

# Engineer's Report

## Klehini Valley Volunteer Fire Station Onsite System

This wastewater system will serve the Klehini Valley Volunteer Fire Station. The station was built in the 1980s and the drawings of the wastewater system cannot be located. The plumber who worked on the original system estimated where he recalled the septic tank was installed some 25 years ago. The location is marked on Sheet 2 of 5, between two bollards and the utility pole.

The well serving this building is located on the southeast corner of the lot, approximately 200 feet from the septic tank location, as shown on Sheet 2 of 5.

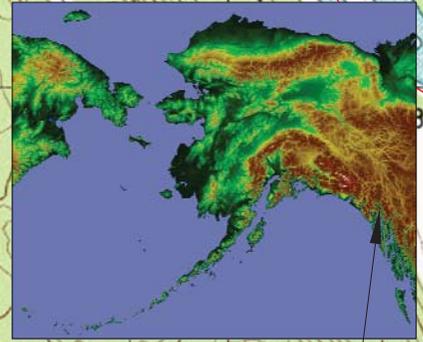
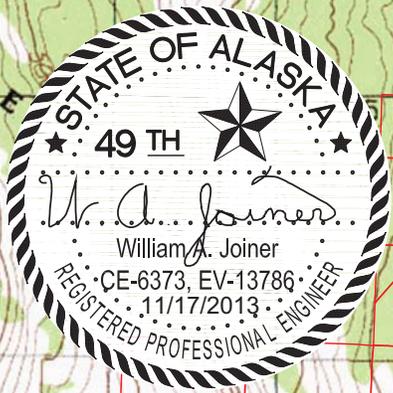
The existing system is failing as it does not drain due to high groundwater. A mound system will be built to achieve proper treatment and drainage. An Anchorage Tank and Welding Septic Tank Effluent Pumping (STEP) System will be used. This tank includes the effluent pump in the second chamber, so hence it is a 1250 gallon tank. See Sheets 2 and 3 of 5 for separation distance details.

The mound will consist of scraping away the organics and importing 2+ feet of Heinmiller (Floreske) or Wolverine Pit Sand (see attached analysis), leach chambers and drain rock, covered with Tytar 3401 fabric and three feet of dirt, to be planted with grass, will complete the mound, as shown on Sheets 4 and 5 of 5.

The effluent will be distributed inside approximately 440 square feet of drain field using leach chambers and 1-½ inch pressure distribution system hung from the crown on the leach chambers. The lift station effluent discharge line and distribution manifold will be 2"Ø pipe. The lift station will discharge approximately 80 gallons per dose to the drain field against approximately 17 feet of head. See Sheets 2 through 5 of 5 for details.

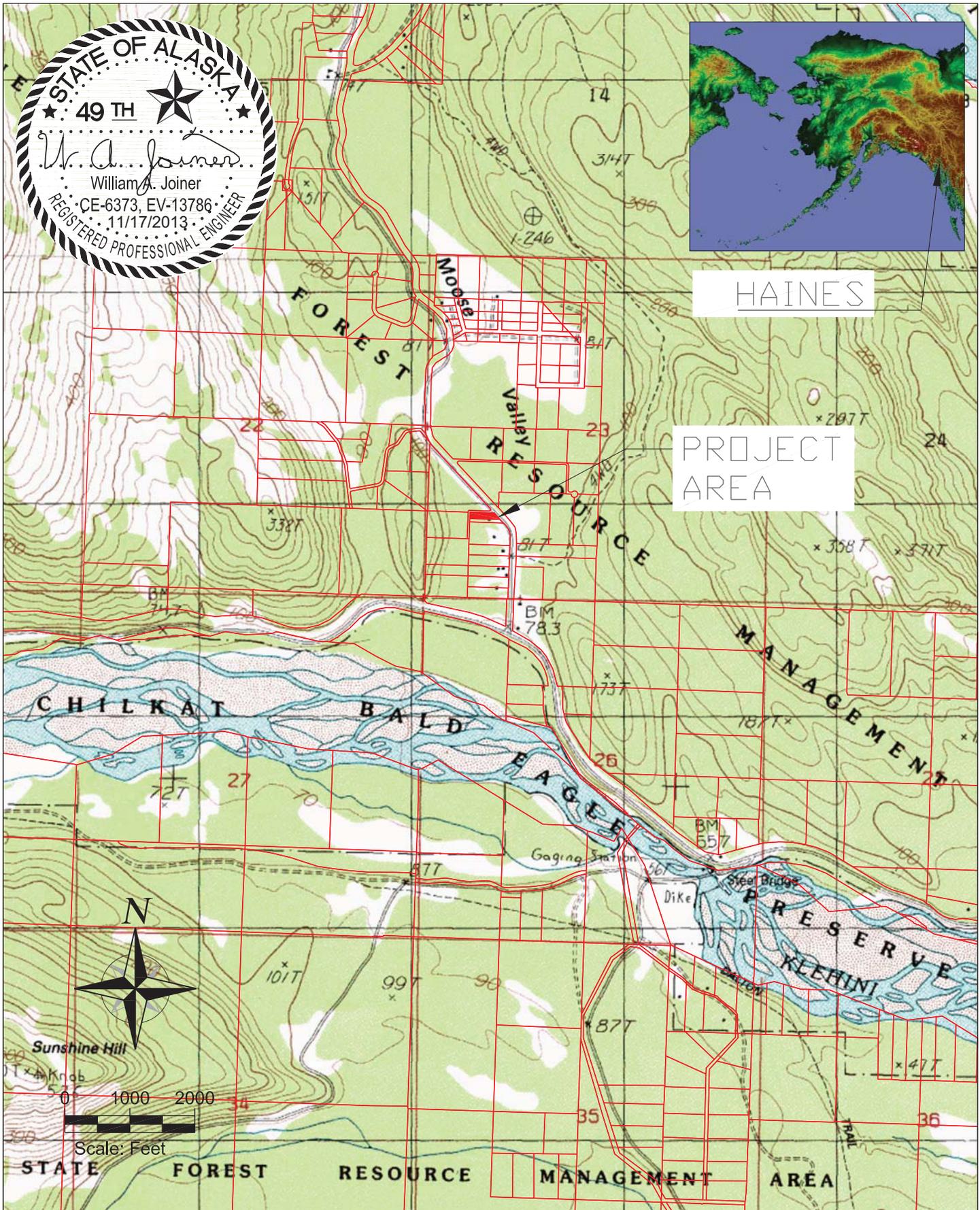
The operator installing the new system will first have to locate the old septic tank and the sewer line coming from the fire station. This old tank either will be pumped and removed or filled with gravel and abandoned in place. The new tank will be protected by bollards similar to City and Borough of Juneau Hydrant Guard Post Standard 404. This protection is essential since the existing tank was damaged by heavy equipment in the past.





HAINES

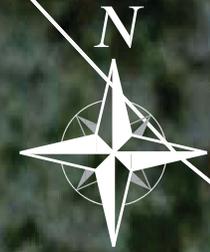
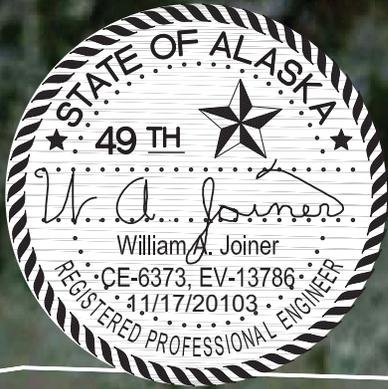
PROJECT AREA



0 1000 2000

Scale: Feet

Date: 11/4/2013		<p>KLEHINI VALLEY VFD VICINITY MAP          TL-2303, T28S, R55E, SEC. 23, CRM          HAINES, ALASKA</p>	<p>Drawn by: WAJ</p>	<p>Sheet 1 of 5</p>
			<p>Checked by: WAJ</p>	<p>Project No: 13-018</p>



MOSQUITO LAKE ROAD

POSSIBLE LOCATION OF EXISTING SEPTIC TANK & SEWER PIPE -- FIELD VERIFY

BOLLARDS

149'

UTILITY POLE

WELL

R100'

RELOCATE EQUIPMENT AND/OR MODIFY EFFLUENT LINE ALIGNMENT, AS REQUIRED

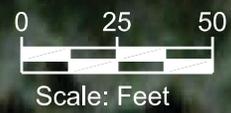
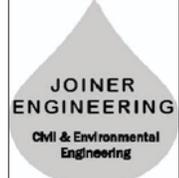
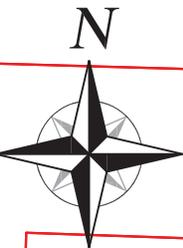


IMAGE: GOOGLE EARTH 8/1/2002



KLEHINI VALLEY VFD AERIAL PLAT  
 TL-2303, T28S, R55E, SEC. 23, CRM  
 HAINES, ALASKA

Date: 11/7/2013	Sheet 2 of 5
Drawn By: WAJ	Project No: 13-018
Checked By: WAJ	

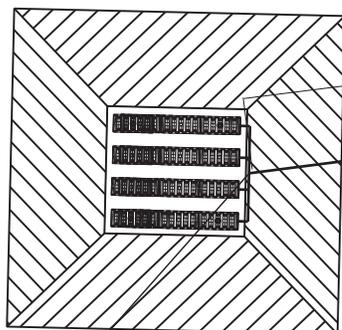


POSSIBLE LOCATION OF EXISTING  
SEPTIC TANK & SEWER PIPE -- FIELD  
VERIFY ALL UTILITY LOCATIONS



BOLLARDS

149'



UTILITY POLE

KLEHINI VALLEY  
VOLUNTEER FIRE  
DEPARTMENT  
STATION

DISTRIBUTION MANIFOLD HIGH POINT IN EFFLUENT  
PIPING SYSTEM. SLOPE EFFLUENT LINE TO DRAIN  
BACK INTO LIFT STATION OR INTO DRAIN FIELD SO  
LINE DRY BETWEEN DOSES FROM LIFT STATION.

RELOCATE EQUIPMENT AND/OR MODIFY  
EFFLUENT LINE ALLIGNMENT, AS REQUIRED



Scale: Feet



KLEHINI VALLEY VFD PLAT  
TL-2303, T28S, R55E, SEC. 23, CRM  
HAINES, ALASKA

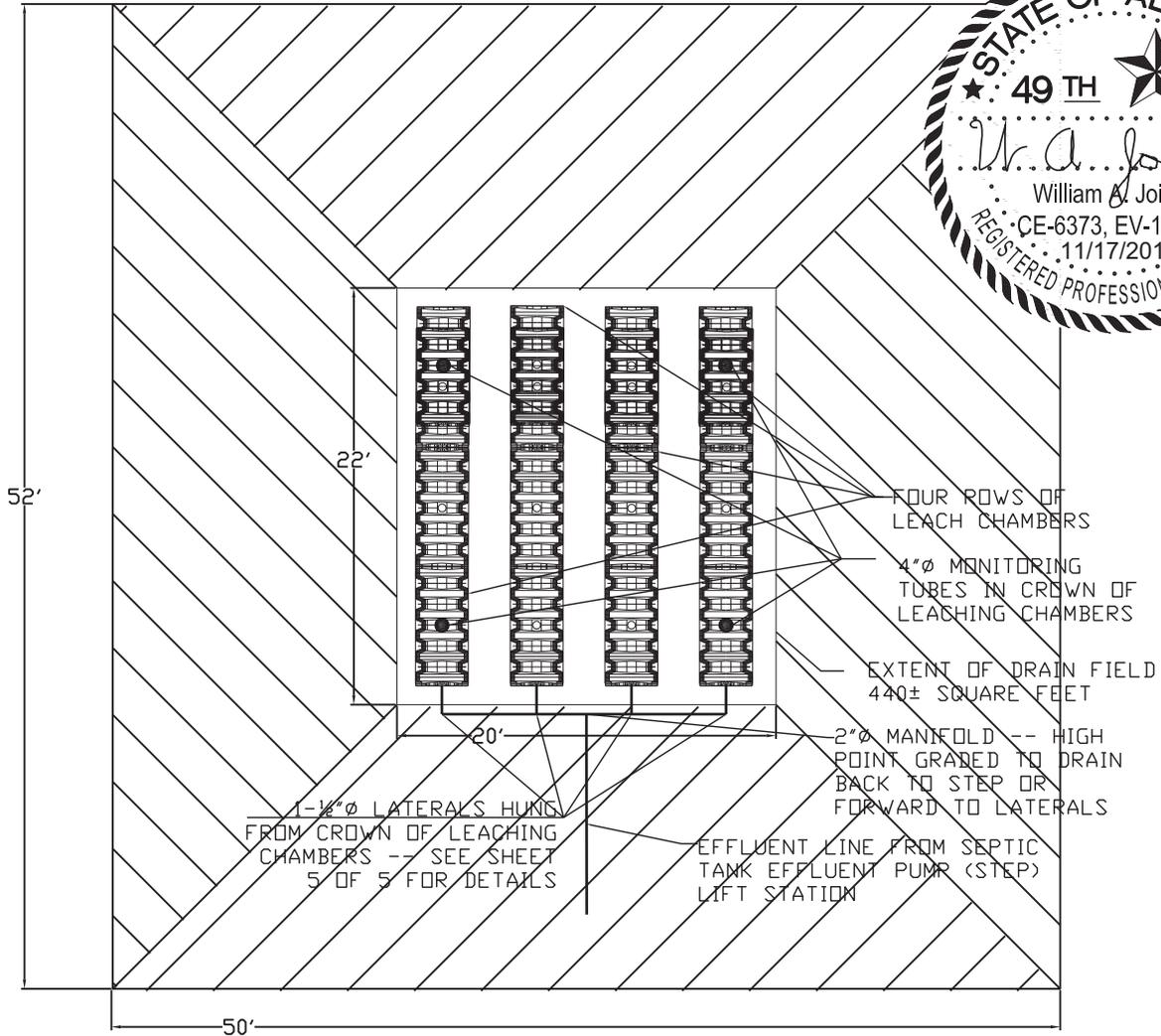
Date:  
11/12/2013

Sheet 3 of 5

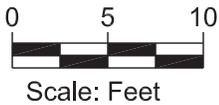
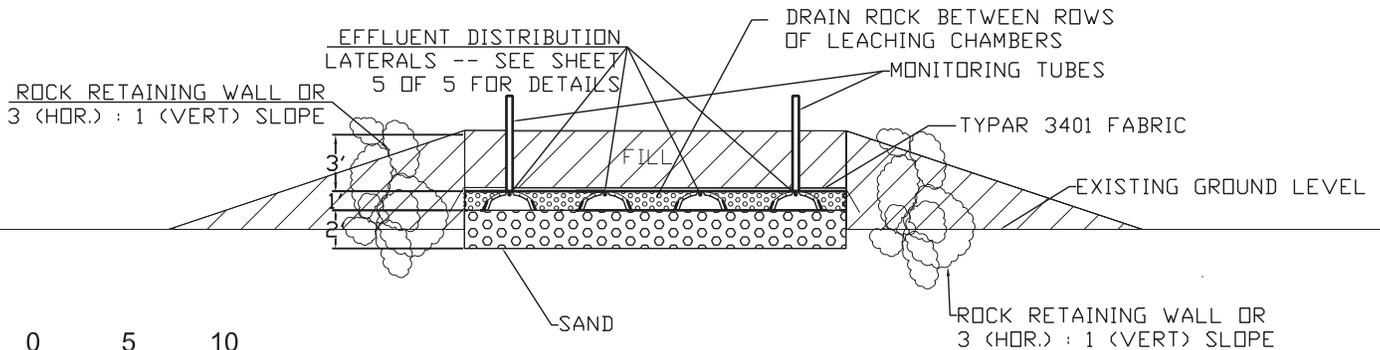
Drawn By: WAJ

Project No:  
13-018

Checked By: WAJ



PLAN VIEW



ELEVATION VIEW

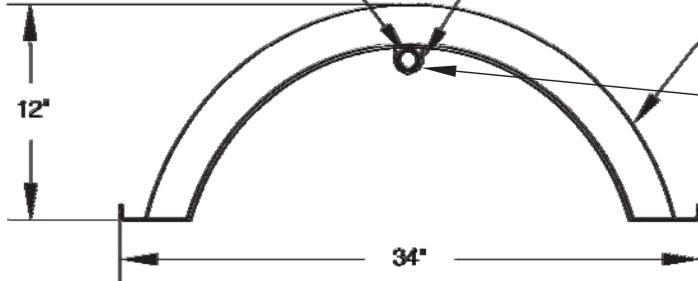
Date: 11/17/2013		<b>KLEHINI VALLEY VFD DRAIN FIELD</b> TL-2303, T28S, R55E, SEC. 23, CRM HAINES, ALASKA	Drawn by: WAJ	Sheet 4 of 5
			Checked by: WAJ	Project No: 13-018

**TOP PLACEMENT**

PRESSURE PIPE WITH HOLES AT 12 O'CLOCK

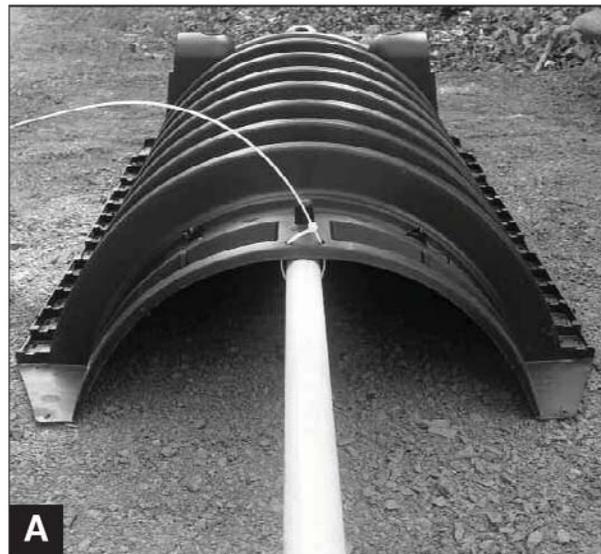
ALL WEATHER PLASTIC PIPE STRAP WITH 120 POUNDS TENSILE STRENGTH AT EVERY CHAMBER CONNECTION

QUICK4 STANDARD CHAMBER



3/16"Ø HOLES, 18" O.C. @ 12 O'CLOCK, EXCEPT LAST HOLE NEAR END CAP @ 6 O'CLOCK FOR DRAINAGE AFTER EACH DOSE -- PLACE SPLASH GUARD OR PAVING BLOCK BELOW LAST HOLE TO PROTECT INFILTRATIVE SURFACE FROM EROSION.

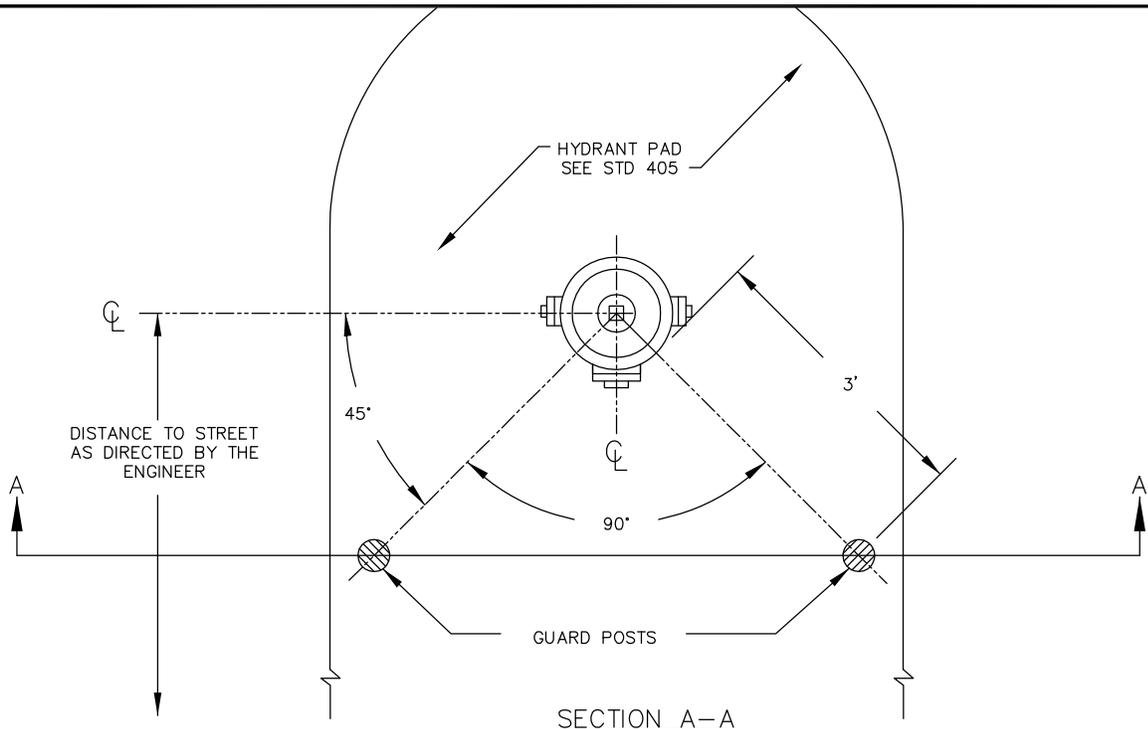
- Pipe and orifice placed closer to the chamber dome offer improved distribution.
- Pipe positioned at the top of the chamber places it well above effluent.
- Plastic pipe hanger easily secures pipe in place.



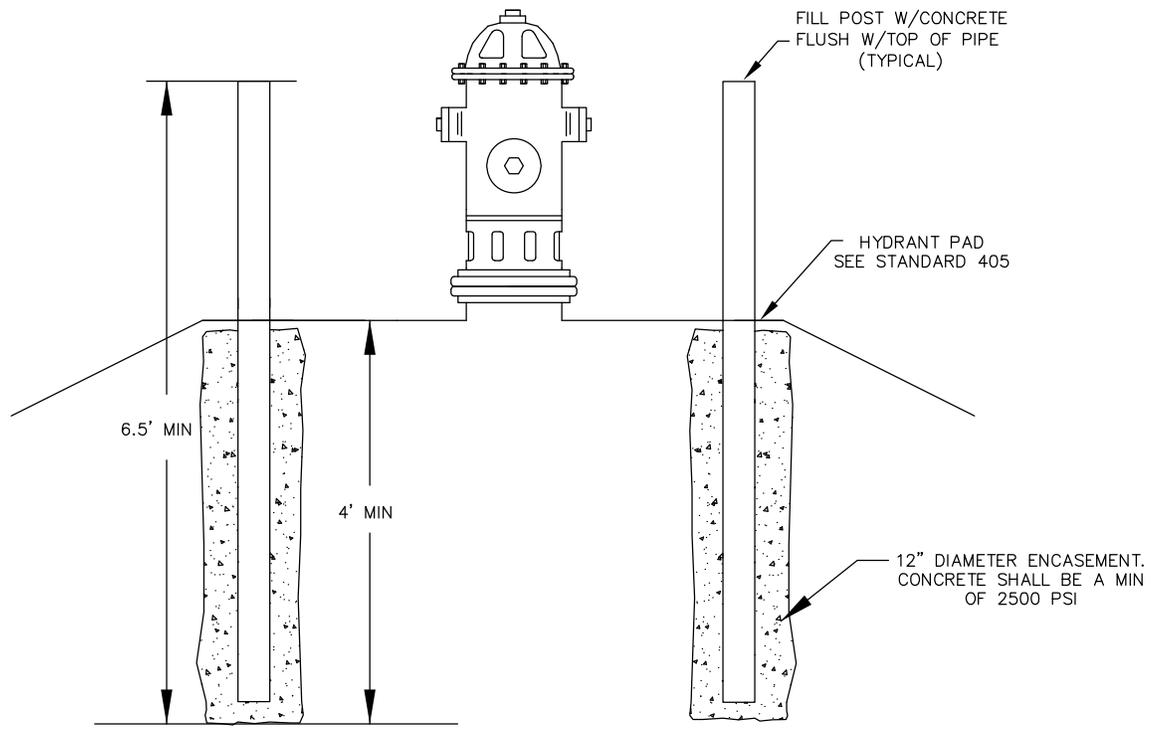
NOTE:

1. LATERALS GRADED SLIGHTLY TO DRAIN FROM HOLE @ 6 O'CLOCK NEAR END CAP.
2. EFFLUENT LINE FROM LIFT STATION GRADED TO DRAIN BACK TO LIFT STATION AT END IF DOSE -- REMOVE CHECK VALVE OR DRILL WEEP HOLES TO EMPTY LINE BETWEEN DOSES.
3. SEPTIC TANK / LIFT STATION TO BE BURIED ~4.5 FEET. ~1% GRADE FROM LIFT STATION TO MOUND, WITH MINIMUM 3 FOOT COVER ON EFFLUENT LINE.
4. ORDER RISERS FOR SEPTIC TANK / LIFT STATION AS REQUIRED SO ACCESS HATCHES ACCESSABLE FROM GROUND LEVEL.
5. PROTECT SEPTIC TANK / LIFT STATION WITH BOLLARDS EQUIVALENT TO CBJ HYDRANT GUARD POST STANDARD 404.

Date: 11/17/2013		KLEHINI VALLEY VFD DRAIN FIELD DETAIL TL-2303, T28S, R55E, SEC. 23, CRM HAINES, ALASKA	Drawn by: WAJ	Sheet 5 of 5
			Checked by: WAJ	Project No: 13-018



SECTION A-A



ELEVATION VIEW

NOTES

1. GUARD POST ARE REQUIRED ON ALL HYDRANTS EXCEPT THOSE IN SIDEWALKS, ALONG STATE HIGHWAYS OR AS DIRECTED BY THE ENGINEER.
2. GUARD POST SHALL BE 4" DIAMETER, SCHEDULE 40 STEEL PIPE WITH A MINIMUM 4 FEET OF BURIAL AND 2-1/2 FEET OF EXPOSURE.
3. POSTS SHALL BE FILLED FLUSH WITH CONCRETE AND PAINTED WITH 4C-184 CATERPILLAR YELLOW ENAMEL AFTER INSTALLATION.
4. POSTS SHALL NOT BLOCK OPERATION OF VALVE.

SCALE: NTS	DATE: 11/20/96	CITY AND BOROUGH OF JUNEAU, ALASKA	
DRAWN BY: DRW	CHECKED BY: STAFF	HYDRANT GUARD POSTS	
APPROVED BY: <i>DRW</i>	REVISED: 8/14/2011	STANDARD 404	

KLEHINI VALLEY VOLUNTEER FIRE DEPARTMENT  
TL-2303, Section 23, T28S, R55E, CRM,  
HAINES, ALASKA

TREATMENT UNIT LOADING

SEPTIC TANK                       AEROBIC TREATMENT UNIT (ATU)

This building is a volunteer fire station. There may be one or two volunteers there working on equipment or paperwork. They also rent out a portion of the building to the local power company, Inside Passage Electrical Cooperative, so there may be an additional two or three people there for a portion of the day. There may be weekly meetings or drills or a big dinner a few times per year. This daytime loading may be similar to an industrial building for a maximum of 17.2 GPCP\* X 5 people = 86 GPD. The various meetings and dinners loading may be similar to a restaurant at 4 GPCD\* X 30 people (?) = 120 GPD for a maximum day total = 206 GPD. This loading is less than half a typical three bedroom house, so sizing for a three bedroom house should be satisfactory, with a large factor of safety built in. Due to high groundwater, a mound with a lift station will be required.

BRAND: Anchorage Tank & Welding      SIZE:              1250 gallons  
          Septic Tank Effluent Pumping  
          System (STEP)

DISINFECTION REQUIRED?

No

YES       ULTRAVIOLET      BRAND:  
                   CHLORINE                      FLOW RATE:

DRAIN FIELD LOADING

By Bedroom:  
                  125 = Application Rate per Bedroom (square feet per bedroom)

3 No. Bedrooms x Loading Rate per Bedroom =              375 square feet

\* Loadings based on Table 1 of ADEC's *Installers Manual for Conventional Onsite Domestic Wastewater Treatment and Disposal Systems*. August 1, 2000



KLEHINI VALLEY VOLUNTEER FIRE DEPARTMENT  
 TL-2303, Section 23, T28S, R55E, CRM,  
 HAINES, ALASKA

**INPUT**  
**LOOK UP**

LATERAL LENGTH

**20** FT X **4** LATERALS = 80 FEET = 8.3 GALLONS  
 HOLE DIAMETER = **3/16** INCH = 0.1875 INCH  
 DISTANCE = **20** FEET = 2.1 GALLONS/LATERAL  
 FRICTION LOSS @ 10.8 GPM = **2.00** FT/100 FT = 0.4 FEET/LATERAL  
 DISCHARGE RATE PER 3/16 IN HOLE @ **18** IN O.C. = 1.5 FEET O.C.  
 AREA/ORIFICE = 6.0 FT<sup>2</sup>/ORIFICE  
**3.5** FEET HEAD TO BE MAINTAINED AT DISCHARGE (SQUIRT HEIGHT)  
**0.78** GPM  
 14 HOLES PER LATERAL  
 10.8 GPM PER LATERAL  
**43.2** GPM MINIMUM DISCHARGE RATE FOR ALL LATERALS

MINIMUM DOSE VOLUME

VOLUMES PER FOOT		
NOM. Ø (IN)	I.D. (IN)	GPF
1.5	1.59	0.1031
2	2.047	0.1709

2" DIAMETER MANIFOLD = **15** FEET = 2.56 GALLONS  
 FRICTION LOSS @ 43.2 GPM = **3.71** FT/100 FT = 0.56 FEET

2" DIAMETER LINE FROM LIFT STATION TO DRAIN FIELD MANIFOLD

DISTANCE = **149** FEET = 25.47 GALLONS = DRAIN BACK VOLUME  
 FRICTION LOSS @ 43.2 GPM = **3.71** FT/100 FT = 2.98 FEET

LATERAL VOLUME = 8.3 GALLONS  
 DOSE @ 5 X LATERAL VOLUME = **41** GALLONS  
 DESIGN FLOW = **450** GPD X 20% = **90** GALLONS

DRAIN FIELD PIPE VOLUME = 10.8 GALLONS

Δ ELEV. L.S. WSE TO CROWN OF LEACH CHAMBERS = 9 FEET

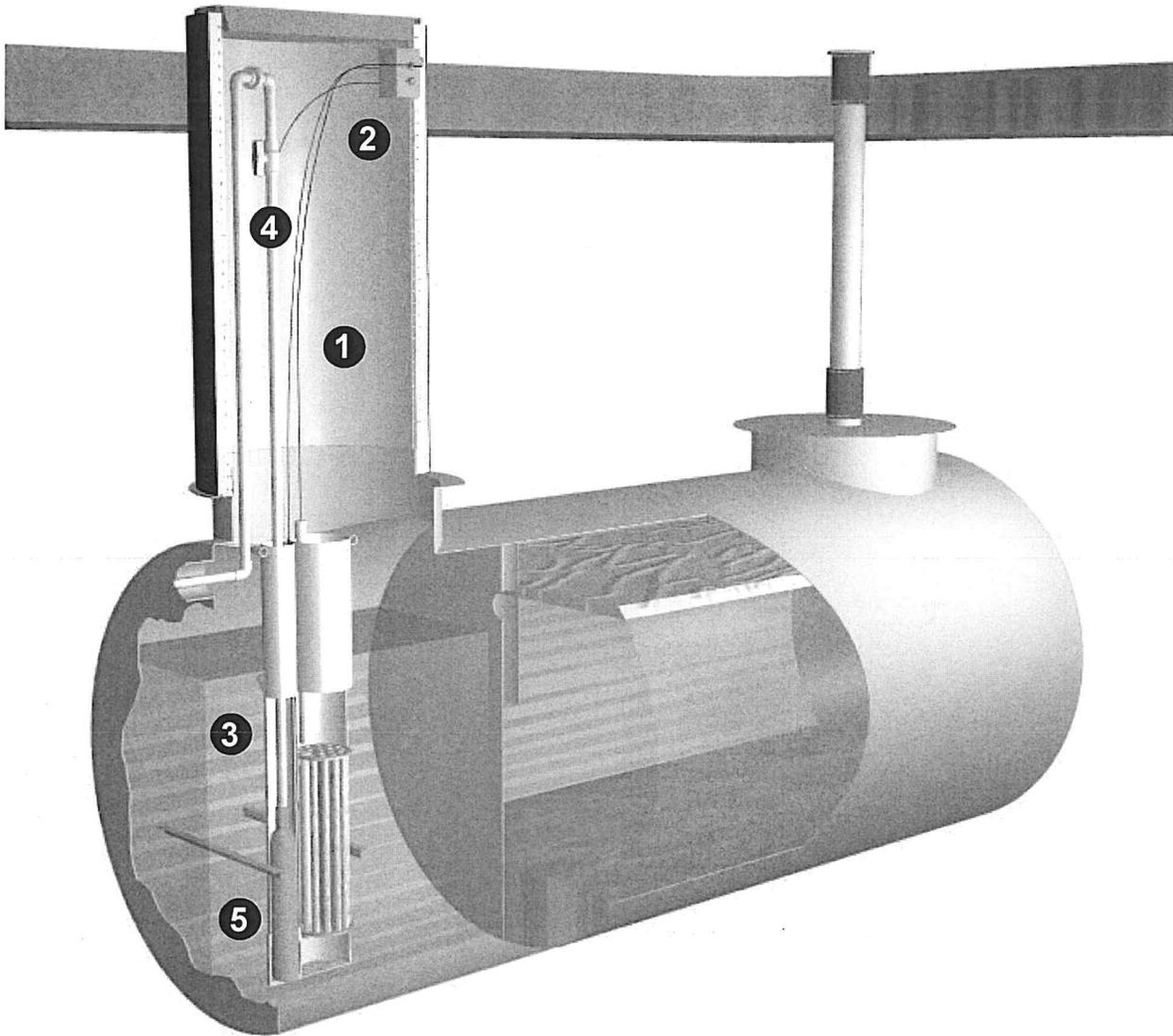
LATERAL FRICTION LOSS ADJUSTMENT FACTOR = 1.3

PUMPING HEAD = HEIGHT TO TOP OF LEACHING CHAMBERS - LIFT STATION MIN WSE +  
 ELEVATION RISE + PRESSURE HEAD IN LATERALS + PIPE FRICTION LOSSES=  
 TOTAL HEAD = **16.8** FEET

SET THE FLOATS IN THE LIFT STATION TO DELIVER APPROXIMATELY 80 GALLONS PER DOSE.



# Lift Stations



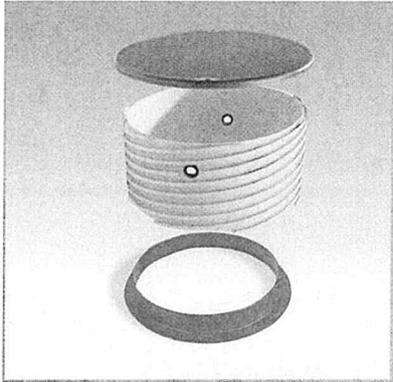
## Septic Tank Effluent Pumping (S.T.E.P.) System

The Anchorage Tank & Welding, Inc. S.T.E.P. System is a combination of a specially designed Anchorage Tank septic tank and Orenco Systems®, Inc. riser, pumps, and controls.

Effluent from the building enters the S.T.E.P. System and travels the length of the first compartment. A pump (or pumps) located in a screened pump vault near the outlet of the tank pumps the effluent to a pressurized drain-field.

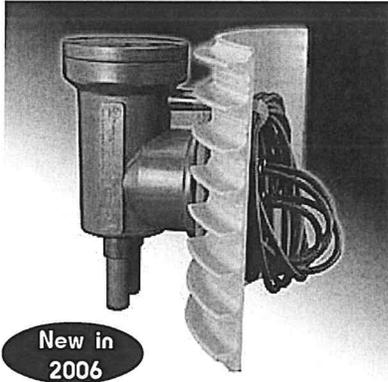
Designed specially for tough Alaskan conditions, the S.T.E.P. System is available with either single or duplex pumps, in either residential or commercial configurations.

# Lift Stations



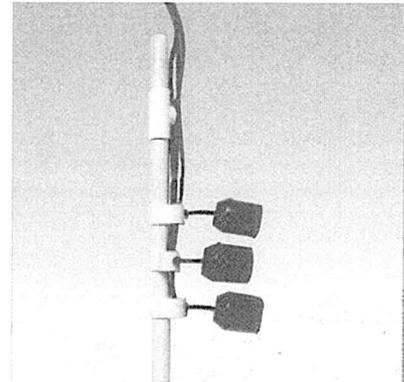
## 1 Riser, Lid, and Accessories

- Allow easy access to tank
- Attractive, non-skid lids
- Strong & lightweight
- Insulated with 2" urethane foam
- Standard 48" length
- Longer risers available in 12" increments
- Tamper resistant



## 2 Splice Box

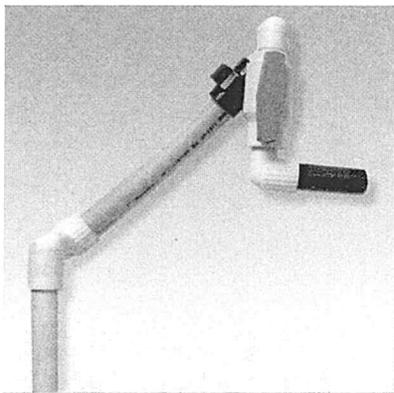
- UL listed
- At-grade installation
- Strong & lightweight
- Completely watertight
- Provides easy access for inspection and servicing
- Covered by U.S. Patent numbers D461,870 & D445,476



## 3 Float Switch Assembly

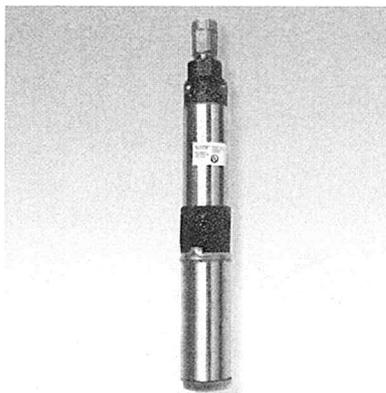
- For reliable pump control
- Pilot duty or motor-rated switches
- Arrangements for any pumping situation

*Your float switch assembly may only have two floats.*



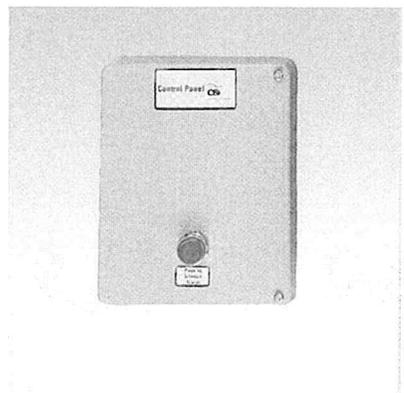
## 4 Hose and Valve Assembly

- Intelligently designed with quick disconnect unions, ball valves, and flexible hose and fittings
- Provides easy access for maintenance and servicing of the pump system
- Configurations available for deep installations and designed for Alaskan conditions



## 5 Effluent Pump

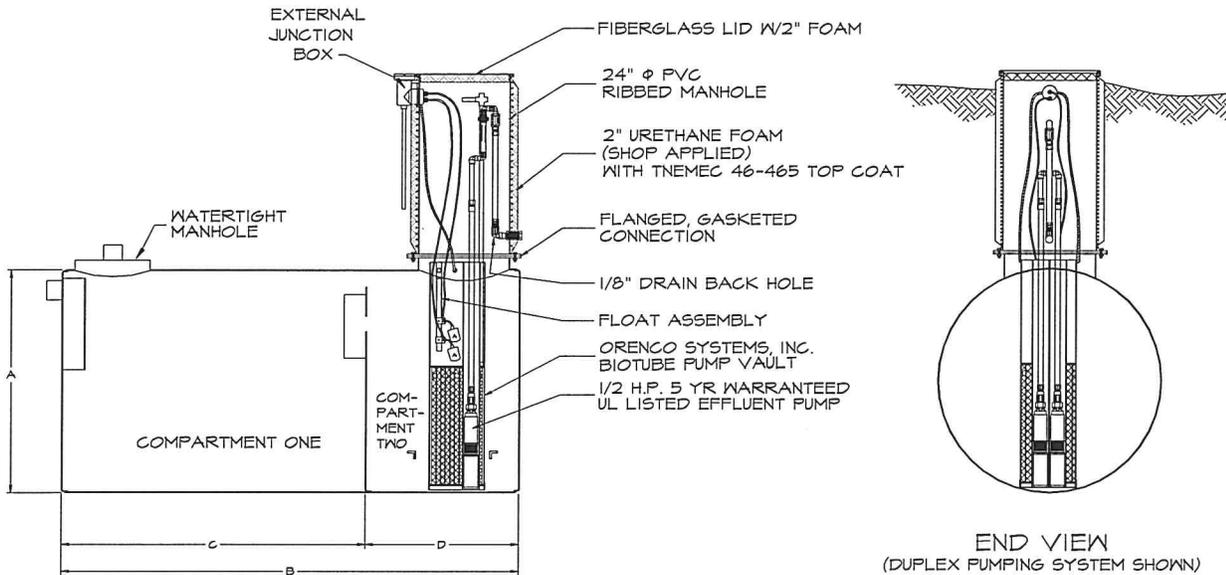
- Turbine-type effluent pump manufactured specifically for wastewater applications. UL listed
- Lightweight (about 25 pounds) yet powerful
- High pressure capacity to clear plugged orifices.
- Extremely durable and versatile



## Control Panel

- UL listed
- Engineered specifically for wastewater applications
- Corrosion-proof NEMA 4X rated enclosures
- Intrinsically safe relays in commercial panels
- Models for any need

# Residential Lift Stations 1,250 - 2,500 Gallon



## Features:

- Constructed to the requirements of the Uniform Plumbing Code.
- Watertight manholes prevent seeping of groundwater.
- Coated inside and out with coal tar pitch.
- Custom tanks, including special interior and/or exterior coatings, are available.
- Available in Commercial configurations; single or duplex pumps.
- Dimensions and weights are approximate.
- Approved by the Municipality of Anchorage.
- Detailed *Installation, Operation, and Maintenance Manual*.



ANCHORAGE TANK MODEL NUMBER	APPROX. GALLONS	STEEL GAUGE	DIAM. (INCHES) (A)	LENGTH (FEET) (B)	LENGTH COMPT. 1 (C)	LENGTH COMPT. 2 (D)	SHIPPING WEIGHT (LBS)	MAXIMUM BURIAL DEPTH (FT.)
AT1250L	1,250	12	58	10	6'-8"	3'-4"	1,256	5.45
AT1250L 10	1,250	10	58	10	6'-8"	3'-4"	1,372	8.75
AT1500L	1,500	12	58	12	8'-0"	4'-0"	1,398	4.01
AT1500L 10	1,500	10	58	12	8'-0"	4'-0"	1,573	7.22
AT2000L	2,000	10	58	16	10'-8"	5'-4"	1,772	6.13
AT2500L	2,500	3/16	64	17	11'-4"	5'-8"	2,650	11.85

# PF Series High-Head Effluent Pumps

## Applications

Our submersible High-Head Effluent Pumps are designed to transport screened effluent (with low TSS counts) from septic tanks or separate dosing tanks. All our pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics; all are field-serviceable and repairable with common tools; and all standard 60-Hz PF Series models are CSA certified to the U.S. and Canadian safety standards for effluent pumps, meeting UL requirements.

High-Head Effluent Pumps from Oreco® are used in a variety of applications, including pressurized drainfields, packed bed filters, mounds, aerobic units, effluent irrigation, effluent sewers, wetlands, lagoons, and more. These pumps are designed to be used with a Biotube® pump vault.

## Features/Specifications

To specify this pump for your installation, require the following:

- Minimum 24-hour run-dry capability with no deterioration in pump life or performance\*
- 1/8-inch (3-mm) bypass orifice (patent pending) to ensure flow recirculation for motor cooling and to prevent air bind
- Liquid end repair kits available for better long-term cost of ownership
- TRI-SEAL™ floating impeller design on 10-, 20-, and 30-gpm models; floating stack design on 50- and 75-gpm models
- Super stainless Franklin Electric motor, rated for continuous use and frequent cycling
- Type SOOW 600-V motor cable (suitable for Class I, Division 1 and Division 2 applications)
- Five-year warranty from date of manufacture against defects in materials or workmanship

\* Not applicable for 5-hp models

## Standard Models

See specifications chart, pages 2-3, for a list of standard pumps. For a complete list of available pumps, call Oreco.

## Nomenclature

PF □ □ □ □ □ - □ □

Cord length:

Blank = 10'  
20\* = 20'  
30 = 30'  
50 = 50'

Voltage (nameplate):

1 = 115 (1/2 hp only)  
200 = 200  
2 = 230 (220 if 50 Hz)  
4 = 460

Frequency:

1 = single-phase 60 Hz  
3 = three-phase 60 Hz  
5 = single-phase 50 Hz

Horsepower:

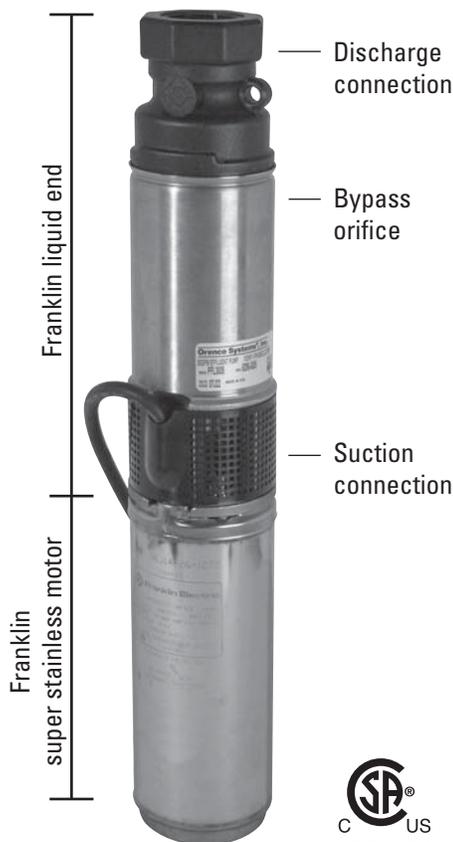
05 = 1/2 hp  
07 = 3/4 hp  
10 = 1 hp  
15 = 1-1/2 hp  
20 = 2 hp  
30 = 3 hp  
50 = 5 hp

Nominal flow (gpm):

10  
20  
30  
50  
75

Pump (PF Series)

\* Note: 20-foot cords are available only for single-phase pumps through 1-1/2 hp



# PF Series High-Head Effluent Pumps (continued)

## Specifications

Model	60 Hz		Phase	Nameplate voltage	Actual voltage	Design flow amps	Max amps	Impellers	Discharge size and material <sup>1</sup>	Length, in. (mm)	Min. liquid level, <sup>2</sup> in. (mm)	Weight, <sup>3</sup> lb (kg)	Rated cycles/day
	Design gpm (L/sec)	Horsepower (kW)											
PF100511	10 (0.6)	0.5 (0.37)	1	115	120	12.7	12.7	6	1 1/4 in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100512	10 (0.6)	0.5 (0.37)	1	230	240	6.3	6.3	6	1 1/4 in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF10053200	10 (0.6)	0.5 (0.37)	3	200	208	3.8	3.8	6	1 1/4 in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100712 <sup>4,5</sup>	10 (0.6)	0.75 (0.56)	1	230	240	8.3	8.3	8	1 1/4 in. GFP	25.9 (658)	17 (432)	30 (14)	300
PF10073200 <sup>4,5</sup>	10 (0.6)	0.75 (0.56)	3	200	208	5.1	5.2	8	1 1/4 in. GFP	25.4 (645)	17 (432)	31 (14)	300
PF101012 <sup>4,5</sup>	10 (0.6)	1 (0.75)	1	230	240	9.6	9.6	9	1 1/4 in. GFP	27.9 (709)	18 (457)	33 (15)	100
PF10103200 <sup>4,5</sup>	10 (0.6)	1 (0.75)	3	200	208	5.5	5.5	9	1 1/4 in. GFP	27.3 (693)	18 (457)	37 (17)	300
PF102012 <sup>6,7,8</sup>	10 (0.6)	2 (1.49)	1	230	240	12.1	12.1	18	1 1/4 in. SS	39.5 (1003)	22 (559)	48 (22)	100
PF10203200 <sup>6,8</sup>	10 (0.6)	2 (1.49)	3	200	208	8.7	8.7	18	1 1/4 in. SS	37.9 (963)	20 (508)	44 (20)	300
PF200511	20 (1.5)	0.5 (0.37)	1	115	120	12.3	12.5	4	1 1/4 in. GFP	22.3 (566)	18 (457)	25 (11)	300
PF200512	20 (1.5)	0.5 (0.37)	1	230	240	6.4	6.5	4	1 1/4 in. GFP	22.5 (572)	18 (457)	26 (12)	300
PF20053200	20 (1.5)	0.5 (0.37)	3	200	208	3.7	3.8	4	1 1/4 in. GFP	22.3 (566)	18 (457)	26 (12)	300
PF201012 <sup>4,5</sup>	20 (1.5)	1 (0.75)	1	230	240	10.5	10.5	7	1 1/4 in. GFP	28.4 (721)	20 (508)	33 (15)	100
PF20103200 <sup>4,5</sup>	20 (1.5)	1 (0.75)	3	200	208	5.8	5.9	7	1 1/4 in. GFP	27.8 (706)	20 (508)	33 (15)	300
PF201512 <sup>4,5</sup>	20 (1.5)	1.5 (1.11)	1	230	240	12.4	12.6	9	1 1/4 in. GFP	34.0 (864)	24 (610)	41 (19)	100
PF20153200 <sup>4,5</sup>	20 (1.5)	1.5 (1.11)	3	200	208	7.1	7.2	9	1 1/4 in. GFP	30.7 (780)	20 (508)	35 (16)	300
PF300511	30 (1.9)	0.5 (0.37)	1	115	120	11.8	11.8	3	1 1/4 in. GFP	21.3 (541)	20 (508)	28 (13)	300
PF300512	30 (1.9)	0.5 (0.37)	1	230	240	6.2	6.2	3	1 1/4 in. GFP	21.3 (541)	20 (508)	25 (11)	300
PF30053200	30 (1.9)	0.5 (0.37)	3	200	208	3.6	3.6	3	1 1/4 in. GFP	21.3 (541)	20 (508)	25 (11)	300
PF300712	30 (1.9)	0.75 (0.56)	1	230	240	8.5	8.5	5	1 1/4 in. GFP	24.8 (630)	21 (533)	29 (13)	300
PF30073200	30 (1.9)	0.75 (0.56)	3	200	208	4.9	4.9	5	1 1/4 in. GFP	24.6 (625)	21 (533)	30 (14)	300
PF301012 <sup>4</sup>	30 (1.9)	1 (0.75)	1	230	240	10.4	10.4	6	1 1/4 in. GFP	27.0 (686)	22 (559)	32 (15)	100
PF30103200 <sup>4</sup>	30 (1.9)	1 (0.75)	3	200	208	5.8	5.8	6	1 1/4 in. GFP	26.4 (671)	22 (559)	33 (15)	300
PF301512 <sup>4,5</sup>	30 (1.9)	1.5 (1.11)	1	230	240	12.6	12.6	8	1 1/4 in. GFP	32.8 (833)	24 (610)	40 (18)	100
PF30153200 <sup>4,5</sup>	30 (1.9)	1.5 (1.11)	3	200	208	6.9	6.9	8	1 1/4 in. GFP	29.8 (757)	22 (559)	34 (15)	300
PF302012 <sup>4,5,7</sup>	30 (1.9)	2 (1.49)	1	230	240	11	11	10	1 1/4 in. SS	35.5 (902)	26 (660)	44 (20)	100
PF30203200 <sup>4,5</sup>	30 (1.9)	2 (1.49)	3	200	208	9.3	9.3	10	1 1/4 in. SS	34.0 (864)	24 (610)	41 (19)	300
PF303012 <sup>6,7,8</sup>	30 (1.9)	3 (2.23)	1	230	240	16.8	16.8	14	1 1/4 in. SS	44.5 (1130)	33 (838)	54 (24)	100
PF303032 <sup>6,8</sup>	30 (1.9)	3 (2.23)	3	230	240	10	10.1	14	1 1/4 in. SS	44.3 (1125)	27 (686)	52 (24)	300
PF305012 <sup>6,7,8</sup>	30 (1.9)	5 (3.73)	1	230	240	25.6	25.8	23	1 1/4 in. SS	66.5 (1689)	53 (1346)	82 (37)	100
PF305032 <sup>6,8</sup>	30 (1.9)	5 (3.73)	3	230	240	16.6	16.6	23	1 1/4 in. SS	60.8 (1544)	48 (1219)	66 (30)	300
PF500511	50 (3.2)	0.5 (0.37)	1	115	120	12.1	12.1	2	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF500512	50 (3.2)	0.5 (0.37)	1	230	240	6.2	6.2	2	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF50053200	50 (3.2)	0.5 (0.37)	3	200	208	3.7	3.7	2	2 in. SS	20.3 (516)	24 (610)	28 (13)	300
PF500712	50 (3.2)	0.75 (0.56)	1	230	240	8.5	8.5	3	2 in. SS	23.7 (602)	25 (635)	31 (14)	300
PF50073200	50 (3.2)	0.75 (0.56)	3	200	208	4.9	4.9	3	2 in. SS	23.1 (587)	26 (660)	32 (15)	300
PF500734	50 (3.2)	0.75 (0.56)	3	460	480	1.8	1.8	3	2 in. SS	34.8 (884)	25 (635)	31 (14)	300
PF501012	50 (3.2)	1 (0.75)	1	230	240	10.1	10.1	4	2 in. SS	27.0 (686)	26 (660)	35 (16)	100
PF50103200	50 (3.2)	1 (0.75)	3	200	208	5.7	5.7	4	2 in. SS	26.4 (671)	26 (660)	39 (18)	300
PF501512 <sup>4</sup>	50 (3.2)	1.5 (1.11)	1	230	240	12.5	12.6	5	2 in. SS	32.5 (826)	30 (762)	41 (19)	100
PF50153200 <sup>4</sup>	50 (3.2)	1.5 (1.11)	3	200	208	7	7	5	2 in. SS	29.3 (744)	26 (660)	35 (16)	300
PF503012 <sup>4,5,7,8</sup>	50 (3.2)	3 (2.23)	1	230	240	17.7	17.7	8	2 in. SS	43 (1092)	37 (940)	55 (25)	100
PF503032 <sup>4,5,8</sup>	50 (3.2)	3 (2.23)	3	230	240	10.4	10.4	8	2 in. SS	40 (1016)	30 (762)	46 (21)	300
PF50303200 <sup>4,5,8</sup>	50 (3.2)	3 (2.23)	3	200	208	13.1	13.1	8	2 in. SS	43.4 (1102)	30 (762)	55 (25)	300
PF505032 <sup>6,8</sup>	50 (3.2)	5 (3.73)	3	230	240	16.5	16.5	13	2 in. SS	59.3 (1506)	49 (1245)	64 (29)	300
PF751512	75 (4.7)	1.5 (1.11)	1	230	240	12.1	12.3	4	2 in. SS	33.4 (848)	30 (762)	44 (20)	100

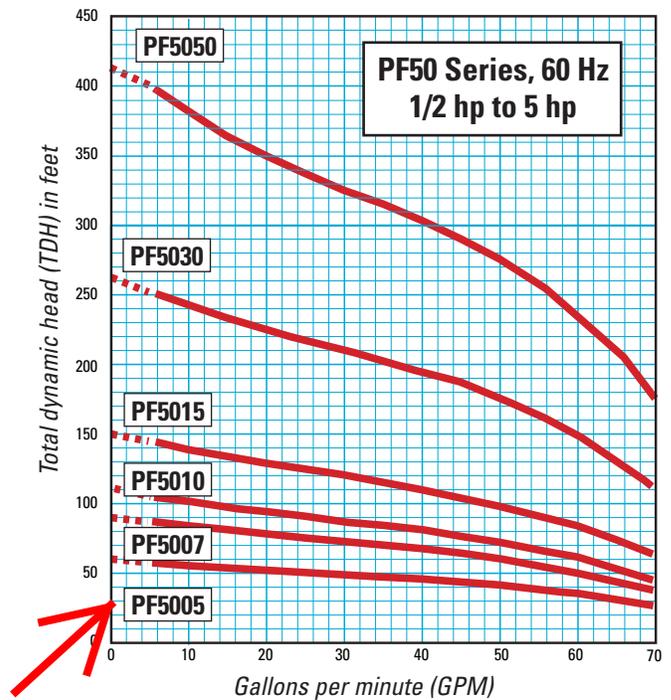
See notes on following page.

# PF Series High-Head Effluent Pumps (continued)

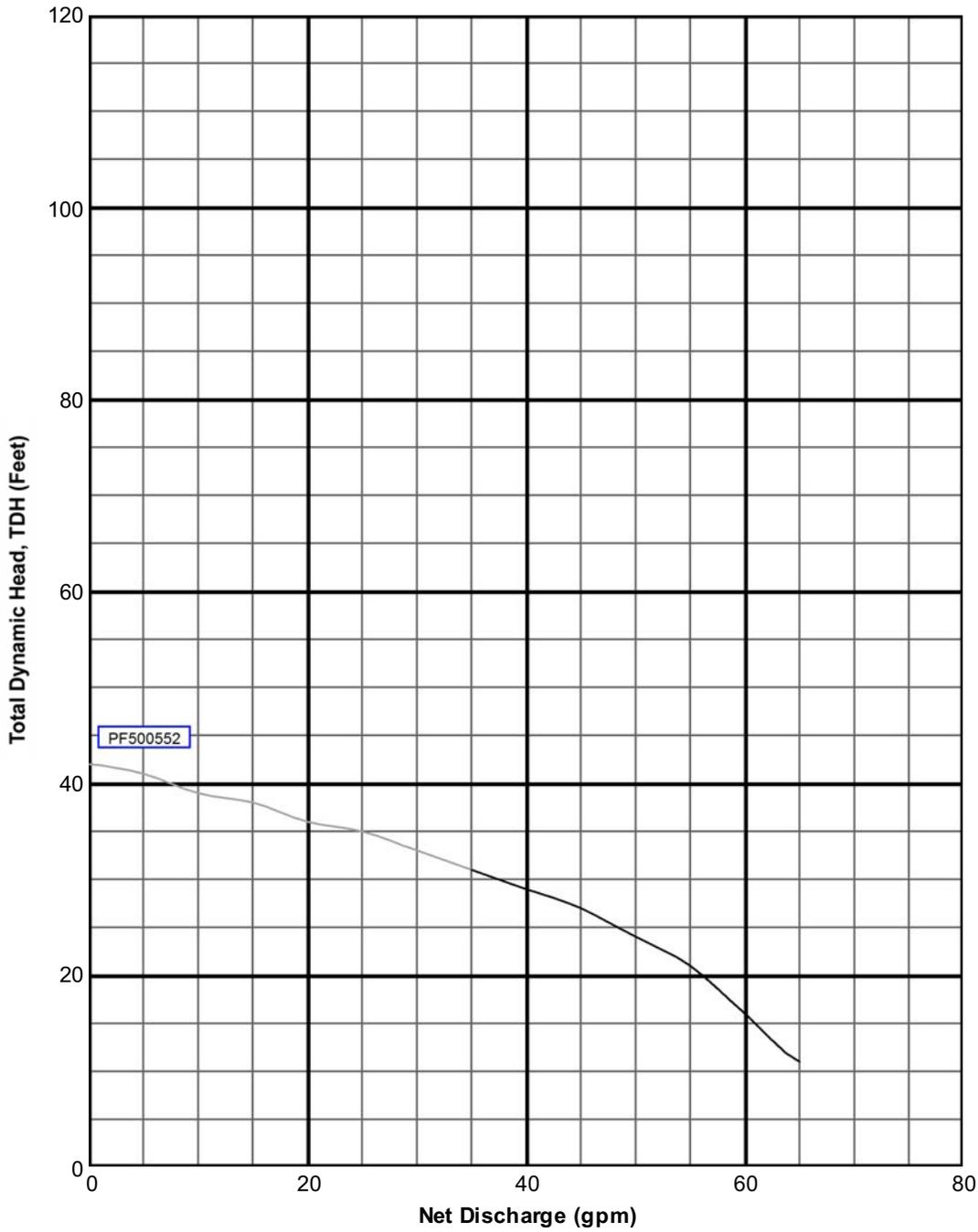
## Using a Pump Curve

A *pump curve* helps you determine the best pump for your system. Pump curves show the relationship between flow (gpm or L/sec) and pressure (total dynamic head, or TDH), providing a graphical representation of a pump's optimal performance range. Pumps perform best at their *nominal flow rate* — the value, measured in gpm (or L/sec), expressed by the first two numerals in an Orenco pump nomenclature. At low flow rates, TDH varies from pump to pump, so it is represented as a dashed line in the pump curves. For most accurate pump specification, use Orenco's PumpSelect™ software.

## 60 Hz Models



**Pump Curve**  
for PF500552



## ADS BioDiffuser ARC 36™ SEPTIC LEACHING CHAMBER SPECIFICATIONS

### Scope

This specification describes the BioDiffuser ARC 36 chamber unit for use in onsite wastewater disposal applications.

### Chamber Requirements

BioDiffuser ARC 36 chambers are manufactured from high-density polyethylene with an open bottom, solid top and louvered sidewalls. Sidewall louvers shall be designed to minimize soil intrusion.

Chamber shall meet the load rating of H-10 (16,000 lb per axle) with a minimum of 12 inches of cover when tested in accordance with IAPMO PS 63 and installed in accordance with ADS installation procedures.

### Chamber Connection

Each chamber shall interlock with an integral articulating joint. Articulating joints shall have a free range of horizontal rotation of 20 degrees, with a maximum of 10 degrees in either direction. Articulating joint shall be constructed by placing the dome engagement hole of the incoming chamber over the bullet post of the previously-installed chamber, with final engagement occurring when the lower base flanges of the incoming chamber under-lap the raised base flanges of the previously-installed chamber.

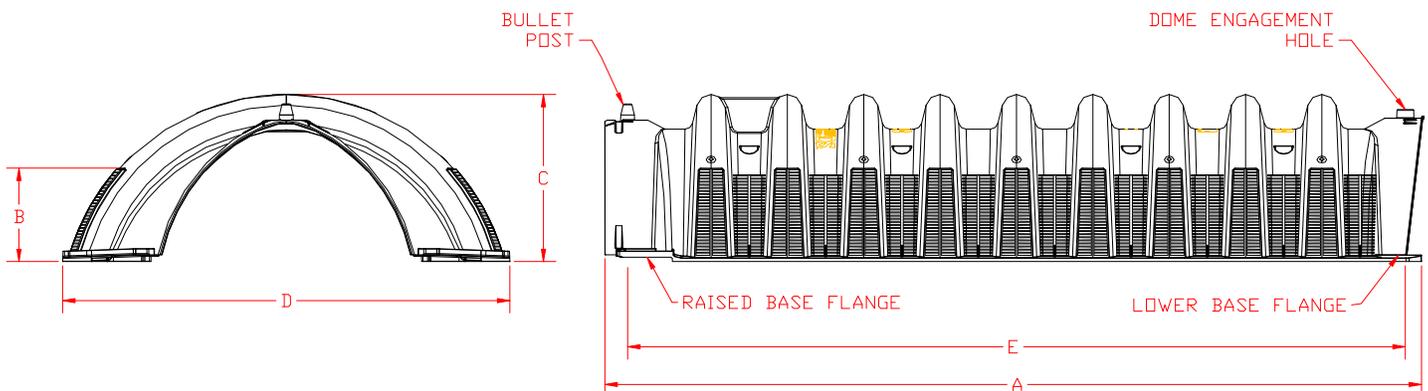
### Material Properties

Each chamber shall be manufactured from high density polyethylene resin as defined and described in IAPMO PS 63.

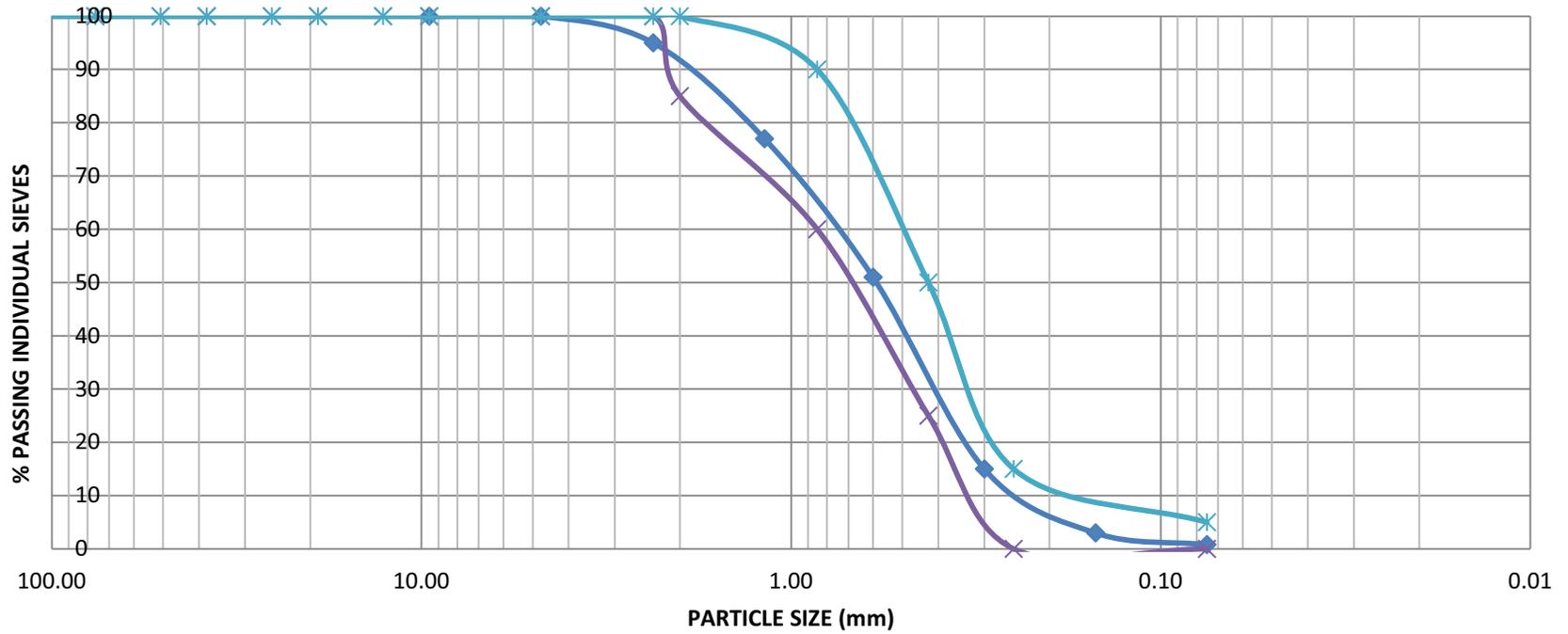
### Installation

Installation shall be in accordance with ADS installation procedures and those issued by the local health department regulations.

BioDiffuser ARC 36 Model No. 3613BD	
Length (A)	63 in
Repeat Length (E)	60 in
Side Wall Height (B)	7.13 in
Overall Height (C)	13 in
Overall Width (D)	34.5 in
Capacity	8.04 cu ft (60.14 gal)
Weight	16 lbs
Pallet Quantity	60 chambers
Van (Box Trailer) Quantity	25 Pallets
Flatbed Quantity	22 Pallets



# WOLVERINE CONCRETE SAND



**WET SIEVE GRADATION CALCULATION SHEET-ASTM C117, C136, C128**

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Western Region Lab

Date 3/27/2012

Time 2:45 p.m.



- Stockpile
- Shipment
- Belt cut From Belt # \_\_\_\_\_
- Blend Comment: \_\_\_\_\_
- Washed

Technician Ben Weber  
Product Name Concrete sand

Material Source Wolverine RM

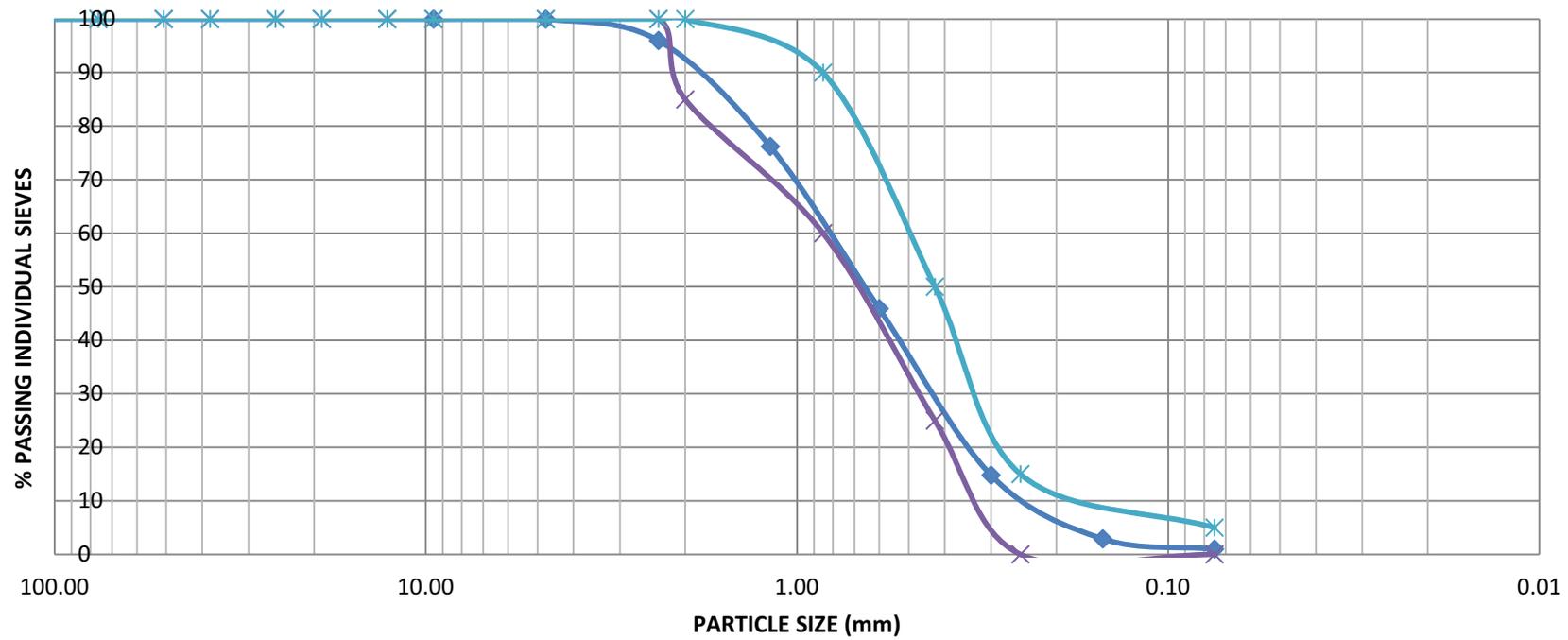
U.S. SIEVE	WEIGHT RETAINED	RETAINED % DRY	PASSING % DRY	ASTM Specs % MIN	ASTM Specs % MAX
3/8"	0.0	0.0%	100%	100%	100%
#4	1.6	0.1%	100%	95%	100%
#8	62.7	4.5%	95%	80%	100%
#16	250.2	18.0%	77%	50%	85%
#30	372.3	26.7%	51%	25%	60%
#50	493.9	35.4%	15%	5%	30%
#100	170.0	12.2%	3%	0%	10%
#200	31.2	2.2%	0.8%	0.0%	3.0%
PAN	1.5	0.1%			
<b>TOTAL</b>	<b>1393.4</b>				
<b>Washed</b>	<b>1383.4</b>				

**Other Tests**

FM	2.58

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# HEINMILLER PIT SAND



◆ HEINMILLER PIT SAND    ✕ DEC MIN    \* DEC MAX

DEC SAND LINER (FILTER) SPECIFICATION			
SIEVE SIZE (in/#)	PARTICLE SIZE (mm)	DEC MIN	DEC MAX
4	101.60	100	100
3	76.20	100	100
2	50.80	100	100
1 1/2	38.10	100	100
1	25.40	100	100
3/4	19.05	100	100
1/2	12.70	100	100
3/8	9.53	100	100
4	4.75	100	100
8	2.36	100	100
10	2.00	85	100
20	0.85	60	90
40	0.43	25	50
60	0.25	0	15
200	0.08	0	5

HEINMILLER PIT SAND		
SIEVE SIZE (in/#)	PARTICLE SIZE (mm)	PERCENT PASSING
4	101.60	100
3	76.20	100
2	50.80	100
1 1/2	38.10	100
1	25.40	100
3/4	19.05	100
1/2	12.70	100
3/8	9.53	100.00
4	100.00	100.00
8	100.00	96.00
16	100.00	76.20
30	90.00	45.90
50	50.00	14.80
100	15.00	2.90
200	5.00	0.99