Received by
Tom Shuck

SHOAF PRECAST SEPTIC TANK, INC.
4130 West U.S. Hwy. 64
Lexington, NC 27295
Telephone: (336) 787-5826
FAX No. (336) 787-2826
Email Address: info@shoafprecast.com

2-16-2017

TO: Iredell County Health Department

This is to certify the 1000 gallon top-seam pump tank with EZset Risers, SHOAF 1000 PT 363, delivered for Carolina Pipe Cleaning on February 11, 2016, to Lot 4, Bells Crossing, was manufactured on November 10, 2015.

This the 16th day of February, 2016.

SHOAF PRECAST SEPTIC TANK, INC.

Phillip J. Shoaf
Operations Manager

Pressure Manifold
Septic System Design

for

BELLS CROSSING PH 3 S/D Lot 4
Raleigh, North Carolina

Designed by:

Matt Burdette
Bateman Civil Survey Company, PC
Holly Springs, North Carolina
BCSC Project #: 120314.034

APPROVED FEB - 5 2016

01/07/2016

BELLS CROSSING PH 3 S/D Lot 4

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Attachments

Septic and Pumptank Details	Figure	1
Pressure Mainfold and Trench Details	Figure	2

BELLS CROSSING PH 3 S/D Lot 4

Contact Information

Client: Meritage Homes
Attn: Robert Price
Street Address: 11605 North Community House Road
Charlotte, NC 28277
Phone: (704) 944-8939
Fax: na

Designer: Bateman Civil Survey Company, PC
Attn: Matt Burdette
Street Address: 200 North Main Street
Holly Springs, NC 27540
Phone: 919-577-1080
Fax: 919-577-1081

Email: Matt @ bateman civilsurvey.com

BELLS CROSSING PH 3 S/D Lot 4

Layout/Design Specifications

Facility Type:	Single Family Home	
# of Bedrooms:	4	
Daily Flow:	480	**gal/day**
L.T.A.R.:	0.250	**gal/day/sq.ft**
Trench Depth:	36	**in**
Trench Width:	36	**in**
Stone Depth:	accepted	**in**
Manifold Length:	36	**in**
Manifold Diameter:	4	**in sch 80pvc**
Supply Line Length:	53	**ft**
Supply Line Diameter:	2	**in sch 40pvc**
Supply Line Volume:	9.22	**gallons**
Friction Loss + Fitting Loss:	4.26	**ft(supply line length + 70' for fittings in pump tank)**
Design Head:	2	**ft**
Elevation Head:	11.40	**ft**
Total Head:	17.66	**ft**
Dose Volume:	249.91	**gals**
% of Pipe Vol.	.80	
Drawdown:	12.40	**in @ 20.16 gal/in**
Pump Run Time:	5.83	**Minutes**
Control Panel:	SJE Rhombus Model112 control panel (or approved equivalent)	
Pump:	Zoeller M161 Flow-Mate (or approved equivalent)	
Tank Effluent Filter:	Zoeller 170-0144 residential effluent filter (or approved equivalent)	
Septic Tank:	1000	**gallon Shoaf**
Pump Tank:	1000	**gallon Shoaf**

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BELLS CROSSING PH 3 S/D Lot 4
SYSTEM TAP CHART

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Bench Mark:	0	= 100.00	**Manifold elev:**	98.40	
Pump tank elevation:	92.40		**Pump elev:**	87.00	

line	color	rod read	elevation	length	hole size	flow/tap	gal/day	trench area	LINE LTAR
1-2	Red & Pink	2.60	97.40	112	3/4in SCH 80	10.1	113.03	336	0.3364
3	Blue	4.10	95.90	80	1/2in SCH 40	7.11	79.57	240	0.3315
4	Orange	5.10	94.90	112	3/4in SCH 80	10.1	113.03	336	0.3364
5	Blue	6.40	93.60	112	3/4in SCH 80	10.1	113.03	336	0.3364
6A	Yellow	8.60	91.40	64	1/2in SCH 80	5.48	61.33	192	0.3194
	P-TANK	7.60	92.40						
		total	**feet =**	**480**	**gal/min =**	**42.89**		**LTAR =**	**0.250**

Des. Flow	480	**(ltar + 5%)** 0.26
24 Hour Pump Run=	11.19	**(ltar W/ INOV)** 0.33
		(ltar + 5%) 0.35

Comments: Lines 1 and 2 use stepdown

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.

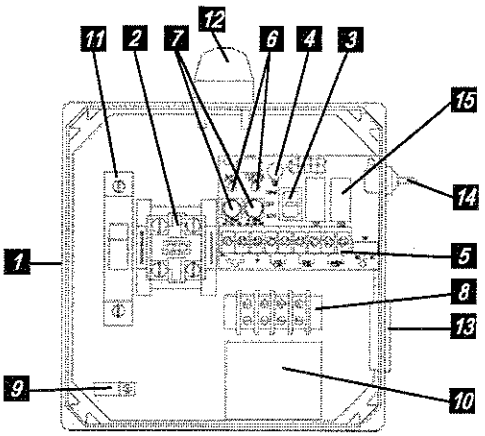
PANEL COMPONENTS

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 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.

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Model Shown 1121W914X

STANDARD ALARM PACKAGE

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 in lieu of horn.
14. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition has been cleared.
15. **Horn Silence Relay** (mounted on circuit board).

NOTE: other options available.

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

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

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.

112	1	W	9	1	4	H	3A, 8A, 8C

MODEL 112

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ALARM PACKAGE
- [ ] 0 = select options or no alarm package
- [X] 1 = alarm package (includes test/normal/silence switch, fuse, red light, horn & float)

ENCLOSURE RATING
- [ ] I = Indoor, NEMA 1 (metal)
- [X] W = Weatherproof, NEMA 4X (engineered thermoplastic)

STARTING DEVICE
- [ ] 1 = magnetic motor contactor 120/208/240V
- [X] 9 = magnetic motor contactor 120V only

PUMP FULL LOAD AMPS
- [ ] 0 = 0-7 FLA
- [X] 1 = 7-15 FLA
- [ ] 2 = 15-20 FLA
- [ ] 3 = 20-30 FLA

PUMP DISCONNECTS
- [ ] 0 = no pump disconnect
- [ ] 1 = pull-out with safety deadfront in a 10"x8" enclosure
- [X] 4 = circuit breaker 120V (select STARTING DEVICE option 9 above)
  120/208/240V (select STARTING DEVICE option 1 above)

FLOAT SWITCH APPLICATION
- [X] H or L = pump down or pump up
- [ ] X = no floats
  WITH alarm package
  WITHOUT alarm package

OPTIONS *Listed below*

★ ENCLOSURE UPSIZE - If you selected 3 or more of the ★ options, or one ★★ option, **a one-time enclosure upsize fee would apply.**

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

	CODE	DESCRIPTION
[ ]	1A	Red beacon only / no audio *(must select 1E if floats included)*
[ ]	1C	Horn only / no visual *(must select 1E if floats included)*
[ ]	1E	Alarm float
[X]	3A	Alarm flasher
[ ]	★ 3B	Manual alarm reset
[ ]	★ 4A	Low level cutout *(select option 4D if floats included)*
[ ]	★ 4B	Red low-level indicator & alarm *(must select 4A also)*
[ ]	4D	Low-level float
[ ]	★ 5A	Thermal cutout/heat sensor auto reset (for pumps w/thermal switch leads)
[ ]	★★5E	Seal failure circuit & red indicator (2 wire)
[ ]	6A	Auxiliary alarm contact, form C type
[X]	★ 8A	Elapsed time meter
[X]	★ 8C	Event (cycle) counter
[ ]	★★9_A	Pump overload specify amperage after number 9 followed by letter "A". Example: 912A = 12 amp pump.
	★★[ ]	0-25 FLA
	★★[ ]	25-30 FLA
[ ]	10E	Lockable latch - NEMA 4X
[ ]	10E	Lockable latch - NEMA 1
[ ]	★10F	Lightning arrester
[ ]	★10K	Anti-condensation heater

	CODE	DESCRIPTION
[ ]	11C	NEMA 1 alarm panel *must select option 6A*
[ ]	11D	NEMA 4X alarm panel *must select option 6A*
[ ]	★★14B	Main disconnect (rotary style, mounted through door) non-fused
	★★[ ]	0-20 FLA (total of both pumps)
	★★[ ]	20-30 FLA (total of both pumps)
[ ]	15A	Control / alarm circuit breaker *Does not include the circuit board as in standard.*
[ ]	16A	10' cord in lieu of 20' *(per float)*
[ ]	16B	15' cord in lieu of 20' *(per float)*
[ ]	16C	30' cord in lieu of 20' *(per float)*
[ ]	16D	40' cord in lieu of 20' *(per float)*
[ ]	17A	SJE SignalMaster® / mounting strap ● *(per float)*
[ ]	17B	SJE SignalMaster® / externally weighted ● *(per float)*
[ ]	17C	Sensor Float® / internally weighted ▲ *(per float)*
[ ]	17D	Sensor Float® / externally weighted ▲ *(per float)*
[ ]	17E	Sensor Float® Mini / pipe clamp ▲ *(per float)*
[ ]	17F	Sensor Float® Mini / externally weighted ▲ *(per float)*
[ ]	19T	TOA (Test/Off/Automatic) switch and pump run light through door mounted
[ ]	19U	HOA (Hand/Off/Automatic) switch and pump run light through door mounted
[ ]	19X	Door mounted pump run indicator
[ ]	21A	SJE PumpMaster® in lieu of on/off switches ●
[ ]	21B	SJE PumpMaster® Plus in lieu of on/off switches ●
[ ]	21C	Super Single® in lieu of on/off switches ▲
[ ]	21D	Double Float® in lieu of on/off switches ▲

● Mechanically-activated ▲ Mercury-activated

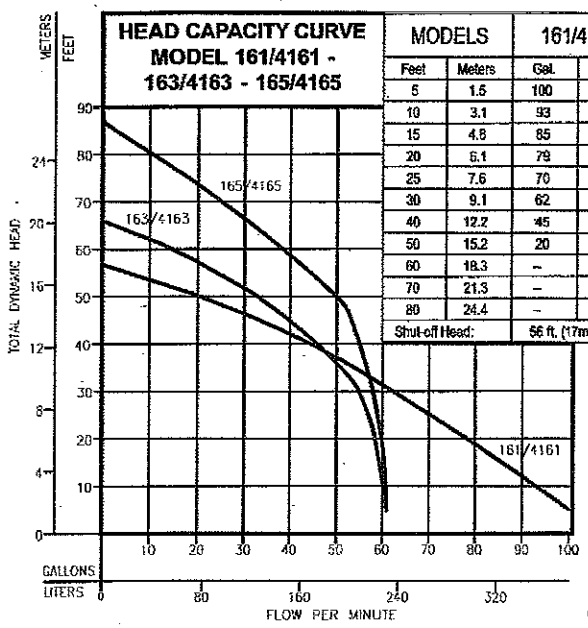
SAMPLE

MODEL	112	1	W	9	1	4	H	3A 8A

- Alarm Package
- Enclosure Rating
- Starting Device
- Pump Full Load Amps
- Pump Disconnect
- Float Switch Application
- Options: Flasher, Elapsed Time Meter

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HEAD CAPACITY CURVE MODEL 161/4161 - 163/4163 - 165/4165

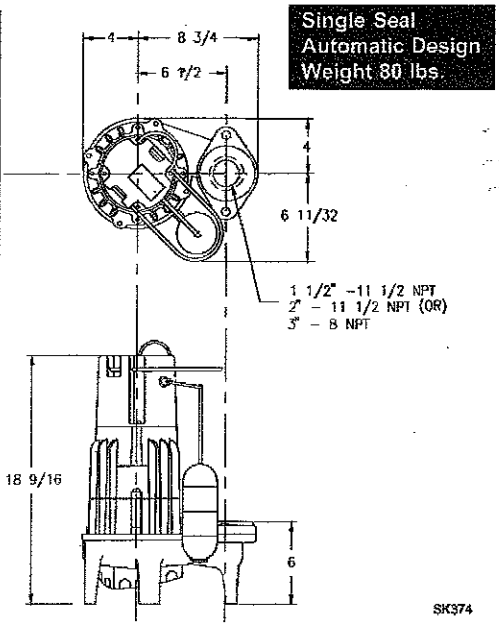


009920A

MODELS		161/4161		163/4163		165/4165	
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	100	379	61	231	61	231
10	3.1	93	352	60.5	229	60.5	229
15	4.6	85	322	60	227	60.5	229
20	6.1	79	297	59	223	60	227
25	7.6	70	265	57	216	59	223
30	9.1	62	233	55	206	58	220
40	12.2	45	170	46	172	55	208
50	15.2	20	76	33	125	50	189
60	18.3	–	–	15	57	39	148
70	21.3	–	–	–	–	22.5	85
80	24.4	–	–	–	–	10	38
Shut-off Head:		56 ft. (17m)		66 ft. (20m)		86.5 ft. (26m)	

009920B

Single Seal Automatic Design Weight 80 lbs.



SK374

Standard all models - 20 ft. cord - ½ 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	1	—	Y	Y
N161	N4161	115	1	Non	15.5	2	3 or 5 & 6	Y	Y(1)
D161	—	230	1	Auto	7.5	1	—	Y	Y
E161	E4161	230	1	Non	7.5	2	3 or 5 & 6	Y	Y
* H161	—	200-208	1	Auto	8.8	1	—	Y	N
* I161	* I4161	200-208	1	Non	8.8	2	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 - ½ 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	1	—	Y	Y
N163	N4163	115	1	Non	15.0	2	3 or 5 & 6	Y	Y(1)
D163	—	230	1	Auto	7.5	1	—	Y	Y
E163	E4163	230	1	Non	7.5	2	3 or 5 & 6	Y	Y
* H163	—	200-208	1	Auto	8.5	1	—	Y	N
* I163	* I4163	200-208	1	Non	8.5	2	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

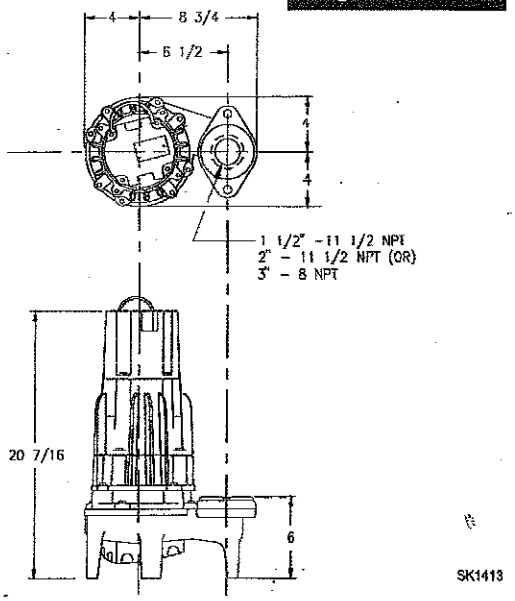
Standard all models - 20 ft. cord - 1 H.P.

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	1	—	Y	Y
E165	E4165	230	1	Non	10.2	2	3 or 5 & 6	Y	Y
* H165	—	200-208	1	Auto	12.6	1	—	Y	N
* I165	* I4165	200-208	1	Non	12.6	2	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.

Double Seal Design Weight 87 lbs.



SK1413

SELECTION GUIDE

1. Integral float operated 2-pole mechanical switch, no external control required.
2. Single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
3. Mechanical alternator M-Pak 10-0072 or 10-0075. Refer to FM0495
4. Simplex three phase control panel. Refer to FM1228.
5. See FM0712 for correct model of Electrical Alternator.
6. Variable level control switch 10-0225 used as control activator, specify simplex (3) float or duplex (3) or (4) float system.

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

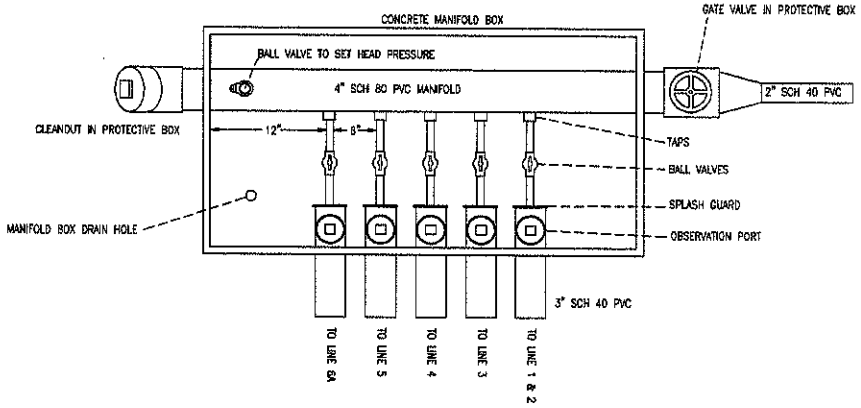
All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA).

RESERVE POWERED DESIGN

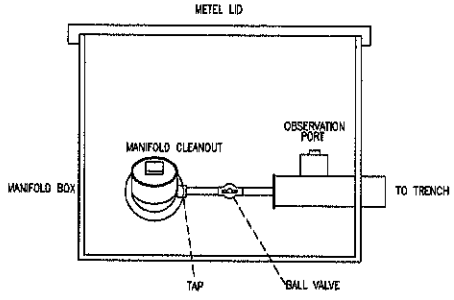
For unusual conditions a reserve safety factor is engineered into the design of every Zoeller pump.

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PRESSURE MANIFOLD DETAILS
TOP VIEW



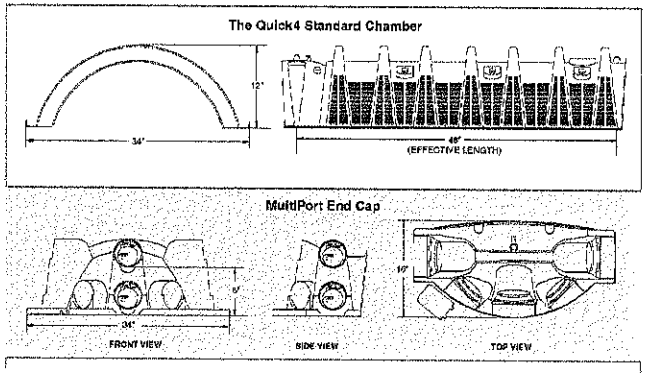
PRESSURE MANIFOLD DETAILS
END VIEW



TAP SCHEDULE	
LINE #	TAP
1 & 2	¾" SCH 80
3	~~1"~~ ~~SCH 80~~
4	¾" SCH 40
5	¾" SCH 80
6A	1" SCH 80

SCH 40 ½"
80 ¾"
1" 1¼"

The
Quick4® Standard
Chamber



INFILTRATOR CHAMBER DETAILS

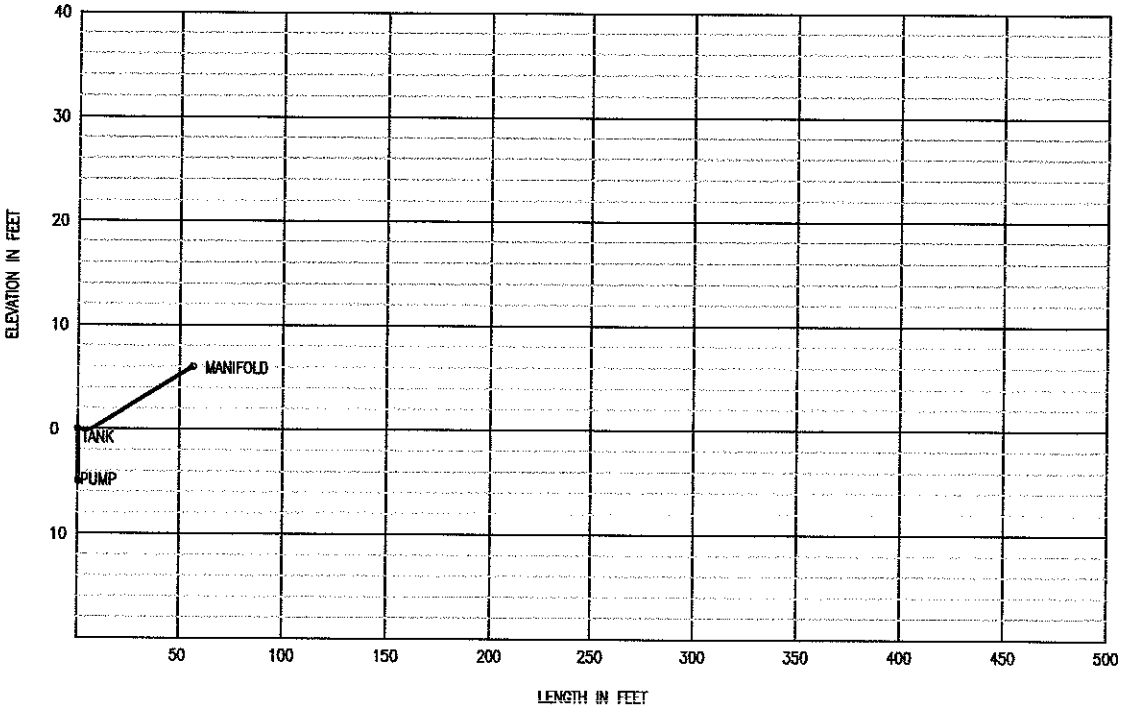
TANK DETAILS - LOT 4
FOR

Meritage Homes

Bateman Civil Survey Company
Engineers • Surveyors • Planners
2324 Reliance Ave, Apex, NC 27539 Ph: 919.577.1080 Fax: 919.577.1081
www.batemancivilsurvey.com Info@batemancivilsurvey.com
NCBELS Firm No. C-3376

BELLS CROSSING SUBDIVISION LOT 1
MOORESVILLE, NC
IREDELL COUNTY
DATE: 01/07/16 DRAWN BY: TMB CHECKED BY: TMB
SCALE: AS SHOWN

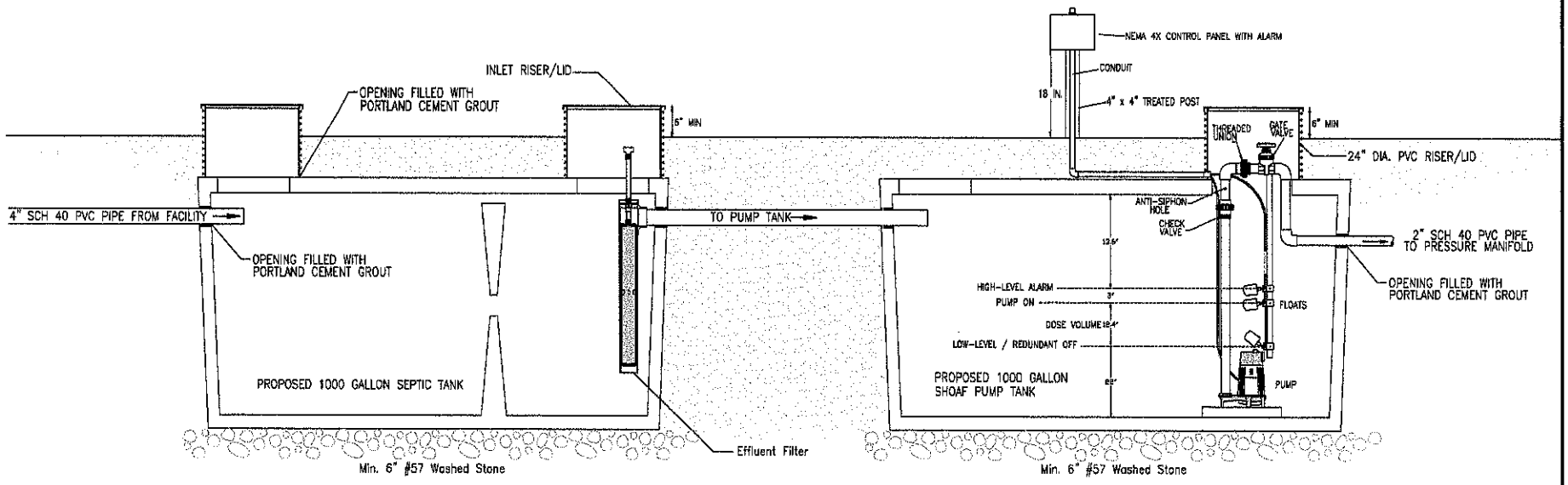
SUPPLY LINE
HYDRAULIC PROFILE



Bateman Civil Survey Company
Engineers • Surveyors • Planners
2534 Reliance Ave, Apex, NC 27539 Ph: 919.577.1080 Fax: 919.577.1081
www.batemancivilsurvey.com info@batemancivilsurvey.com
NCBELS Firm No. C-3576

Meritage Homes

LOT 2
PEARL CROSSING SUBDIVISION
FUQUAY-VARINA, NC (WAKE COUNTY)
DATE: 01/07/16
JOB NO. 15-148 DRAWN BY: HB



APPROVED FEB - 5 2016

NOTES:

1. **CONTROL PANEL SHALL HAVE A VISUAL AND AUDIO ALARM**
2. **FINAL GRADE SHOULD SHED WATER AWAY FROM TANKS**
3. **TANKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STATE RULE 15A NCAC 18A .1953**

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2524 Reliance Ave, Apex, NC 27539 Ph: 919.577.1080 Fax: 919.577.1081
www.batemancivilsurvey.com info@batemancivilsurvey.com
NCBELS Firm No. C-2378

TANK DETAILS - LOT 4

FOR

Meritage Homes

BELLS CROSSING SUBDIVISION LOT 1
MOORESVILLE, NC
IREDELL COUNTY

DATE: 01/07/16 DRAWN BY: TMB CHECKED BY: TMB

SCALE: AS SHOWN