

HT# 07-5-17702R

Harnett County Department of Public Health

24562

Improvement Permit

A building permit cannot be issued with only an Improvement Permit

ISSUED TO: Jason Kolesar PROPERTY LOCATION: 401
 SUBDIVISION: Spence Mill Trk Park LOT # 7
 NEW REPAIR EXPANSION Site Improvements required prior to Construction Authorization Issuance:
 Type of Structure: Education Bldg. 2800 ft²
 Proposed Wastewater System Type: 25% Retention dual alternating fields
 Projected Daily Flow: 570 GPD MAX
 Number of bedrooms: 694/pupil Number of Occupants: 5 employees 90 students max
 Basement Yes No
 Pump Required: Yes No May be required based on final location and elevations of facilities
 Type of Water Supply: Community Public Well Distance from well _____ feet Permit valid for: Five years
 Permit conditions: _____ No expiration

Authorized State Agent: Bryan McSwain, R.S. Date: 2/25/2008 SEE ATTACHED SITE SKETCH
 The issuance of this permit by the Health Department in no way guarantees the issuance of other permits. The permit holder is responsible for checking with appropriate governing bodies in meeting their requirements. This site is subject to revocation if the site plan, plat, or the intended use changes. The Improvement Permit shall not be affected by a change in ownership of the site. This permit is subject to compliance with the provisions of the Laws and Rules for Sewage Treatment and Disposal and to conditions of this permit.

Construction Authorization

(Required for Building Permit)

The construction and installation requirements of Rules .1950, .1952, .1954, .1955, .1956, .1957, .1958, and .1959 are incorporated by references into this permit and shall be met. Systems shall be installed in accordance with the attached system layout.

ISSUED TO: Jason Kolesar PROPERTY LOCATION: 401
 SUBDIVISION: Spence Mill Trk Park LOT # 7
 Facility Type: Education Bldg. 2800 ft² New Expansion Repair
 Basement? Yes No Basement Fixtures? Yes No
 Type of Wastewater System** _____ (Initial) Wastewater Flow: 570 GPD
 (See note below, if applicable _____ (Repair))

Installation Requirements/Conditions

Septic Tank Size Existing + 2000 gallons Exact length of each trench 2x165 feet Trench Spacing: 9 Feet on Center
 Pump Tank Size 2000 gallons Trenches shall be installed on contour at a Soil Cover: 6 inches
 Maximum Trench Depth of: 12 inches (Maximum soil cover shall not exceed 36" above the trench bottom)
 Pump Requirements: _____ ft. TDH vs. _____ GPM _____ inches below pipe
 Conditions: See Attachments for specifications & layout Aggregate Depth: _____ inches above pipe
 _____ inches total

**If applicable: I understand the system type specified is different from the type specified on the application. I accept the specifications of this permit.

Owner/Legal Representative Signature: _____ Date: _____

This Construction Authorization is subject to revocation if the site plan, plat, or the intended use changes. The Construction Authorization shall not be transferred when there is a change in ownership of the site. This Construction Authorization is subject to compliance with the provisions of the Laws and Rules for Sewage Treatment and Disposal and to the conditions of this permit.

Authorized State Agent: Bryan McSwain, R.S. Date: 2/25/2008 SEE ATTACHED SITE SKETCH
 Construction Authorization Expiration Date: 2/25/2017

HALLOWEN & ASSOCIATES, INC.

SOIL & ENVIRONMENTAL SCIENTISTS

P.O. Box 400, 266 Old Coats Road

Lillington, NC 27546-0400

Phone (910) 893-8743 / Fax (910) 893-3594

E-mail: halowen@earthlink.net

30 January, 2008

Mr. Bryan McSwain
Harnett County Environmental Health Division
307 Cornelius Harnett Blvd
Lillington, NC 27546

Reference: Septic System Expansion for Jonathan's House School

Dear Mr. McSwain,

A site investigation was conducted for the above referenced property located on the western side of US 401, Buckhorn Township, Harnett County, North Carolina. The purpose of the investigation was to determine the ability of this property to support expansion and modification to the subsurface sewage waste disposal system for a small private school facility. All sewage disposal ratings and determinations were made in accordance with "Laws and Rules for Sewage Treatment and Disposal Systems, 15A NCAC 18A .1900". This report represents my professional opinion as a Licensed Soil Scientist but does not guarantee or represent permit approval by the local Health Department.

Existing Facility and Client Proposals

The existing facility, Jonathan's House, is a licensed school with a current enrollment of 40 students and 9 full-time teacher/staff positions. Typical hours of operation for the school are from 9:00 am to 2:30 pm Monday through Friday. The school has neither a cafeteria nor shower. Our clients wish to increase student enrollment and teaching/staff positions by twice their existing numbers. A new building is proposed to be constructed to accommodate additional students.

Determination of the Adjusted Daily Sewage Flow

An adjusted design daily sewage flow was determined using total monthly water consumption for 12 consecutive months and 30 consecutive daily water consumption readings, supplied by the Harnett County Public Utilities and the client, as specified by rule 15A NCAC 18A.1949(c)(1) (See attachments 1 and 2). A peaking factor of 1.26 was calculated by dividing a total water usage measurement of 4800 gallons (achieved in November 2006 and June 2007) by 3800 gallons, the total monthly water usage during the 30 consecutive daily measurements (See Attachment 3). It should be noted that the monthly reading of 6200 total gallons for August 2007 was determined to be an outlier due to a running toilet and therefore was excluded for calculation of the adjusted design daily sewage flow. Rule 15A NCAC 18A.1949(c)(1) outlines that the adjusted design daily sewage flow be determined by taking the numerical average of the greatest ten percent of the daily readings and multiplying by the peaking factor. However, due to the fact that the water meter at the site measures water usage in 100-gallon increments, the

average daily water consumption per school day was calculated for each month and the highest value used in place of the average of the greatest ten percent (Table 1). Again it should be noted that data for August 2007 was excluded from all calculations. A value of 224 gallons per school day was multiplied by the calculated peaking factor of 1.26 and an adjusted design daily sewage flow of 282 gallons per day was calculated (See Attachment 3). The average daily water usage was calculated at 5.76 gallons per person and was rounded up to 6.0 gallons per person.

Existing System and proposed expansion

The existing system is composed of 2 x 165-ft of EEE-ZZZ Lay accepted system drainline. Soil LTAR was determined by the Harnett Local Health Department to be 0.3 gal/day/sqft with a trench LTAR of 0.4 gal/day/sqft. This amount of drainline would allow for 396 gallons per day of sewage flow for the existing system. However, if the proposed facility is constructed and the current enrollment is increased by two, the existing system will not support the additional daily wastewater flow. Furthermore, there is inadequate usable soil area to modify the size of the existing system to accept the increase in wastewater flow and also inadequate usable soil area to 100% repair the existing system if it should fail. There is however an adequate amount of usable soil area located adjacent to US 401 to double the total amount of drainline in the existing system and therefore have two separate and equally sized nitrification fields. By installing 330-ft of accepted system drainline, each nitrification field would technically be sized at 75% of the total area required for a single field and under rule 15A NCAC 18A.1955 (p) would not need a repair area. A Zoeller 4000 series automatic multizone diversion valve will be utilized to alternate distribution of wastewater between the two nitrification fields.

Nitrification field A would include the existing system consisting of a 1000-gallon septic tank and the 2 x 165-ft of accepted system drainline (see attached site plan). Nitrification field B would consist of 330-ft of accepted system drainline installed ultra shallow with pressure manifold distribution. A 2000-gallon septic tank will be used commonly between the existing building and the proposed building for collection of all generated wastewater and a common 2000-gallon pump tank utilized to properly transport wastewater. The large septic tank will allow for more storage and initially a longer period of rest for the existing system. It is proposed that the existing septic tank associated with Nitrification field A be utilized so that wastewater is alternately pumped into the existing septic tank and subsequently transported to the existing drainlines. The Zoeller 4000 series automatic multizone diversion valve would need to be placed at an elevation higher than the commonly shared pump tank, existing septic tank and the pressure manifold for Nitrification field B to allow for wastewater to drain away from the diversion valve. The multizone diversion valve assembly would require clear schedule 40 pvc inspection pipes for the first foot of distribution lines leaving the valve as well as a Zabel A300 Commercial Filter installed in the commonly shared septic tank.

With utilization of the existing septic system and installation of the proposed system along with the accompanying water usage data, it appears that this system expansion is adequate to allow for no more than 130 students/teachers/staff. However, due to the marginal soils observed at the site and the wide range of wastewater flows observed from the existing facility, it is conservatively recommended that total occupancy of the two facilities not exceed 95 students/teachers/staff.

Attached is the septic system layout and supporting information for this facility. I trust that this report provides all the information that you require at this time. If you have any questions or need additional information, please contact me at your convenience.

Sincerely,



John C. Roberts
Licensed Soil Scientist



Pressure Manifold Design Criteria for Nitrification Area A

Applicant: Jason Kolesar Phone #: 919-567-1626

Mailing Address: PO Box 42 Kipling, NC 27543

D# : _____ PIN: _____ S/D: _____ Lot#: _____

Site Address: 15 Randy Court Kipling, NC 27543

Septic Tank: 2000 gallons
 LTAR: 0.3 gpd/sqft
 Amt. of Drineline: 990 sqft
 TRENCHES Length (ft): see tap chart Depth (in): 12 Stone Depth (in): 12
 SUPPLY LINE Length (ft): 230 Diameter: 2" sch 40 pvc
 MANIFOLD Length (ft): 3.5 Diameter: 4" sch 80 pvc Elevation: 103.37
 # Taps 4 Tap Configuration: 6in. spacing, 1 side of manifold

Daily Flow: 396 gallons
 Pump Tank: 2000 gallons
 Trench LTAR: 0.4 gpd/sqft
 or 330 linear ft

Tap Chart

LTAR + 5% = 0.42

| Line | Color | Relative Elevation | Drainline Length(ft) | Tap Size/ Schedule | flow (gpm) per tap | gpd | Trench Area | LTAR gpd/sqft |
|------|-------|--------------------|----------------------|-----------------------|-----------------------|--------|-------------|------------------|
| 1 | Y | 100.55 | 35 | FD 1/2" sch 80 | 2.74 | 43.09 | 105 | 0.410 |
| 2 | R | 100.81 | 35 | FD 1/2" sch 80 | 2.74 | 43.09 | 105 | 0.410 |
| 3 | B | 101.21 | 95 | 1/2" sch 40 | 7.11 | 111.82 | 285 | 0.392 |
| 4 | W | 101.62 | 70 | 1/2" sch 80 | 5.48 | 86.18 | 210 | 0.410 |
| 5 | Y | 102.37 | 95 | 1/2" sch 40 | 7.11 | 111.82 | 285 | 0.392 |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |

Total Drainline: 330 Total Flow: 25.18 Sq. Foot: 990.00

Calculations:

Dose Volume: 161.62 gallons, with Pipe Volume at % 75
 Dose Pump Run Time (min) 6.42 Daily Pump Run Time (min): 15.73
 Drawdown: 162 gallons divided by 27 gal/ inch = 5.99 inches

Pump Tank Elevation (ft): 99.92 Pump Elevation (ft): 94.92
 Friction Head: 14.26 (supply line length + 70' for fittings in pump tank + 10.4' for zone valve)
 Elevation Head: 8.45 Design Head: 2 Total Head: 24.71 feet

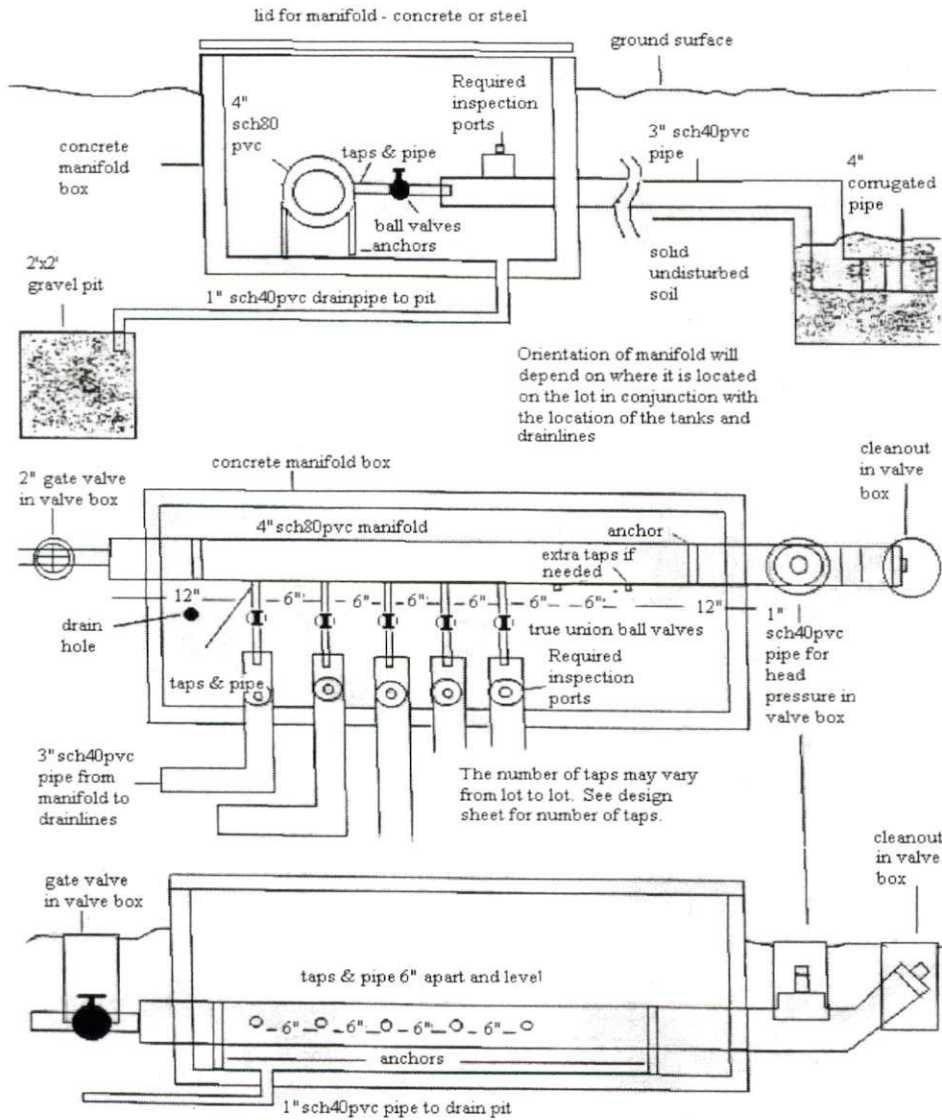
Pump to Deliver: 25.18 gpm @ 24.71 ft head

Simplex Control Panel (SJE Rhombus 112 or equal) with elapsed time meter, cycle counter, alarm, and pump on separate circuits is required. Floats to be determined by type of pump tank used.

A septic filter (Zabel A300 Commercial) is required.

Possible Pumps Include: Hydromatic: SHEF 50 series Zoeller: 163 series

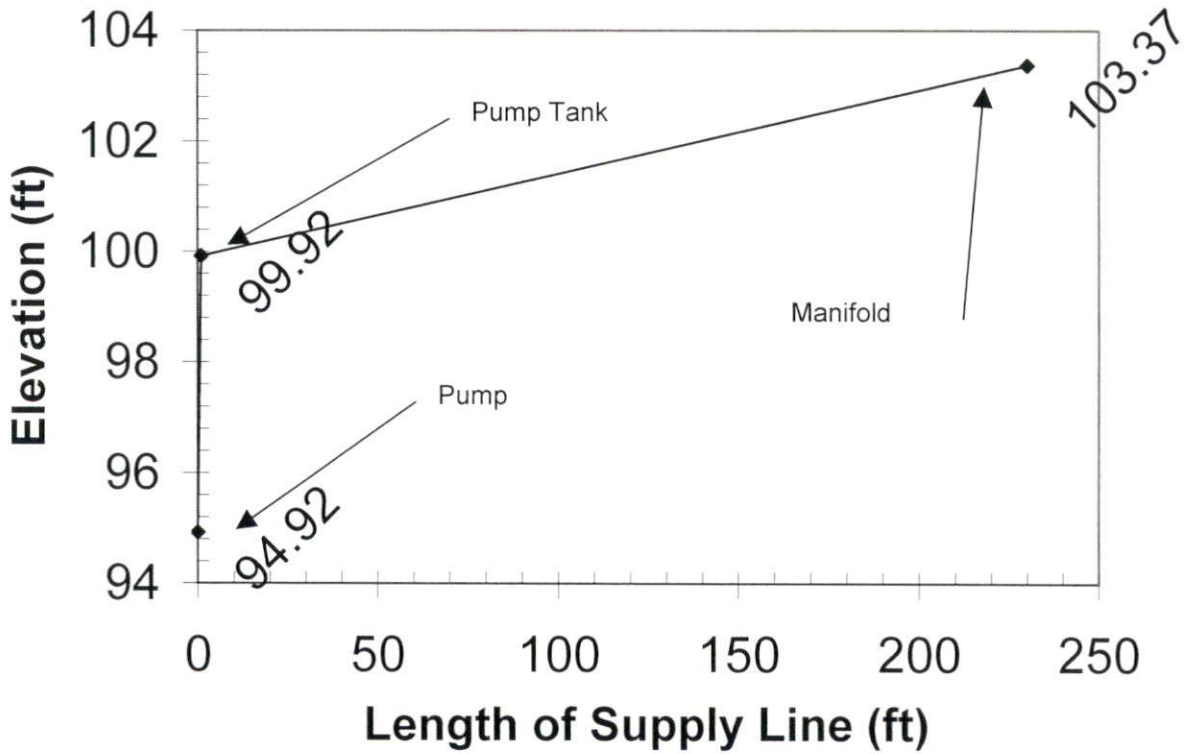
Pressure Manifold Requirements



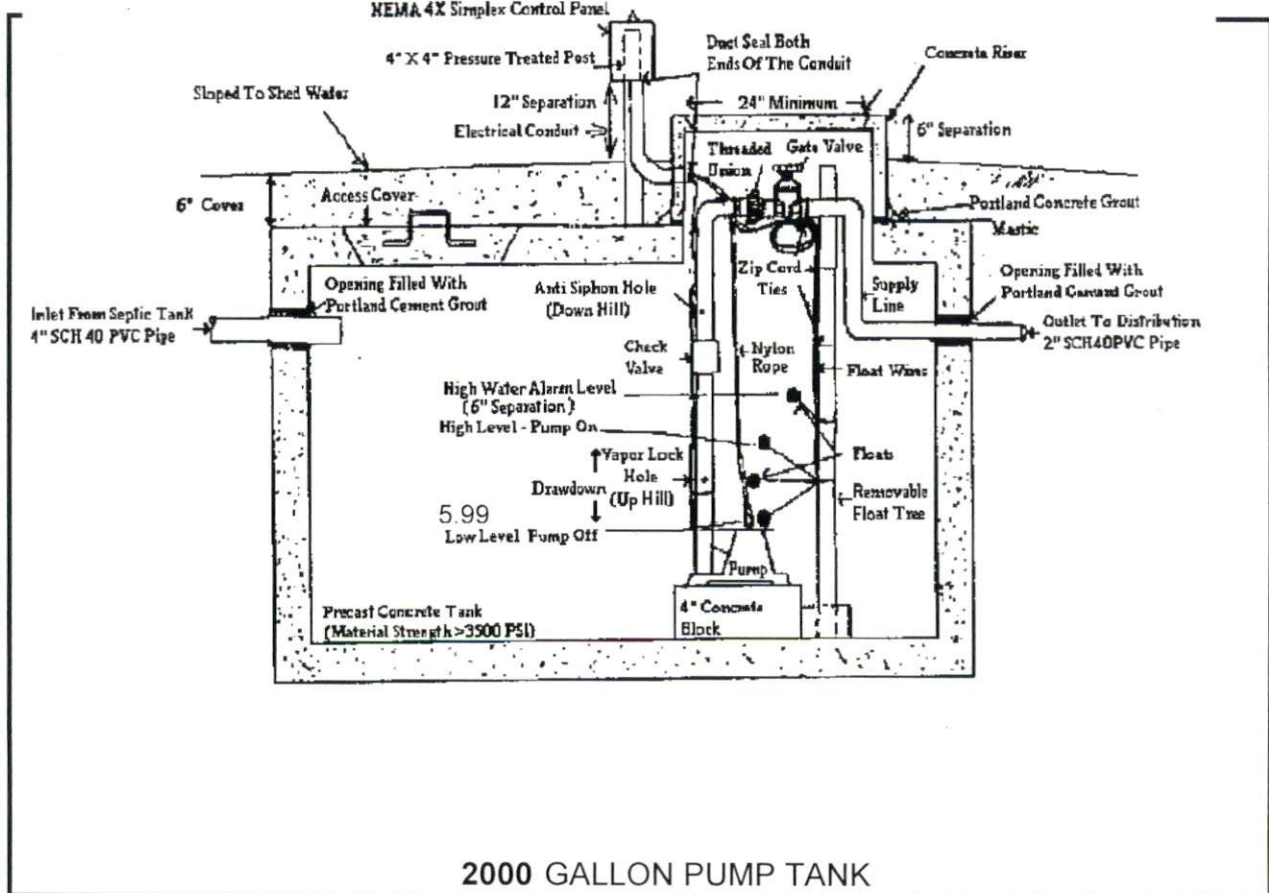
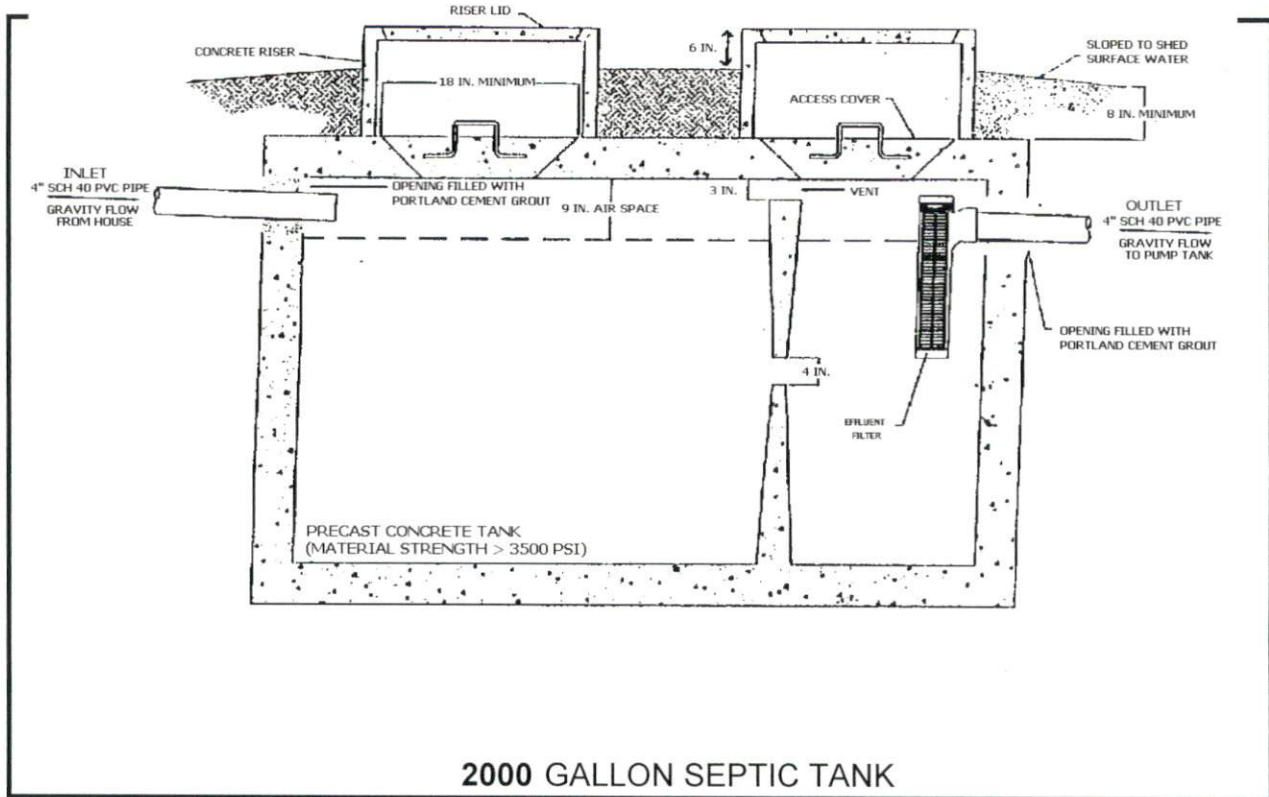
MANIFOLD DIAGRAM (Initial System):

| Tap# | 1 | 2 | 3 | 4 |
|--------------|-------------|-------------|----------------|-------------|
| Tap size | 1/2" sch 80 | 1/2" sch 40 | 1/2" sch 80 | 1/2" sch 40 |
| flow per tap | 5.48 | 7.11 | 5.48 | 7.11 |
| line(length) | L1 (35-ft) | 2.74 | ⊗ flow divider | |
| | L2 (35-ft) | 2.74 | | |
| | | L3 (95-ft) | | |
| | | | L4 (70-ft) | |
| | | | | L5 (95-ft) |

Hydraulic Profile of Supply Line



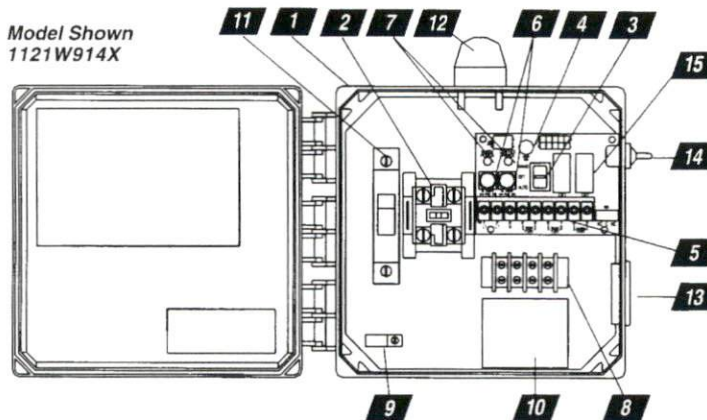
| | Distance | Elevation |
|---------------------|----------|-----------|
| Pump Elevation | 0 | 94.92 |
| Pump Tank Elevation | 1 | 99.92 |
| manifold | 230 | 103.37 |
| 4) | | |
| 4) | | |
| 5) | | |
| 6) | | |
| 7) | | |
| 8) | | |
| 9) | | |
| 10) | | |



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. **required (2X)**

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).

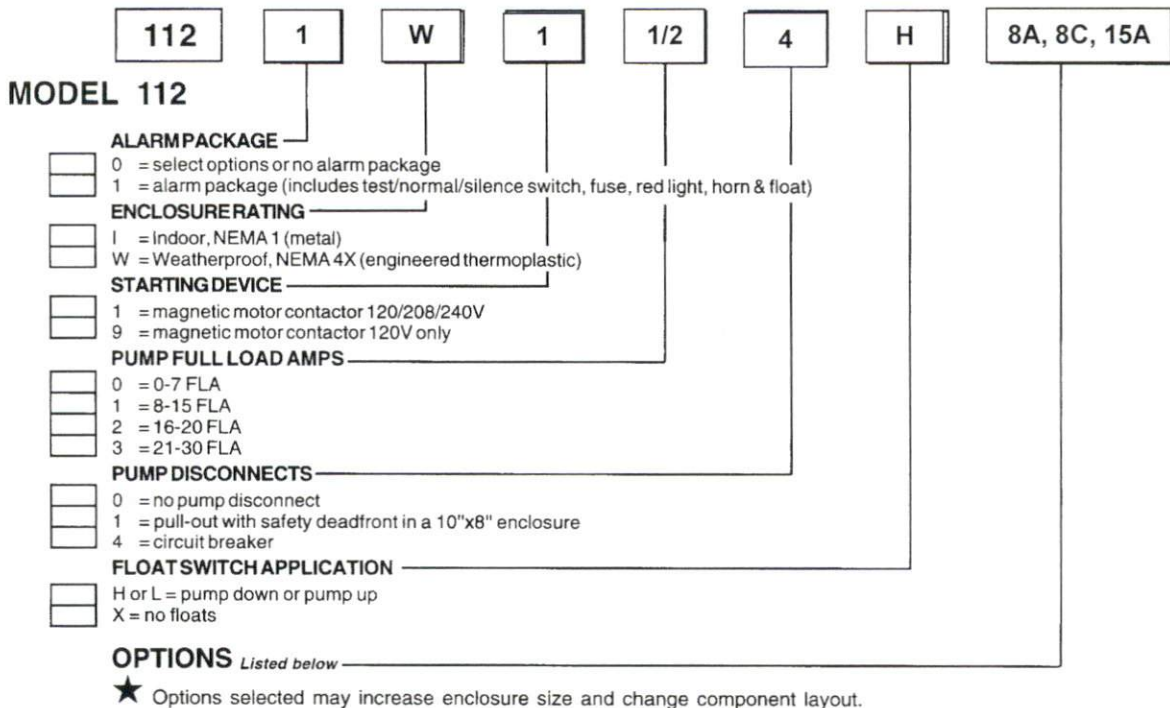
FEATURES

- 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
SJ ELECTRO SYSTEMS, INC.

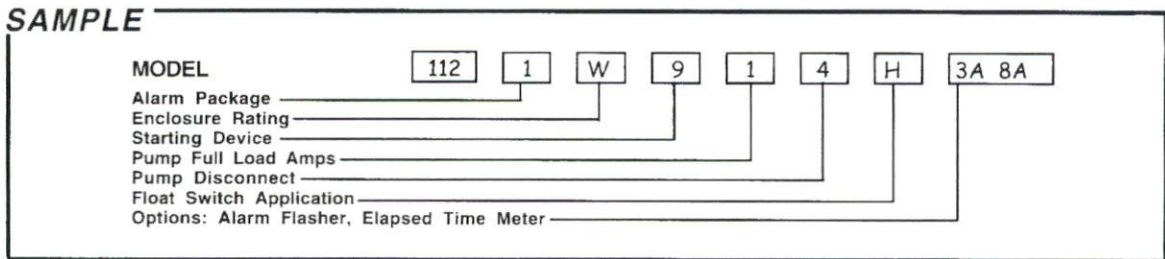
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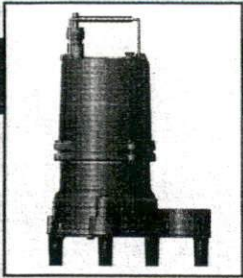


If additional features are required, call the factory for a quote on either a Pro-Line or Engineered Custom control panel system.

| CODE | DESCRIPTION | CODE | DESCRIPTION |
|--------------------------------|--|------------------------------|--|
| <input type="checkbox"/> 1A | Red beacon only / no audio <i>must select 1E if floats included</i> | <input type="checkbox"/> 11C | NEMA 1 alarm panel <i>must select option 6A</i> |
| <input type="checkbox"/> 1C | Horn only / no visual <i>must select 1E if floats included</i> | <input type="checkbox"/> 11D | NEMA 4X alarm panel <i>must select option 6A</i> |
| <input type="checkbox"/> 1E | Alarm float | <input type="checkbox"/> 15A | Control / alarm circuit breaker <i>Does not include the circuit board as in standard.</i> |
| <input type="checkbox"/> 3A | Alarm flasher | <input type="checkbox"/> 16A | 10' cord in lieu of 20' |
| <input type="checkbox"/> ★ 4A | Low level cutout <i>select option 4D if floats included</i> | <input type="checkbox"/> 16B | 15' cord in lieu of 20' |
| <input type="checkbox"/> ★ 4B | Red low-level indicator & alarm <i>must select 4A also</i> | <input type="checkbox"/> 16C | 30' cord in lieu of 20' |
| <input type="checkbox"/> 4D | Low-level float | <input type="checkbox"/> 16D | 40' cord in lieu of 20' |
| <input type="checkbox"/> 6A | Auxiliary alarm contact, form C type | <input type="checkbox"/> 17A | SJE SignalMaster® / mounting strap ● |
| <input type="checkbox"/> ★ 8A | Elapsed time meter | <input type="checkbox"/> 17B | SJE SignalMaster® / externally weighted ● |
| <input type="checkbox"/> ★ 8C | Event (cycle) counter | <input type="checkbox"/> 17C | Sensor Float® / internally weighted ▲ |
| <input type="checkbox"/> 10E | Lockable latch - NEMA 4X | <input type="checkbox"/> 17D | Sensor Float® / externally weighted ▲ |
| <input type="checkbox"/> 10E | Lockable latch - NEMA 1 | <input type="checkbox"/> 17E | Sensor Float® Mini / pipe clamp ▲ |
| <input type="checkbox"/> ★ 10F | Lightning arrester | <input type="checkbox"/> 17F | Sensor Float® Mini / externally weighted ▲ |
| <input type="checkbox"/> ★ 10K | Anti-condensation heater | <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 ▲ |

● Mechanically-activated ▲ Mercury-activated



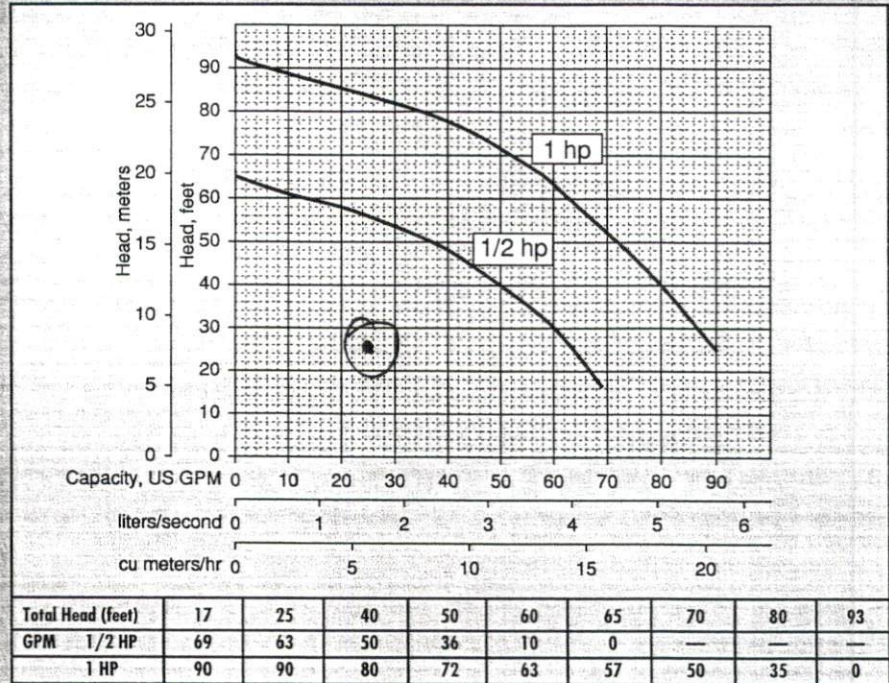


ENGINEERING DETAILS - SHEF50/100

Performance Data

Pump Characteristics

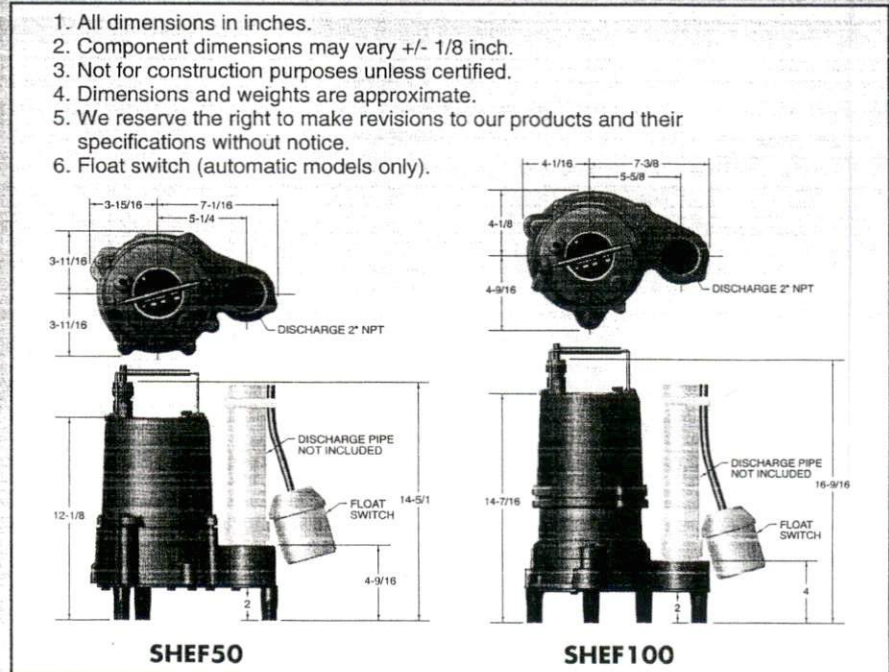
| | | | | | |
|--------------------|---|---------|---------------|-----|-----|
| Pump/Motor Unit | Submersible | | | | |
| Manual Models (50) | M1 | M2 | M3 | M4 | M5 |
| Automatic Models | A1 | A2 | - | - | - |
| Horsepower | 1/2 | | | | |
| Full Load Amps | 15.0 | 7.6/7.1 | 3.2/3.1 | 1.6 | 1.2 |
| Motor Type | Capacitor Start | | | 3 Ø | |
| R.P.M. | 3450 | | | | |
| Phase | 1 Ø | | 3 Ø | | |
| Voltage | 115 | 208-230 | 208-230 | 460 | 575 |
| Manual Model (100) | M2 | | M3 | M4 | M5 |
| Automatic Models | A2 | | - | - | - |
| Horsepower | 1 | | | | |
| Full Load Amps | 13.6/12.1 | | 6.0/5.8 | 2.8 | 1.9 |
| Motor Type | Capacitor Start | | | 3 Ø | |
| RPM | 3450 | | | | |
| Phase | 1 Ø | | 3 Ø | | |
| Voltage | 208-230 | | 208-230 | 460 | 575 |
| Hertz | 60 | | | | |
| Temperature | 140° F Max Fluid Temp. | | | | |
| NEMA Design | L | | B | | |
| Insulation | Class B | | | | |
| Discharge Size | 2" NPT Std. | | | | |
| Solids Handling | 3/4" | | | | |
| Unit Weight | 58 lbs. (50) | | 65 lbs. (100) | | |
| Power Cord | 115V, 14/3, SJTW-A; 230V, 1ø, 16/3 STW-A; 3ø, 16/4, STW-A, All cords 20' std. with 30' opt. | | | | |



Dimensional Data

Materials of Construction

| | |
|-----------------------|--|
| Handle | Stainless Steel |
| Lubricating Oil | Dielectric Oil |
| Motor Housing | Cast Iron |
| Pump Casing | Cast Iron |
| Shaft | Stainless Steel |
| Mechanical Shaft Seal | Seal Faces: Carbon/Ceramic Seal Body: Brass Spring: Stainless Steel Bellows: Buna-N |
| Impeller | Engineered Thermoplastic |
| Upper Bearing | Single Row Ball Bearing |
| Lower Bearing | Single Row Ball Bearing |
| Bottom Plate | Polyester Coated Steel |
| Fasteners | Stainless Steel |
| Legs | Engineered Thermoplastic |



AURORA/HYDROMATIC Pumps, Inc.

1840 Baney Road, Ashland, Ohio 44805 (419)289-3042

"QUALITY PUMPS SINCE 1939"

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



SECTION: 2.20.050

FM0460

0300

Supersedes

0798

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347
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<http://www.zoeller.com>

COMPARE THESE FEATURES

- Non-clogging bronze vortex impeller design.
- Durable cast construction. Cast iron switch case, base, motor and pump housing.
- Castings - Cast iron class 25-30 (25,000# tensile strength). Impeller, bronze class 85-5-5-5.
- Corrosion resistant powder coated epoxy finish.
- 20 foot UL listed 3-wire neoprene cord and plug. Longer cords available in lengths of 25-35-50 feet.
- Automatic reset thermal overload protection. (1 Ph only).
- Oil-filled motor - hermetically sealed.
- Carbon and ceramic shaft seal.
- Maximum temperature for effluent or dewatering, 130° F. - 54° C. (ED 140° F. - 60° C).
- 3450 RPM, 60 cycle.
- Major width 12¾". Height 18⁹/₁₆". (Single seal pumps)
- No screens to clog.
- Square Ring & Gasket - Neoprene.
- Bearings - Lower ball & upper sleeve.
- Stainless steel screws, bolts, float rod, handle guard, arm and seal assembly.
- Passes ¾" spherical solids.
- 1½" NPT discharge with 2" or 3" flange available.
- Automatic units available with float operated, submersible (NEMA 6) 2 - pole mechanical switch. On point 14¾" - Off point 5".
- Available in single or double seal designs.
- 100% of units are computerized tested.

MODELS 4161-4163-4165

DOUBLE SEAL PUMPS (Nonauto only)

- Protects motor from seal leaks.
- Improved bearing lubrication.
- Helps eliminate seal and bearing damage from dry runs.
- Major width 12¾". Height 20⁷/₁₆".

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

AUTOMATIC UNITS NOT RECOMMENDED FOR USE IN EFFLUENT SYSTEMS.

161 - 163 - 165 Single Seal Series 4161 - 4163 - 4165 Double Seal Series (For Pump Prefix Identification see News & Views 0052)



HIGH HEAD "FLOW-MATE"



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

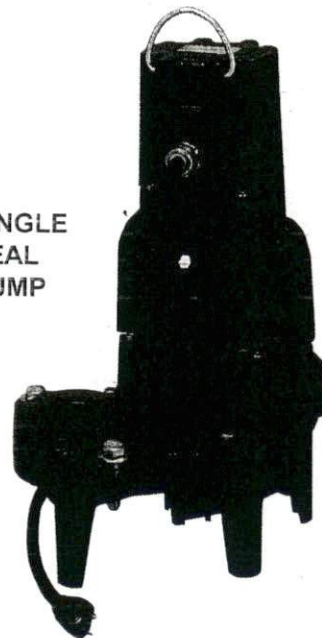
EFFLUENT

OR DEWATERING PUMP • SUBMERSIBLE

1½" NPT DISCHARGE STANDARD • 2" AND 3" NPT FLANGE AVAILABLE



SINGLE
SEAL
PUMP



DOUBLE
SEAL
PUMP



MODELS AVAILABLE

• Automatic (Single Seal Only) or Nonautomatic

161-163 and 4161-4163 Series

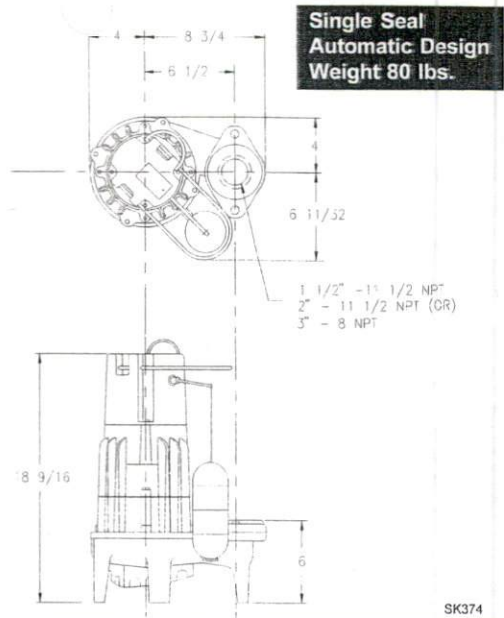
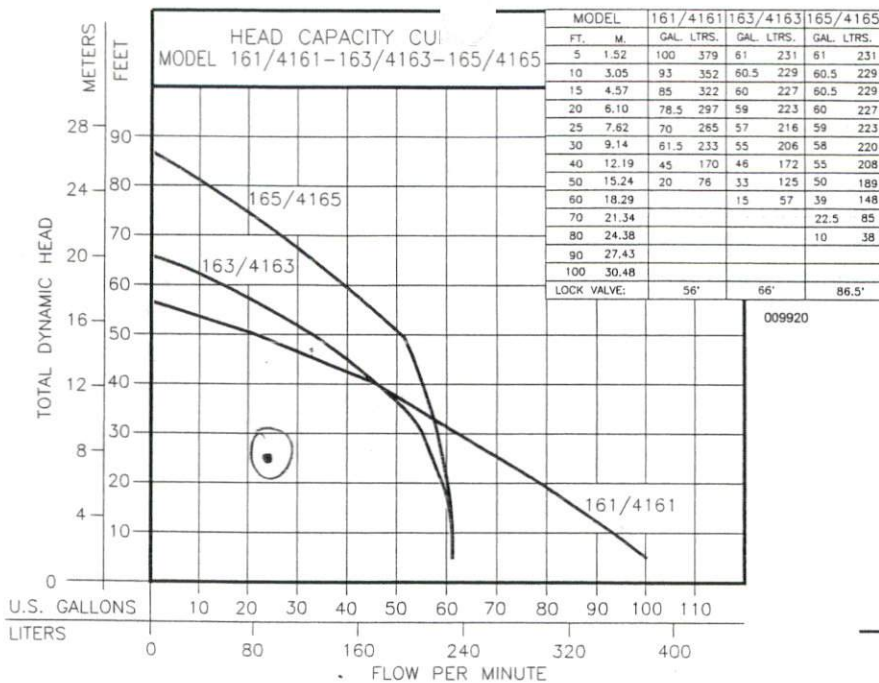
- ½ H.P., 1 Ph, 115V, 200-208V or 230V
- ½ H.P., 3 Ph., 200-208V, 230V or 460V

165 and 4165 Series

- 1 H.P., 1 Ph., 200-208V or 230V
- 1 H.P., 3 Ph., 200-208 230V or 460V

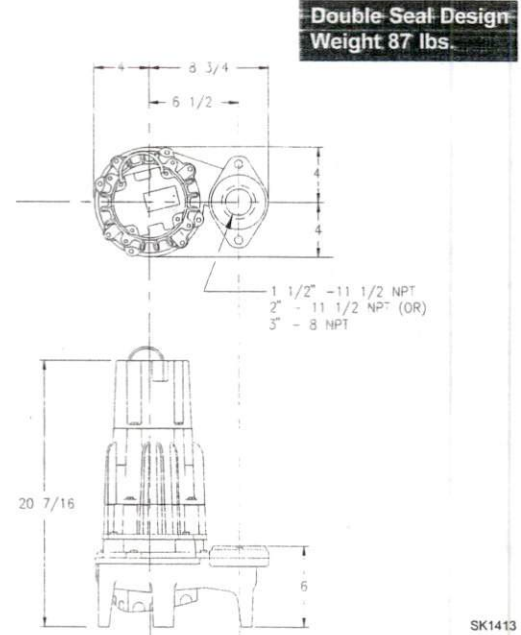
*NOTE: No UL listing or approval for 200-208V 1Ph or Extra Duty (ED) pumps. See back page for UL & CSA Listings.

© Copyright 2000 Zoeller Co. All rights reserved.



Standard all models - 20 ft. cord - 1/2 H.P.

| 161 MODELS | 4161 MODELS | Control Selection | | | | | | Listings | |
|-------------|-------------|-------------------|------|------|---------|----------------|-----|------------------|--|
| Single Seal | Double Seal | Volts - Ph | Mode | Amps | Simplex | Duplex | CSA | UL | |
| M161 | ----- | 115 1 | Auto | 15.5 | ----- | ----- | Y | Y | |
| N161 | N4161 | 115 1 | Non | 15.5 | ----- | 3 or 5 & 6 | Y | Y ⁽¹⁾ | |
| D161 | ----- | 230 1 | Auto | 7.5 | ----- | ----- | Y | Y | |
| E161 | E4161 | 230 1 | Non | 7.5 | ----- | 3 or 5 & 6 | Y | Y | |
| * H161 | ----- | 200-208 1 | Auto | 8.8 | ----- | ----- | Y | N | |
| * I161 | * I4161 | 200-208 1 | Non | 8.8 | ----- | 3 or 5 & 6 | Y | N | |
| * J161 | * J4161 | 200-208 3 | Non | 6.4 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |
| * F161 | * F4161 | 230 3 | Non | 5.2 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |
| * G161 | * G4161 | 460 3 | Non | 2.9 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |



Standard all models - 20 ft. cord - 1/2 H.P.

| 163 MODELS | 4163 MODELS | Control Selection | | | | | | Listings | |
|-------------|-------------|-------------------|------|------|---------|----------------|-----|------------------|--|
| Single Seal | Double Seal | Volts - Ph | Mode | Amps | Simplex | Duplex | CSA | UL | |
| M163 | ----- | 115 1 | Auto | 15.0 | ----- | ----- | Y | Y | |
| N163 | N4163 | 115 1 | Non | 15.0 | ----- | 3 or 5 & 6 | Y | Y ⁽¹⁾ | |
| D163 | ----- | 230 1 | Auto | 7.5 | ----- | ----- | Y | Y | |
| E163 | E4163 | 230 1 | Non | 7.5 | ----- | 3 or 5 & 6 | Y | Y | |
| * H163 | ----- | 200-208 1 | Auto | 8.5 | ----- | ----- | Y | N | |
| * I163 | * I4163 | 200-208 1 | Non | 8.5 | ----- | 3 or 5 & 6 | Y | N | |
| * J163 | * J4163 | 200-208 3 | Non | 6.0 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |
| * F163 | * F4163 | 230 3 | Non | 4.8 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |
| * G163 | * G4163 | 460 3 | Non | 2.9 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |

Standard all models - 20 ft. cord - 1 H.P.

| 165 MODELS | 4165 MODELS | Control Selection | | | | | | Listings | |
|-------------|-------------|-------------------|------|------|---------|----------------|-----|----------|--|
| Single Seal | Double Seal | Volts - Ph | Mode | Amps | Simplex | Duplex | CSA | UL | |
| D165 | ----- | 230 1 | Auto | 10.2 | ----- | ----- | Y | Y | |
| E165 | E4165 | 230 1 | Non | 10.2 | ----- | 3 or 5 & 6 | Y | Y | |
| * H165 | ----- | 200-208 1 | Auto | 12.6 | ----- | ----- | Y | N | |
| * I165 | * I4165 | 200-208 1 | Non | 12.6 | ----- | 3 or 5 & 6 | Y | N | |
| * J165 | * J4165 | 200-208 3 | Non | 7.5 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |
| * F165 | * F4165 | 230 3 | Non | 7.4 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |
| * G165 | * G4165 | 460 3 | Non | 3.7 | 4 & 6 | 3 & 4 or 5 & 6 | Y | Y | |
| * BA165 | * BA4165 | 575 3 | Non | 3.0 | 4 & 6 | 3 & 4 or 5 & 6 | N | N | |

* No Molded Plug
(1) UL listed unit available with 20 Amp plug.

For information on additional Zoeller products refer to catalog on Piggyback Variable Level Float Switches, FM0477; Electrical Alternator, FM0486; Mechanical Alternator, FM0495; Alarm Package, FM0732; and Sump/Sewage Basins, FM0487.

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).

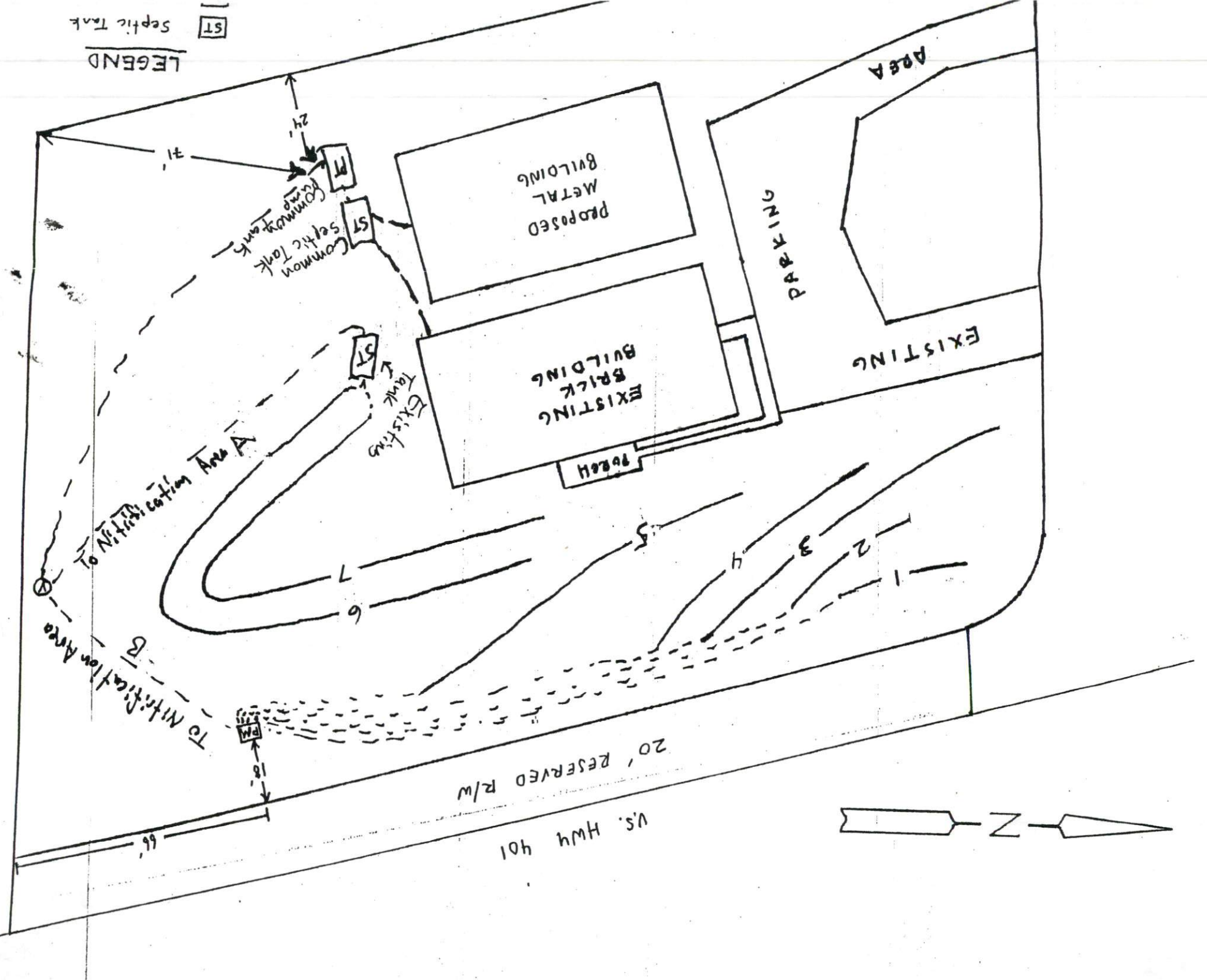
RESERVE POWERED DESIGN

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

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ST Septic Tank

LEGEND



U.S. HWY 401

20' RESERVED R/W

To Nitritification Area B

To Nitritification Area A

PROPOSED METAL BUILDING

EXISTING BRICK BUILDING

EXISTING

DRAINAGE

AREA

ST Common Septic Tank

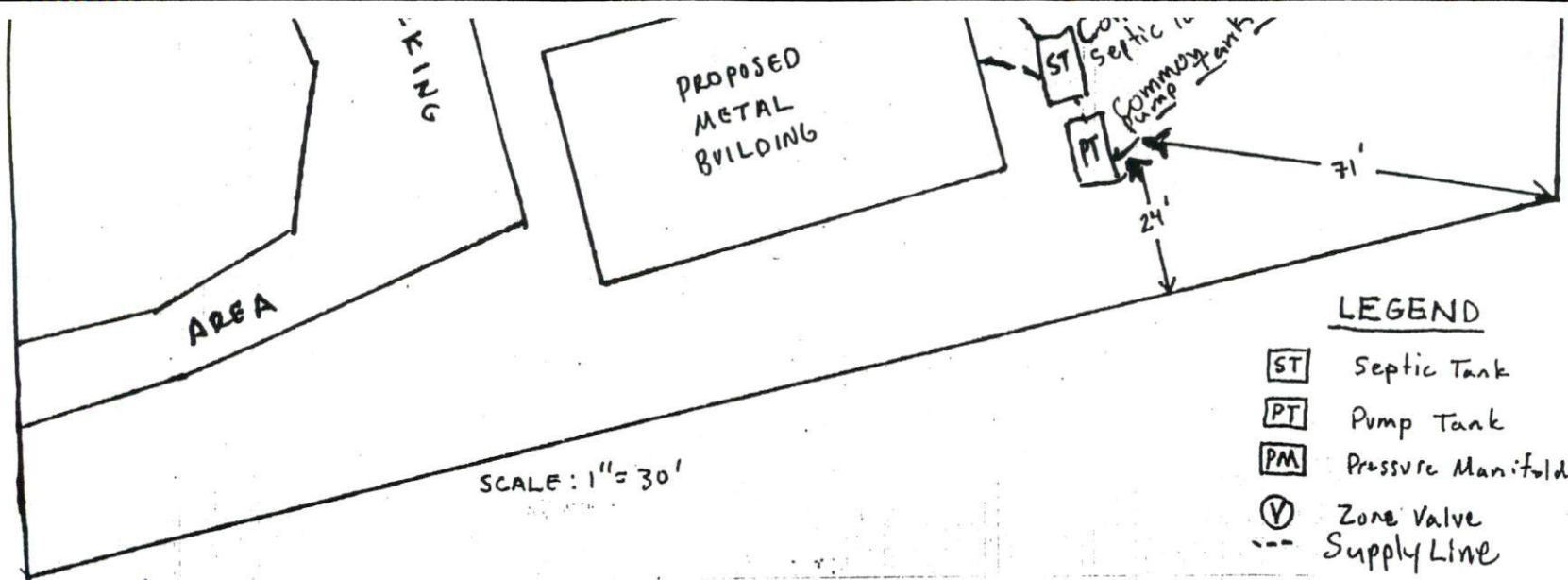
ST Existing Tank

66'

10'

24'

21'



All distances are Paced and Approximate.

Lines flagged at site on 9-ft centers.

| Nitrification Area A or B | Line # | Color | Drainline Length(ft) | Measured Field Line Length (ft) | Relative Elevation (ft) |
|---------------------------|--------|-------|----------------------|---------------------------------|-------------------------|
| A | 1 | Y | 35 | 35 | 100.5 |
| A | 2 | R | 35 | 54 | 100.81 |
| A | 3 | B | 95 | 101 | 101.21 |
| A | 4 | W | 70 | 70 | 101.62 |
| A | 5 | Y | 95 | 109 | 102.37 |
| B | 6 | | 165 | 165 | 102.66 |
| B | 7 | | 165 | 165 | 102.62 |
| Pump Tank: | | | | | 99.92 |
| Pressure Manifold | | | | | 103.37 |
| Multizon Vavle | | | | | 103.81 |
| Total: | | | 660 | 699 | EIP = 100 |