

Chatham County Public Health Department
Environmental Health Division
80 East Street, P.O. Box 130 Pittsboro, NC 27312
(919) 542-8208 FAX (919) 542-8288

File Name _____
911 Address _____
Parcel Number _____

SEWAGE DISPOSAL CONSTRUCTION AUTHORIZATION

EXPIRATION DATE 4-9-13

New Repair Expansion

Owner Lee Moore Oil Company Drug Store site 2
Directions To Property 15501 N on right

- This permit authorizes its permit holder to install the sewage disposal system within five years of the issue date on the Improvement Permit.
- This permit is non-transferable.
- The installer must be registered with the Chatham County Environmental Health Division.
- This authorization is required prior to the issuance of a building permit.
- Before an Operations Permit is issued, all required inspections and conditions of the permit must be completed and verified by this department and payment of applicable fees must be received.

Instructions and Conditions

- Design capacity: Number of bedrooms _____ or GPD 600.
- Plans, if required were approved by _____.
- Approximate contour in system area is shown on site plan. The installer must flag the system prior to installation to ensure proper grade.
- Approximate system component locations shown on site plan, contractor must verify component locations prior to installation to assure proper fall from house to septic tank and from septic tank to approved system area.
- Approved site plan attached.
- Site plan per Improvement Permit approved.
- System Type* IIIbg System types III (b), IV, V and VI require the payment of annual onsite wastewater monitoring fees to the Chatham County Public Health Department. *Payment of the first annual fee is required prior to issuance of the Operation Permit.*
 - Accepted 25% reduction with pressure manifold
 - 600' x 3' x 14"
 - Additional Soil cover required to achieve final 6" cover

The Operation Permit is required to be recorded at the Chatham County Register of Deeds Office prior to Environmental Health notifying Chatham County Building Inspections Department of Septic System Approval.

This Construction Authorization is subject to revocation if the site plan, plat or the intended use changes. This Construction Authorization is subject to compliance with the provisions of the Laws and Rules for Sewage Treatment and Disposal conditions on this permit.

Permit issued by Jerri C. Ritter Date 11-5-08
Environmental Health Specialist

* I understand that the system type specified is different from the type specified on the application and accept the specifications of this permit.

Signature _____ Date _____
Owner/Legal Representative

CHATHAM COUNTY HEALTH DEPARTMENT ENVIRONMENTAL HEALTH DIVISION

80 East Street ▪ P. O. Box 130 ▪ Pittsboro, NC 27312-0130
Phone (919) 542-8208 ▪ Fax (919) 542-8288

OFFICE USE ONLY

TPN _____
Permit No. _____
Date _____
EHS _____
System Type _____

Improvement Permit for Wastewater Systems ARTICLE II-CHAPTER 130A OF THE NC GENERAL STATUTES

NEW REPAIR EXPANSION REVISED

An Improvement Permit is issued to Lee Moore Oil Co. for

a 10± acre site located Lot 2 County Line Derry Street

in Chatham County. It is specifically issued for the following facility:

Facility: Residential () Non-Residential (x)

No. Bedrooms _____ No. Residents/Employees 10,000ft² retail

Type Wastewater: Residential (x) Commercial ()

Initial System Type: I () II () III (x) IV () V () VI ()

Description _____

Type System: Shallow Conventional () LPP ()

Other Accepted 25% Reduction with Pressure Manifold

Design Flow 1200 EGD Application Rate .25 GPD/ft²

Size Tank(s) w/Risers and Effluent Filter ST 2000 Gal PT 2000 Gal

Nitrification Line (Length/Width/Max Depth) 1200' x 3' x 14"

Additional 1200' required to allow final 6' cover

(On contour in approved septic area; sch. 40 PVC required over step-downs)

Repair System Type: I () II () III () IV () V (x) VI ()

Description Derry Wastewater with 25% Treatment

Special Conditions Final recorded map must prior to issuance of CA

A plat with site plan showing specific location of the facility, the site for the proposed wastewater system, existing buildings, property lines, water supplies, surface waters, the conditions for any site modifications; and any other information required by the department must be attached to be valid.

Septic tank riser 6" above grade required over outlet access port as a visible marker for the septic tank. Solid PVC with elbows must be used to construct conveyance over dams or stepdowns.

This permit is valid [] without expiration [x] for five years but is subject to revocation if the site is altered, soil disturbed, set-backs violated, or the plans of intended use are changed.

The Improvement Permit shall not be affected by change in ownership.

THIS IS NOT AUTHORIZATION TO INSTALL. An authorization for Wastewater Construction must be obtained from this department before installation.

Issued by James J. Payne R.S.
Environmental Health Specialist

N.C. Registration Number 1359

Date 4-9-08

911 Address

Name Lee Moore Oil Co. Lot 2



Soil & Environmental Consultants, PA

11010 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-5900 • Fax: (919) 846-9467
www.SandEC.com

April 7, 2008

Attached is a proposed design for a Pressure Manifold Septic System for a drug store located on HWY 15-501, Lot 2 County Line Site, Wake County, NC

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S&EC PROJECT #10956.S1
DESIGN – S. Menser
PROJECT MGR – R. Pontello

INFORMATION FOR THE INSTALLER

The permit should be read very carefully prior to bidding. The following are details that must be considered by the installer prior to and during installation:

- Tanks shall be approved by NCDENR, and certification supplied by the manufacturer.
- Tanks shall be water tested prior to installation.
- The installer shall be responsible to the owner for placement of the tanks and to insure that final grades are returned to the original grade, with exception of added structural features.
- The supply trench shall be compacted to eliminate cavities left during initial fill placement without damage or displacement of pipe or fittings.
- Installation of the system shall be during dry conditions in order to protect the soil structure.
- All fittings shall be pressure rated fittings.
- All joints shall be cleaned with PVC pipe cleaner and a heavy-bodied PVC pipe glue applied to weld all joints.
- Where required by Chatham County Environmental Services, post installation inspections by the designer must be scheduled 5 week days in advance.
- Trenches shall be carefully excavated so the bottom is within 2" from the highest to the lowest points of elevation within the trench. If the bottom elevation needs adjusting after it has been trenched, it will be done by removing high points rather than filling low points. It is extremely important to insure that trenches are not over excavated during initial trenching. All fine grading within the trench will be done by hand with a shovel. No loose material will be left in the trench.
- All pipe openings in the tanks shall be properly grouted with waterproof grout. This also applies to the joints around the riser.
- All tanks shall be properly back filled and compacted to prevent settlement.
- Earth dams, constructed of relatively impervious material, shall be installed at the beginning and end of each lateral.
- No heavy equipment shall be used on the field during or after installation. The use of a small loader (i.e. Bobcat) or a trencher (i.e. Ditch Witch 2300/2310) may be used for installation.
- Elevations at pinflag locations should be checked by the installer prior to beginning trench excavation.
- Pump tank riser shall be 6" above grade, control panel shall be 12" above grade.
- System uses EZ-FLOW drain line.
- Repair uses EZ-FLOW drain line.

**County Line Drug Store
Project No. 10956.S1
PRESSURE MANIFOLD SYSTEM
FOR WASTEWATER TREATMENT**

Owner: Lee Moore Capital Company
Attn: Kirk J. Bradley
Address: P.O. Drawer 9
Sanford, NC 27331
Phone: 919-895-6000
County: Chatham
Location: County Line Drug Store

Source of Wastewater Flow: Drug Store (10,000 sq ft)
Estimated Daily Wastewater Production: 1200 gpd
System Flow: 59.1 gpm

Design Specifications

Number of Drain Lines: 9
Drainfield Size: 1290 ft
Loading Rate: 0.25 gpd/sq ft
Distribution Method: EZ-Flow
Gravel Size (if applicable): NA
Trench Depth: ~~24~~¹⁴ in
Trench Width: 36 in
Septic Tank: 2000 gal
Pump Tank: 2000 gal
Grease Trap Size: NA -
Estimated Supply Line Length: 969 ft
Supply Line Diameter: 2 in. SCH 40 PVC
Supply Line Volume: 372.10 gal
Supply Manifold: 6 in. SCH 80 PVC
Supply Manifold Length: 6.0 ft (minimum)
Supply Manifold Volume: NA
Threaded Union: In Tank
Gate Valves: 1 in Tank
1 at Pressure Manifold
Check Valves: In Tank
Anti-Siphon Hole: In Tank
Solenoid Valve: NA
Air Release/Vacuum Break Valve: NA

Recommended Float Controls: SJE Sensor Float Control Switches as Required for Control Panel or County Approved Equivalent
Recommended Control Panel: SJE-Rhombus Model 112 (NEMA 4x) Control Panel or County Approved Control Panel.
Recommended Pump: Zoeller Model 188 or County Approved Equivalent
TDH Capacity: 50.03 ft
Flow Capacity: 59.1 gpm

Additional Comments: Soil suitability was performed by the
Chatham County Health Department.

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**County Line Drug Store
Project No. 10956.S1
DESIGN CALCULATIONS**

Supply line length	969	ft
3 in. PVC	<u>0.384</u>	gal/ft
Supply line Volume	<u>372.096</u>	gal
Total drain field length	1290	ft
4" pipe	<u>0.65079</u>	gal/ft
Total drain field volume	839.52	gal
Percent of dose volume	60%	
Dose Volume	<u>503.7</u>	gal
Dose volume	<u>503.71</u>	gal
Pump tank	44.85	gal/in
Pump tank Drawdown	<u>11.2</u>	in
Pump Tank Elevation	529.0	ft
Pump elev	<u>5.4</u>	ft
	523.6	ft
Manifold Elevation	560.0	ft
	36.4	ft
Elevation Head	<u>36.4</u>	ft
System flow	59.1	gal/minute
Friction factor	1.00	f/100ft
Supply Line Length	969	ft
Friction Adjustment for Fittings	1162.8	
Friction Head	<u>11.6</u>	ft
Pressure Head	<u>2.0</u>	ft
(TDH) Total Dynamic Head	<u>50.0</u>	ft
Daily flow	1200	gal/day
LTAR	0.25	sqft/day
Trench width	3	ft
Required drain field length (gravel)	<u>1600</u>	ft
Required drain field length (ezflow)	<u>1200</u>	ft

County Line Drug Store

Project No. 10956.S1

Drug Store (1200 gpd)

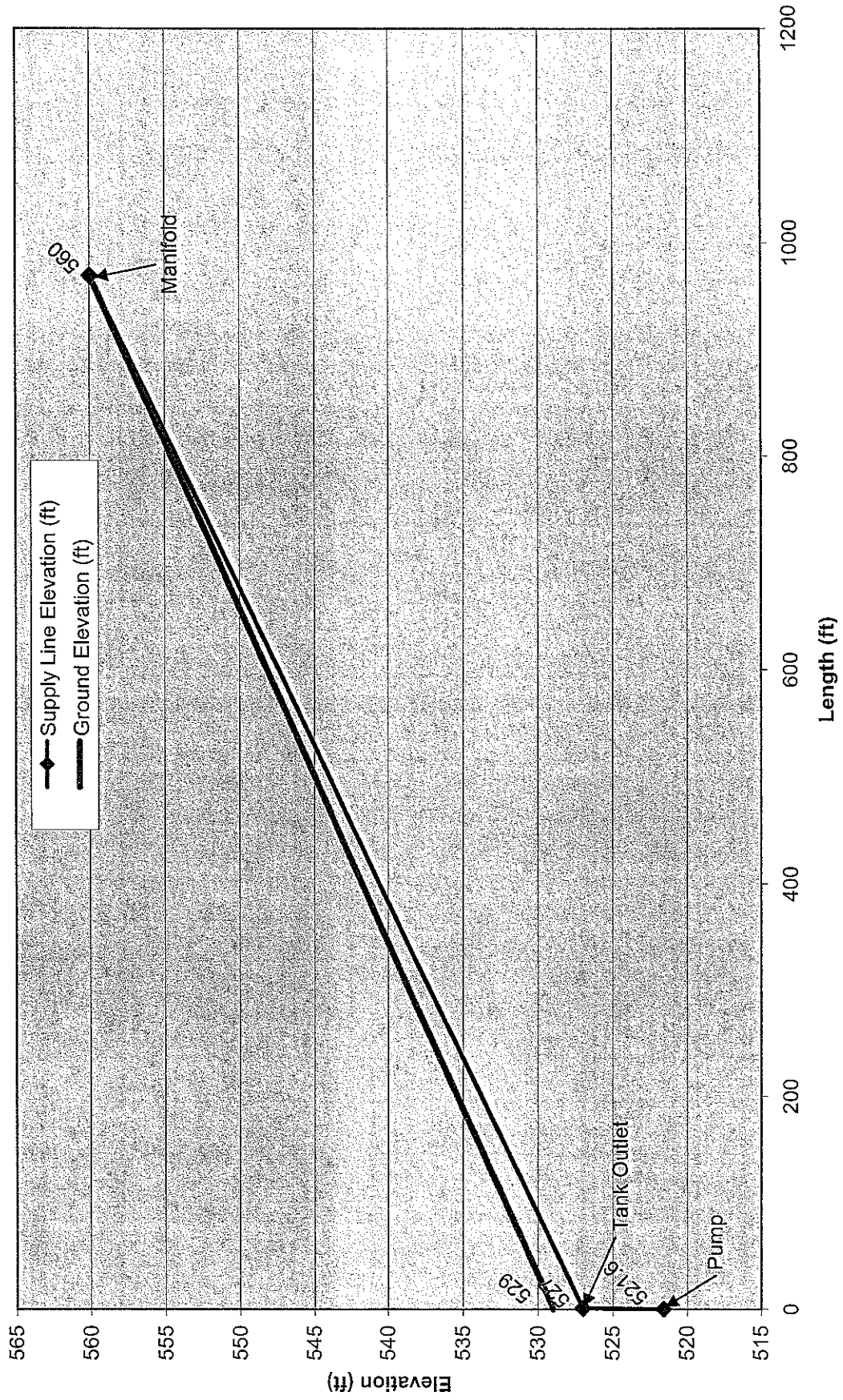
April 7, 2008

<u>LINE #</u>	<u>FLAG</u> <u>COLOR</u>	<u>BS (ft)</u>	<u>HI (ft)</u>	<u>FS (ft)</u>	<u>ELEVATION (ft)</u>	<u>FLAGGED</u> <u>LINE LENGTH (ft)</u>	<u>DESIGN</u> <u>LINE LENGTH (ft)</u>
TBM		4.0			559.00		
INSTR. 1			563.00				
1	BLUE			3.20	559.80	82	0
2	PINK			3.50	559.50	70	0
3	ORANGE			3.80	559.20	90	0
4	YELLOW			4.00	559.00	133	120
5	BLUE			4.30	558.70	164	155
6A	PINK			4.70	558.30	350	155
6B	PINK			4.70	558.30	0	155
7	ORANGE			5.30	557.70	200	155
8	BLUE			5.90	557.10	130	120
9	RED			6.20	556.80	219	155
10	ORANGE			6.50	556.50	122	120
11	YELLOW			7.40	555.60	155	155
Total						1715	1290

	<u>LINE</u> <u>LENGTH (ft)</u>	<u>LTAR</u> <u>GPD/FT²</u>	<u>SYSTEM</u> <u>TYPE</u>	<u>SOIL</u> <u>LTAR</u> <u>GPD/FT²</u>	<u>INNOVATIVE</u> <u>SYSTEM</u>	<u>DISTRIBUTION</u> <u>PRESSURE</u> <u>MANIFOLD</u>
System	1290	0.25	INNOV.	0.25	EZ-Flow	
Repair	3688	0.20	Drip	0.20	Drip Irrigation	Subsurface Drip Irrigation

- Notes:**
- ** TBM on Ground at PL Stake
 - **TBM is assumed to be 100'.
 - **All measures in feet.
 - **Nitrification lines are demonstrated on contour via colored pin flags.
 - **BS, FS indicate rod readings.

Supply Line Profile County Line Drug Store

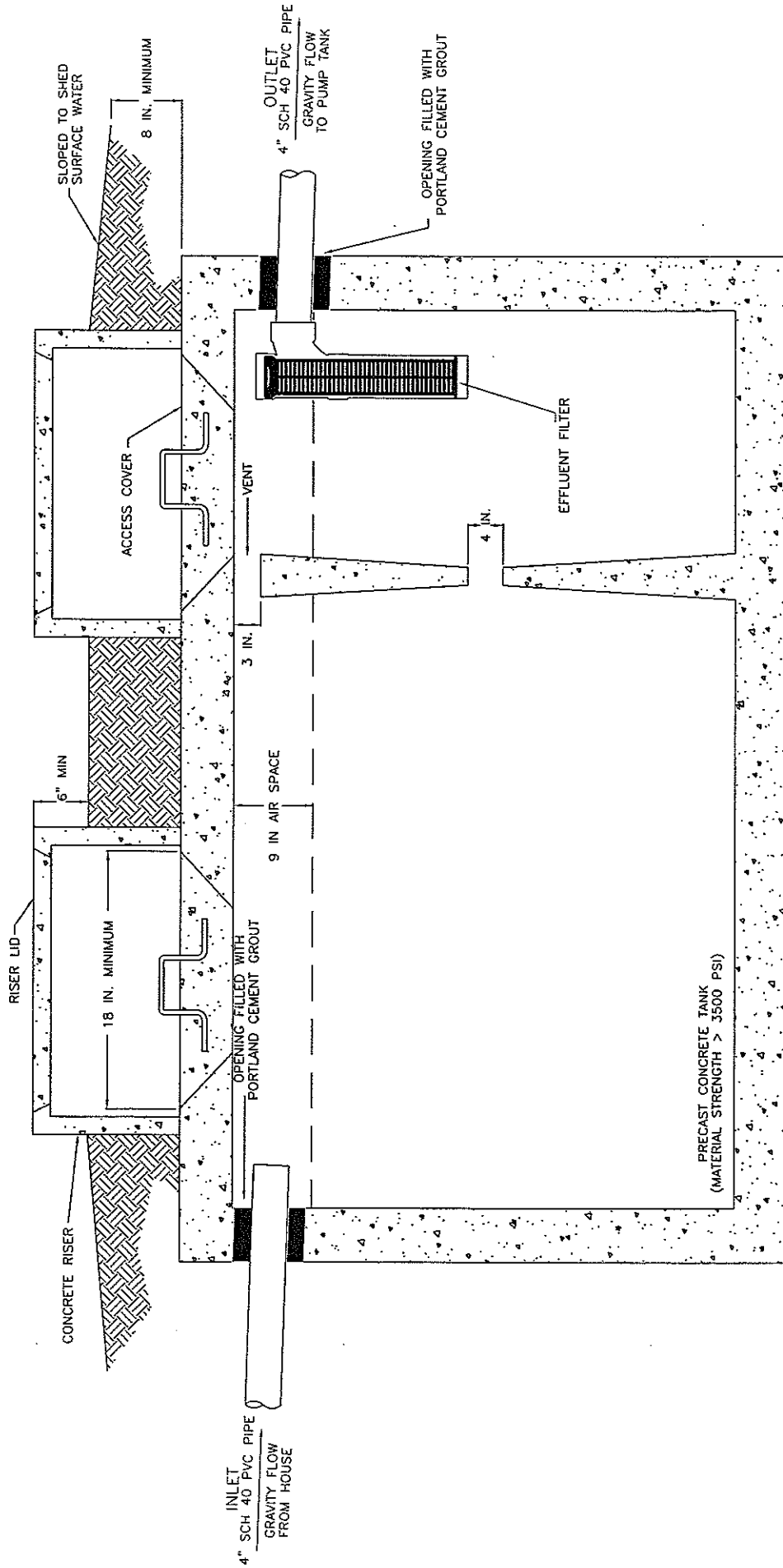


**County Line Drug Store
Project No. 10956.S1
SYSTEM TAP CHART**

Line #	Color	Field Elev. (ft)	Length (ft)	Hole Size (in)	Flow/Tap (gpm)	gpd	Trench Area (sq ft)	Line LTAR (gpd/sq ft)
4	YELLOW	559.00	120	1/2" SCH. 80	5.48	111.27	360	0.309
5	BLUE	558.70	155	1/2" SCH. 40	7.11	144.37	465	0.310
6A	PINK	558.30	155	1/2" SCH. 40	7.11	144.37	465	0.310
6B	PINK	558.30	155	1/2" SCH. 40	7.11	144.37	465	0.310
7	ORANGE	557.70	155	1/2" SCH. 40	7.11	144.37	465	0.310
8	BLUE	557.10	120	1/2" SCH. 80	5.48	111.27	360	0.309
9	RED	556.80	155	1/2" SCH. 40	7.11	144.37	465	0.310
10	ORANGE	556.50	120	1/2" SCH. 80	5.48	111.27	360	0.309
11	YELLOW	555.60	155	1/2" SCH. 40	7.11	144.37	465	0.310

Total Length (ft) = 1290 gal/min = 59.1

Design Flow	1200	gpd
Total Pump Run	20.30	min
Soil LTAR	0.25	gpd/sq ft
(LTAR +5%)	0.2625	gpd/sq ft
LTAR with INNOV.	0.333333333	gpd/sq ft
LTAR with INNOV. + 5%	0.35	gpd/sq ft
100% Dose Volume	839.48	gal
Percent Dose Volume	60%	
Dose Volume	503.69	gal
Pump Run Time	8.52	min



BRANTLEY 2000 GALLON SEPTIC TANK

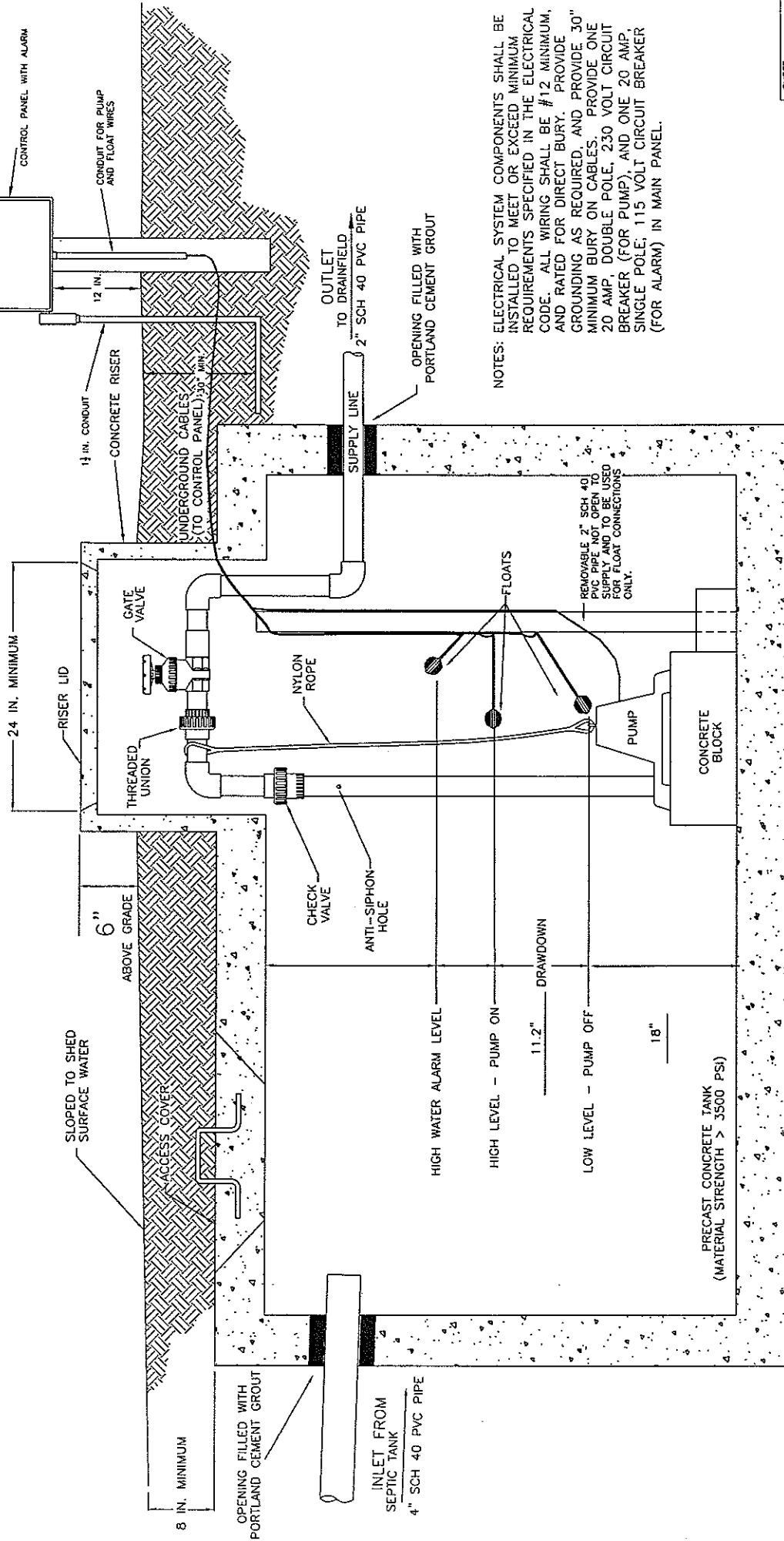
SHEET 8 of 17

JOB NO. 10856.S1	PROJECT NAME: COUNTY LINE DRUG STORE
PROJECT MGR. RP	SHEET TITLE: SEPTIC TANK DIAGRAM
SCALE	NTS



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 11010 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-5900 • Fax: (919) 846-9467
 www.SandEC.com

2000 GALLON BRANTLEY PUMP TANK
 DRAWDOWN SPECIFIED 44.85 GALLONS PER INCH

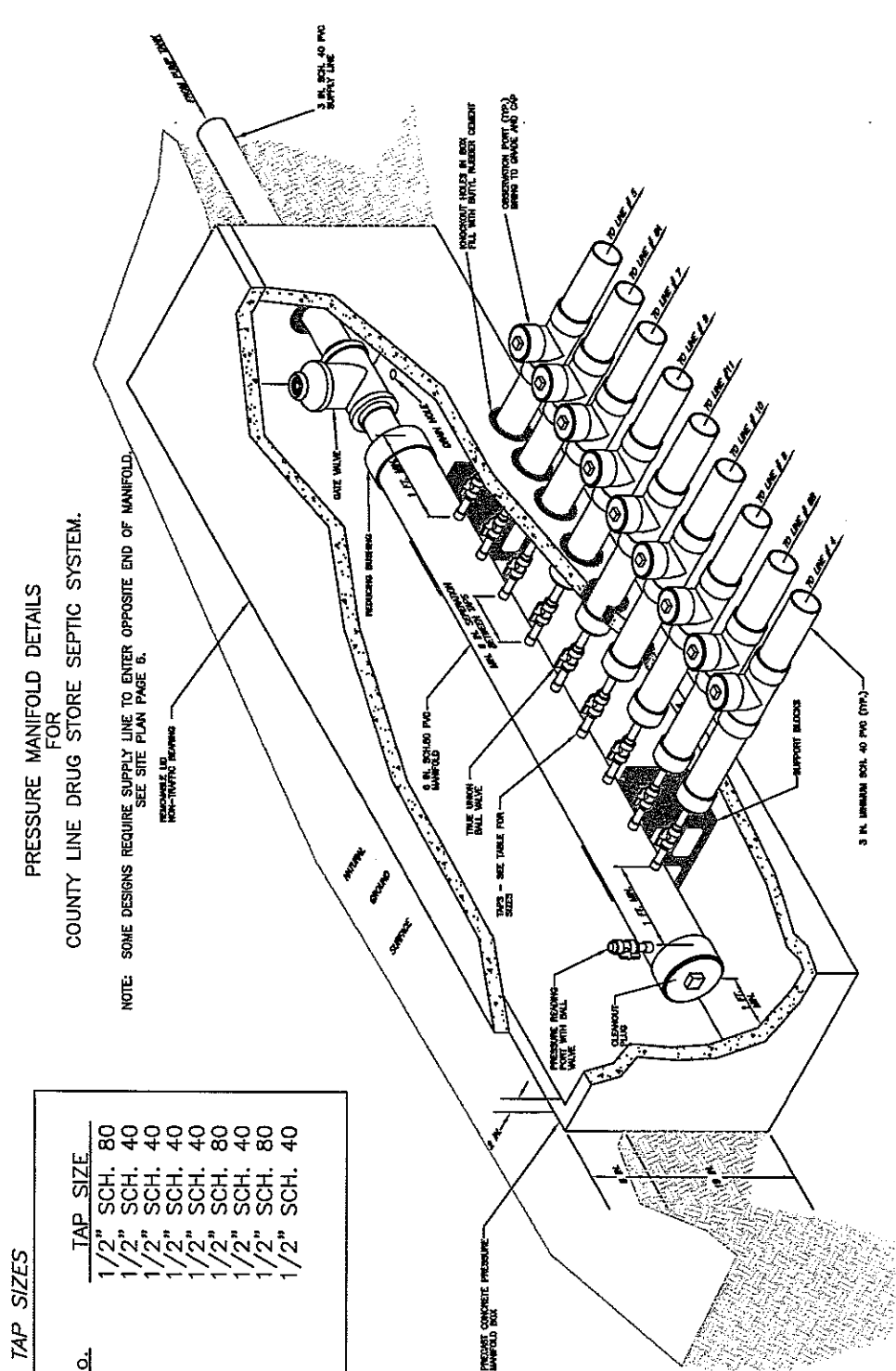


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 www.StandEC.com



PROJECT NAME: COUNTY LINE DRUG STORE
 SHEET TITLE: PUMP TANK DIAGRAM

JOB NO. 10956.51
 PROJECT MGR. RP
 SCALE NTS



PRESSURE MANIFOLD DETAILS FOR COUNTY LINE DRUG STORE SEPTIC SYSTEM.

NOTE: SOME DESIGNS REQUIRE SUPPLY LINE TO ENTER OPPOSITE END OF MANIFOLD. SEE SITE PLAN PAGE 6.

TAP SIZES

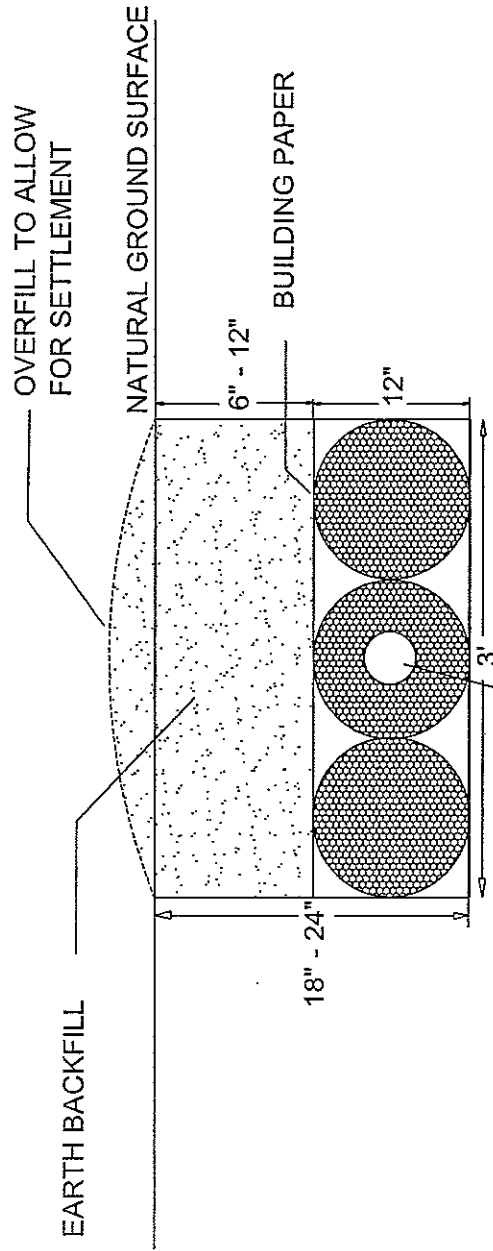
LINE No.	TAP SIZE
4	1/2" SCH. 80
5	1/2" SCH. 40
6A	1/2" SCH. 40
6B	1/2" SCH. 40
7	1/2" SCH. 40
8	1/2" SCH. 80
9	1/2" SCH. 40
10	1/2" SCH. 80
11	1/2" SCH. 40

COUNTY LINE DRUG STORE

PRESSURE MANIFOLD DIAGRAM

JOB NO. 10956531	PROJECT NBR. RP	SHEET TITLE NTS
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NITRIFICATION TRENCH DETAIL FOR EZ-FLOW



NOTE :

EZ-FLOW
 4" DIAMETER CORRUGATED
 PLASTIC DRAIN PIPE
 SURROUNDED BY
 POLYSTYRENE BLOCKS
 WRAPPED W/PLASTIC MESH

1. PERFORATED CORRUGATED PLASTIC PIPE SHALL MEET REQUIREMENTS OF ASTM D 2729.
2. PIPE SHALL BE LEVEL.
3. END CAP SHALL BE PROVIDED AT END OF ALL CORRUGATED PLASTIC PIPE LINES.
4. TRENCH BOTTOM SHALL BE LEVEL.
4. SEE INFORMATION FOR INSTALLER.

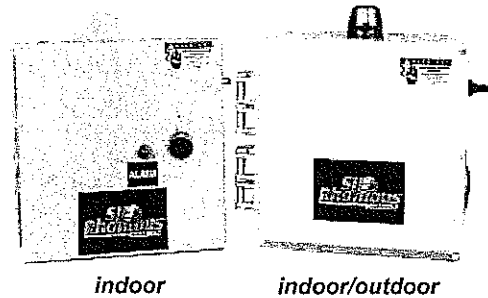
JOB NO.	PROJECT NAME:
DWG. ST.	COUNTY LINE DRUG STORE
PROJECT MGR.	TRENCH DETAIL
RP	
SCALE	
NTS	



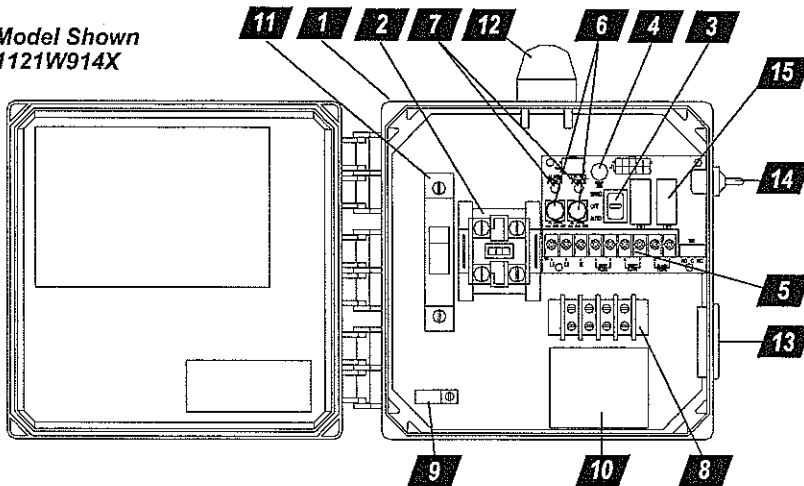
MODEL 112 Control Panel

Single phase, simplex motor contactor control.

The Model 112 control panel provides a reliable means of controlling one 120, 208, or 240 VAC single-phase pump in pump chambers, sump pump basins, irrigation systems and lift stations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system.



Model Shown
1121W914X



1. **Enclosure** measures 8 x 8 x 4 inches (20.32 X 20.32 X 10.16 cm). Choice of NEMA 1 (steel for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic with removable flanges for outdoor or indoor use).
* Options selected may increase enclosure size and change component layout.
2. **Magnetic Motor Contactor** controls pump by switching hot electrical lines.
3. **HOA Switch** for manual pump control (mounted on circuit board).
4. **Green Pump Run Indicator Light** (mounted on circuit board).
5. **Float Switch Terminal Block** (mounted on circuit board).
6. **Alarm and Control Fuses** (mounted on circuit board).
7. **Alarm and Control Power Indicators** (mounted on circuit board).
8. **Pump Input Power and Pump Connection Terminal Block**
9. **Ground Lug**
10. **Terminal Block Installation Label**
11. **Circuit Breaker** (optional) provides pump disconnect and branch circuit protection.

STANDARD ALARM PACKAGE (other options available)

12. **Red Alarm Beacon** provides 360° visual check of alarm condition.
Note: NEMA 1 style utilizes a door mounted indicator in lieu of a beacon.
13. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
Note: NEMA 1 style utilizes an internally mounted buzzer (83 to 85 decibel) in lieu of horn.
14. **Exterior Horn Test/Normal/Silence Switch** allows alarm horn to be silenced and testing of horn and light to ensure proper operation of alarm system.
15. **Horn Silence Relay** automatically resets alarm after alarm condition has been resolved (mounted on circuit board).

FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes three 20' Sensor Float® control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty



SJE rhombus CONTROLS
SJ ELECTRO SYSTEMS, INC.

PO Box 1708, Detroit Lakes, MN 56502
1-888-DIAL-SJE • 1-218-847-1317
1-218-847-4617 Fax
email: sje@sjerhombus.com
www.sjerhombus.com

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112 1 W 9 0 4 L 3A, 8A, 8C

MODEL 112

- ALARM PACKAGE**
- 0 = select options or no alarm package
 - 1 = alarm package (includes test/normal/silence switch, fuse, red light, horn & float)
- ENCLOSURE RATING**
- I = Indoor, NEMA 1 (metal)
 - W = Weatherproof, NEMA 4X (engineered thermoplastic)
- STARTING DEVICE**
- 1 = magnetic motor contactor 120/208/240V
 - 9 = magnetic motor contactor 120V only
- PUMP FULL LOAD AMPS**
- 0 = 0-7 FLA
 - 1 = 8-15 FLA
 - 2 = 16-20 FLA
 - 3 = 21-30 FLA
- PUMP DISCONNECTS**
- 0 = no pump disconnect
 - 1 = pull-out with safety deadfront in a 10"x8" enclosure
 - 4 = circuit breaker
- FLOAT SWITCH APPLICATION**
- H or L = pump down or pump up
 - X = no floats

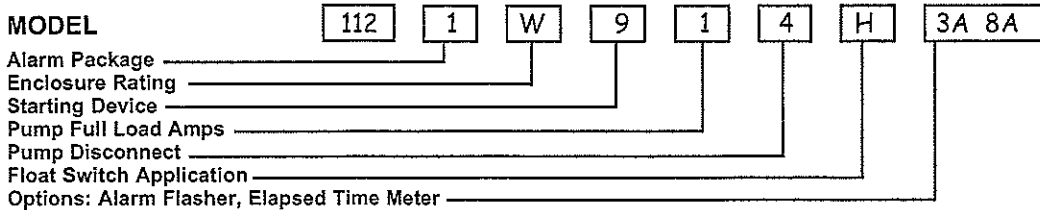
OPTIONS *Listed below*

★ Options selected may increase enclosure size and change component layout.

If additional features are required, call the factory for a quote on either a Pro-Line or Engineered Custom control panel system.

- | | |
|---|---|
| <p>CODE DESCRIPTION</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1A Red beacon only / no audio
<i>must select 1E if floats included</i> <input type="checkbox"/> 1C Horn only / no visual
<i>must select 1E if floats included</i> <input type="checkbox"/> 1E Alarm float <input checked="" type="checkbox"/> 3A Alarm flasher <input type="checkbox"/> ★ 4A Low level cutout
<i>select option 4D if floats included</i> <input type="checkbox"/> ★ 4B Red low-level indicator & alarm
<i>must select 4A also</i> <input type="checkbox"/> 4D Low-level float <input type="checkbox"/> 6A Auxiliary alarm contact, form C type <input checked="" type="checkbox"/> ★ 8A Elapsed time meter <input checked="" type="checkbox"/> ★ 8C Event (cycle) counter <input type="checkbox"/> 10E Lockable latch - NEMA 4X <input type="checkbox"/> 10E Lockable latch - NEMA 1 <input type="checkbox"/> ★ 10F Lightning arrester <input type="checkbox"/> ★ 10K Anti-condensation heater | <p>CODE DESCRIPTION</p> <ul style="list-style-type: none"> <input type="checkbox"/> 11C NEMA 1 alarm panel <i>must select option 6A</i> <input type="checkbox"/> 11D NEMA 4X alarm panel <i>must select option 6A</i> <input type="checkbox"/> 15A Control / alarm circuit breaker
<i>Does not include the circuit board as in standard.</i> <input type="checkbox"/> 16A 10' cord in lieu of 20' <input type="checkbox"/> 16B 15' cord in lieu of 20' <input type="checkbox"/> 16C 30' cord in lieu of 20' <input type="checkbox"/> 16D 40' cord in lieu of 20' <input type="checkbox"/> 17A SJE SignalMaster® / mounting strap ● <input type="checkbox"/> 17B SJE SignalMaster® / externally weighted ● <input type="checkbox"/> 17C Sensor Float® / internally weighted ▲ <input type="checkbox"/> 17D Sensor Float® / externally weighted ▲ <input type="checkbox"/> 17E Sensor Float® Mini / pipe clamp ▲ <input type="checkbox"/> 17F Sensor Float® Mini / externally weighted ▲ <input type="checkbox"/> 19X Door mounted pump run indicator <input type="checkbox"/> 21A Pumpmaster® in lieu of on/off switches ● <input type="checkbox"/> 21B PumpMaster® Plus in lieu of on/off switches ● <input type="checkbox"/> 21C Super Single® in lieu of on/off switches ▲ <input type="checkbox"/> 21D Double Float™ in lieu of on/off switches ▲ <p style="text-align: center;">● Mechanically-activated ▲ Mercury-activated</p> |
|---|---|

SAMPLE



Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
 SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961
 (502) 778-2731 • 1 (800) 928-PUMP • FAX (502) 774-3624

visit our web site:
www.zoeller.com

COMPARE THESE FEATURES

- Non-clogging vortex impeller design bronze class 88-8-0-4 (180 Series).
- Enclosed impeller design (191 Series).
- Float operated, submersible (NEMA 6) 2-pole mechanical switch.
- Durable cast construction. Cast iron switch case, base, motor and pump housing. No sheet metal parts to rust or corrode.
- Stainless steel screws, bolts, float rod, handle, guard, arm and seal assembly.
- 20 ft. UL Listed 3-wire neoprene cord and plug. Extra cord lengths available in 25-35-50 foot length only.
- Motor - 60 Hz, 3450 RPM, oil-filled, hermetically sealed, automatic reset, thermal overload protected (1 PH only).
- Maximum temperature for effluent or dewatering 130°F. 54°C, WD189 120°F (49°C).
- Variable level control systems available.
- Square Ring & Gasket - Neoprene.
- Shaft Seal - Stainless steel carbon & ceramic rotary.
- Upper sleeve bearing and lower ball bearing running in bath of oil.
- All 180/4180 series pass 3/4-inch spherical solids. Model 191 pump passes 5/8-inch spherical solids.
- On point 14 3/4" • Off point 5" (automatic units).
- Major width 12 3/4" • Height 18 9/16". (Single seal pumps)
- 1 1/2" NPT discharge with 2" or 3" flange available. (Model 191 is not available with 3" flange)
- Corrosion resistant powder coated epoxy finish.

MODELS 4185-4186-4188-4189

DOUBLE SEAL PUMPS (Nonauto only)

- Protects motor from seal leaks.
- Improved bearing lubrication.
- Helps eliminate seal and bearing damage from dry runs.
- Major width 12 3/4". Height 20 7/16".

Note: The sizing of effluent systems normally requires variable level float(s) controls and properly sized basins to achieve required pumping cycles or dosing timers with nonautomatic pumps.

AUTOMATIC UNITS NOT RECOMMENDED FOR USE IN EFFLUENT SYSTEMS

*NOTE: No UL Listing for 200/208 1 Phase Pumps, Model 186 & 191, or Double Seal Series. See Back Page for UL & CSA Listings

Nonautomatic Model for variable level systems

185 - 186 - 188 - 189 Single Seal Series
4185 - 4186 - 4188 - 4189 Double Seal Series
191 Single Seal Drip Pump
 (For Pump Prefix Identification see News & Views 0052)

Tested to UL Standard UL778 & Certified to CSA Standard C22.2 No. 108

HIGH HEAD

"FLOW-MATE"

FOR SEPTIC TANK • LOW PRESSURE PIPE (LPP)
 AND ENHANCED FLOW STEP SYSTEMS

EFFLUENT

OR DEWATERING PUMP • SUBMERSIBLE
 1 1/2" NPT DISCHARGE STANDARD • 2" or 3" FLANGE AVAILABLE

SSPMA
MEMBER

SUMP AND SEWAGE PUMP MFRS. ASSN.

230V Automatic
Controlled by variable level float switch integral to the pump in WD189/WD4189 Series only.

Double Seal Pump

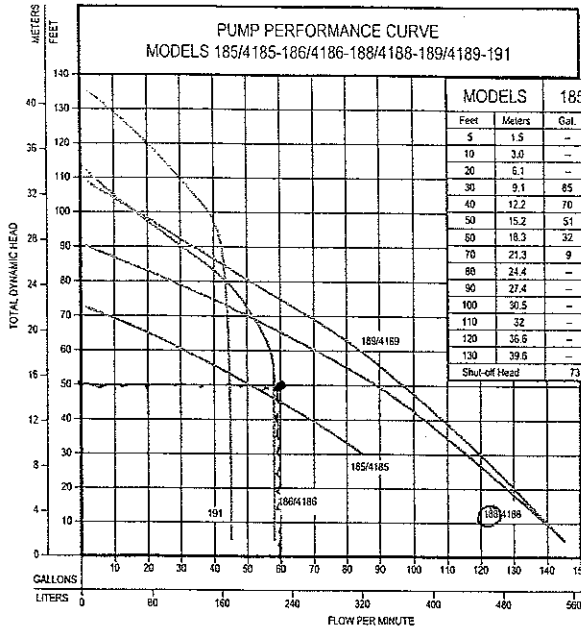
230V 1PH Automatic
Available in 185, 186, 188 Series

230V 1PH Nonautomatic
Available in 185/4185, 186/4186, 188/4188, 189/4189 Series

POWDER COATED TOUGH™

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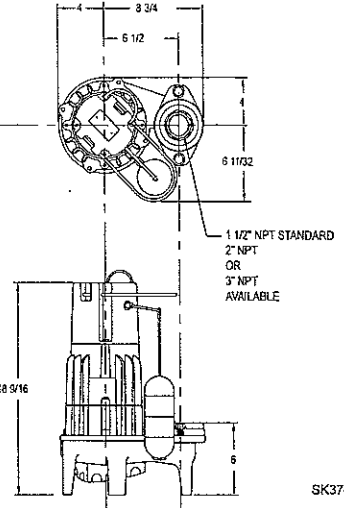
Simple Seal All Series
Automatic Design
Weight 89-170 lbs.



MODELS		185/4185		186/4186		188/4188		189/4189		191	
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	—	—	38	220	145	549	145	549	45	170
10	3.0	—	—	58	220	140	530	140	530	45	170
20	6.1	—	—	58	220	128	484	130.5	494	45	170
30	9.1	85	322	56	220	116	439	120	454	45	170
40	12.2	70	265	58	220	103.5	392	109	413	45	170
50	15.2	51	193	58	220	90	341	97	367	45	170
60	18.3	32	121	58	220	71	269	85	322	45	170
70	21.3	9	34	52	197	51	193	69	261	45	170
80	24.4	—	—	45	170	28	108	51	193	45	170
90	27.4	—	—	30.5	115	2	8	34	129	45	170
100	30.5	—	—	16	60	—	—	17	64	40	151
110	32	—	—	4	15	—	—	—	—	30	114
120	36.6	—	—	—	—	—	—	—	—	20	75
130	39.6	—	—	—	—	—	—	—	—	10	38
Shut-off Head		73 ft. (22m)		114 ft. (35m)		91 ft. (28m)		110 ft. (34m)		137 ft. (42m)	

009903

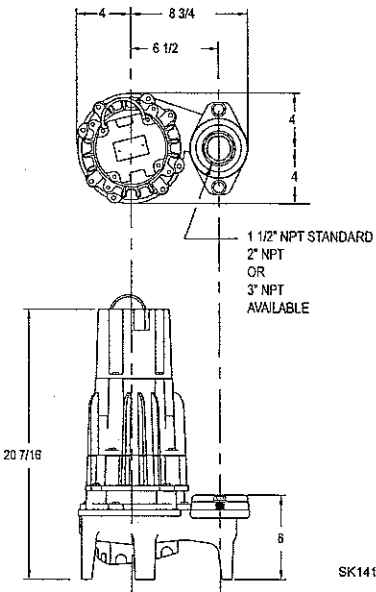
WARNING: Model 185 should not be subjected to heads less than 30 feet TDH.



SK374

185 MODELS		4185 MODELS		Standard all models - 20 ft. cord - 1 H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	CSA	UL		
D185	—	230	1	Auto	9.8	1	—	Y	Y		
E185	E4185	230	1	Non	9.8	2 or 3	4	Y ⁽²⁾	Y		
* H185	—	200-208	1	Auto	11.5	1	—	N	N		
* I185	* I4185	200-208	1	Non	11.5	2 or 3	4	N	N		
* F185	* F4185	230	3	Non	7.4	3 & 5	4 & 5	Y	Y		
* J185	* J4185	200-208	3	Non	7.5	3 & 5	4 & 5	Y	Y		
* G185	* G4185	460	3	Non	3.7	3 & 5	4 & 5	Y	Y		
* BA185	—	575	3	Non	3.3	3 & 5	4 & 5	Y	N		

Double Seal-4180 Series / Weight 89-94 lbs.



SK1413

186 MODELS		4186 MODELS		Standard all models - 20 ft. cord - 1 1/2 H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	CSA	UL		
D186	—	230	1	Auto	13.7	1	—	N	N		
E186	E4186	230	1	Non	13.7	2 or 3	4	N	N		
* F186	* F4186	230	3	Non	9.2	3 & 5	4 & 5	N	N		
* G186	* G4186	460	3	Non	4.6	3 & 5	4 & 5	N	N		

188 MODELS		4188 MODELS		Standard all models - 20 ft. cord - 1 1/2 H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	CSA	UL		
D188	—	230	1	Auto	14.0	1	—	N	Y ⁽¹⁾		
E188	E4188	230	1	Non	14.0	2 or 3	4	Y ⁽²⁾	Y ⁽¹⁾		
* H188	—	200-208	1	Auto	16.8	1	—	N	N		
* I188	* I4188	200-208	1	Non	16.8	2 or 3	4	N	N		
* F188	* F4188	230	3	Non	8.9	3 & 5	4 & 5	Y	Y		
* J188	* J4188	200-208	3	Non	10.3	3 & 5	4 & 5	Y	Y		
* G188	* G4188	460	3	Non	4.6	3 & 5	4 & 5	Y	Y		
* BA188	—	575	3	Non	3.5	3 & 5	4 & 5	Y	N		

SELECTION GUIDE

1. Integral float operated mechanical switch, no external control required.
2. For automatic use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
3. See FM1228 for correct model of simplex control panel.
4. See FM0712 for correct model of duplex control panel.
5. Variable level control switch 10-0225 used as a control activator, specify simplex (3) float or duplex (4) float system.

CAUTION

All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA).

For information on additional Zoeller products refer to catalog on Piggyback Variable Level Float Switches, FM0477; Electrical Alternator, FM0486; Mechanical Alternator, FM0495; Sump/Sewage Basins, FM0487; Simplex Pump Control, FM1596; Alarm Systems, FM0732; and Disconnect/Rail Systems, FM0787.

189 MODELS		4189 MODELS		Standard all models - 20 ft. cord - 2 H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	CSA	UL		
⁽¹⁾ D189	—	230	1	Auto	17.1	1	—	N	Y ⁽¹⁾		
⁽²⁾ E189	⁽²⁾ E4189	230	1	Non	17.1	2 or 3	4	Y ⁽²⁾	Y ⁽¹⁾		
* H189	—	200-208	1	Auto	20.5	1	—	N	N		
* I189	* I4189	200-208	1	Non	20.5	2 or 3	4	N	N		
* F189	* F4189	230	3	Non	11.2	3 & 5	4 & 5	Y	Y		
* J189	* J4189	200-208	3	Non	13.2	3 & 5	4 & 5	Y	Y		
* G189	* G4189	460	3	Non	6.0	3 & 5	4 & 5	Y	Y		
* BA189	—	575	3	Non	5.8	3 & 5	4 & 5	Y	N		
⁽³⁾ WD189	* WD4189	230	1	Auto	17.1	1	4	N	N		

191 MODEL		Standard all models - 20 ft. cord - 2 H.P.				Control Selection		Listings	
Single Seal	Double Seal	Volts	Ph	Mode	Amps	Simplex	Duplex	CSA	UL
E191	—	230	1	Non	14.5	2 or 3	4	N	N

(1) No Molded Plug
 (1) UL Listed unit available with 20 Amp Plug.
 (2) CSA Approval without plug cap.
 (3) 20 Amp Outlet, P/N 10-0060 must be used.

RESERVE POWERED DESIGN

For unusual conditions a reserve safety factor is engineered into the design of every Zoeller pump.

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County Line Drug Store

Project No. 10956.S1

Drug Store (1200 gpd)

April 7, 2008

<u>LINE #</u>	<u>FLAG COLOR</u>	<u>BS (ft)</u>	<u>HI (ft)</u>	<u>FS (ft)</u>	<u>ELEVATION (ft)</u>	<u>FLAGGED LINE LENGTH (ft)</u>	<u>DESIGN LINE LENGTH (ft)</u>
TBM		3.6			531.50		
INSTR. 1			535.10				
1	BLUE			3.60	531.50	186	186
2	-			3.75	531.35	0	178
3	ORANGE			3.90	531.20	170	170
4	-			4.25	530.85	0	178
5	RED			4.60	530.50	186	186
6	-			4.75	530.35	0	186
7	YELLOW			4.90	530.20	185	185
8	-			5.05	530.05	0	181
9	RED			5.20	529.90	177	177
10	-			5.35	529.75	0	176
11	BLUE			5.50	529.60	175	175
12	-			5.70	529.40	0	175
13	YELLOW			5.90	529.20	175	175
14	-			6.05	529.05	0	173
15	ORANGE			6.20	528.90	170	170
16	-			6.35	528.75	0	168
17	PINK			6.50	528.60	165	165
18	-			6.70	528.40	0	128
19	RED			6.90	528.20	90	90
20	-			7.05	528.05	0	83
21	ORANGE			7.20	527.90	75	75
22	-			7.45	527.65	0	68
23	BLUE			7.70	527.40	60	60
24	-			7.90	527.20	0	55
25	YELLOW			8.10	527.00	50	50
26	-			8.30	526.80	0	43
27	PINK			8.50	526.60	35	35
Total						1899	3688

	<u>LINE LENGTH (ft)</u>	<u>LTAR GPD/FT²</u>	<u>SYSTEM TYPE</u>	<u>SOIL LTAR GPD/FT²</u>	<u>INNOVATIVE SYSTEM</u>	<u>DISTRIBUTION PRESSURE MANIFOLD</u>
System	1290	0.25	INNOV.	0.25	EZ-Flow	
Repair	3688	0.20	Drip	0.20	Drip Irrigation	Subsurface Drip Irrigation

- Notes:**
- **TBM is assumed to be 531.5'.
 - **All measures in feet.
 - **Nitrification lines are demonstrated on contour via colored pin flags.
 - **BS, FS indicate rod readings.

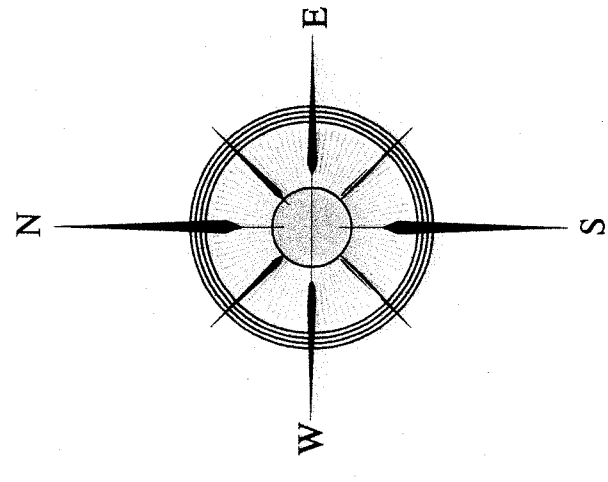
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Client: Lee Moore Capital Co.
 Location: Chatham CO., NC

Project: County Line Drug Store
 Sheet Title: Septic System Site Plan

Project No.: 10956.51
 Project Manager: RP
 Drawn: SM
 Field Work: RP
 Date: 4/7/08
 Sheet No.: 1 of 1



- NOTES:
- 1) SITE DATA TO INCLUDE PROPERTY BOUNDARIES, STRUCTURE LOCATION, UTILITIES, ROADS, AND OTHER SITE FEATURES WERE PROVIDED BY CE GROUP, INC. AND ARE SHOWN TO DISPLAY GENERAL SITE CONDITIONS.
 - 2) ALL SEPTIC SYSTEM COMPONENTS TO INCLUDE TANKS, PUMPS, MANIFOLDS, AND SYSTEM AND REPAIR LINES HAVE BEEN GPS LOCATED BY SOIL AND ENVIRONMENTAL CONSULTANTS, PA. ALL LOCATIONS, ELEVATIONS, AND DIMENSIONS ARE APPROXIMATE AND AS SUCH NO SPECIFIC ACCURACY EITHER VERTICAL OR HORIZONTAL IS IMPLIED.
 - 3) PROPERTY AND EASEMENT BOUNDARIES SHOWN ON THIS SITE SKETCH ARE APPROXIMATE AND ARE NOT INTENDED FOR LOCATING PROPERTY OR IDENTIFYING PROPERTY OR EASEMENT CORNERS. THIS IS NOT A SURVEY.

