DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

Sheet ____ *of* ____
PROPERTY ID #: _____
COUNTY: _____

SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM

OWNER: _____Noble Mills_____ APPLICATION DATE_____
ADDRESS:_____226 Lippard Springs Circle_____Statesville, NC 28677_____ DATE EVALUATED: __11/20/06
PROPOSED FACILITY: 4 bedroom house PROPOSED DESIGN FLOW (.1949): _480 gal__ PROPERTY SIZE: ___2.035 ac_____
LOCATION OF SITE: ____Lot 12 Buffalo Creek_____ PROPERTY RECORDED: _____
WATER SUPPLY: ☐ Private ☐ Public ☒ Well ☐ Spring ☐ Other _____
EVALUATION METHOD: ☒ Auger Boring ☐ Pit ☐ Cut TYPE OF WASTEWATER: ☒ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE	SOIL MORPHOLOGY (.1941) .1941 CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	OTHER PROFILE FACTORS .1943 SOIL DEPTH	OTHER PROFILE FACTORS .1956 SAPRO CLASS	OTHER PROFILE FACTORS .1944 RESTR HORIZ	PROFILE CLASS & LTAR
1	LINEAR 10%	0-5	WKF GR SCL	FR NS NP NEXP	>46	>46	>46	>46	0.3 PS
		5-24	MM SBK C	FI SS SP SEXP					
		24-36	MM SBK C	FI SS SP SEXP					
		36-46	WKF SBK CL	FR SS SP SEXP					
2	LINEAR 10%	0-3	WKF GR SCL	FR NS NP NEXP	>44	>44	>44	>44	0.30 PS
		3-36	MM SBK C	FI SS SP SEXP					
		36-44	WKF SBK CL	FR SS SP SEXP					
3	LINEAR 10%	0-3	WKF GR SCL	FR NS NP NEXP	>46	>46	>46	>46	0.3 PS
		3-26	MM SBK C	FI SS SP SEXP					
		26-46	WKF SBK CL	FR SS SP SEXP					
4	LINEAR 8%	0-9	WKF GR SCL	FR NS NP NEXP	>42	>42	>42	>42	0.3 PS
		9-31	MM SBK C	FI SS SP SEXP					
		31-42	WKF SBK CL	FR SS SP SEXP					

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	400	400
System Type(s)	CONV/INNOV	CONV/INNOV
Site LTAR	0.3	0.3

OTHER FACTORS (.1946): _____
SITE CLASSIFICATION (.1948): ___PS_____
EVALUATED BY: _____SP_____
OTHER(S) PRESENT: _____EB, BF_____

LICENSED SOIL SCIENTIST
STEVEN M. PRUETT
1153
STATE OF NORTH CAROLINA

S&EC

Soil & Environmental Consultants, PA

236 LePhillip Court, Suite C • Concord, North Carolina 28025 • Phone: (704) 720-9405 • Fax: (704) 720-9406
www.SandEC.com

Attached is a proposed design for a Pressure Manifold Septic System for a 4 bedroom single family residence on lot 12 Buffalo Creek Drive in Iredell County, North Carolina.

Contents: **Page**

Information for the Installer---------- 1

Design Information
- Design Specifications---------- 2-3
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Site Plan/System Plan---------- 7

Septic Tank Diagram---------- 8

Pump Tank Diagram---------- 9

Pressure Manifold Diagram---------- 10

Control Panel Specifications---------- 11-15

Pump Specifications---------- 16-17

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January-07
S & EC Project No. 5-1611
Design By: S. Price

Greensboro Office:
3817-E Lawndale Drive
Greensboro, NC 27455
Phone: (336) 540-8234
Fax: (336) 540-8235

Raleigh Office:
11010 Raven Ridge Road
Raleigh, NC 27614
Phone: (919) 846-5900
Fax: (919) 846-9467

PRESSURE MANIFOLD SYSTEM
FOR WASTEWATER TREATMENT

Owner: Noble and Sandy Mills

Address:

Phone:
County: Iredell
Location: Lot 12 Buffalo Creek Dr
Source of Wastewater Flow: 4 Br house
Estimated Daily Wastewater Production: 480 gpd
System Flow: 21.33

Design Specifications

Drainfield Size: 400
Loading Rate: 0.30
Depth of Gravel in Trench: N/A
Gravel Size: N/A
Trench Depth: 24
Trench Width: 36 in.
Septic Tank Size: 1500
Pump Tank Size: 1500
Estimated Supply Line Length: 140
Supply Line Diameter: 2 in. SCH 40 PVC
Supply Line Volume: 24.36
Dosing Volume: 182.84
Supply Manifold: 4 in. SCH 80 PVC
Supply Manifold Length: 5 ft. (minimum)
Supply Manifold Volume: N/A

Recommended Float Controls: SJE Sensor Float Control Switches as Required for Control Panel or County Approved Equivalents
Recommended Control Panel: SJE-Rhombus Model 112 (NEMA 4x) Control Panel or County Approved Control Panel.
Pressure Head: 2 ft.
Friction Head: 1.41
Elevation Head: 16.60
Total Dynamic Head: 23.02
Threaded Union: In Tank
Ball ~~Gate~~ Valves: 1 in Tank
GATE VALVE: 1 at Pressure Manifold
Check Valves: In Tank
Anti-Siphon Hole: NA
Recommended Pump: Myers Model ME50 or County Approved Effluent Rated Pump Capable of Delivering ~23 ft.of Head at ~22 gpm Total Flow

Additional Comments: Soil suitability was performed by S&EC
Trench depth for repair should be 18 inches with at least a 6" soil cap for cover

Buffalo Creek Drive Lot 13
PRESSURE MANIFOLD DESIGN

DESIGN FLOW:	480
SOIL APPLICATION RATE:	0.30 gpd/ft.^{2}
TOTAL AREA TRENCH BOTTOM:	1200
TOTAL LATERAL LENGTH:	400
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	400
SUPPLY LINE LENGTH:	140
TOTAL DYNAMIC HEAD:	23.02
MANIFOLD SIZE:	*4* in.SCH 80 PVC
DOSING VOLUME:	182.84
PUMP TANK DRAW DOWN*:	8.7
SEPTIC TANK SIZE:	1500
PUMP TANK SIZE:	1500
RECOMMENDED PUMP:	Myers Model ME50 or County Approved Effluent Rated Pump Capable of Delivering ~23 ft.of Head at ~22 gpm Total Flow

**Pump tank draw down based on a volume basis of 21 gallons per inch. Draw down may vary among pump tank manufacturers.*

Buffalo Creek Dr. Lot 12

Project No. 5-1611

LAYOUT FOR A FOUR BEDROOM HOME **Nov-06**

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	Designed Length
TBM		2.6			100.0		
INSTR. 1			102.6				
			Repair				
1	Orange			2.30	100.3	185	180
2	Yellow			3.00	99.6	200	180
3	Blue			3.50	99.1	215	180
			System			**Total**	**540**
4	Pink			4.30	98.3	225	133
5	Red			5.10	97.5	225	133
6	Orange			5.90	96.7	225	134
						Total	**400**

	LINE LENGTH	LTAR GPD/FT^2	SYSTEM TYPE	INNOVATIVE TYPE	DISTRIBUTION
* System	400	0.30	Conv/Innov	Chamber	P. Manifold
Repair	540	0.30	Conv	NA	P. Manifold

Notes:

**TBM marked in field
**TBM is assumed to be 100'
**All measures in feet
**Nitrification lines are demonstrated on contour via colored pin flags
**BS and FS indicate rod readings
**Repair lines are to be center fed not to exceed 50' laterals

Buffalo Creek Drive lot 12

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/Tap	Flow/ft	gpd	Trench Area	Line LTAR
4	Pink	98.3	133	SCH 40 1/2	7.11	0.053	160.00	399	0.40
5	Red	97.5	133	SCH 40 1/2	7.11	0.053	160.00	399	0.40
6	Orange	96.7	134	SCH 40 1/2	7.11	0.053	160.00	402	0.40
	total	feet =	400	gal/min =	21.33				
			Des. Flow	480					
			Pump Run=	22.50					
			soil LTAR	0.3					
			Innovative LTAR	0.40					

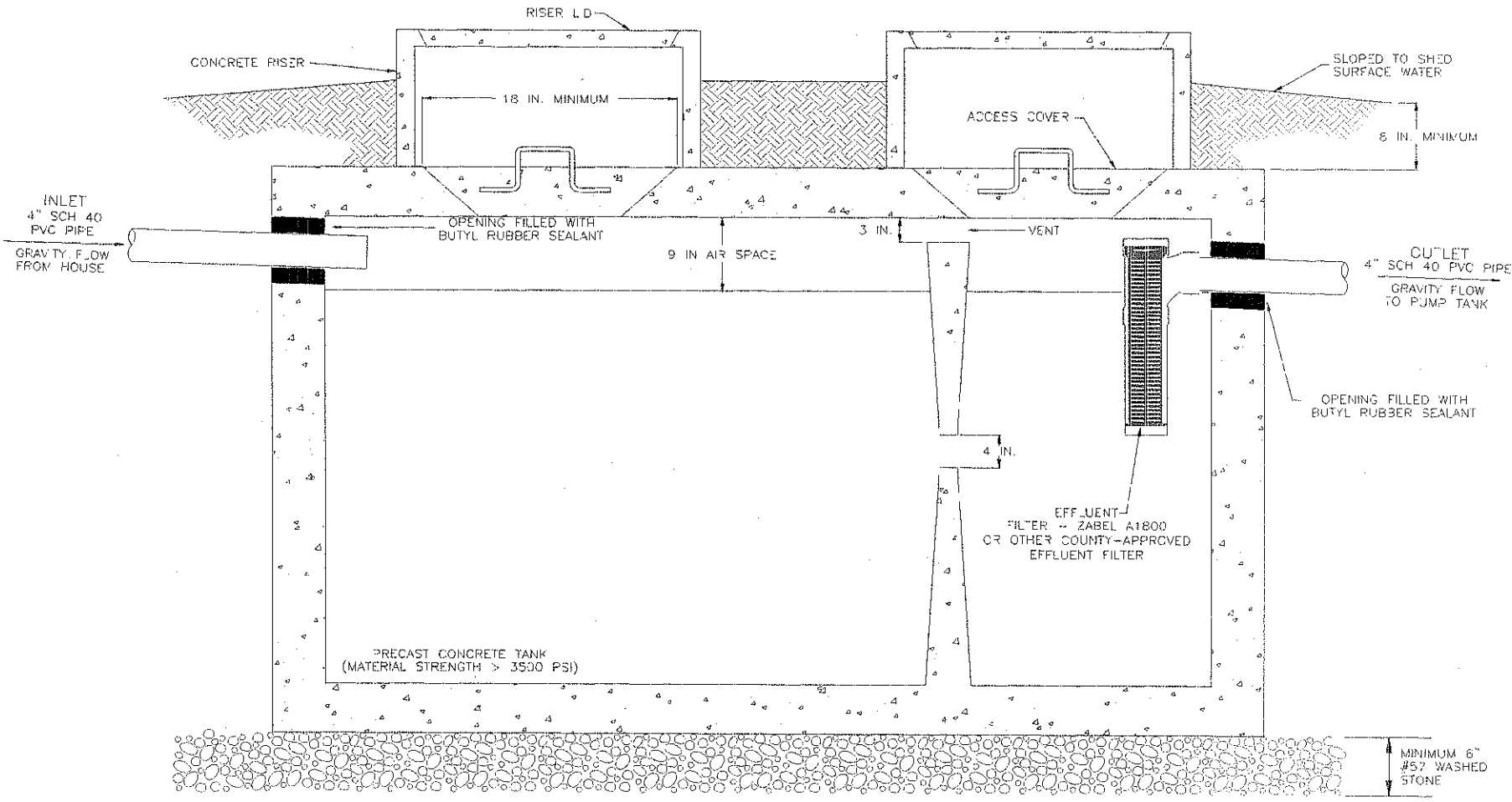
	Date	Initials
Drain Lines Checked		
Tanks Checked		
Pressure Manifold or Valve Box Checked		
Pressure Head Set		
Electrical Checked		ALL
Floats Set		ALL
Alarm Checked		ALL
Maintenance Contract Y / (N)		

Buffalo Creek Drive Lot 12

REPAIR

Line #	Color	Elev	Length	Hole Size	Flow/Tap	Flow/ft	gpd	Trench Area	Flow/Foot
1	Orange	100.3	180	SCH 40 1/2	7.11	0.0395	160.00	540	0.30
2	Yellow	99.6	180	SCH 40 1/2	7.11	0.0395	160.00	540	0.30
3	Blue	99.1	180	SCH 40 1/2	7.11	0.0395	160.00	540	0.30

total	feet =	540	gal/min =	21.33	
		Des. Flow	480		
		Pump Run=	22.50		
		soil LTAR	0.3		



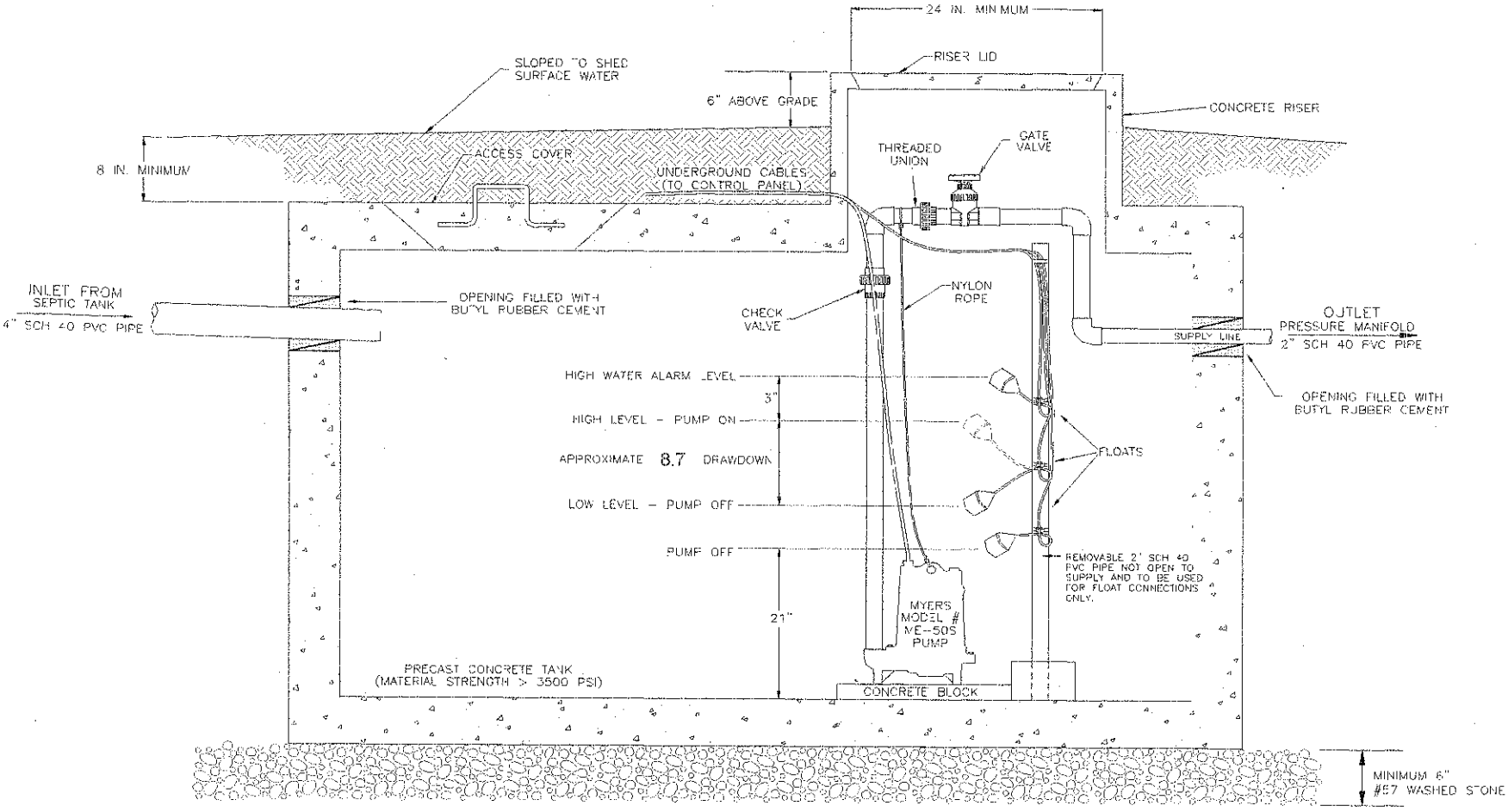
NOTES

1. TANK DIMENSIONS VARY BY MANUFACTURER.

1500 GALLON SEPTIC TANK

PROJECT NO: 4591	PROJECT NAME:
PROJECT MGR.	
SCALE: NTS	SHEET TITLE: SEPTIC TANK DIAGRAM

S&EC
Soil & Environmental Consultants, Inc.
11010 Raven Ridge Road Raleigh, North Carolina 27614 Phone: (919) 846-5900 Fax: (919) 846-9467
Web Page: www.SandEC.com



NOTES

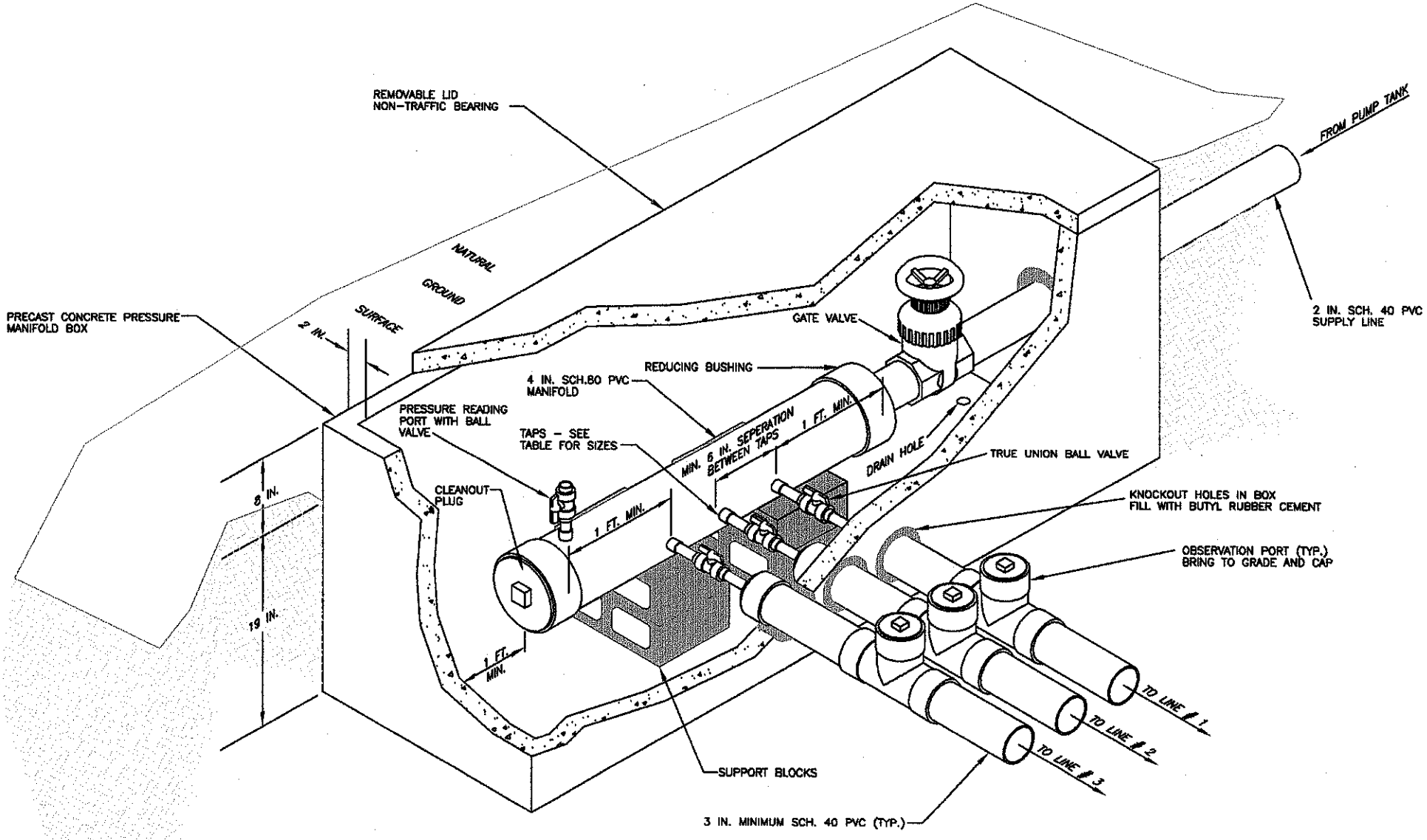
1. TANK DIMENSIONS VARY BY MANUFACTURER.
2. DRAWDOWN WILL VARY WITH TANK DIMENSIONS. DRAWDOWN SHOWN BASED ON 31 GALLONS PER INCH.

1500 GALLON PUMP TANK

PROJECT NO. 5-1611	PROJECT NAME
PROJECT MGR.	
SCALE NTS	SHEET TITLE: PUMP TANK DIAGRAM

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PRESSURE MANIFOLD DETAILS
FOR
PROJECT

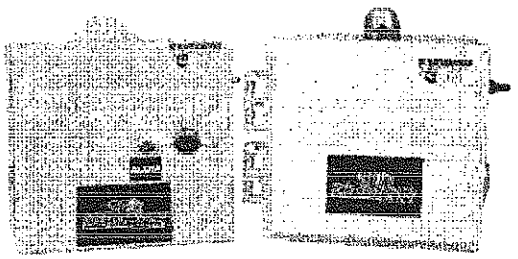


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MODEL 112 Control Panel

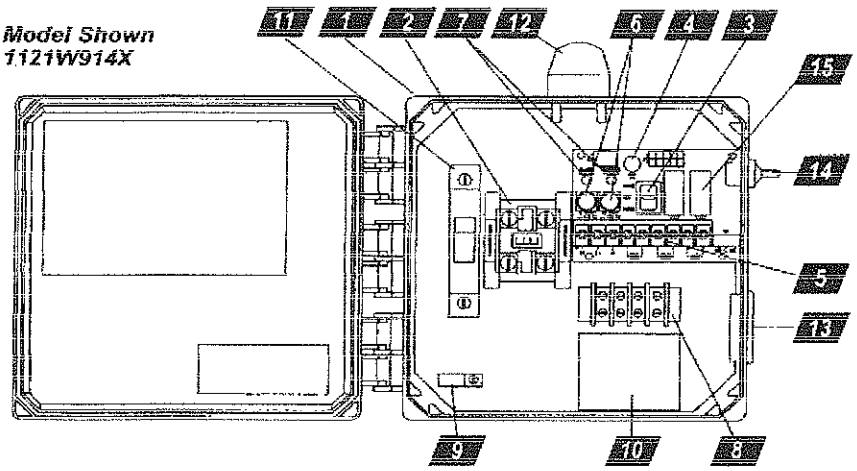
Single phase, simplex motor contactor control.

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.



indoor *indoor/outdoor*

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).

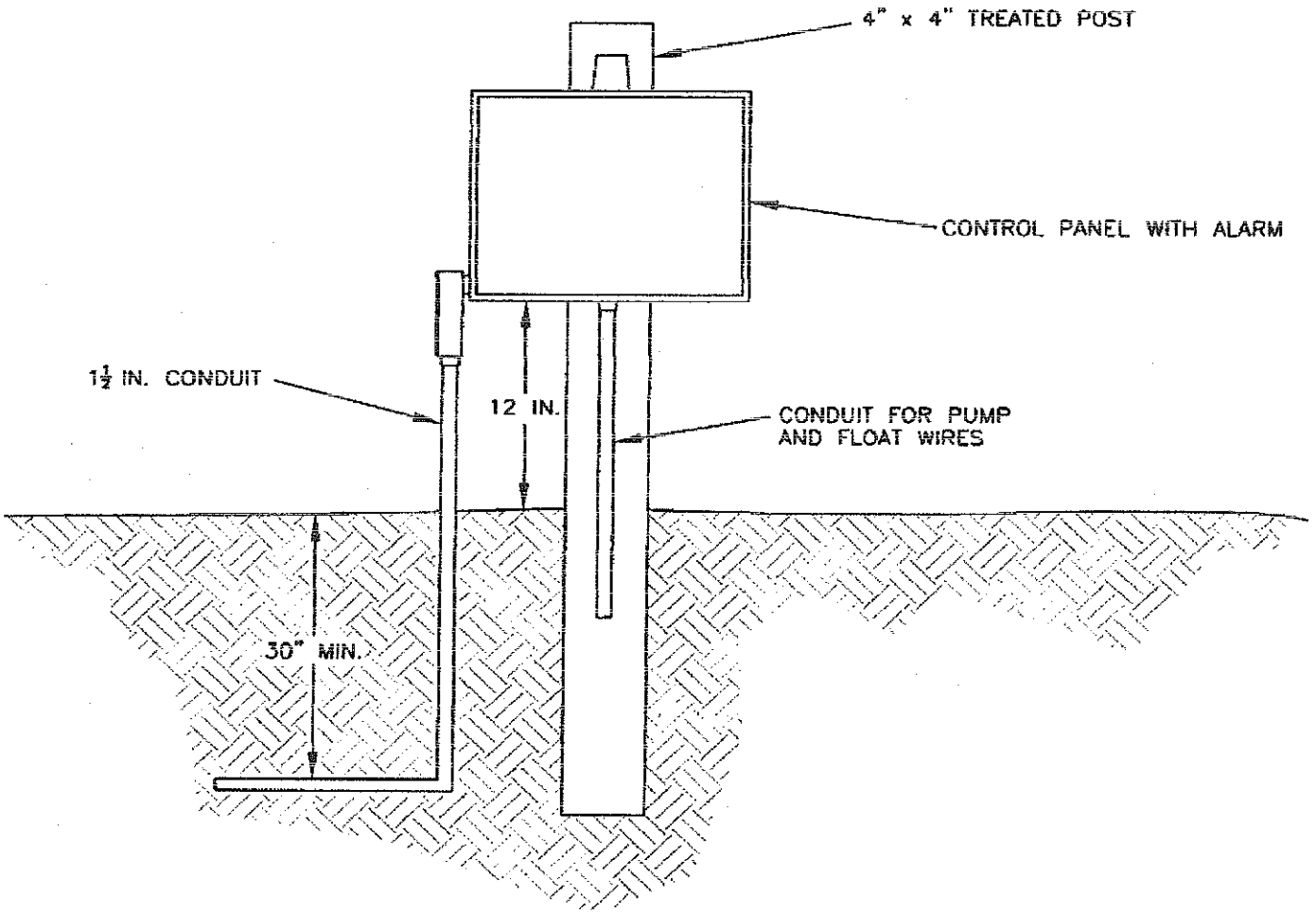
FEATURES

- 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

c UL us
LISTED

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

ELECTRIC BOX



NOTES: ELECTRICAL SYSTEM COMPONENTS SHALL BE INSTALLED TO MEET OR EXCEED MINIMUM REQUIREMENTS SPECIFIED IN THE ELECTRICAL CODE. ALL WIRING SHALL BE #12 MINIMUM, AND RATED FOR DIRECT BURY. PROVIDE GROUNDING AS REQUIRED, AND PROVIDE 30" MINIMUM BURY ON CABLES. PROVIDE ONE 20 AMP, DOUBLE POLE, 230 VOLT CIRCUIT BREAKER (FOR PUMP), AND ONE 20 AMP, SINGLE POLE, 115 VOLT CIRCUIT BREAKER (FOR ALARM) IN MAIN PANEL.

CALCULATIONS

Location Buffalo Creek Drive

Project Number 5-1611

Lot No: 12

No. of Bedrooms	4	
Design Flow	480	$^{gal}/_{day}$
LTAR	0.3	$^{gal}/_{ft^2\ day}$
EZ-Lay? (YES OR NO)	no	
Supply Line Length	140	ft.
Supply Line Volume	24.36	gal.
Required Feet of Line	400	ft.
Amount of Line from Layout	400	ft.
Gallons per Minute	21.33	$^{gal}/_{min}$
Required Septic Tank Capacity	1500	gal.
Minimum Standard Tank Size	1500	
Lateral Line Volume	261.2	gal.
Dosing Volume	182.84	gal.

Note: Dosing Volume based on 70% of the lateral line volume.

Tank Draw Down	8.7	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	8.57	minutes
Estimated Elevation Head	16.6	ft.
Pressure Head	2	ft.
Friction Factor	1.01	ft./100 ft. *(From the interpolater.)*
Friction Head	1.41	ft.
Total Dynamic Head (+15%)	23.02	ft.

FRICTION FACTOR INTERPOLATER
2" SCH 40 PVC

GPM	*f*
20	0.84
22	1.01
25	1.27
	-1.28
30	1.78
	-1.76
35	2.37
	-2.25
40	3.03
40.67	3.13
45	3.77
48.14	4.28
50	4.58
57.11	5.89
58.47	6.14
60	6.42

Buffalo Creek Dr. Lot 12

Project No. 5-1611

LAYOUT FOR A FOUR BEDROOM HOME **Nov-06**

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