App# EH1901-0003

Harnett County Department of Public Health

Improvement Permit

A building permit cannot be issued with only an Improvement Permit

PROPERTY LOCATION: _____

ISSUED TO: _____ SUBDIVISION _____ LOT # _____

NEW ☐ REPAIR ☐ EXPANSION ☐

Site Improvements required prior to Construction Authorization Issuance:

Type of Structure: _____

Proposed Wastewater System Type: _____

Projected Daily Flow: _____ GPD

Number of bedrooms: _____ Number of Occupants: _____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 ☐ No expiration

Permit conditions: _____

Authorized State Agent:: _____ Date: _____ 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: Robert Whittaker

PROPERTY LOCATION: 88 Brookview Court

SUBDIVISION The Creek LOT # 4

Facility Type: Ext SFD ☐ New ☐ Expansion ☒ Repair

Basement? ☐ Yes ☒ No Basement Fixtures? ☐ Yes ☐ No

Type of Wastewater System** _____ (Initial) Wastewater Flow: 360 GPD

(See note below, if applicable ☐)

_____(Repair)

Installation Requirements/Conditions

Septic Tank Size _____gallons

Pump Tank Size _____gallons

Number of trenches _____

Exact length of each trench _____feet

Trenches shall be installed on contour at a

Maximum Trench Depth of: _____inches

(Trench bottoms shall be level to +/-1/4" in all directions)

Trench Spacing: _____ Feet on Center

Soil Cover: _____inches

(Maximum soil cover shall not exceed 36" above the trench bottom)

Pump Requirements: _____ ft. TDH vs. _____GPM

_____ inches below pipe

Aggregate Depth: _____ inches above pipe

_____ inches total

Conditions: See attached sheets fo all specifications.

WATER LINES (INCLUDING IRRIGATION) MUST BE 10FT. FROM ANY PART OF SEPTIC SYSTEM OR REPAIR AREA.
NO UTILITIES ALLOWED IN INITIAL OR REPAIR DRAIN FIELD AREA.

**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. SEE ATTACHED SITE SKETCH

Authorized State Agent: _____ RGMS Date: 1/22/21

Construction Authorization Expiration Date: 4/22/21

1/42

Engineers and Soil Scientists

Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
www.agriwaste.com

NORTH CAROLINA PROFESSIONAL SEAL 045605 ENGINEER SCOTT P. JONES

Firm # C-0519

11/18/2020

November 18, 2020

Harnett County Environmental Health
307 W Cornelius Harnett Boulevard
Lillington, NC 27546

SUBJECT: Repair Septic System Layout & Design – Whittaker Property
Lot 4 - The Creek
88 Brookview Court
Angier, NC 27501
PIN# 0672-60-2805.000

To Whom It May Concern:

Enclosed please find a layout and design package for a repair pressure manifold septic system for the property located at 88 Brookview Court Angier, NC 27501. The repair system is designed for a three (3) bedroom single-family residence. The design flow is 360 gallons/day. AWT laid out additional line on the property to utilize as much area as feasible for the repair system. The existing chamber lines will be used in the repair system and any damaged chambers shall be replaced. The existing septic tank and pump tank are proposed to be used pending leak tests. The existing septic tank shall be upfitted with single-piece access risers and an effluent filter.

The repair system will utilize the following components:

- Existing 1,000-gallon septic tank
- Existing 1,000-gallon pump tank
- New Pressure Manifold
- Control Panel with Elapsed Timer and Counter
- Accepted Drainfield Product

I appreciate your time and efforts in reviewing this application. If you have any questions or comments, please feel free to contact me at 919-859-0669.

Best Regards,

Scott P. Jones, P.E.
Project Engineer

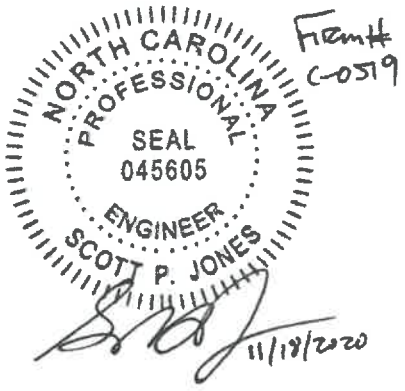
Engineers and Soil Scientists

Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
www.agriwaste.com

FINAL DESIGN
NOT RELEASED FOR
CONSTRUCTION

Whittaker Property Repair WWTS
Lot 4 – The Creek
88 Brookview Court
Angier, NC 27501
Harnett County
PIN# 0672-60-2805.000

Plans and Specifications for Wastewater Treatment System



Date: November 18, 2020

Consultants: Scott P. Jones, PE
Project Engineer
sjones@agriwaste.com
Agri-Waste Technology, Inc.
501 N. Salem Street, Ste 203
Apex, NC 27502
Office: 919-859-0669

Engineers and Soil Scientists

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Whittaker Property Repair WWTS
Lot 4 – The Creek
88 Brookview Court
Angier, NC 27501
Harnett County
PIN# 0672-60-2805.000

Plans and Specifications for Wastewater Treatment System

- Narrative Description of System
- Design Spreadsheets
- Drawings of Proposed System
- Tank Specification Sheets
- Access Riser Adapters, Risers, Lids, and Safety Net
- Effluent Filter Specification
- Pump Specification
- Specification for Control Panel and Floats
- Pressure Filter

Narrative Description
of
Wastewater Treatment System

The Wastewater Treatment System that has been designed considers the following components:

- Septic Tank
- Pump Tank
- Discharge Pump and Filter
- Pressure Manifold
- Control Panel and Floats
- Drainfield

Due to the pump in this system, it is recommended that a Certified Operator be contracted to maintain this system.

Septic Tank
The existing 1,000-gallon septic tank will be used for this system pending a leak test. The existing septic tank shall be upfitted with single-piece access risers and an effluent filter. If the existing septic tank does not pass the leak test, a new 1,000-gallon (minimum) septic tank will be installed for this system. A 4" effluent filter will be installed in the outlet end of the septic tank. Access risers (24") will be installed on both the inlet and outlet ends of the septic tank. To facilitate the installation of the access risers, the tank will have riser adapters cast into the top of the tank during tank construction. Inner lids or safety nets will be included with the risers. Rubber boots (4") shall be cast into the inlet and outlet end of the tank. Waste that exits the septic tank will flow into the pump tank.

Pump Tank
The existing 1,000-gallon pump tank will be used for this system pending a leak test. If the existing pump tank does not pass the leak test, a new pump tank, sized to a minimum of 1,000 gallons AND with 24 hours of emergency storage, will be installed for this system. A 24" or 30" access riser will be installed on the outlet end of the pump tank. To facilitate the installation of the access riser, the tank will have a riser adapter cast into the top of the tank during tank construction. Rubber boots (4") shall be cast into the inlet and outlet end of the tank. The pump tank will house the discharge pump.

Discharge Pump and Filter
The system will pump to a conventional pressure manifold drainfield. The discharge pump will be a submersible pump and will be outfitted with a check valve, pressure filter, union and gate valve on the discharge pipe. The pressure filter will reduce the potential of solids entering the drainfield.

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Control Panel and Floats
One control panel will be required for this wastewater system. The existing or new panel shall meet the following requirements:

This panel will control operation of the discharge pump. Three floats will be installed; "Pump Off", "Pump On" and "High Water Alarm". The pump off float is set to keep the pump covered with effluent at all times. The pump on float is set based on the intended field dose volume. When the dose volume is reached in the tank (as the water level rises), the pump on float will engage (the pump off float will also be "up") and pump the tank contents to the drainfield. As the liquid level drops, the pump on float will drop and then once the pump off float drops, the pump will cease pumping. In the event of a power outage, pump failure or extremely high inflow to the system, the effluent level may rise above the pump on float. If the effluent level rises sufficiently, the high-water alarm will activate. The high-water alarm is set at 6" above the pump on float and allows for a minimum of one-day storage in the pump tank.

Drainfield
The drainfield will utilize chamber product for the repair system. A six (6) tap conventional pressure manifold will be utilized for the repair system. Trench depth for the system will be 18" and the width will be 36".

If there are questions, comments, or concerns regarding the operation of the system, please contact AWT at 919-859-0669.

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Conventional PM System - Design Summary Page

Engineers and Soil Scientists
Agri-Waste Technology, Inc.

Project: Whittaker Property
Property: 88 Brookview Court
Angier, NC 27501
Subdiv.: The Creek
Lot #: Lot 4

Date: 10/22/2020
County: Harnett
Permit #:

Project Manager:
Scott Jones
(919) 859-0669
sjones@agriwaste.com
Engineer:
Scott Jones
(919) 859-0669
sjones@agriwaste.com

Owner: Robert Whittaker
Address: 88 Brookview Court
Angier, NC 27501
Phone: (401)-710-2054
Email: rwhittaker1@verizon.net

EHS:

Type of System:
III b
New Construction
P.I.N. #:
0672-60-2805.000

Soil Parameters

Soil Evaluation By:
Jeff Vaughan

LTAR: 0.3 gpd/ft^2

Special Conditions/Notes:
Repair system with 18" trench depth.

Design Parameters

Type of Establishment: Residence (less than 6 bedrooms)
Unit: Bedroom
# of Units: 3

Septic Tank Specifications (if existing Septic Tank is replaced)

Min. Tank Capacity: 900 gal
Actual Tank Volume: 1,000 gal
Tank Manufacturer: Shoaf
Tank Model: TS 1000 STB-347

	Exterior	Interior	
Length:	9.00	8.50	ft
Width:	4.83	4.33	ft
Depth:	5.63		ft

Repair Drainfield Specifications

Type of Distribution: Parallel Press. Manifold
Trench Media: Chamber
Trench Width: 3 ft
Trench Depth: 18 in
(or as specified on permit)

Trench Bottom Area: 1200 ft^2
Minimum Drain Line: 400 ft
Actual Drain Line: 483 ft
Number of Lines: 8
Minimum Line Spacing: 9 ft O.C.

Wastewater Treatment System Design Calculations

Project: Whittaker Property
Location: 88 Brookview Court
Angier, NC 27501

Date: 10/22/2020
County: Harnett

Septic Tank Sizing

Daily Flow Estimate:

Unit	# of Units	Flow/Unit	Flow/Day
Bedroom	3	120	360
			0
			0
			0
			0
			0

Q= 360 gpd

Septic Tank Minimum Capacity: Per NCAC T15A:18A .1952(b)(1):

For individual residences with 3 or fewer bedrooms,

V = 900

Minimum Liquid Capacity (V)= 900 gal

Septic Tank Specs: (if tank is replaced)

Manufacturer: Shoaf
Model: TS 1000 STB-347
Volume: 1,000 gal
Weight: 10,500 lbs

	Exterior		Interior	
Length:	9.00	ft	8.50	ft
Width:	4.83	ft	4.33	ft
Depth:	5.63	ft		

Shape of Risers: Circular
Diameter: 2.00 ft

Drainfield Design

Project: Whittaker Property
Location: 88 Brookview Court
Angier, NC 27501

Date: 10/22/2020
County: Harnett

Drainfield Sizing

LTAR:	0.3 gpd/ft^2		
Daily Design Flow:	360 gpd	**Type of Drainfield Media:**	Chambers
Drainfield Area:	1,200 ft^2	**Required Drainline**	
Trench Width:	3 ft	**After 25% Reduction:**	300
Required Drainline:	400 ft	**Minimum Line Spacing:**	9 ft (O.C.)

Drainfield Layout

Benchmark Description: Northeast Property Corner

Benchmark Elevation: 100 ft

Line	Use	Flag Color	Elevation (ft)	Layout Length (ft)	Utilized Primary Length (ft)	Utilized Repair Length (ft)
1	Layout Line	Red	101.3	110		85
2	Existing Line	Ex. Yellow	100.4	84		84
3	Existing Line	Ex. Pink	99.7	83		83
4	Existing Line	Ex. Purple	98.5	81		81
5	Layout Line	White	97.7	47		45
6	Layout Line	Blue	97.1	40		40
7	Layout Line	Red	95.9	38		35
8	Layout Line	White	95.0	31		30
				Total:	0	483
				Count:	0	8

24/b

CONVENTIONAL SEPTIC SYSTEM DESIGN (Repair)

Designed by: SJ
Revised: 10/22/2020

Site Information

Project: Whittaker Property
Site Address: 88 Brookview Court
Angier, NC 27501
County: Harnett

Design Information

Estimated Daily Flow:	360	gal/day
L.T.A.R.:	0.3	gal/day/ft^2
L.T.A.R. + 5%:	0.315	gal/day/ft^2
Trench Width:	3	ft.
Line Length Required:	400	ft.
L.T.A.R. Reduced:	0.300	gal/day/ft^2
L.T.A.R. Reduced + 5%:	0.315	gal/day/ft^2

DRAINFIELD INFO. - **Repair**

Proposed Type of System/Distribution: ***Pump to Pressure Manifold using Chambers***

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	Red	85	1/2in SCH 40	7.11	0.084	0.291
2	Ex. Yellow	84	1/2in SCH 80	5.48	0.065	0.227
3	Ex. Pink	83	1/2in SCH 80	5.48	0.066	0.230
4	Ex. Purple	81	1/2in SCH 80	5.48	0.068	0.235
5 6	White Blue	85	1/2in SCH 80	5.48	0.064	0.224
7 8	Red White	65	1/2in SCH 80	5.48	0.084	0.293
TOTAL		**483**		**34.51**		0.250

Total Run Time =	10.43 min.	
% of Dose Volume =	66.0%	(Req. Range 66% - 75%)
Dose Volume =	208.2 gal/dose	
Run Time/Dose =	**6.0 min**	(Range 5-7 min unless uphill, checked)
Volume/depth =	21.07 gal/in	(Dependent upon tank manufacturer, to be field verified)
Estimated Drawdown =	10 in.	

Manifold Box

Number of Taps =	6	
Manifold Length =	4.0 ft.	(approximate)

PUMP DESIGN

System (initial/repair): **Repair**

Project: Whittaker Property
Site Address: 88 Brookview Court
Angier, NC 27501
County: Harnett

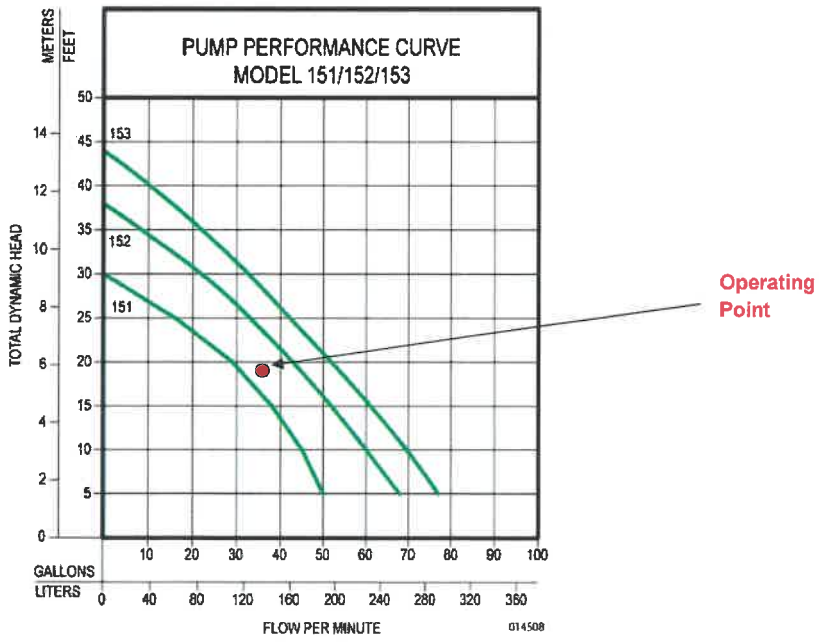
Friction Losses

Suction Head =	0 ft.		*(submersible = 0)*
Elev. Difference (highest point from pump) =	10.00 ft.		
Design Pressure At Outlet =	2 ft.		
Supply Line - *2.5" Schedule 40 PVC*			
Pipe Diameter (ID) =	2.445 in.	Flow =	34.51 gpm
Pipe Length =	150 ft.	Velocity =	2.36 ft/sec
Pipe Length for Fittings =	15 ft.		
Est. Friction Loss per 100' =	0.89 ft/100 ft.		
Estimated Friction Loss =	1.48 ft.		
Pressure Filter Friction Loss =	1.16 ft.		*(from manufacturer)*
Friction Loss - Taps/Special Fittings =	3.5 ft.		
TOTAL =	**18.13 ft.**		

Pump Efficiency =	0.7	*(assumed, typical)*
Motor Efficiency =	0.9	*(assumed for electric pumps)*
Flow =	**34.51 gpm**	
Required Horsepower =	0.25 hp	
TDH =	**18.13 ft.**	

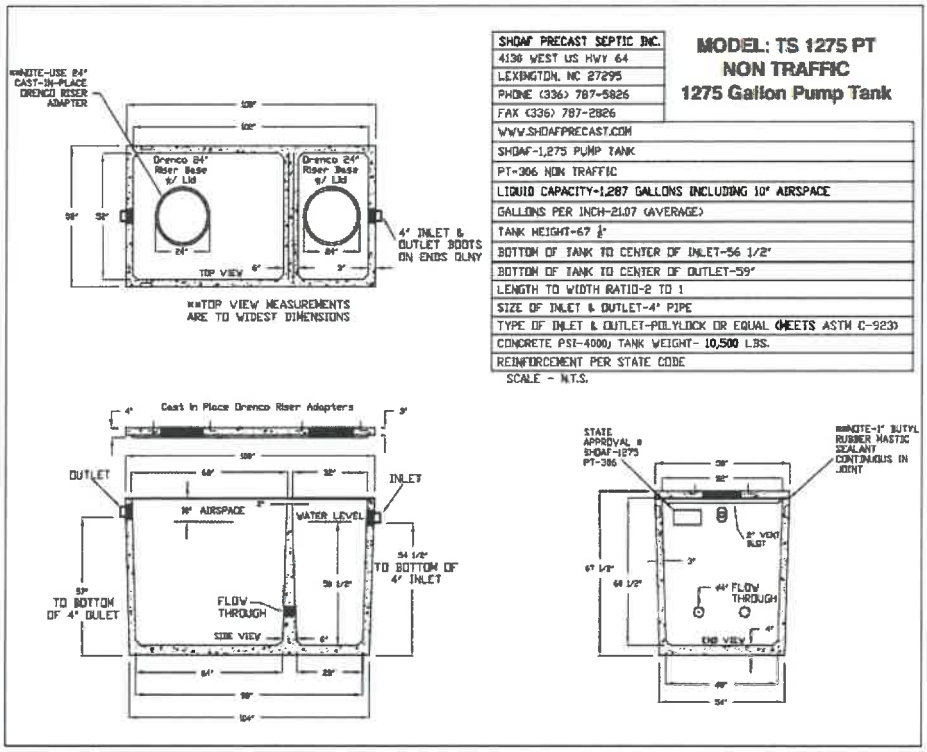
Pump Selection

Manufacturer:	**Zoeller**
Model:	**N152**
Horsepower:	**2/5**



11/42

PUMP TANK STORAGE (if tank is replaced)



Interior Height (in.)	**60.5**
Avg. Gals/Inch	**21.07**

Primary & Repair System

Elevations, measured from bottom towards top (0 = Interior Bottom of Tank):

Top of pump (including 4" block)	16.0 in.	(Pump approx. 12" tall)
Pump Off	18.0 in.	
Pump On	28.0 in.	(set for dose volume)
Alarm on	34.0 in.	(6" above ON Float)

Emergency Storage Available

Pump Tank	558.4 gal	(HWA to Tank Ceiling)
Days of Storage	1.55 days	

(determined from interior top of tank - "High Water Alarm")

Septic Tank Buoyancy

Project: Whittaker Property
Location: 88 Brookview Court
Angier, NC 27501

Date: 10/22/2020
County: Harnett

Properties/Assumptions

Tank Size:	1,000	gal
Effluent Density:	62.4	lb/ft^3 (Specific Weight of Water)
Soil Cover Over Tank:	1	ft
Soil Bulk Density:	1.25	
Groundwater Height:	-1	ft
(in relation to top of the tank)		

Tank Dimensions

	Exterior		Interior	
Length:	9.00	ft	8.50	ft
Width:	4.83	ft	4.33	ft
Depth:	5.63	ft		
Effective Depth:	4.63	ft *(accounting for the groundwater height)*		
Permanent Liquid Depth in Tank:	0	ft		
Area of Riser Openings:	6.28	ft^2		
Estimated Tank Weight:	10,500	lb *(from manufacturer)*		

Buoyancy Force Calculation

Buoyancy Force = Specific Weight of Water * Displaced Volume

Buoyancy Force = 12,554 lb

Weight Calculation

Tank Weight:	10,500	lb
Water Weight in Tank:	0	lb
Soil Weight Over Tank:	2,903	lb
Total Weight:	13,403	lb

Result

The total weight must be greater than the buoyancy force so that tank will not float during high water table conditions.

Since the total weight is greater than the buoyancy force, the tank will not float and is suitable for use.

Conact Engineer if soil wetness conditions are found within 2' of exisiting grade at tank burial location

Pump Tank Buoyancy

Project: Whittaker Property
Location: 88 Brookview Court
Angier, NC 27501

Date: 10/22/2020
County: Harnett

Properties/Assumptions

Tank Size:	1,275	gal
Effluent Density:	62.4	lb/ft^3 (Specific Weight of Water)
Soil Cover Over Tank:	1	ft
Soil Bulk Density:	1.25	
Groundwater Height:	-1	ft
(in relation to top of the tank)		

Tank Dimensions

	Exterior		Interior	
Length:	9.00	ft	8.50	ft
Width:	4.83	ft	4.33	ft
Depth:	5.63	ft		
Effective Depth:	4.63	ft *(accounting for the groundwater height)*		
Permanent Liquid Depth in Tank:	0	ft		
Area of Riser Openings:	3.14	ft^2		
Estimated Tank Weight:	10,500	lb *(from manufacturer)*		

Buoyancy Force Calculation

Buoyancy Force = Specific Weight of Water * Displaced Volume

Buoyancy Force = 12,554 lb

Weight Calculation

Tank Weight:	10,500	lb
Water Weight in Tank:	0	lb
Soil Weight Over Tank:	3,148	lb
Total Weight:	13,648	lb

Result

The total weight must be greater than the buoyancy force so that tank will not float during high water table conditions.

Since the total weight is greater than the buoyancy force, the tank will not float and is suitable for use.

Conact Engineer if soil wetness conditions are found within 2' of exisiting grade at tank burial location

Whittaker Property Repair WWTS

Project Location:
Lot 4 – The Creek
88 Brookview Court
Angier, NC 27501
Harnett County
PIN: 0672-60-2805.000

Project Owner:
Robert Whittaker
88 Brookview Court
Angier, NC 27501
(401) 710 – 2054
rwhittaker1@verizon.net

Project Consultant:
Jeff Vaughan, L.S.S.
javaughan@agriwaste.com
Scott Jones, P.E.
sjones@agriwaste.com

Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, NC 27502
(919) 859-0669
(919) 233-1970 Fax

System Overview:
Single Family Residence – Repair
Three (3) Bedroom, 360 gpd
Pressure Manifold with Chambers

NTS

VICINITY MAP

Sheet Index

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
www.agriwaste.com

Whittaker Property
Repair WWTS

Owner Information:
Robert Whittaker
88 Brookview Court
Angier, NC 27501
(401) 710-2054
rwhittaker1@verizon.net

Property Information:
88 Brookview Court
Lot 4 – The Creek
Angier, NC 27501
Harnett County
PIN: 0672-60-2805.000

This document originally issued and sealed by Scott P. Jones, N.C. PE #045605, on November 18, 2020. This medium shall not be considered a certified document.

FINAL DESIGN
NOT RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Cover Sheet

DRAWN BY:	CREATED ON:
S. Jones	10/30/2020
REVISED BY:	REVISED ON:
RELEASED BY:	RELEASED ON:

SHEET NAME:
WW-1

15/176

NOTES:

1.) Remove existing D-Box and Step Downs.

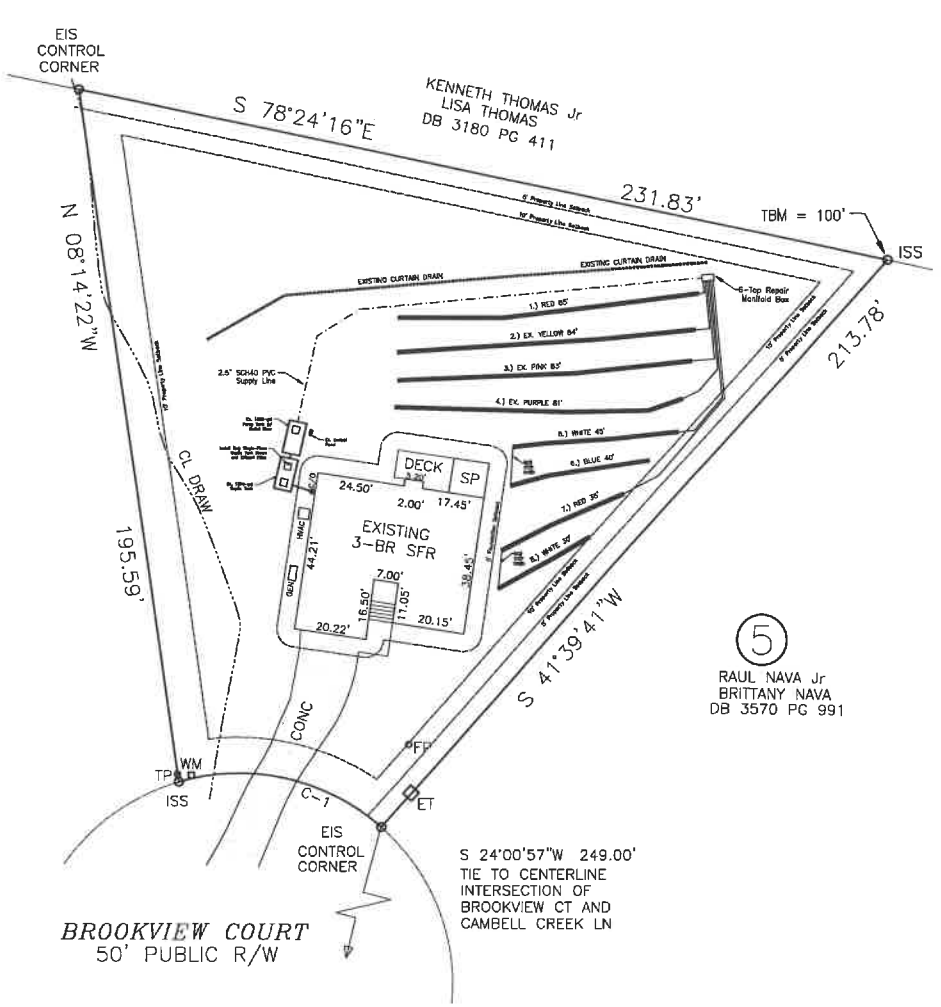
2.) Contractor shall re-establish vegetation over all disturbed areas.

3.) Damaged chambers shall be replaced.

4.) Leak Test required for existing tanks.

5.) Control Panel shall have elapsed timer and counter.

5.) Base Survey by Others.



PROPERTY LAYOUT

Scaled for 24"x36" output

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0689
www.agriwaste.com

Whittaker Property
Repair WWTS

Owner Information:
Robert Whittaker
88 Brookview Court
Angier, NC 27501
(401) 710-2054
rphittaker1@verizon.net

Property Information:
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Lot 4 - The Creek
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Harnett County
PIN: 0672-60-2085.000

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FINAL DESIGN
NOT RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

Property Layout

DRAWN BY:	CREATED ON:
S. Jones	10/30/2020
REVISED BY:	REVISED ON:
RELEASED BY:	RELEASED ON:

SHEET NAME:

WW-2

16/43

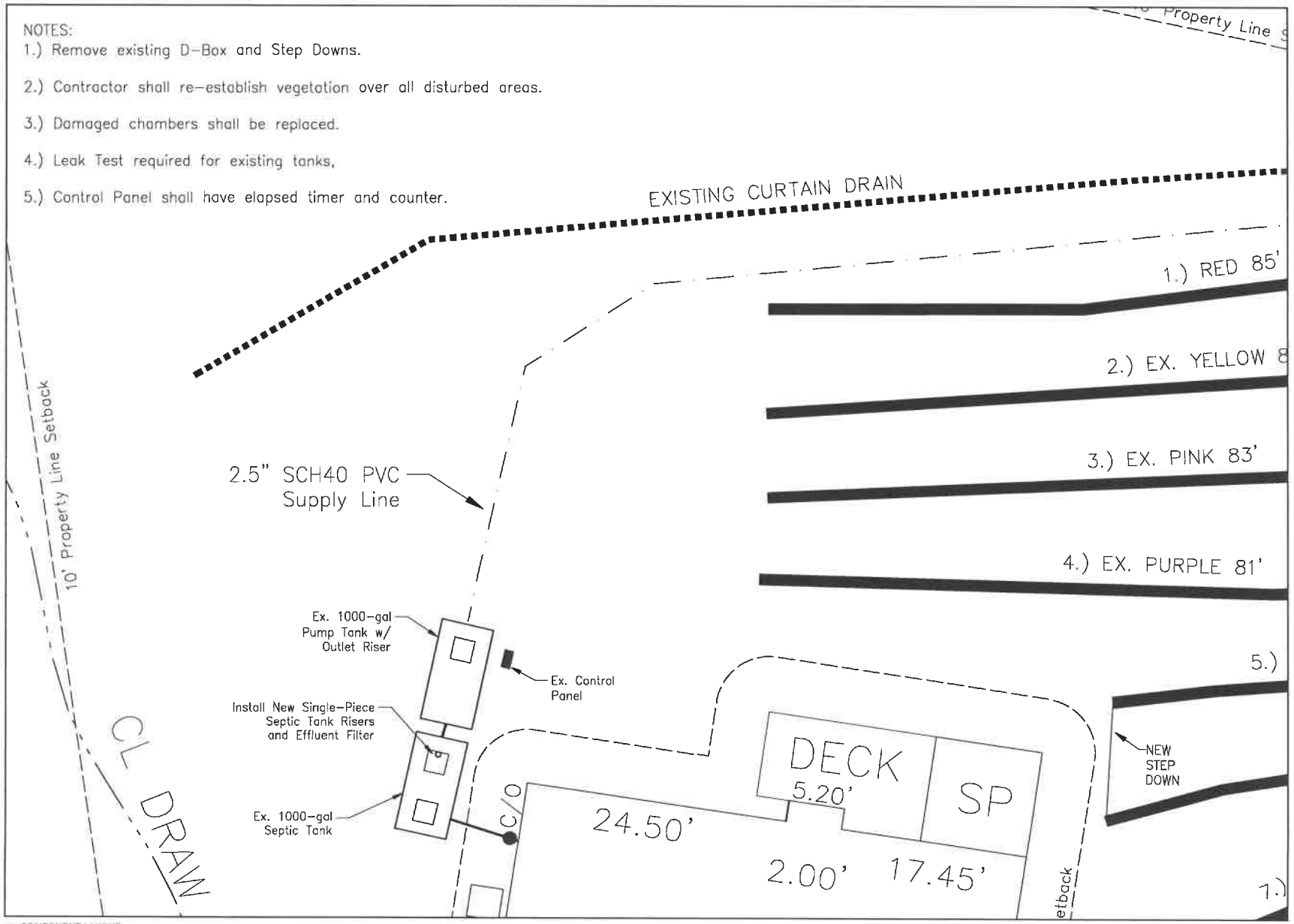
NOTES:
1.) Remove existing D-Box and Step Downs.

2.) Contractor shall re-establish vegetation over all disturbed areas.

3.) Damaged chambers shall be replaced.

4.) Leak Test required for existing tanks,

5.) Control Panel shall have elapsed timer and counter.



COMPONENT LAYOUT

Scaled for 24"x36" output

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
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Whittaker Property
Repair WWTS

Owner Information:
Robert Whittaker
88 Brookview Court
Angier, NC 27501
(401) 710-2054
rphittaker1@verizon.net

Property Information:
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Lot 4 - The Creek
Angier, NC 27501
Harnett County
PIN: 0672-60-2086.000

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FINAL DESIGN
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REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

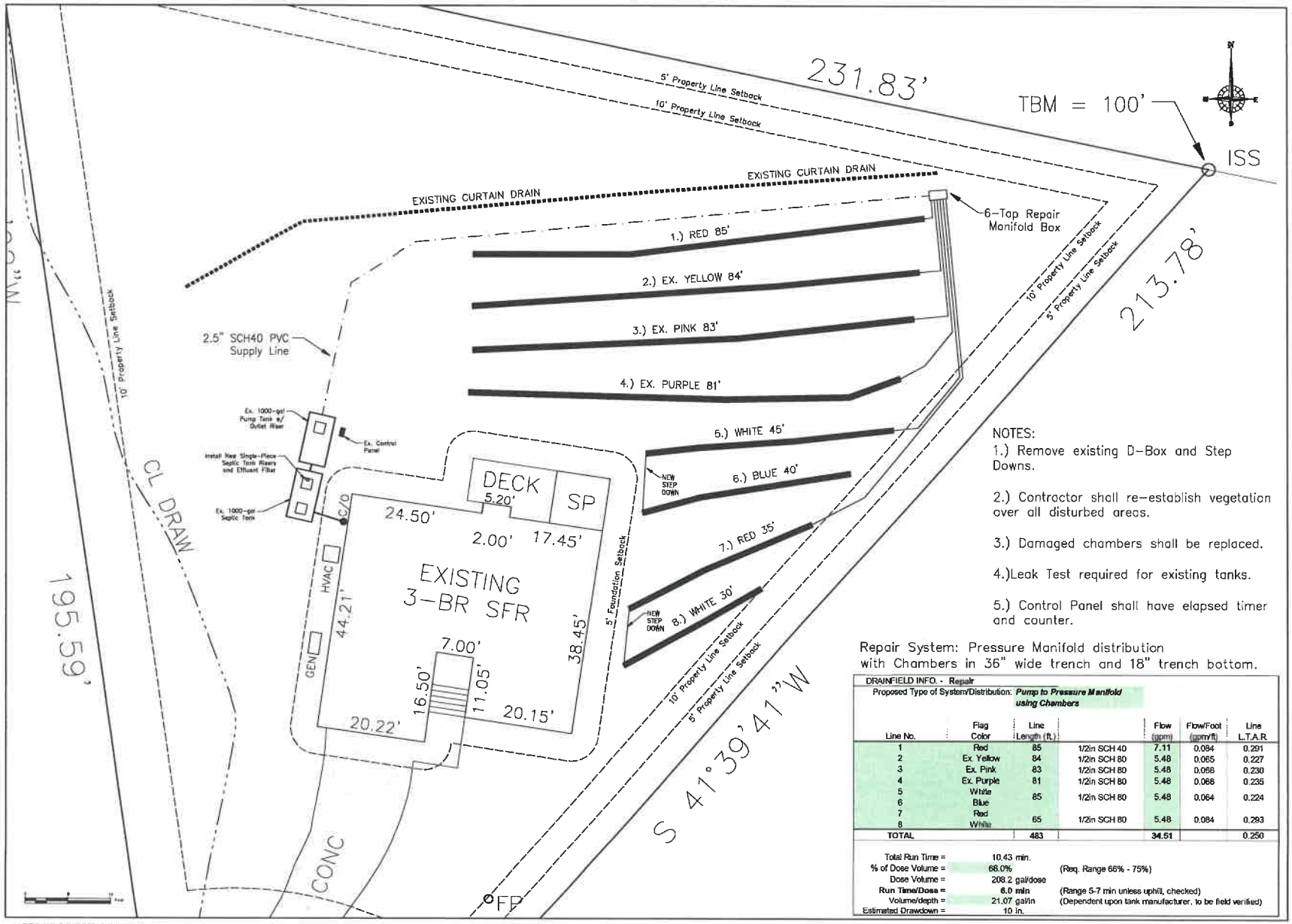
Component Layout

DRAWN BY:	CREATED ON:
S. Jones	10/30/2020
REVISED BY:	REVISED ON:
RELEASED BY:	RELEASED ON:

SHEET NAME:

WW-3

11/4/20



NOTES:

1.) Remove existing D-Box and Step Downs.

2.) Contractor shall re-establish vegetation over all disturbed areas.

3.) Damaged chambers shall be replaced.

4.)Leak Test required for existing tanks.

5.) Control Panel shall have elapsed timer and counter.

Repair System: Pressure Manifold distribution with Chambers in 36" wide trench and 18" trench bottom.

DRAINFIELD INFO. - Repair

Proposed Type of System/Distribution: *Pump to Pressure Manifold using Chambers*

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	Red	85	1/2in SCH 40	7.11	0.084	0.291
2	Ex. Yellow	84	1/2in SCH 80	5.48	0.065	0.227
3	Ex. Pink	83	1/2in SCH 80	5.48	0.066	0.230
4	Ex. Purple	81	1/2in SCH 80	5.48	0.068	0.235
5	White	85	1/2in SCH 80	5.48	0.064	0.224
6	Blue					
7	Red	65	1/2in SCH 80	5.48	0.084	0.293
8	White					
TOTAL		483		34.51		0.250

Total Run Time =	10.43 min.	
% of Dose Volume =	66.0%	(Req. Range 66% - 75%)
Dose Volume =	208.2 gal/dose	
Run Time/Dose =	6.0 min	(Range 5-7 min unless uphill, checked)
Volume/depth =	21.07 gal/in	(Dependent upon tank manufacturer, to be field verified)
Estimated Drawdown =	10 in.	

REPAIR DRIPFIELD LAYOUT

Scaled for 24"x36" output

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
www.agriwaste.com

Whittaker Property
Repair WWTS

Owner Information:
Robert Whittaker
88 Brookview Court
Angier, NC 27501
(401) 710-2054
rjwhittaker1@verizon.net

Property Information:
88 Brookview Court
Lot 4 - The Creek
Angier, NC 27501
Harnett County
PIN: 0672-50-2085.000

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FINAL DESIGN
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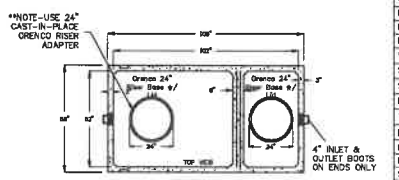
REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Repair Drainfield

DRAWN BY:	CREATED ON:
S. Jones	10/30/2020
REVISED BY:	REVISED ON:
RELEASED BY:	RELEASED ON:

SHEET NAME:
WW-4

24/81

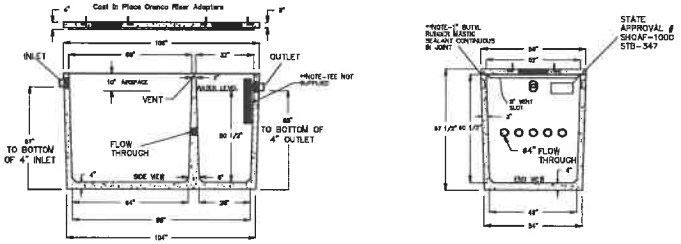


**TOP VIEW MEASUREMENTS ARE TO WIDEST DIMENSIONS

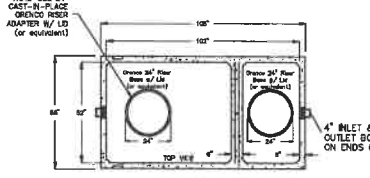
SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
WWW.SHOAFPRECAST.COM
SHOAF-1,000 SEPTIC TANK
STB-347 NON TRAFFIC
LIQUID CAPACITY-1,000 GALLONS/AIRSPACE-10"
TANK HEIGHT-67 ½"
BOTTOM OF TANK TO CENTER OF INLET-59"
BOTTOM OF TANK TO CENTER OF OUTLET-57"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-4" PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-4000; TANK WEIGHT- 10,500 LBS.
REINFORCEMENT PER STATE CODE

MODEL: TS 1000 STB
NON TRAFFIC
1000 Gallon Septic Tank

SCALE – N.T.S.



SEPTIC TANK DETAIL (or equivalent if tank is replaced)



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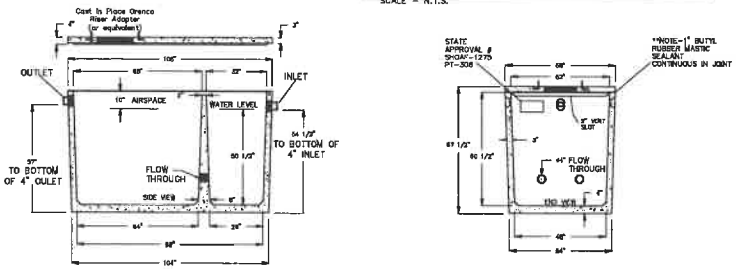
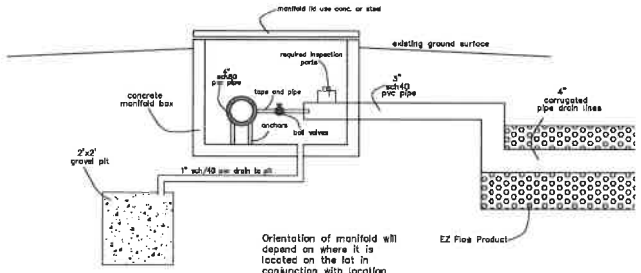
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
WWW.SHOAFPRECAST.COM
SHOAF-1,275 PUMP TANK
PT-306 NON TRAFFIC
LIQUID CAPACITY-1,287 GALLONS INCLUDING 10" AIRSPACE
GALLONS PER INCH-21.07 (AVERAGE)
TANK HEIGHT-67 ½"
BOTTOM OF TANK TO CENTER OF INLET-56 1/2"
BOTTOM OF TANK TO CENTER OF OUTLET-58"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-4" PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-4000; TANK WEIGHT- 10,600 LBS.
REINFORCEMENT PER STATE CODE

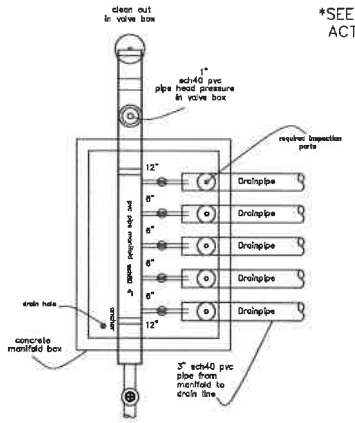
MODEL: TS 1275 PT
NON TRAFFIC
1275 Gallon Pump Tank

SCALE – N.T.S.



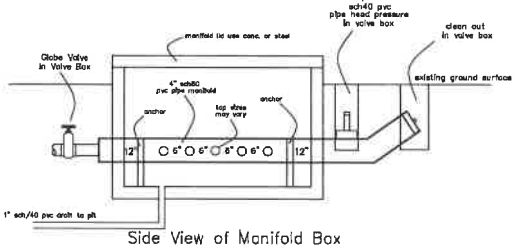
PUMP TANK DETAIL (or equivalent tank with 1-day storage if tank is replaced)





*SEE TAP SHEET FOR ACTUAL NUMBER OF TAPS

Top View of Manifold Box



Side View of Manifold Box

Manifold Detail - FOR ILLUSTRATION ONLY

Scaled for 24"x36" output

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Engineers and Soil Scientists
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919-859-0999
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Whittaker Property
Repair WWTS

Owner Information:
Robert Whittaker
88 Brookview Court
Angier, NC 27501
(401) 710-2054
rahittaker1@verizon.net

Property Information:
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Harnett County
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REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

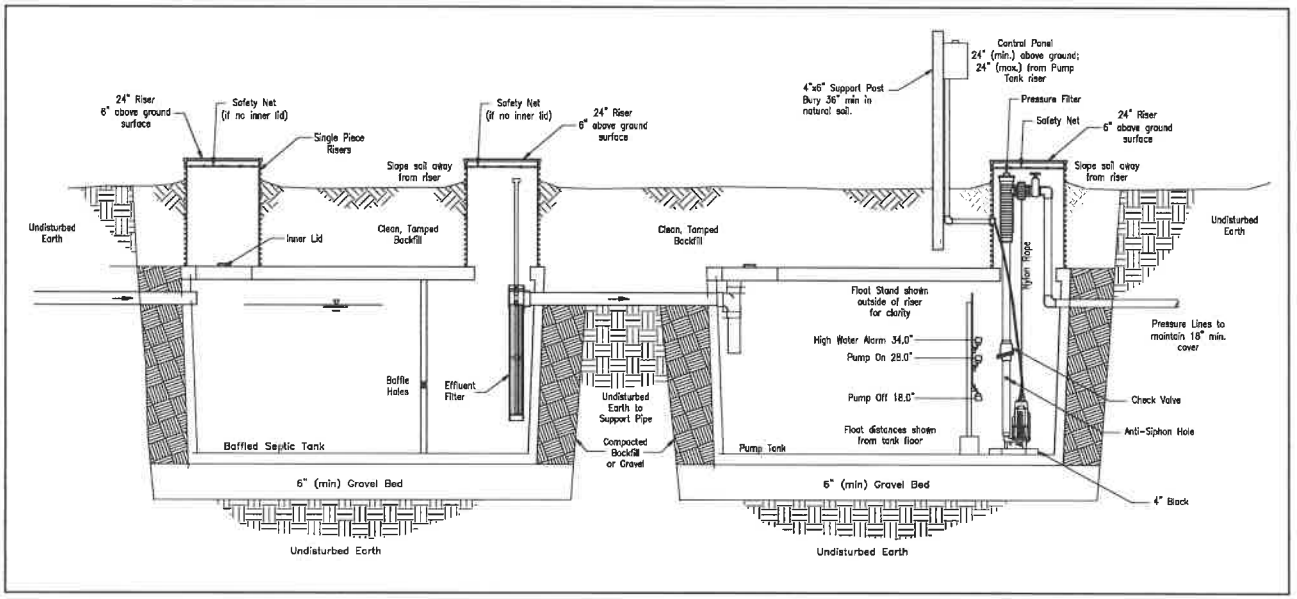
Detail Sheet 1

DRAWN BY: S. Jones	CREATED ON: 10/30/2020
REVISED BY:	REVISED ON:
RELEASED BY:	RELEASED ON:

SHEET NAME:

WW-5

19/42



SYSTEM PROFILE VIEW

NOTES

1. Boundary information taken from Property Survey by others.
2. Installation to follow all NC DHHS and Harnett County applicable rules and regulations.
3. Septic Tank to have approved effluent filter and single-piece access risers.
4. Contractor to abide by all safety regulations during system installation.
5. Contractor shall backfill around all access areas such that storm water is shed away from potential entry points.
6. Invert elevations of all components to be verified in field by contractor to insure proper operation.
7. All system piping to be SCH40 PVC (except where noted).
8. All gravity elbows to be long radius or long sweeping type elbows.
9. Actual installation and placement of treatment system to be overseen by Contractor.
10. Tanks to be set on 6" minimum gravel base. Use #5 or #57 stone for base.
11. Contractor to seed and/or mulch disturbed areas to coincide with existing landscape. Area shall not be left with uncovered soil.
12. Mount Control Panel a minimum of 24" above grade.
13. Power to panel to be installed by licensed electrician per code. Two 20 amp circuits with individual neutrals to be run from house to control panel.
14. All risers to have cast-in tank adapters and be single piece riser. Riser to extend 6" above soil surface and be designed to prevent surface water inflow.
15. Tank(s) shall be backfilled with gravel or tank hole shall be over-excavated a minimum of 2' in all directions to allow for mechanical tamping of backfill.
16. All penetrations to be sealed.
17. All pressure lines to maintain 18" min. cover.
18. Contractor to adjust tank placement to meet site constraints.
19. All existing and proposed tanks require 24-hr leak test (or equivalent).
20. Control Panel shall have elapsed timer and counter.

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919-859-0689
www.agriwaste.com

Whittaker Property
Repair WWTS

Owner Information:
Robert Whittaker
88 Brookvies Court
Angier, NC 27501
(401) 710-2064
rphittaker1@verizon.net

Property Information:
88 Brookvies Court
Lot 4 - The Creek
Angier, NC 27501
Harnett County
PIN: 0672-60-2085.000

PROFESSIONAL ENGINEER SEAL

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REV.	ISSUED DATE	DESCRIPTION

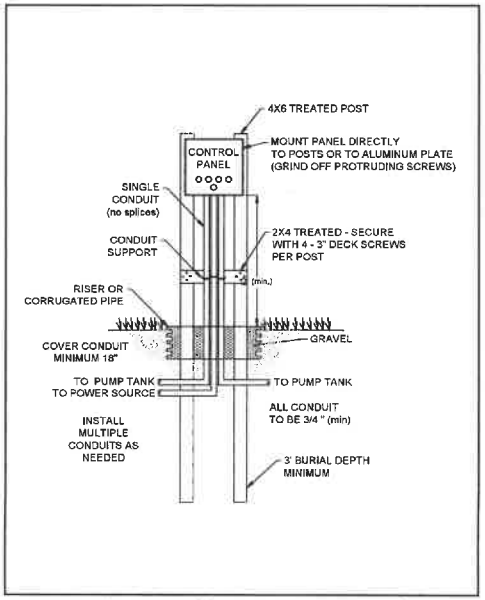
SHEET TITLE

Detail Sheet 3

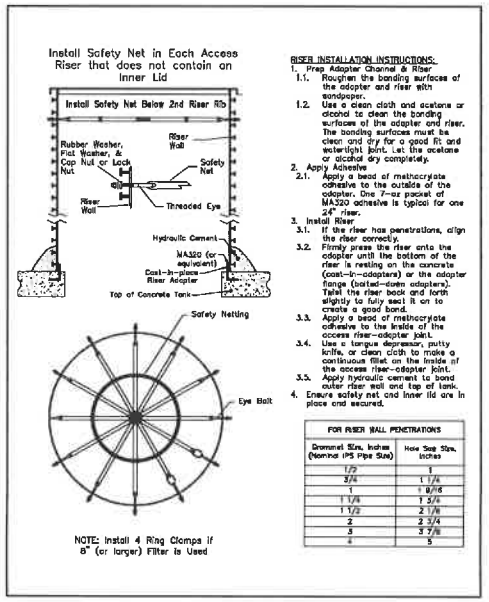
DRAWN BY:	CREATED ON:
S. Jones	10/30/2020
REVISED BY:	REVISED ON:
RELEASED BY:	RELEASED ON:

SHEET NAME:

WW-6



CONTROL PANEL SUPPORT (If Existing Control Panel is Replaced)



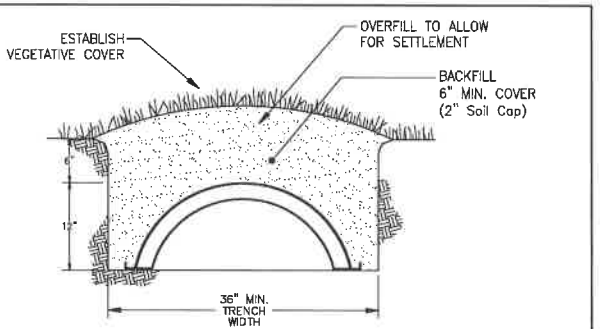
NOTE: Install 4 Ring Clamps if 8" (or larger) Filter is Used

RISER INSTALLATION INSTRUCTIONS:

1. Prep Adapter Channel & Riser
   - 1.1. Roughen the bonding surfaces of the adapter and riser with sandpaper.
   - 1.2. Use a clean cloth and acetone or alcohol to clean the bonding surfaces of the adapter and riser. The bonding surfaces must be clean and dry for a good fit and watertight joint. Let the acetone or alcohol dry completely.
2. Apply Adhesive
   - 2.1. Apply a bead of methacrylate adhesive to the outside of the adapter. One 7-oz packet of MA320 adhesive is typical for one 24" riser.
3. Install Riser
   - 3.1. If the riser has penetrations, align the riser correctly.
   - 3.2. Firmly press the riser onto the adapter until the bottom of the riser is resting on the concrete (cast-in-adapters) or the adapter flange (bolted-down adapters). Twist the riser back and forth slightly to fully seat it on to create a good bond.
   - 3.3. Apply a bead of methacrylate adhesive to the inside of the access riser-adapter joint. Use a tongue depressor, putty knife, or clean cloth to make a continuous fillet on the inside of the access riser-adapter joint.
   - 3.4. Apply hydraulic cement to bond outer riser wall and top of tank.
4. Ensure safety net and inner lid are in place and secured.

FOR RISER WALL PENETRATIONS	
Diameter Size, Inches (Nominal IPS Pipe Size)	Hole Saw Size, Inches
1/2	1
3/4	1 1/4
1	1 5/8
1 1/4	1 7/8
1 1/2	2 1/8
2	2 3/4
3	3 7/8
4	5

RISER DETAIL



NOTES:
1. Earth Backfill should be mounded above the Natural Ground Surface to allow for settlement.
2. Perforated corrugated plastic pipe shall meet requirements of ASTM D 2729.
3. Pipe shall be level, 0.00% slope.
4. End cap shall be provided at end of all corrugated plastic lines.
5. Trench bottom shall be level.

Chambers Detail (Drainfield)

Scaled for 24"x36" output

26/42

Trenching and Excavation Safety

The employer must comply with the trenching and excavation requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA-approved state plan requirements.

Inspection of Excavations
OSHA standards require that a competent person inspect trenches daily and as conditions change before worker entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

Access and Egress
OSHA standards require safe access and egress to all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet (1.22 meters) or deeper. These devices must be located within 25 feet (7.6 meters) of all workers.

Recommendations
Heavy equipment and trucks should stay as far as possible from the edge of any trench.
Always use pads under stabilizers to minimize ground pressures that could lead to failures.

(b) Definitions

"Cemented soil" means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.
"Cohesive soil" means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.
"Dry soil" means soil that does not exhibit visible signs of moisture content.
"Fissured" means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.
"Granular soil" means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.
"Layered system" means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.
"Moist soil" means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.
"Plastic" means a property of a soil which allows the soil to be deformed or molded without cracking or appreciable volume change.
"Saturated soil" means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or sheer vane.

"Soil classification system" means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.
"Stable rock" means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
"Submerged soil" means soil which is underwater or is free seeping.

"Type A" means cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A.
However, no soil is Type A if:
(i) The soil is fissured; or
(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
(iii) The soil has been previously disturbed; or
(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
(v) The material is subject to other factors that would require it to be classified as a less stable material.

"Type B" means:
(i) **Cohesive soil** with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
(ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
(v) Dry rock that is not stable; or
(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

"Type C" means:
(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
(ii) Granular soils including gravel, sand, and loamy sand; or
(iii) Submerged soil or soil from which water is freely seeping; or
(iv) Submerged rock that is not stable, or
(v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

"Unconfined compressive strength" means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.
"Wet soil" means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) Requirements

(1) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.
(2) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.
(3) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.
(4) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.
(5) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

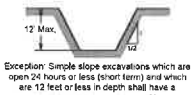
(d) Acceptable visual and manual tests

(1) Visual tests. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.
(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.
(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.
(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.
(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.
(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.
(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.
(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

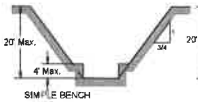
(2) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.
(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.
(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.
(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488 - "Standard Recommended Practice for Description of Soils (Visual - Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.
(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.
(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:
(A) If the sample develops cracks as it dries, significant fissures are indicated.
(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength should be determined.
(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

EXCAVATIONS IN TYPE A SOILS

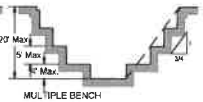
All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of ¾:1.



Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1.

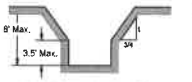


SIMPLE BENCH

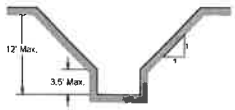


MULTIPLE BENCH

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of ¾:1 and maximum bench dimensions as follows:

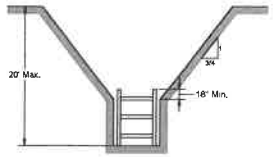


All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



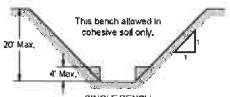
All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

EXCAVATIONS IN TYPE B SOILS

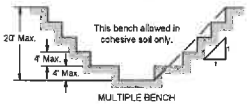
All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

SIMPLE SLOPE

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

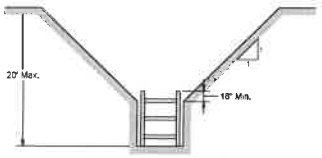


SINGLE BENCH



MULTIPLE BENCH

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 1:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



VERTICALLY SIDED LOWER PORTION

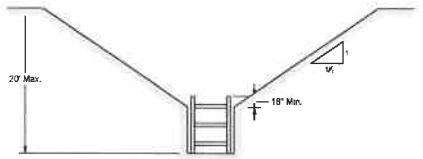
All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

EXCAVATIONS IN TYPE C SOILS

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.

SIMPLE SLOPE

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 1½:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



VERTICALLY SIDED LOWER PORTION

All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

EXCAVATIONS IN LAYERED SOILS

All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.

B OVER A

C OVER A

C OVER B

A OVER B

A OVER C

B OVER C

All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-9669
www.agriwaste.com

Whittaker Property
Repair WWTS

Owner Information:
Robert Whittaker
88 Brookview Court
Angier, NC 27501
(401) 710-2064
rwhittaker1@verizon.net

Property Information:
88 Brookview Court
Lot 4 - The Creek
Angier, NC 27501
Harnett County
PIN: 0672-60-2085.000

PROFESSIONAL ENGINEER SEAL

This document originally issued and sealed by Scott P. Jones, N.C. PE #045605, on November 18, 2020. This medium shall not be considered a certified document.

FINAL DESIGN
NOT RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

Excavation Safety

DRAWN BY: S. Jones	CREATED ON: 10/30/2020
REVISED BY:	REVISED ON:
RELEASED BY:	RELEASED ON:

SHEET NAME:

WW-7

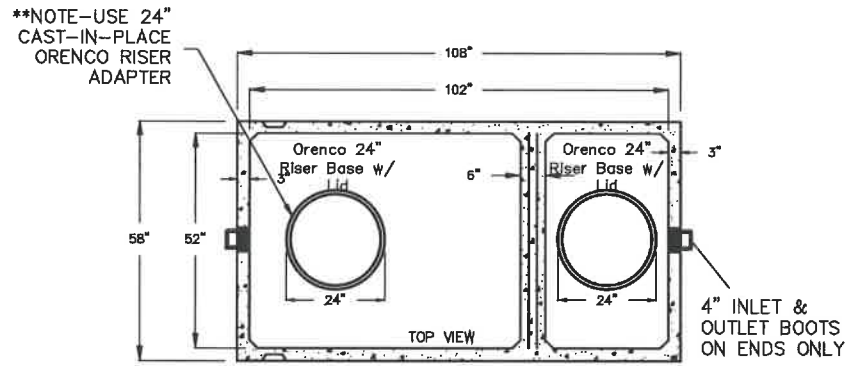
Scaled for 24"x36" output

11/18/20

IF TANK IS REPLACED

SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826

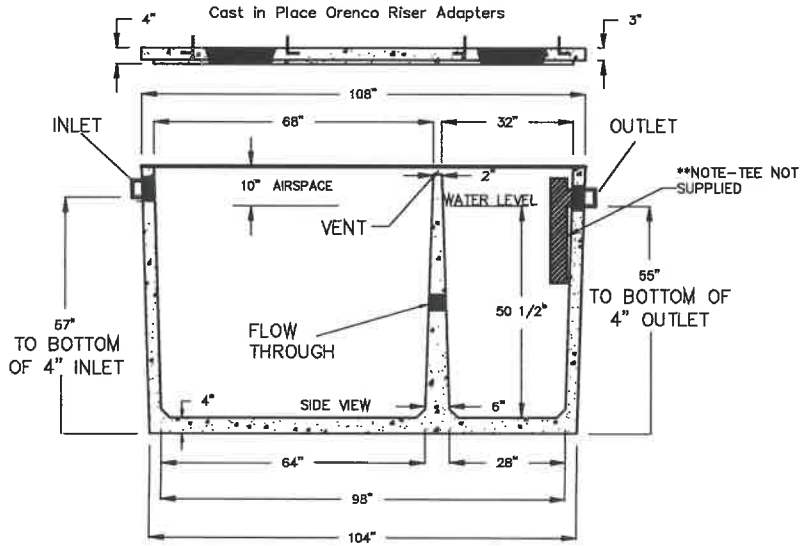
MODEL: TS 1000 STB
NON TRAFFIC
1000 Gallon Septic Tank

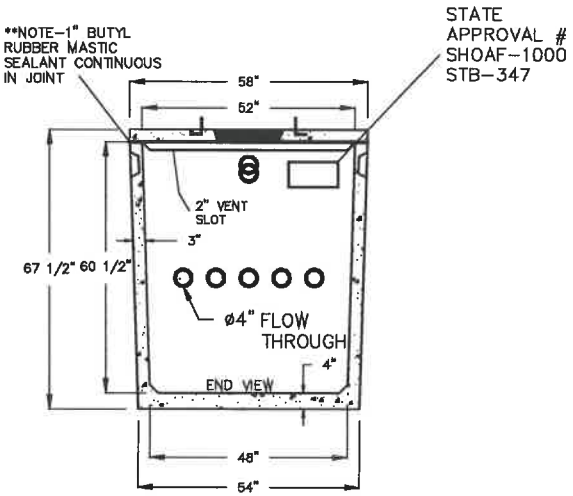


**TOP VIEW MEASUREMENTS ARE TO WIDEST DIMENSIONS

WWW.SHOAFPRECAST.COM
SHOAF-1,000 SEPTIC TANK
STB-347 NON TRAFFIC
LIQUID CAPACITY-1,000 GALLONS/AIRSPACE-10"
TANK HEIGHT-67 ½"
BOTTOM OF TANK TO CENTER OF INLET-59"
BOTTOM OF TANK TO CENTER OF OUTLET-57"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-4" PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-4000; TANK WEIGHT- 10,500 LBS.
REINFORCEMENT PER STATE CODE

SCALE - N.T.S.





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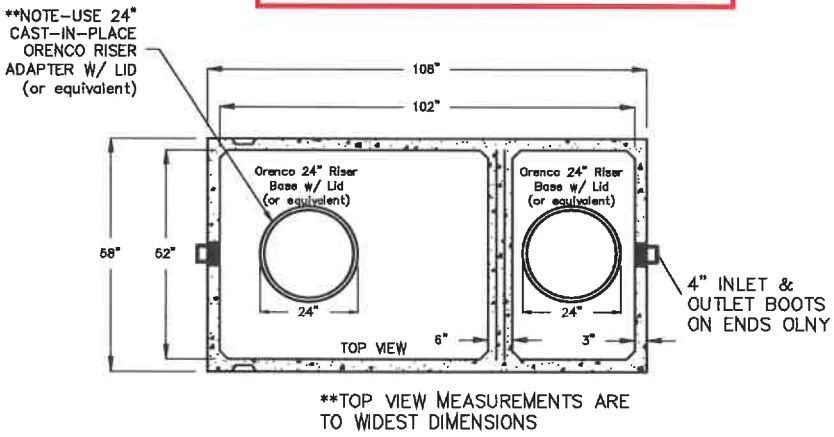
IF TANK IS REPLACED



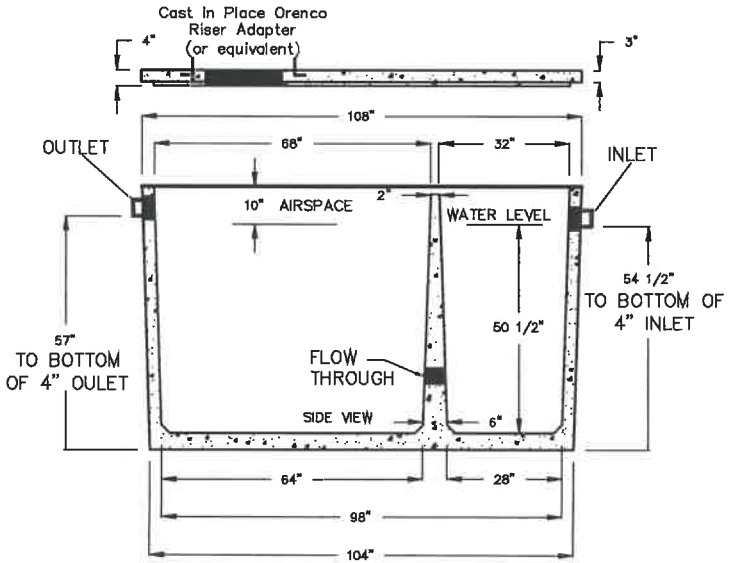
**TOP VIEW MEASUREMENTS ARE TO WIDEST DIMENSIONS

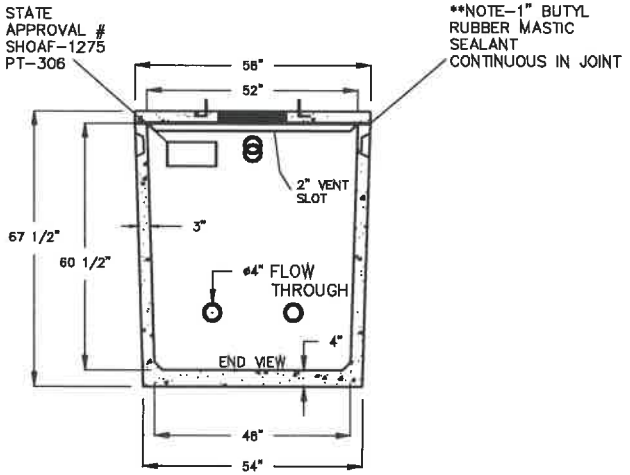
SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826

MODEL: TS 1275 PT
NON TRAFFIC
1275 Gallon Pump Tank

WWW.SHOAFPRECAST.COM
SHOAF-1,275 PUMP TANK
PT-306 NON TRAFFIC
LIQUID CAPACITY-1,287 GALLONS INCLUDING 10" AIRSPACE
GALLONS PER INCH-21.07 (AVERAGE)
TANK HEIGHT-67 ½"
BOTTOM OF TANK TO CENTER OF INLET-56 1/2"
BOTTOM OF TANK TO CENTER OF OUTLET-59"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-4" PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-4000; TANK WEIGHT- 10,500 LBS.
REINFORCEMENT PER STATE CODE

SCALE - N.T.S.





4" Biotube® Effluent Filter

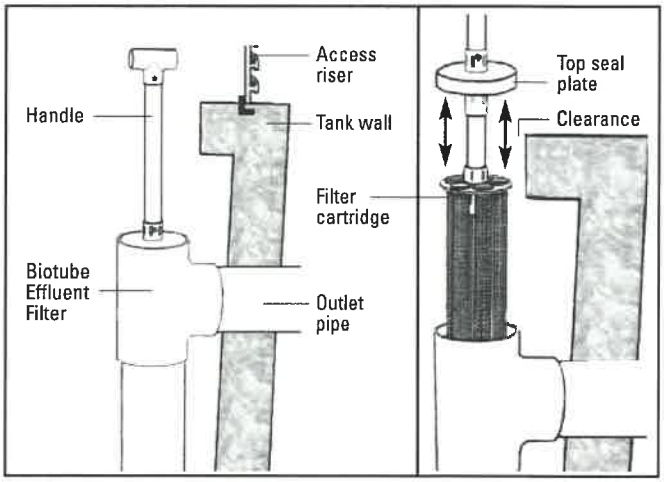
Orenco Systems®
Incorporated
1-800-348-9843

Installation and Maintenance Instructions

Biotube Effluent Filters* extend drainfield life by preventing solids from leaving the septic tank. Our 4" filter comes in its own housing, in both 36" and 28" lengths. Our 18" Jr. insert filter comes with or without its own housing. Biotube Effluent Filters install in minutes, inside new or existing tanks.

Step 1: Test-Fit the Effluent Filter

Test-fit the effluent filter on the septic tank's outlet pipe without gluing. Make sure it fits plumb. Install assembly as snug as possible to the tank wall, but ensure suffcient clearance for removing filter cartridge.



The Biotube Effluent Filter, with its housing, is suspended in the septic tank, supported by the 4" outlet pipe.

*Protected by U.S. Patent #'s 5,492,635 and 4,439,323

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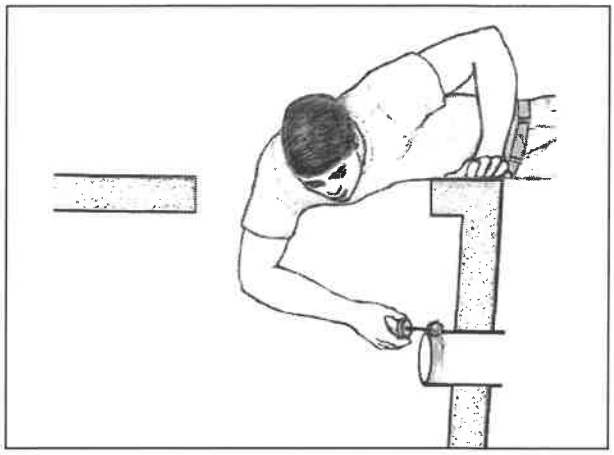
Installation Instructions (continued)

Step 2: Attaching Filter to Tank

Two attachment methods can be used:

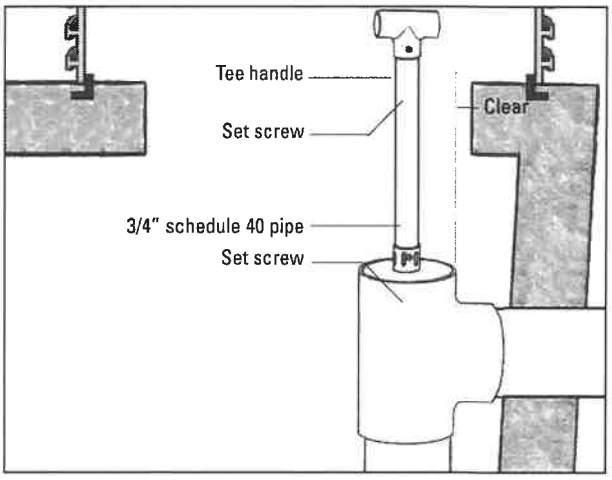
1) Glue the filter onto the tank outlet pipe using appropriate primer and glue.
2) A stainless steel set screw can be used to secure the filter instead of glue.



This illustration shows the gluing technique for installing a filter into a new septic tank. Installing a filter into an existing tank is a custom, site-specific job.

Step 3: Extending Cartridge Handle

For easier access when servicing, the cartridge handle may be extended using a longer length of 3/4" schedule 40 PVC pipe.



Cartridge handles can be extended for easier access.

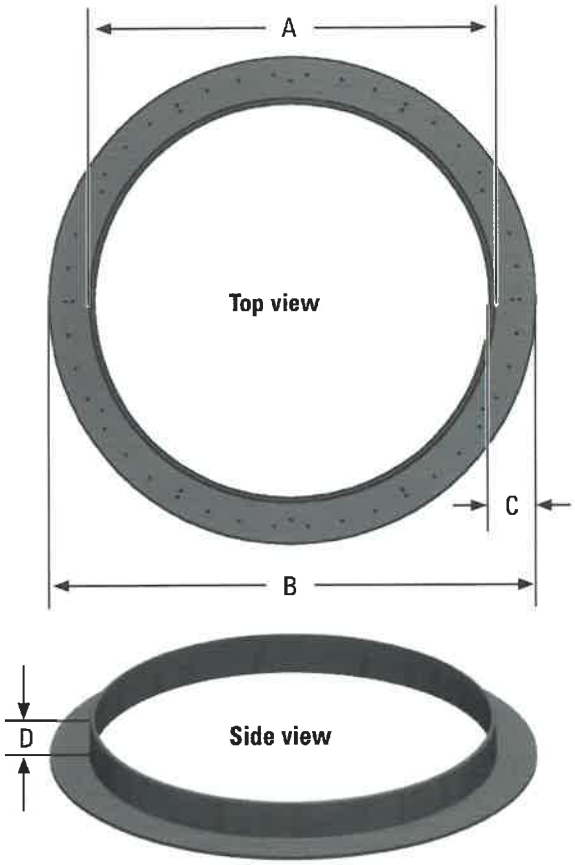
Technical Data Sheet

PRTA ABS Tank Adapters

Orenco Systems® Incorporated
800-348-9843

Applications

PRTA tank adapters are used to provide a structural, watertight method of installing a 24-in. (610 mm) or a 30-in. (762 mm) access riser over a tank opening.



General

Orenco's PRTA tank adapters are molded plastic products and therefore have excellent part-quality and consistency. PRTA tank adapters can be cast into a tank or fastened to the top of the tank with a bolt-down kit. The bolt-down kit consists of either six or twelve (depending on model) stainless steel concrete anchors and a roll of butyl tape.

The O.D. of the vertical flange matches the I.D. of Orenco's ribbed risers, which provides a suitable joint to seal with MA320, ADH100, SS115, or SS140 adhesive.

Standard Models

PRTA24
PRTA30
PRTA24BDKIT (6 anchors)
PRTA30BDKIT (12 anchors)

Cast in Place Tank Adapters for any New Tank
One for each end of Septic Tank and one for Pump Tank
3 x PRTA24

Nomenclature

PRTA □

Riser diameter
24 = 24" riser (Perma-Loc, Ultra-Rib, KOR FLO)
30 = 30" riser (Perma-Loc, Ultra-Rib)

ABS riser tank adapter

Materials of Construction

Tank adapter	ABS
Concrete anchors	Stainless steel anchor bolts
Sealant	Butyl tape

Specifications

Dimensions*	PRTA24	PRTA30
A - Outside diameter	23.38 in. (594 mm)	29.25 in. (743 mm)
B - Flange diameter	26.75 in. (679 mm)	34.25 in. (870 mm)
C - Horizontal flange width	2.00 in. (51 mm)	2.50 in. (64 mm)
D - Vertical flange height	3.50 in. (89 mm)	3.25 in. (83 mm)

**The tank adapter has a nominal 0.25 inch (6 mm) thickness.*

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Technical Data Sheet

Access Risers – Ultra-Rib™

Orenco Systems® Incorporated
800-348-9843

Applications

Orenco's Access Risers provide access to septic tank openings and can be cast into the tops of concrete tanks, bonded in place, or bolted down using a riser tank adaptor. They can also be used as valve enclosures.

General

Orenco Ultra-Rib™ Access Risers are constructed of ribbed PVC pipe and are available in 12-, 18-, 21-, and 24-in. diameters. They can be ordered in 3-in. (76.2-mm) increments in lengths up to 13 ft (3.96 m) for 12- and 18-in. diameter risers, and up to 14 ft (4.27 m) for 21- and 24-in. diameter risers. Orenco Ultra-Rib riser pipe is also available in truckload quantities. A complete line of Orenco pipe-cutting tools makes it easy to fabricate risers in your shop or in the field

Standard Models

RR12XX, RU18XX, RR21XX, RR24XX

Nomenclatures

R [ ] [ ] [ ] + [ ] + [ ]

Discharge grommet:
10 = 1" (25 mm)
12 = 1-¼" (32 mm)
15 = 1-½" (38 mm)
20 = 2" (51 mm)

Splice box:
S = 1" (25 mm) grommet installed[1]
L = 1-¼" (32 mm) grommet installed[2]
S1 = SB1 attached
S2 = SB2 attached
S3 = SB3 attached
S4 = SB4 attached
L5 = SB5 attached
L6 = SB6 attached
SX = Predrilled hole for external splice box[3]
XS = Explosion-proof splice box for simplex pumps[4]
XD = Explosion-proof splice box for duplex pumps[4]
XT = Explosion-proof splice boxes for triplex pumps[4]

Riser height (specify in. or mm):

Riser diameter:
12 = 12" (305 mm)[5]
18 = 18" (457 mm)[5]
21 = 21" (533 mm)
24 = 24" (610 mm)

Routing code:
U = Ultra-Rib™: 18" (457 mm)
R = Ultra-Rib: 12", 21", 24" (305, 533, or 610 mm)

Riser

[1] For Orenco SB1 - SB4 splice boxes
[2] For Orenco SB5, SB6 splice boxes
[3] Minimum riser height 18" (457 mm)
[4] Used in Class I Division I environments
[5] Not intended for use over pump vaults

RPU [ ]

Indicates riser diameter:
12 = 12" (300 mm)[1]
18 = 18" (450 mm)[1]
21 = 21" (525 mm)[2]
24 = 24" (600 mm)[2]

Bulk Ultra-Rib™ riser pipe

[1] 13' (3.96 m) length
[2] 14' (4.27 m) length

Materials of Construction

Ultra-Rib™ PVC Pipe:	PVC

Specifications

Model	RR12XX	RU18XX	RR21XX	RR24XX
I.D., in. (mm)	11.74 (298)	17.65 (448)	20.50 (521)	23.50 (597)
Wall Thickness - excluding ribs, in. (mm)	0.10 (3)	0.19 (5)	0.25 (6)	0.25 (6)
O.D. - including ribs, in. (mm)	13.13 (334)	19.44 (494)	22.63 (575)	25.63 (651)
Weight, lbs per ft (kg per m)	5 (7.4)	11 (16.4)	15 (22.3)	19 (28.3)

Access Risers and Tank Adapters

Orenco Systems® Incorporated
800-348-9843

Installation Instructions

Access risers provide access to septic tank openings, simplifying inspection and maintenance procedures. It is important that the riser be sized correctly and installed properly (i.e., appropriate tank adapter, attachment method, etc.) to ensure a watertight seal. Without a watertight seal, groundwater or surface water can leak into the tank, reducing the tank's performance. When setting a riser, orient the grommets in the appropriate directions before bonding to the tank.

In this document, metric equivalents are omitted for nominal dimensions, such as riser and pipe diameters. If you are using pipe other than IPS standard sizes, consult your Distributor for adapters you may need.

Riser Sizing

The installed riser should extend about 3 in. (76 mm) above the finished ground level (approximately 2 in. [51 mm] for tank settlement and 1 in. [25 mm] to ensure drainage away from the riser). If the riser is too long, it may be cut to the appropriate height using a circular saw or table saw. Always cut excess length from the bottom of the riser. To ensure a good fit and watertight joint, a square cut is essential. If the riser is too short, a grade ring may be used as an extension.

Selecting a Riser and Tank Adapter Installation Method

To select an appropriate riser and tank adapter installation method, first determine the type of tank being used: concrete or fiberglass. Then refer to the chart below, as you follow these steps:

Concrete Tanks

1. Determine desired riser diameter.
2. Determine if the riser tank adapter will be cast-in or bolted down.
3. Referring to the chart below, pick the appropriate tank adapter for your riser diameter and method of attachment. If the bolt-down method is being used, make sure the adapter you selected will cover the tank's opening.

Orenco Fiberglass Tanks (contact your distributor or Orenco for other fiberglass tanks)

1. For 30-in. riser, choose the FRTA30-FRP tank adapter.
2. For 24-in. riser, no adapter is needed; 24-in. riser fits tank directly.

Riser diameter	Method of attachment	Tank adapter	Maximum tank opening
24 in.	Bolted down or cast into concrete tank	PRTA24	24 in. round/17 in. square*
30 in.	Bolted down or cast into concrete tank	PRTA30	30 in. round/21 in. square*
21 or 24 in.	Bolted down to concrete tank or epoxied to top of non-Orenco FRP tank	RRFTA	24 in. round/24 in. square
30 in.	Bolted down to concrete tank	RRFTA30	30 in. round/30 in. square
30 in.	Glued onto Orenco FRP tank or PRTA24, allowing it to accept 30-in. riser.	FRTA30-FRP	NA
12 in.	Bolted down to concrete tank	RUBDKIT	10 in. round/7 in. square
18 in.	Bolted down to concrete tank	RUBDKIT	16 in. round/11 in. square

** **NOTE:** For PRTA 24 and PRTA 30 risers, the **minimum** tank opening is 19 in., but 20 in. is recommended, so that the Biotube Pump Vault (PVU) can rest on the lip of the opening.*

Choosing Your Instruction Set

Following are five different installation instruction sets for adapters, depending on your application, adapter, and method of attachment. Refer to the chart below to determine which instruction set to use. Instructions for installing grommets in risers are also provided.

Installation Instructions (continued)

Clockwise from left: ADH10 (IPS810) quart, SS115, ADH100, SS140, ADH845, ADH10 (IPS810) pint, and MA320

Use ADH 100 or MA 320

About Adhesives

ADH100 is a single-component adhesive/sealant for sealing pipe grommets and joining PVC or fiberglass risers to ABS or fiberglass PRTA-style tank adapters (where the joint is in shear). Handling strength is achieved within 12 hours, and full cure in 2 to 3 days. It comes in a 10.2-oz (300-mL) cartridge tube for application with a caulking gun.

ADH10 (IPS810) adhesive is a white, two-component, self-leveling methacrylate adhesive for bonding PVC, ABS, fiberglass, and concrete. ADH10 comes in pint (500-mL) and quart (1000-mL) kits, consisting of A and B components (adhesive and activator), and requires hand mixing. If a self-leveling adhesive is NOT required or if concrete is NOT being bonded, SS115 or SS140 is preferred over ADH10.

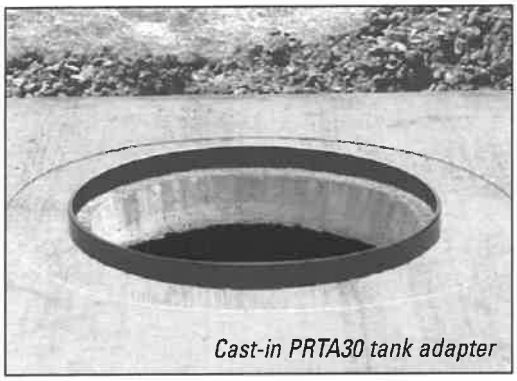
ADH845 adhesive is a tan two-component methacrylate adhesive for bonding PVC, ABS, fiberglass, and concrete. This is our only adhesive formulated to work in wet conditions or even under water, making it ideal for field repairs. Repairs on leaking riser connections are possible, but any water pressure must be removed during the repair. ADH845 has the consistency of molasses, comes in 400-mL cartridges, and requires the manual dispensing gun ADH845-GUN.

MA320 is a white two-component methacrylate adhesive that bonds PVC, ABS and fiberglass to themselves or each other, but does not bond to concrete. It comes in a two-part 200-gram see-through plastic pouch that must be kneaded to mix the two components, then cut open and squeezed to apply adhesive.

SS140 adhesive is a gray two-component methacrylate adhesive for bonding PVC and fiberglass to themselves or each other. It does not bond to concrete. It has the consistency of toothpaste and will sag slightly in warmer temperatures. Surface roughening is recommended and provides the best bond strengths, but is not always necessary. Use SS140 above 65° F (18° C) and SS115 below 50° F (10° C). Working life of mixed adhesive is typically 20 to 30 minutes, and it usually hardens in less than 2 hours, depending on temperature and adhesive thickness. It comes in an 870-mL two-part cartridge and can be dispensed from pneumatic gun SS-MK or, for occasional use, manual gun SS-MK-MANUAL GUN.

SS115 adhesive is a white two-component methacrylate adhesive with properties similar to those of SS140 and comes in the same two-part cartridge, but has a much shorter open time for use in cooler temperatures and jobs where quicker cure times are desired, or for applications where a white color is desired. Working life of mixed adhesive is typically 10 to 15 minutes, and it usually hardens in less than 45 minutes, depending on temperature and adhesive thickness.

Installation Instructions (continued)



Cast-in PRTA30 tank adapter

Instruction Set 2: Cast-In Adapters

Adapter type used: PRTA24 or PRTA30
Adhesive used: ADH100, MA320, SS115, or SS140
Bolt-down kit used: None

Step 2a: Apply Adhesive

Apply adhesive to the outside surface of the riser tank adapter.

Hint: If you plan to backfill the same day, the use of MA320, SS115 or SS140 adhesive is recommended because of their quicker cure times. If you have multiple riser installations and do not have bulk adhesive (SS115/SS140), consider using both MA320 and ADH100. Apply just enough MA320 on the outside of the tank adapter for a quick structural joint (cure time is typically less than an hour). A single package of MA320 can be used to provide a structural joint on two or three risers. Then apply ADH100 to the inside of the adapter and the riser joint, for a watertight seal.

Step 2b: Place Riser

Orient the riser correctly and carefully slide it onto the adapter before the adhesive cures.

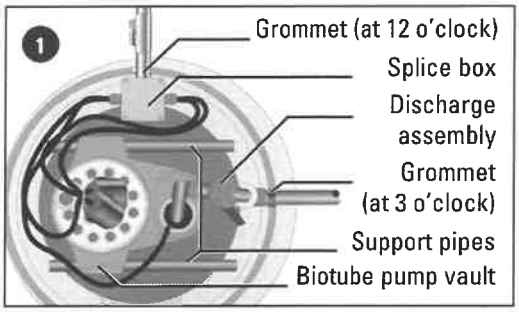
Step 2c: Seal Adapter-to-Riser Joint

Apply adhesive to the inside of the adapter and riser joint. Use a putty knife or similar tool to form a continuous fillet between the tank adapter and the inside of the riser.

Step 2d: Cure Adhesive

Allow adhesive to harden before backfilling. For ADH100, handling strength is typically achieved within 12 hours. For MA320, cure time is achieved within 30 minutes to 3 hours, depending on temperature.

Installation Instructions (continued)



Installing Grommets

Step 1: Mark the Riser

To install grommets in the field, first mark the riser for location of the grommets. (For Perma-Loc risers, you should try to avoid cutting through the pipe seam — the extra thick rib — unless it is unavoidable.)

Step 2: Notch the Ribs

Using a 4-in. (100-mm) grinder or other cutting tool, notch through the PVC ribs to the wall of the PVC riser. Remove an area of ribbing equal to approximately 1 in. (25 mm) larger than the grommet diameter.

Step 3: Remove the Ribs

Using a hammer and chisel, break the notched ribs from the riser. Use a grinder to remove any remaining rib material so that you are left with a smooth area, ensuring a watertight fit. (Hole saws with attached pocket cutters are available from Orenco; they cut away the ribs as the hole is cut, eliminating the need to notch and break the ribs.)

Step 4: Cut the Hole

Using the Grommet Hole Saw Sizing Chart below, select a hole saw for the grommet installation and drill out the opening. (If you are using pipe and grommets other than U.S. nominal sizes, ascertain the correct hole size for your grommet.) Use a deburring tool or knife to deburr the edges of the opening, being careful not to enlarge the opening.

Grommet Hole Saw Sizing Chart

Grommet size (in.)	Hole size (in.)
1/2	1
3/4	1-1/4
1	1-9/16
1-1/4	1-3/4
1-1/2	2-1/8
2	2-3/4
3	3-7/8
4	5

NOTE:
Grommet size = nominal (IPS) pipe size. For more information about grommet dimensions and actual pipe O.D., see Orenco's Grommet Submittal (NSU-RLA-PG-1), available from the Document Library at www.orenco.com.

Step 5: Glue in the Grommet

Install the grommet in the riser. Apply a bead of ADH100 adhesive to the groove of the grommet before inserting it into the riser hole. This will make the grommet more secure and will overcome any imperfections in the drilled hole.

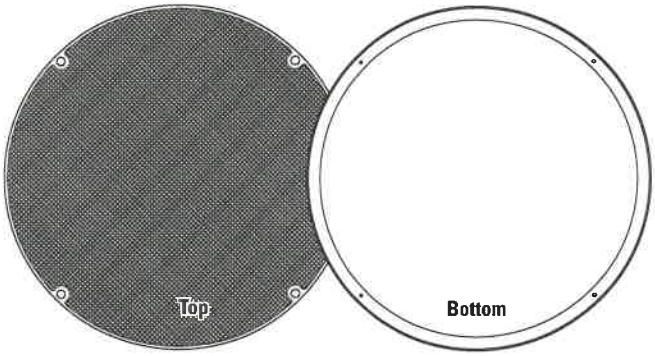
Technical Data Sheet

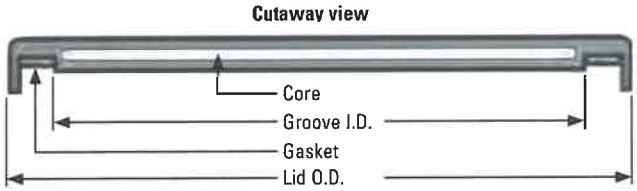
Fiberglass Access Lids

Orenco Systems® Incorporated
800-348-9843

Applications

Orenco® Fiberglass Access Lids provide a secure covering for risers, pump basins, and access ports. Lids fit Perma-Loc™, Ultra-Rib™, Kor Flo™, and Ultra-Corr™ pipe. Orenco Fiberglass Access Lids are capable of supporting a 2500-lb (1134-kg) wheel load; however, they are not designed or recommended for vehicular traffic.





General

Orenco Fiberglass Access Lids are molded using fiberglass reinforced polyester resin encapsulating a wood or structural foam core, for added durability and longevity. The finish is green or brown and the top surface is textured to provide a nonskid surface. Gasketed lids include a polyurethane or neoprene gasket. Lid comes with either two or four 5/16-inch stainless steel flathead socket cap screws and a hex key wrench.

Standard Models

FL18G-4BU, FL21G, FL24G, FL24-4B, FL30G, FL36G, FL48G

Nomenclature

FL24G-4BU

FL □□ □-□-□

- Options:
  - Blank = green
  - B = brown
  - W = warning label (24" and 30" only)
  - C = custom logo
  - ATX = AdvanTex logo (24" only)
- Attachment method:
  - Blank = 2-bolt-hole lid (30" diameter only)
  - 4B = 4-bolt-hole lid (24", and 36" diameter only)
  - 4BU = 4-bolt-hole lid Ultra-Rib (18" and 24" diameter only)
  - 8B = 8-bolt-hole lid (48" diameter only*)
- Options:
  - G = gasket
  - V = vent
  - CF = carbon filter†
  - I2 = 2" insulation‡
  - I4 = 4" insulation‡
- Lid diameter: 18", 21", 24", 30", 36", 48"
- Fiberglass lid

** 48" lids come without bolt holes unless FL48G-8B is ordered and hole locations are specified. For a 48" lid with no holes, to mount on a concrete riser, specify FL48G.*

† For more information on this option, see the Carbon Filters Submittal Data Sheet, NSU-RLA-CF-1.

‡ Blue Styrofoam™ has an R-value of 10 per each 2-inch (51mm) increment.

Note: for basin bottoms without bolt holes, specify FL18, FL21, FL24, or FL30.

Materials of Construction

Lid	Fiberglass
Core	Wood (structural foam in FL36)
Gasket	Polyurethane or neoprene

Specifications

Model	FL18G-4BU	FL21G	FL24G-4BU	FL24G-4B	FL30G	FL36G	FL48G
Lid O.D. in. (mm)	20.25 (514)	22.5 (572)	26.25 (667)	25.5 (648)	32.6 (829)	39.63 (1006)	53.88 (1368)
Groove I.D. in. (mm)	17.5 (445)	20.25 (514)	22.75 (578)	23.25 (591)	28.75 (730)	35 (889)	47.5 (1207)
Avg. thickness in. (mm)	0.75 (19)	0.75 (19)	0.75 (19)	0.75 (19)	1.0 (25)	1.5 (38)	1.5 (38)
Weight lb (kg)	7.25 (3.3)	9.75 (4.4)	12.5 (5.7)	12.5 (5.7)	21.5 (9.8)	41.0 (18.6)	103.0 (46.7)
Gasket type	polyurethane	polyurethane	neoprene	polyurethane	polyurethane	polyurethane	polyurethane
Applications	Ultra-Rib	Ultra-Rib Perma-Loc	Ultra-Rib	Perma-Loc	Perma-Loc Kor Flo	Kor Flo	Call for more information

NTD-RLA-FL-1
Rev. 1.0, © 9/08

Technical Data Sheet

External Splice Box

Orenco Systems® Incorporated
800-348-9843

Applications

The Orenco® External Splice Box attaches outside the access riser of an underground tank. It is engineered specifically for water and wastewater treatment systems and is especially suited for use in locations prone to high groundwater and other wet conditions. Its separate conduit hubs, large volume, and optional dividers make it useful for maintaining isolation of high and low voltage wires where needed. It has four cord grips which accommodate power cords for floats and pumps of 0.170 - 0.470 inches (4.3 - 11.9 mm) in diameter. Unused cord grips can be plugged watertight with the supplied cord grip plugs. Each External Splice Box is provided with a hole-cutting template to simplify installation on the riser.

Standard Models

SBEX1-4, SBEX1-4-P

Nomenclature

SBEX1-4 - ☐

- ☐: Blank = no divider plates; P = divider plates
- SBEX1-4: External splice box

SBEX1-4 (Or Equivalent), Use as Needed

General

To specify the Orenco External Splice Box for your installation, require the following:

- Watertight for prolonged submergence per UL listing (Type 6P)
- Attachment external to access riser to allow inspection with no need to open the riser lid
- Volume of 100 in.^{3} (1639 cm^3) for easy wiring access and to accommodate multiple wiring configurations
- Bottom entry, so conduit or direct-bury cable always remains below minimum burial depth
- Molded of UL (f1) rated plastic, resistant to cold and UV exposure, suitable for external applications
- Optional divider plates available for isolating high and low voltage wires from separate conduits or direct-bury cable

The External Splice Box is molded of a UL (f1) rated PVC alloy. It has a UL Type 6P listing for prolonged submergence.

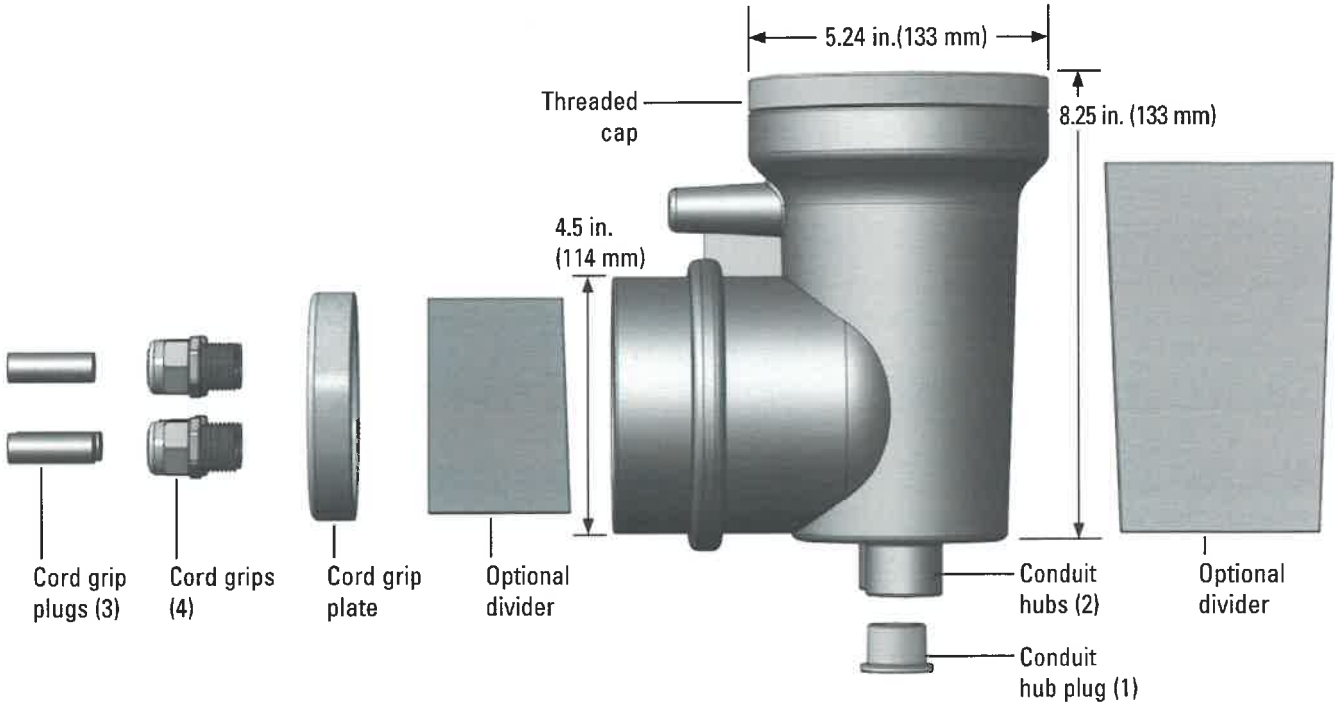
External Splice Box (continued)

Physical Specifications

Volume	100 in.^{3} (1639 cm^3)
Cord grips	4 per SBEX
Cord grip plugs	3 per SBEX
Cord diameters accommodated	0.170- 0.470 in. (4.3 - 11.9 mm)
Conduit hubs	2
Conduit hub plug	1
Conduit sizes accommodated	¾ in. 1 in. (with coupling) ½ in. (with fitting or bell end)
Diameter of hole into riser	5 in. (127 mm) (hole-cutting template included)

Materials of Construction

Splice box	PVC alloy
Cord grips	Nylon
Cord grip plugs	EPDM rubber
O-rings	Buna rubber
Conduit hub plug	PVC per ASTM D-1784



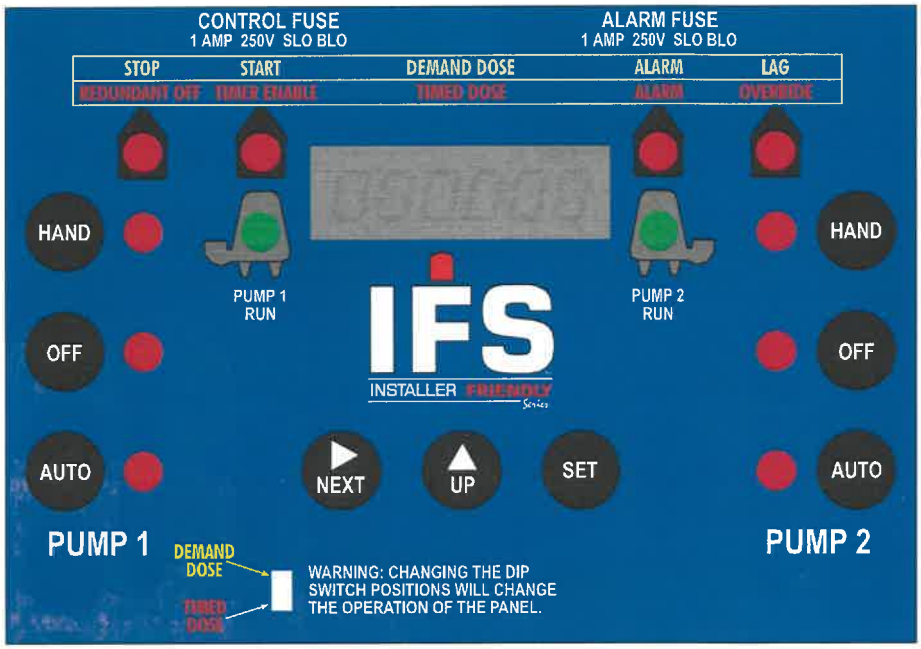
Installer Friendly Series® Control Panels

The innovative **Installer Friendly Series®** control panels from SJE-Rhombus® feature an **easy-to-use touch pad** on the inner door for programming and monitoring on-site installations.

- IFS Single Phase Simplex Demand/Timed Dose Panel
- IFS Single Phase Duplex Demand/Timed Dose Panel

IFS PANEL FEATURES:

- **NEMA 4X** weatherproof enclosure for indoor/outdoor use
- Inner door for added safety
- New innovative circuit board design offers a clean installation
- Separate control and alarm fuses
- Digital display board is standard
- Alarm beacon and horn (85 decibel rating) provides audio/visual warning of alarm condition
- Test / normal / silence switch
- Panel can be easily converted to either demand dose to timed dose in the field
- Easy to read float/pump wiring diagram
- Instruction label on inside cover for viewing and programming digital display
- Includes float switches
- Includes step-by-step installation instructions



TOUCH PAD/DISPLAY FEATURES:

- Easy-to-use touch pad for programming pump control
- Pump run indicator(s)
- Float status indicators, including float out-of-sequence alarm
- HAND/OFF/AUTO pump control switch(es)
- Hand mode safety feature
- Six digit LED display (now a standard feature) includes:
  - Elapsed time meter(s)
  - Cycle counter(s)
  - Alarm counter
  - Lead/Lag Selector toggles pump operation (duplex models)
  - Float error counter
  - Override counter (timed dose)

c UL us LISTED

3 YEAR LIMITED WARRANTY

SJE-Rhombus®

1-888-DIAL-SJE (1-888-342-5753)
www.sjerhombus.com

INSTALLER FRIENDLY SERIES® - IFS Single Phase Simplex (Demand/TD)

Single phase, simplex demand dose or timed dose, float or C-Level™ controlled system for pump control and system monitoring.

The IFS simplex control panel is designed to control one 120, 208, 240 VAC single phase pump in water and sewage installations. The panel features an easy-to-use touch pad with display on the inner door for programming and system monitoring. The panel configuration can be easily converted in the field to either a timed dose or demand dose.

The optional C-Level™ sensor is a pressure transducer that senses the liquid level in the tank and sends a signal to the IFS panel. Pump activation levels can be adjusted by using the panel touch pad. C-Level™ CL40 sensor operating range is 3-39.9 inches (7.6-101.3 cm). C-Level™ CL100 operating range is 3-99.5 inches (7.6-252.7 cm).

TOUCH PAD FEATURES

A. **Level Status Indicators** illuminate when floats or set points are activated. Alarm will activate if a float operates out of sequence.

B. **HOA (Hand-Off-Automatic) Buttons** control pump mode with indication. Hand mode defaults to Automatic when stop level or redundant off level is reached.

C. **Pump Run Indicator** illuminates when pump is called to run.

D. **LED Display** shows system information including: level in inches or centimeters (C-Level™ only), mode, pump elapsed time (hh:mm), events (cycles), alarm counter, float error count, timed dose override counter (timed dose only), and ON/OFF times (timed dose only).

E. **NEXT Push Button** toggles display.

F. **UP and SET Push Buttons** set pump ON/OFF times (timed dose only) or activation levels (C-Level™ only).

PANEL COMPONENTS

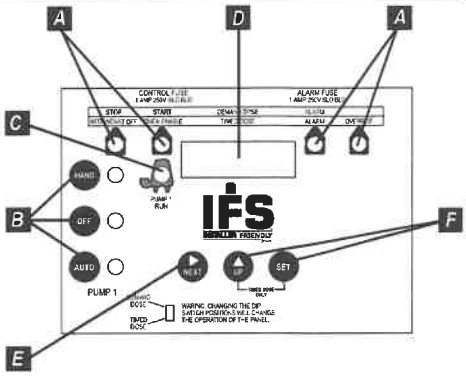
1. **Enclosure** base measures 10 X 8 X 4 inches (25.4 X 20.32 X 10.16 cm). NEMA 4X (ultraviolet stabilized thermoplastic with removable mounting feet for outdoor or indoor use). **Note:** Options, voltage, and amp range selected may change enclosure size and component layout.
2. **Red Alarm Beacon** provides 360° visual check of alarm condition.
3. **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 is cleared.
4. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
5. **Circuit Breaker** (optional) provides pump disconnect and branch circuit protection.
6. **Power Relay** controls pump by switching electrical lines. Definite purpose contactor used when pump full load amps are above 15.
7. **Float Connection Terminal Block**
8. **Incoming Control/Alarm Power & Pump Terminal Block**
9. **Control Power Indicator/Fuse** indicator light illuminates if control power is present in panel. Alarm will activate if control fuse is blown.
10. **Alarm Power Indicator/Fuse** indicator light illuminates if alarm power is present in panel.
11. **Ground Lug**

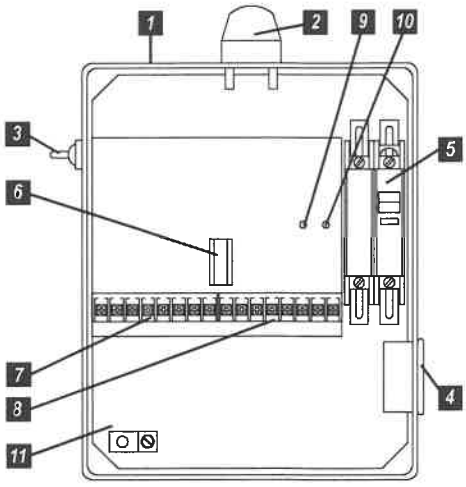
NOTE: Schematic/Wiring Diagram and Pump Specification Label are located inside the panel on enclosure cover

OPTIONAL FEATURE

- **34" (86.36cm) Panel Mounting Post** (Factory Installed). Includes Duplex Installation Kit (Enclosure upsized to 10" x 8" x 6" (25.4 x 20.32 x 15.24 cm). Max. Enclosure size14" x 12" x 6" (35.56 x 30.48 x 15.24 cm)

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.





Model Shown IFS11W114X8AC

Reg. Cdn Pat. & TM Off
C-Level™ Sensor US Patent 8,336,385. Other patents pending.

FEATURES

- Entire control system is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes:
  Demand Dose - three 20' SJE MilliAmpMaster™ control switches
  Timed Dose - two 20' SJE MilliAmpMaster™ control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty

c UL us LISTED

SJE Rhombus®
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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IFS	2	1	W	1	1	4	H	8AC 17G 10E 15A

MODEL IFS

MODEL TYPE

	1 = SPLX TIMED DOSE (includes option 8AC standard)	$824.00
X	2 = SPLX DEMAND DOSE (includes option 8AC standard)	$852.00

ALARM PACKAGE

✔	1 = alarm package (includes test/normal/silence switch, fuse, red light & horn)	Base

ENCLOSURE RATING

✔	W = NEMA 4X	Base

STARTING DEVICE

X	1 = 120/208/240 VAC	Base
	9 = 120 VAC	Base

PUMP FULL LOAD AMPS

	0 = 0-7 FLA	Base
X	1 = 7-15 FLA	Base
	2 = 15-20 FLA	$80.00

PUMP DISCONNECTS

	0 = no pump disconnect	Base
X	4 = circuit breaker	
	120 VAC (must select starting device option 9)	$35.00
	120/208/240 VAC (must select starting device option 1)	$70.00

SWITCH APPLICATIONS

X	H = floats (Timed dose = timer enable and alarm / Demand dose = stop, start, and alarm) (select 17 option)	Base
	X = no floats	
	timed dose	-$50.00
	demand dose	-$75.00
	C = C-Level™ sensor (must select 24 or 29 option)	
	(select option 3E and/or 4A & 4D for high water alarm and/or redundant off floats)	
	timed dose	-$50.00
	demand dose	-$75.00

Note: Pump down applications only.

Industry practices suggest that a secondary device, such as a float switch, be used for redundant activation of the high level alarm and pump shut off.

OPTIONS *Listed below*

Total Options _____

TOTAL LIST PRICE _____

	CODE	DESCRIPTION	LIST PRICE
	1J	Duo alarm inputs	$25.00
	3A	Alarm flasher	$50.00
	3B	Manual alarm reset	$90.00
	3E	High water alarm float *(must select 17 option)* ***(Available only when Switch Applications = C)***	$25.00
	4A	Redundant off *(select option 4D if floats are required)*	
		Demand Dose	$55.00
		Timed Dose	$0.00
	4D	Redundant off float *(must select 4A option) (must select 17 option)*	$25.00
	6A	Auxiliary alarm contacts, form C	$40.00
✔	8AC	Display board includes: ETM counter, events (cycles) counter, alarm counter, and override counter (timed dose only). *(Included as standard.)*	$0.00
X	10E	Lockable latch - NEMA 4X	$40.00
	10F	Lightning arrestor *(must select pump circuit breaker, control and alarm power combined)*	$230.00
	10K	Anti-condensation heater	$100.00
	10P	Panel Mounting Post (Factory Installed.Includes Duplex Install. Kit)(Enclosure upsized to 10"x8"x6".Max 14"x12"x6")	$110.00
	11C	NEMA 1 alarm panel *(must select option 6A)*	$80.00

	CODE	DESCRIPTION	LIST PRICE
	11D	NEMA 4X alarm panel *(must select option 6A)*	$250.00
X	15A	Control / Alarm circuit breaker	$85.00
	16A	10' cord in lieu of 20' *(per float)*	-$2.00
	16B	15' cord in lieu of 20' *(per float)*	-$1.00
	16C	30' cord in lieu of 20' *(per float)*	$5.00
	16D	40' cord in lieu of 20' *(per float)*	$15.00
	17C	Sensor Float® / internally weighted ▲ *(per float)*	$5.00
	17D	Sensor Float® / externally weighted ▲ *(per float)*	$7.00
X	17G	MilliAmpMaster™/ pipe clamp ● *(per float)*	$0.00
	17H	MilliAmpMaster™/ externally weighted ● *(per float)*	$7.00
	17J	Sensor Float® / pipe clamp ▲ *(per float)*	$0.00
	18A	Timer override float (timed dose float panel only)	$25.00
	24E	C-Level™ CL40 sensor with 4' vent tube & 20' cord.	$280.00
	24F	C-Level™ CL40 sensor with 4' vent tube & 40' cord.	$310.00
	24G	C-Level™ CL40 sensor with 8' vent tube & 20' cord.	$285.00
	24H	C-Level™ CL40 sensor with 8' vent tube & 40' cord.	$315.00
	24X	No C-Level™ CL40 sensor.	$0.00
	29A	C-Level™ CL100 sensor w/10' vent tube & 20' cord.	$290.00
	29B	C-Level™ CL100 sensor w/10' vent tube & 40' cord.	$320.00
	29X	No C-Level™ CL100 sensor.	$0.00

● Mechanically-activated ▲ Mercury-activated

If additional features are required, call the factory for a quote on an Engineered Custom control panel.

SAMPLE

MODEL	IFS	1	1	W	9	1	4	H	8AC 10E17G
Model Type									
Alarm Package									
Enclosure Rating									
Starting Device									
Pump Full Load Amps									
Pump Disconnects									
Switch Application									
Options: Display, Lockable Latch, SJE MilliAmpMaster™/pipe clamp									

IFS1	See Price List
1	Base
W	Base
9	Base
1	Base
4	$35.00
H	Base
8AC	$0.00
10E	$40.00
17G	$0.00
TOTAL LIST PRICE	$XXX.XX

Cat Page PN 1022328L

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"Quality Pumps Since 1939"

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

ZOELLER PUMP CO.

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

- Durable cast iron construction
- Model 151 comes standard with a glass-filled polypropylene base
- Corrosion resistant powder coated epoxy finish
- Stainless steel lifting handle
- Assembled with stainless steel bolts
- Non-clogging engineered thermoplastic vortex impeller design
- Model 151 - 1/3 HP passes ½" spherical solids
- Model 152 - .4 HP passes ¾" spherical solids
- Model 153 - 1/2 HP passes ¾" spherical solids
- Motor - 60 Hz, 3450 RPM, oil-filled, hermetically sealed, automatic reset thermal overload protected
- Carbon/Ceramic seals
- Upper sleeve bearing and lower ball bearing running in bath of oil
- 20 ft. UL Listed power cord with molded 3-wire plug
- 1½" NPT vertical discharge
- BN and BE standard models include a 20 ft. variable level float switch
- Operates at temperatures to 130°F (54°C) in effluent applications
- All models include a 1½" x 2" PVC adapter fitting

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.

ZOELLER PUMP CO.

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
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Manufacturers of . . .

"Quality Pumps Since 1939"

151/152/153 EFFLUENT SERIES

(For Pump Prefix Identification see News & Views 0052)

"DOSE-MATE"

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

EFFLUENT

SUBMERSIBLE
1½" NPT DISCHARGE

C US
Tested to UL Standard UL778
and Certified to CSA
Standard CSA22.2 No. 108

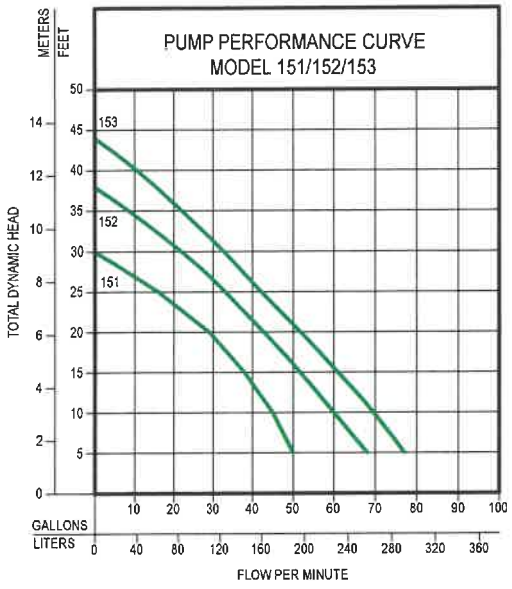
Model N152/N153
High Head
Effluent

MODELS AVAILABLE

- N151/N152/N153 & E151/E152/E153 nonautomatic
- BN151/BN152/BN153 & BE151/BE152/BE153 packaged with Piggyback Variable Level Float Switch
- 1/3, .4 & 1/2 HP, 1Ph 115V or 230V

POWDER COATED TOUGH™

Model BN152/BN153
High Head
Effluent



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TOTAL DYNAMIC HEAD/FLOW
PER MINUTE
EFFLUENT AND DEWATERING

MODEL		151		152		153	
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	50	189	69	261	77	291
10	3.0	45	170	61	231	70	265
15	4.6	38	144	53	201	61	231
20	6.1	29	110	44	167	52	197
25	7.6	16	61	34	129	42	159
30	9.1	--	--	23	87	33	125
35	10.7	--	--	--	--	22	85
40	12.2	--	--	--	--	11	42
Shut-off Head:		30 ft. (9.1m)		38 ft. (11.6m)		44 ft. (13.4m)	

014508B

CONSULT FACTORY FOR SPECIAL APPLICATIONS

- Timed dosing panels available
- Electrical alternators, for duplex systems, are available and supplied with an alarm
- Variable level control switches are available for controlling single phase systems
- Double piggyback variable level float switches are available for variable level long and short cycle controls
- Sealed Qwik-Box available for outdoor installations - See FM1420
- Over 130°F (54°C) special quotation required

151/152/153 Series

151/152/153 MODELS				Control Selection	
Model	Volts-Ph	Mode	Amps	Simplex	Duplex
N151	115 1	Non	6.0	1	2 or 3
BN151	115 1	Auto	6.0	Included	2 or 3
E151	230 1	Non	3.2	1	2 or 3
BE151	230 1	Auto	3.2	Included	2 or 3
N152	115 1	Non	8.5	1	2 or 3
BN152	115 1	Auto	8.5	Included	2 or 3
E152	230 1	Non	4.3	1	2 or 3
BE152	230 1	Auto	4.3	Included	2 or 3
N153	115 1	Non	10.5	1	2 or 3
BN153	115 1	Auto	10.5	Included	2 or 3
E153	230 1	Non	5.3	1	2 or 3
BE153	230 1	Auto	5.3	Included	2 or 3

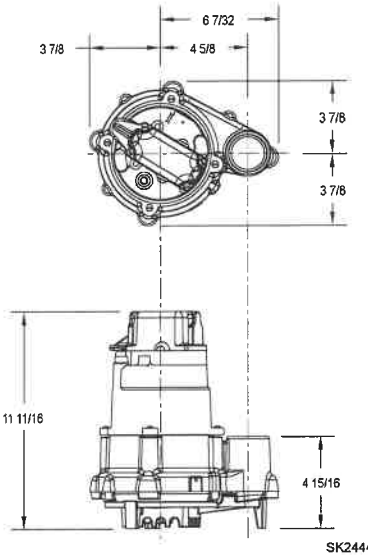
SELECTION GUIDE

1. Single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
2. See FM0712 for correct model of Electrical Alternator E-Pak.
3. Variable level control switch 10-0743 used as a control activator, specify duplex (3) or (4) float system.

⚠ CAUTION

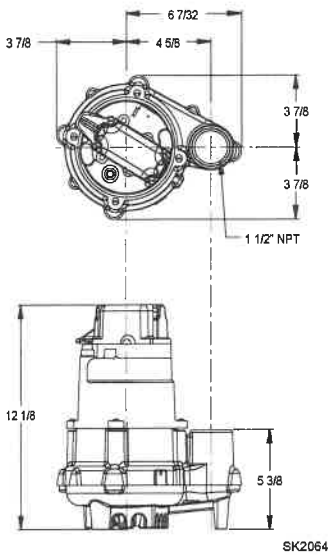
All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

Model 151



SK2444

Models 152 / 153



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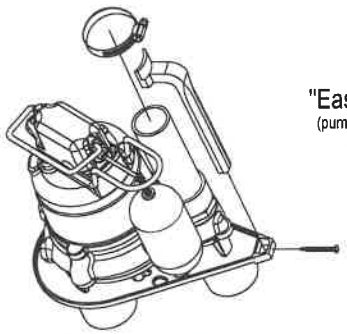


"Easy assembly"
(pump & discharge pipe not included.)

OPTIONAL PUMP STAND P/N 10-2421

- Reduces potential clogging by debris
- Replaces rocks or bricks under the pump
- Made of durable, noncorrosive ABS
- Raises pump 2" off bottom of basin
- Provides the ability to raise intake by adding sections of 1½" or 2" PVC piping
- Attaches securely to pump
- Accommodates sump, dewatering and effluent applications

NOTE: Make sure float is free from obstruction.

RESERVE POWERED DESIGN

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

"Quality Pumps Since 1939"

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

SECTION: 5.10.280
FM0531
1009/2
Supersedes
1009

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) 928-7867 • FAX (502) 774-3624

visit our web site:
www.zoeller.com

SPECIFICATIONS
EFFLUENT/SUMP SIMPLEX SYSTEM
ZOELLER SUBMERSIBLE DEWATERING OR EFFLUENT PUMPS

SEAL	SOLIDS	DISCHARGE	MATERIAL	MODELS							
Single	1/2"	1½" NPT	Cast Iron	53	57	98	140	151			
Single	1/2"	1½" NPT	Cast Bronze	55	59						
Single	5/8"	1½" NPT	Cast Iron	137	191						
Single	5/8"	1½" NPT	Cast Bronze	139							
Single	3/4"	1½" NPT	Cast Iron	145	152	153					
Single	3/4"	1½", 2", or 3 NPT	Cast Iron	161	163	165	185	186	188	189	
Double	1/2"	1½"	Cast Iron	4140							
Double	3/4"	1½", 2", or 3 NPT	Cast Iron	4145	4161	4163	4165	4185	4186	4188	4189

SIMPLEX SYSTEM

Furnish a Zoeller Submersible Pump Model N152 Single Seal or Model _____ Double Seal, with a capacity of 34.51 GPM against a Total Dynamic Head of 18.1 feet. Motor Specification: 115 Voltage, 60 Cycles, 1 Phase, 0.4 HP. Discharge to be X 1½ inch NPT. Optional _____ 2 inch NPT or _____ 3 inch NPT (161/4161 - 189/4189). Cord length to be 20 feet. Pumps will pass _____ ½ inch solids (53,55,57,59, 98, 140/4140 & 151 Series) or _____ 5/8 inch solids (137 & 139 Series) or X 3/4 inch solids (145/4145, 152, 153, 161/4161, 163/4163, 165/4165, 185/4185, 186/4186, 188/4188 & 189/4189 Series.) Pumps shall be _____ UL Listed, X CSA Certified, X SSPMA certified, _____ State of Wisc. approved, _____ other (Specify _____ _____).

SINGLE PHASE PUMPS

GENERAL

Pump motor shall be hermetically sealed, submersible type operating in a high quality dielectric oil for cooling the windings and for lubrication of the motor bearings and ceramic-carbon shaft seal. Single phase motor shall have internal automatic resetting, thermal overload protection. Construction shall be of _____ cast iron with 100% baked-on powder coated epoxy finish for corrosion resistance and longer casting durability (or _____ cast bronze). All fasteners and external metal parts shall be of stainless steel. Impeller shall be of vortex non-clog design. (Addition noted below.) Check applicable series:

_____ 53 (cast iron) _____ 55 (cast bronze) series pump shall have a shaded pole motor. Impeller, with metal insert, and base shall be of glass reinforced molded material. Switch case shall be of cast or molded material. Guard and handle shall be of stainless steel.

_____ 57 (cast iron) _____ 59 (cast bronze) series pump shall have a shaded pole motor. Guard and handle shall be of stainless steel.

_____ 98 (cast iron) series pump shall have ½ HP PSC motor.

_____ 137 (cast iron) _____139 (cast bronze) series pump shall have ½ HP split phase motor with current sensing, starting relay enclosed in switch housing.

_____ 151 (.33 HP) X 152 (.4 HP) _____153 (½ HP) series pump shall have a permanent split capacitor motor. The impeller shall be "glass reinforced thermoplastic." Motor housing shall be cast iron.

_____ 145 (¾ HP) _____ 140 (1 HP) series pump shall have a permanent split capacitor motor with capacitor in the switch housing attached to the pump. The impeller shall be "glass reinforced thermoplastic." Motor housing shall be cast iron. Discharge shall be a permanently affixed 1½ inch female NPT hub.

_____ 4140 (1 HP cast iron) _____ (4145 (¾ HP cast iron) series pump with double carbon/ceramic shaft seals shall have a 1 HP permanent split capacitor motor with capacitor in the switch housing attached to the pump. The impeller shall be "glass reinforced thermoplastic." Motor housing shall be cast iron. Discharge shall be a permanently affixed 1½ inch female NPT hub. The lower seal cavity shall be oil-filled.

_____ 161 (½ HP) _____163 (½ HP) _____165 (1 HP) cast iron series pump shall have a permanent split capacitor motor with run capacitor and magnetic contactor enclosed

SIM/TECH STF-100 / 100A2

series pressure filters

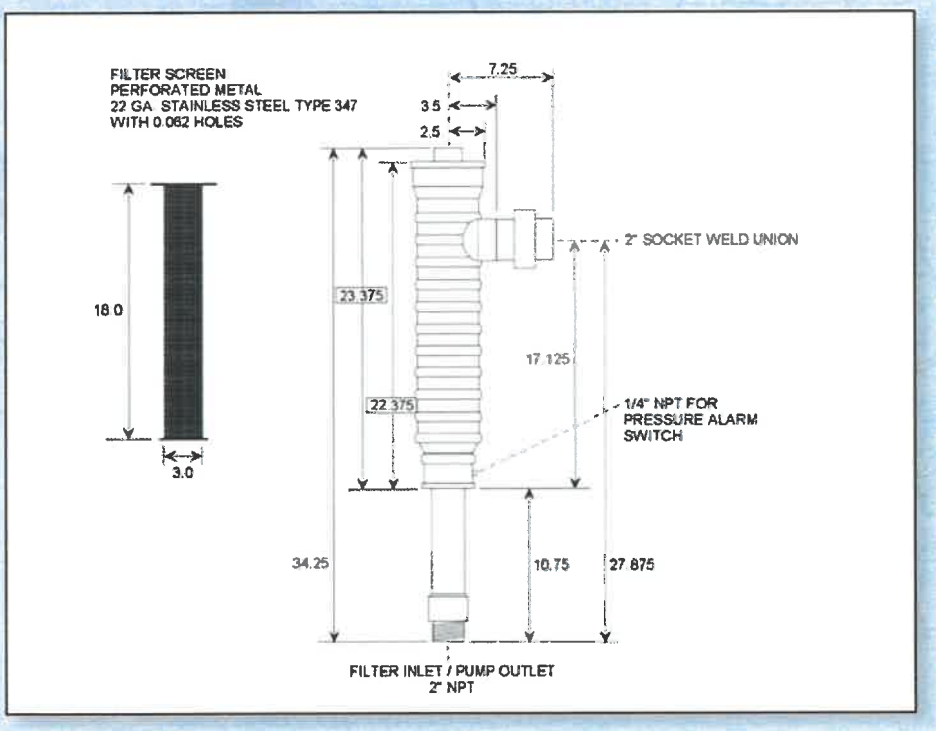
STF-100

Pressure Filter for Pump Discharge

STF-100A2

FEATURES

- Low maintenance
- Easy to install and service
- Economical
- Extends life of drain field
- Improves effluent quality
- The last line of defense before the laterals
- Vortex scrubbing action helps keep filter clean providing maximum maintenance intervals
- Uses a S.S. filter screen with .062 diameter holes
- Provides a 69.52 sq. in. or 41% open area which allows the filter to pass 83.8 GPM at 1 PSI
- Assures quality effluent with lower TSS levels, keeping pressurized systems functioning at 100% efficiency
- Low head loss .5002 ft. or .21 PSI
- Flow rate with clean screen 120,672 GPD @ 1 PSI
- Flow rate with 95% plugged screen 114,912 GPD @ 1.8 PSI
- Job ready with 2" schedule 80 union and tailpiece attached (STF-100)
- Field assemble does not include union or tailpiece (STF-100A2)
- Use optional filter socks to filter smaller particles



Order part No. STF-100
STF-100A2

CAD detail drawing available in DXF format

Locate on pump discharge.

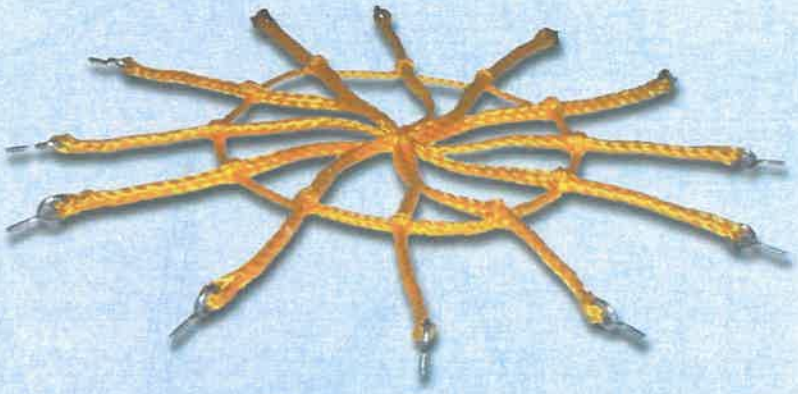
U.S. Patent # 5, 885, 452
Canada Patent # 2, 237, 751

RELATED PRODUCTS

STF-104-600M page 14
STF-104-150190M page 14
STF-104TN page 14
STF-101 page 14
STF-101A page 14
STF-107page 14
STF-102 page 14
STF-FC page 14
STF-150page 14
STF-103Bpage 14
STF-105 page 14

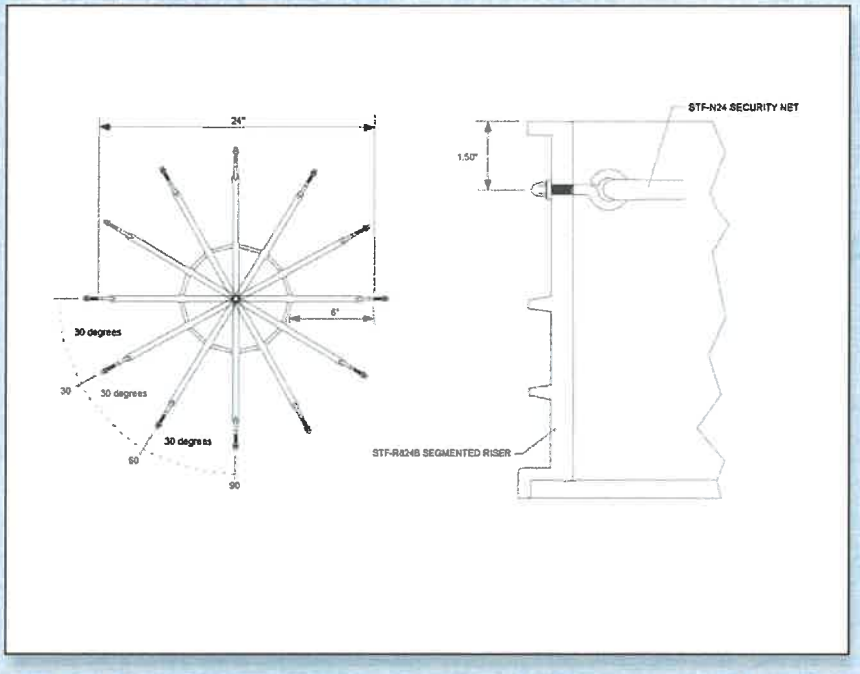
Toll Free 888-999-3290 Office 231-582-1020 Fax 231-582-7324 Email simtech@freeway.net Web www.gag-simtech.com

Safety Nets (as needed).



FEATURES

- Use as a security measure to keep persons, especially children, from accidental entry while systems are being serviced or any other instance where a cover is removed
- Available to fit 18", 24", and 30" diameter risers
- Open areas in web are large enough to allow tanks to be pumped without having to remove the security net
- Installs easily in our segmented riser and others



Order part No. STF-N18
STF-N24
STF-N30

CAD detail drawing available in DXF format

U.S. Patent Pending

RELATED PRODUCTS

STF-CI24 page 5
STF-APC24G page 6
STF-APC24B page 6
STF-R824B page 9
STF-AR24 page 9
STF-APC24GI-075 page 14
STF-APC24BI-075 page 14
STF-APC24GI-100 page 14
STF-APC24BI-100 page 14
STF-APL24G page 14
STF-APL24B page 14