factory for repairs, the condition of the control will be evaluated to determine economic feasibility. When practical, the control will be repaired, factory adjustments made for optimum performance and tested to specifications.

CONTACT BLOCK REPLACEMENT - To order the Bulletin 836 Contact Block Replacement Kit, specify Catalog No. 836-N2.





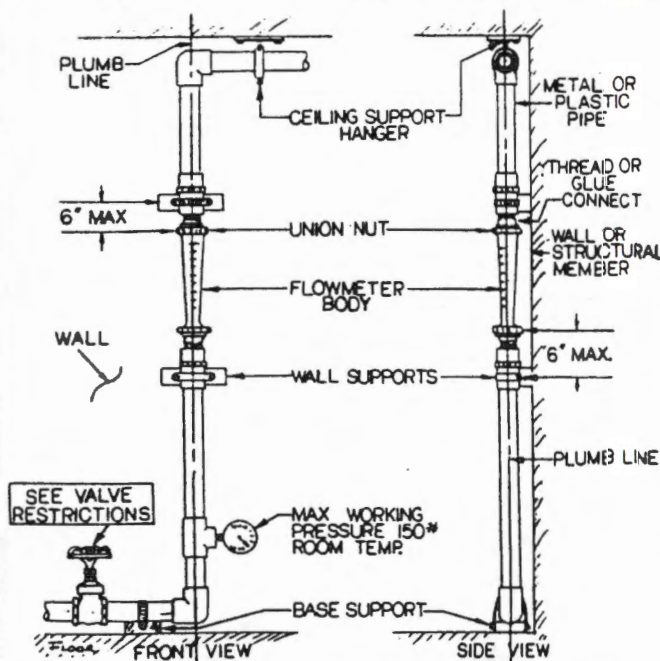
INSTALLATION INSTRUCTIONS

CAUTION

FOLLOW INSTRUCTIONS TO AVOID FAILURE

BLUE WHITE IND.
Westminster, CA
Tel 714/893-8529

THANK YOU for purchasing BLUE WHITE FLOWMETERS.
PLEASE BE AWARE; COMPARED TO OTHER PLUMBING PARTS, CLEAR PLASTIC FLOWMETERS
WITH WEIGHTED FLOATS ARE SOMEWHAT DELICATE AND MUST BE DEALT WITH CAREFULLY.
COMPLY WITH THESE F.M. INSTRUCTIONS.

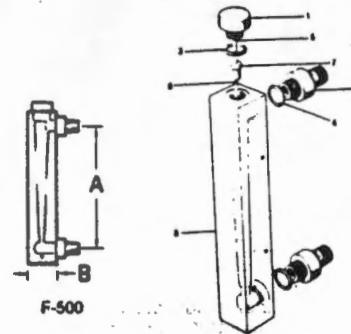


1. Finish piping to be plumb and true.
2. Polysulfone and other exotic plastics cannot tolerate P.V.C. glue and pipe dope. Even the fumes can cause crazing. . . .
3. Use teflon tape for threaded joints.
4. Make up assembly and fit pipes, then: remove F.M. to glue joints. Replace F.M. after glue fumes are vented out.
5. Meter cannot support attached pipes.
6. Excessive vibration may cause float to give poor readings or cause possible fracture.
7. Wall, floor and ceiling mounts to be carefully aligned and sturdy. A support should be at top and bottom of meter. See drawing.
8. Hand tighten union nuts. *No wrenches.*
9. Protect meter from ultra violet (UV) rays.
10. VALVES-avoid a system that will impose a sudden burst of flow to the meter. Such a burst will cause the float to impact the guide assembly with destructive force. Magnet, solenoid, or other quick opening valves cannot be used unless meter is protected against sudden burst of flow.
11. Failure to comply **VOIDS WARRANTY!**

**NOTE: BE SURE FLUID OR GAS BEING METERED
IS COMPATABLE WITH FLOWMETER.
TESTED WITH WATER ONLY.**

F-500

DIMENSIONS	A	B
F-50250L	5-5/8"	1-1/8"
F-50375LN	6-1/2"	1-1/2"
F-50376LN	6-1/2"	1-1/2"
F-50500LN	6-1/2"	1-1/2"
F-50750L	6-1/2"	1-3/4"
F-61000L	8"	2"



PARTS

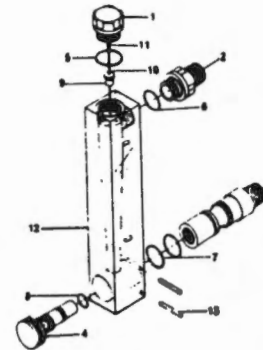
1. Cap (1)
2. Adapter (2)
3. "O" Ring Seal Cap (1)
4. "O" Ring Seal Adapter (2)
5. Float Stop (2)
6. Guide Wire (1)
7. Float (1)
8. Meter Body (1)

EXPLODED VIEW

Maximum temperature up to 150°F† or pressures to 120 psi.†

F-500A

DIMENSIONS	A	B	C
F-50250LA	6"	1-1/8"	2-1/4"
F-50375LNA	6-1/2"	1-1/2"	3"
F-50376LNA	6-1/2"	1-1/2"	3"
F-50500LNA	6-1/2"	1-1/2"	3"



PARTS

1. Cap (1)
2. Adapter Top (1)
3. Valve Body (1)
4. Needle Valve (1)
5. "O" Ring Seal Cap (1)
6. "O" Ring Seal Top Adapter (1)
7. "O" Ring Seal Valve Body (2)
8. "O" Ring Seal Needle Valve (2) except F-50250 (1)
9. Float (1)
10. Guide Wire (1)
11. Float Stop (1)
12. Meter Body (1)
13. Steel Pin All 500 A (1)

EXPLODED VIEW

Maximum temperature up to 120°F† or pressures up to 120 psi.†

FLOAT FACSIMILE



BLUE WHITE®
14931 Chestnut St., Westminster, CA
714/893-8529

†PRESSURE AND TEMPERATURE

Pressure and temperature limits are inversely proportional. At the maximum suggested pressure the temperature should approach 70°F, at the maximum suggested temperature the pressure should approach zero psi. We cannot guarantee our flowmeters will not be damaged either at or below the suggested limits simply because of many factors which influence meter integrity; stress resulting from meter misalignment, damage due to excessive vibration and deterioration caused by contact with certain chemicals to name a few. These situations and others tend to reduce the strength of the materials from which the meters were manufactured.

© 1987 Blue White Industries
REV (8-91)

F-400N/F-500 (4-87)
80000-047



INSTALLATION INFORMATION

F-400N, F-500, F-500E & F-500A

GENERAL

- Always use Teflon tape or a similar sealing material on pipe threads when making connections. Never use oil base pipe dopes or solvents.
- Remember you are installing an instrument and fittings should be tightened only enough to prevent leaking. Over tightening may result in damage to the meter.
- Never hold the meter with pliers or like tools during installation.
- Install the meter in an exactly vertical plane to obtain the best possible reading.
- Whatever the installation circumstances, meters should never be allowed to support the weight of related pipe or tubing.
- When installing F-400N series meters be certain of proper pipe alignment, misalignment will put excessive stress on the meter.
- F-500 series meters are designed for panel mounting. Two #8-32 threaded mounting holes are provided on the rear of the meter body for this purpose.

MAINTENANCE

The "Exploded View" drawings illustrate assembly of the F-400N and F-500 series meters. If your flowmeter needs to be cleaned refer to these and the "Float Facsimile" drawing when reassembling the unit. The tapered tube may be cleaned with a soft bottle brush. Use a MILD soap and water solution for cleaning purposes.

F-400N

DIMENSIONS	A	B
F-40250	8-1/4"	1-1/4"
F-40375	8-1/4"	1-1/4"
F-40376	8-1/4"	1-1/4"
F-40500	8-1/4"	1-1/4"
F-40750	11"	1-3/4"
F-41017	11"	1-3/4"
F-41000	11"	1-3/4"



PARTS

1. Adapters (2)
2. "O" Ring Seal (2)
3. Wire Holder (2)
4. Guide Wire (1)
5. Float (1)
6. Meter Body (1)

EXPLODED VIEW

Maximum temperature up to 150°F† or pressures up to 200 psi.†

F-500E

DIMENSIONS	A	B
F-501E	3"	1-1/4"
F-502E	3"	1-1/4"
F-503E	3"	1-1/4"
F-504E	3"	1-1/4"
F-505E	3"	1-1/4"
F-506E	3"	1-1/4"
F-507E	3"	1-1/4"
F-508E	3"	1-1/4"
F-509E	3"	1-1/4"
F-510E	3"	1-1/4"
F-511E	3"	1-1/4"
F-512E	3"	1-1/4"
F-513E	3"	1-1/4"
F-514E	3"	1-1/4"

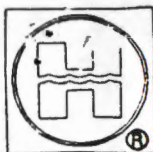


PARTS

1. Cap (1)
2. Adapter (2)
3. "O" Ring Seal Cap (1)
4. "O" Ring Seal Adapter (2)
5. Float (1)
6. Guide Wire 505 E - 510E (1)
7. Spring (1)
8. Float Stop 505E (2)
9. Meter Body (1)

EXPLODED VIEW

Maximum temperature up to 150°F† or pressures up to 120 psi.†



HAYWARD INDUSTRIAL PRODUCTS

INSTALLATION OPERATION & MAINTENANCE

OF TRUE UNION BALL VALVES

SOCKET CONNECTION:

Socket end connections are manufactured to ASTM D2467-87A. Solvent cementing of socket end connections to pipe should be performed per ASTM specifications D2855-87. Cut pipe square. Chamfer and deburr pipe. Surfaces must be cleaned and free of dirt, moisture, oil and other foreign material. Remove assembly nuts and end connectors from valve body. Slide assembly nuts, with threads facing valve, onto pipe to which the end connector is to be cemented. Apply primer to inside socket surface of end connector. Never allow primer or cement to contact valve ball or end connector o-ring sealing surfaces, as leaking may result. Use a scrubbing motion. Repeat applications may be necessary to soften the surface of the socket. Next, liberally apply primer to the male end of the pipe to the length of the socket depth. Again apply to the socket, without delay apply cement to the pipe while the surface is still wet with primer. Next apply cement lightly, but uniformly to the inside of the socket. Apply a second coat of cement to the pipe, and assemble the end connector to the pipe, rotating the end connector 1/4 turn in one direction as it is slipped to full depth on to the pipe. The end connector should be held in position for approx. 30 seconds to allow the connection to "set". After assembly wipe off excess cement. Full set time is a minimum of 30 minutes at 60 to 100 F. Full cure time should be based on the chart below.

JOINT CURE SCHEDULE:

The cure schedules are suggested as guides. They are based on laboratory test data, and should not be taken to be the recommendations of all cement manufacturers. Individual manufacturer's recommendations for their particular cement should be followed.

Temperature Range During Cure Period(B) °F(°C)	Test Pressures for Pipe Sizes 1/2 to 1-1/4 in.		Test Pressures for Pipe Sizes 1-1/2 to 3 in.		Test Pressures for Pipe Sizes 4 to 5 in.		Test Pressures for Pipe Sizes 6 to 8 in.	
	Up to 180 PSI (1240 kPa)	Above 180 to 370 PSI (1240 to 2550 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2170 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2170 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2170 kPa)
60 to 100 (15 to 40)	1 h	6 h	2 h	12 h	6 h	18 h	8 h	24 h
40 to 60 (5 to 15)	2 h	12 h	4 h	24 h	12 h	36 h	16 h	48 h
20 to 40 (-7 to 5)	6 h	36 h	12 h	72 h	36 h A	4 days A	3 days A	9 days A
10 to 20 (-15 to 7)	8 h	48 h	16 h	96 h	72 h A	8 days A	4 days A	12 days A
Colder than 10 (-15)	Extreme care should be exercised on all joints made where pipe, fittings or cement is below 10°F.							

A: It is important to note that at temperatures colder than 20°F on sizes that exceed 3 in., test results indicate that many variables exist in the actual cure rate of the joint. The data expressed in these categories represent only estimated averages. In some cases, cure will be achieved in less time, but isolated test results indicate that even longer periods of cure may be required.

B: These cure schedules are based on laboratory test data obtained on Net Fit Joints (NET FIT=in a dry fit the pipe bottoms snugly in the fitting socket without meeting interference).

THREADED CONNECTION:

Threaded end connections are manufactured to ASTM specifications D2464-88. F437-88 and ANSI B2.1. Wrap threads of pipe with Teflon tape of 3 to 3-1/2 mil thickness. The tape should be wrapped in a clockwise direction starting at the first or second full thread. Overlap each wrap by, 1/2 the width of the tape. The wrap should be applied with sufficient tension to allow the threads of a single wrapped area to show through without cutting the tape. The wrap should continue for the full effective length of the thread. Pipe sizes 2" and greater will not benefit with more than a second wrap, due to the greater thread depth. To provide a leak proof joint, the pipe should be threaded into the end connection "hand tight". Using a strap wrench only. (Never use a stillson type wrench) tighten the joint an additional 1/2 to 1-1/2 turns past hand tight. Tightening beyond this point may induce excessive stress that could cause failure.

FLANGED CONNECTION:

Flange bolts should be tight enough to slightly compress the gasket and make a good seal, without distorting or putting excessive stress on the flanges. Suitable washers should be used between the bolt head and flange and the nut and flange. Bolts should be tightened in alternating sequence.

RECOMMENDED FLANGE BOLT TORQUE

FLANGE SIZE	BOLT DIA.	TORQUE FT. LBS.	FLANGE SIZE	BOLT DIA.	TORQUE FT. LBS.
1/2	1/2	10-15	2	5/8	15-25
3/4	1/2	10-15	2-1/2	5/8	20-25
1	1/2	10-15	3	5/8	20-25
1-1/4	1/2	10-15	4	5/8	20-25
1-1/2	1/2	10-15	6	3/4	30-40

NOTE: USE WELL LUBRICATED METAL BOLTS AND NUTS. USE SOFT RUBBER GASKETS.

ADJUSTMENT:

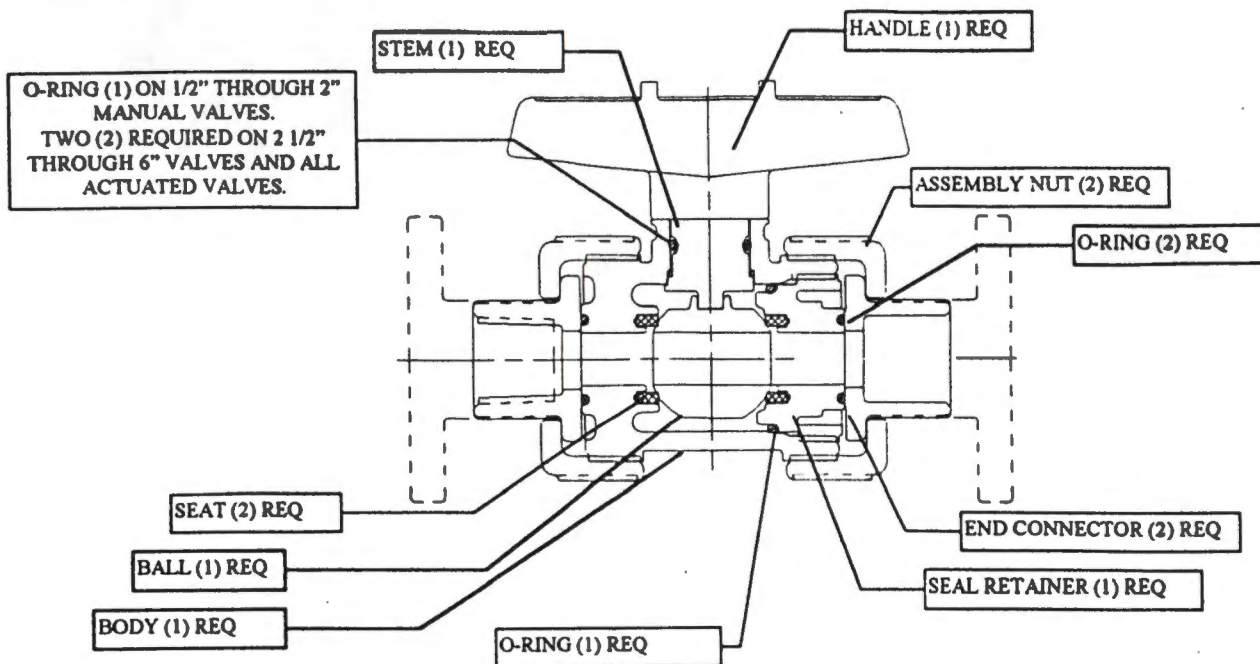
EXTREME CAUTION MUST BE TAKEN WHEN WORKING ON THIS VALVE.

THE PIPING SYSTEM MUST BE DEPRESSURIZED AND DRAINED. PROPER CARE MUST BE TAKEN. CONSULT M.S.D.S. (MATERIAL SAFETY DATA SHEETS) INFORMATION REGARDING YOUR SPECIFIC APPLICATION.

Remove the assembly nut and end connector from the "adjust" end of the body, or the complete valve body from the piping system. The front face of the seal retainer indicates which direction of rotation tightens or loosens the seal retainer, with the word "tighten" and a directional arrow, and the word "loosen" and a directional arrow. Direction of rotation may vary depending on date of manufacture.

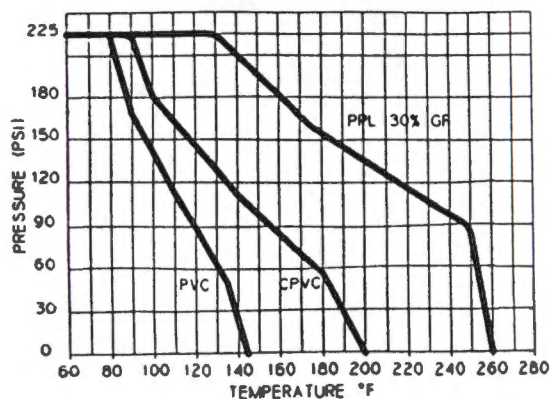
REPAIR:

Follow the adjustment sequence and information above, but rotating the seal retainer completely in the "loosen" direction and remove it from valve body. The o-rings and seals are now accessible for replacement using a "seal" repair kit. Carefully remove the o-rings from their respective locations taking care not to scratch their sealing surfaces. Use a non-petroleum base lubricant to lubricate the o-rings, and re-assemble the valve. See table below.



OPERATING PRESSURE TEMPERATURE

TRUE UNION, TRUE CHECK, & SINGLE ENTRY ONLY



Recommended valve stem torque to rotate the ball 360° when valve is reassembled.

VALVE SIZE	TORQUE IN°LB
1/2"	30
3/4"	40
1"	50
1 1/4"	60
1 1/2"	60
2"	80
3" & 2 1/2"	140
4" & 6"	170

FAX COVER

OK Done Day 10/2/01
Jim Baggett

To: Douglas Hotchkiss

From : Richard A. Sparks

Company : Meridian Automotive Supplies, Inc.

Company : Specialty Chemical Services

Fax Number : 394-8695

Fax Number : 716 473-2450

Voice Number : 716 703-2277

Subject :

Pages including cover page: 4

Date : 10/2/2001

Time : 9:12:12 AM

MESSAGE

Doug,

Please find attached the information you requested. See you tomorrow.

Dick

Specialty Chemical Services

55 Imperial Drive • Rochester, New York 14618
(716)703-2277 Fax: (716)473-2450

614: pH Adjuster

DESCRIPTION: 614 is a blend of inorganic acid balanced at convenient strength for pH control to reduce alkalinity build-up in cooling towers. 614 may also be used to neutralize alkaline cleaning solutions to an acceptable pH (usually 5.0-9.0) for disposal. 614 may also be used as a lime descaler. 614 offers the convenience of a liquid and safety for both personnel and equipment when compared to conventional acids.

PRODUCT PROPERTIES:

Appearance: Non-caking white granular powder.

Specific Gravity: N/A.

Solubility: Complete

Flash Point: None

pH(1%): 1.0-1.5

Phosphate Content: None

Biodegradability: Detergent portion is 100% biodegradable by present standards.

USE INFORMATION:

Concentration: 6-16 oz/gal.

Temperature: 120 - 160°F.

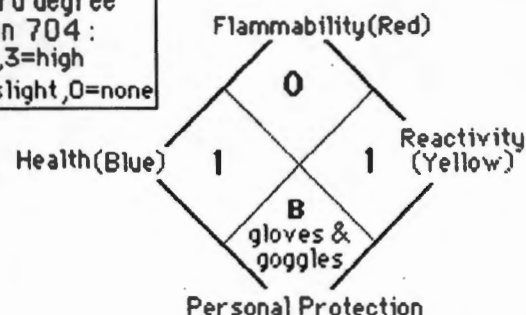
Contact Time: As available.

PRECAUTIONS: May cause severe burns to the skin and eyes upon contact. ****AVOID CONTACT**** When handling, wear proper personal protective equipment as indicated by the accompanying OSHA material safety data sheet. If accidental contact is made immediately flush contacted area repeatedly with cool water. If irritation persists call a physician for treatment. If accidental eye contact occurs flush eyes with cool water and seek the immediate attention of a physician. Launder contaminated clothing before re-use. Wash thoroughly after handling. **FOR INDUSTRIAL USE ONLY!**

PACKAGE: 500 lb drums.

MATERIAL SAFETY DATA SHEETpage 2 : **Sod.Bisulfate****SECTION I**

NFPA hazard degree
designation 704:
4=extreme, 3=high
2=mod., 1=slight, 0=none

Mfg. Name: **Specialty Chemical Services**Address: **1100 University Ave. Rochester, NY 14607**Emergency Phone No : **(716)256-6247**

Product name or number

614

Chemical Synonym

c614date printed: **9/24/1**

DOT Proper Shipping Name/DOT Hazard Class/I.D. No./Packing Group/DOT Label

Sodium Hydrogen Sulfate, Solid / UN1821

Chemical Family

Acidic blend

Formula

Multi-Component Mixture**SECTION II (Ingredients)**ACGIH
TLV (mg/m3)

CAS Registry No.	% by Wt.	Chemical Name(s)	TWA	STEL
7681-38-1	>75.0	Sodium Hydrogen Sulfate	-	-

C = Material with known carcinogen properties * = OSHA 1910.1000 Hazard (2-1),(2-2),(2-3)
S= Chemical subject to reporting requirements of section 313 of the Emergency Planning and
Community Right to Know Act of 1986 and of 40 CFR 372

SECTION III - PHYSICAL DATA

Boiling Pt. °F	Specific Gravity (H2O=1)	Vapor Pressure(mmHg)
% volatile	Vapor Density(air=1)	Evap. Rate (water=1)
Water solubility Complete		pH(1%) <2.0
Appearance & Odor White granular powder, odor nil.		

SECTION IV - FIRE & EXPLOSION HAZARDS

Flash Point (deg F.) None	Method used N/A	Flammable Limits	LEL	UEL
Extinguishing Media None Required				
Special firefighting procedures: Use caution when fighting any fire. Adequate respiratory protection is essential!				
Unusual fire & explosion hazards: None known.				
All technical and OSHA information given is as accurate as possible in our belief. It is offered in good faith. Nothing herein shall be construed as a recommendation for uses which infringe valid patents or as extending a license under valid patents.				

SECTION V - HEALTH HAZARD DATA

PRIMARY ENTRY ROUTES: INHALATION ☒ CONTACT ☒

CONDITIONS TO AVOID (over exposure effects): EYE: mild to severe irritant, may cause burns if not flushed with water. SKIN: moderate irritant, may cause burns if not flushed with water. INHALATION: irritant, no exposure limits established. INGESTION: irritant, may irritate or burn mouth, esophagus, or stomach.

ACUTE: May cause severe irritation to the eyes. Dusts and mists are irritating to the skin, mucous membranes, and upper respiratory tract.

CHRONIC: May cause irritation of the skin, respiratory airways, mucous membranes and eyes. May cause burns if afflicted area not properly flushed with water.

EMERGENCY FIRST AID PROCEDURES: Immediately flush contacted area repeatedly with water for at least 15 minutes, lifting eyelids to thoroughly flush. If inhaled, move to fresh air location. If swallowed, drink large quantities of water or milk, follow with Milk of Magnesia, beaten eggs, or vegetable oil. Do not induce vomiting. If skin irritation persists, or if swallowed, or if eye contact is made, see a physician for treatment.

SECTION VI - REACTIVITY DATA

HAZARDOUS DECOMPOSITION PRODUCTS: None unless heated over 570°F at which SO₂ & SO₃ are formed.STABLE ☒ UNSTABLE ☐

CONDITIONS TO AVOID: Store in dry area to avoid moisture contact.

INCOMPATIBILITY: Strong alkaline materials.
Reacts with water to form weak sulfuric acid solution.

Hazardous Polymerization MAY OCCUR ☐ WILL NOT OCCUR ☒

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Small spill: absorb with suitable absorbant such as sand or vermiculite. Large spill: Stop leak at source and contain with dike made of inert material such as sand or diatomaceous earth. Pump material to suitable container for possible reuse. Solid spill: sweep up and return to container.

WASTE DISPOSAL METHOD: Neutralize spent solutions to an acceptable pH level. Allow oils to separate and decant if possible. Detergent portion is 100% biodegradeable.

SECTION VIII - SPECIAL PROTECTION

RESPIRATORY PROTECTION(specify type): NIOSH or MSA certified dust mask should be worn while handling product to control exposure below nuisance dust limits of 10 mg/M³.

VENTILATION

LOCAL EXHAUST: Local ventilation to a dust collector is recommended.

MECHANICAL RECOMMENDATIONS:

PROTECTIVE GLOVES: Acid resistant such as rubber or neoprene.

EYE PROTECTION: goggles or face shield

OTHER PROTECTIVE EQUIPMENT: Clothes should completely cover skin to avoid skin contact. Coats, coveralls, or aprons are recommended.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep container closed. Do not store where exposed to moist conditions or near strong alkalis. Avoid contact with skin, eyes, or clothing. Wash thoroughly after handling. Launder contaminated clothing before reuse.

OTHER PRECAUTIONS: For industrial and commercial use only!