
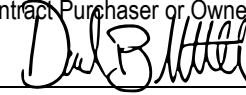
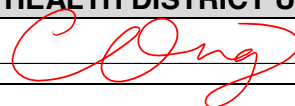
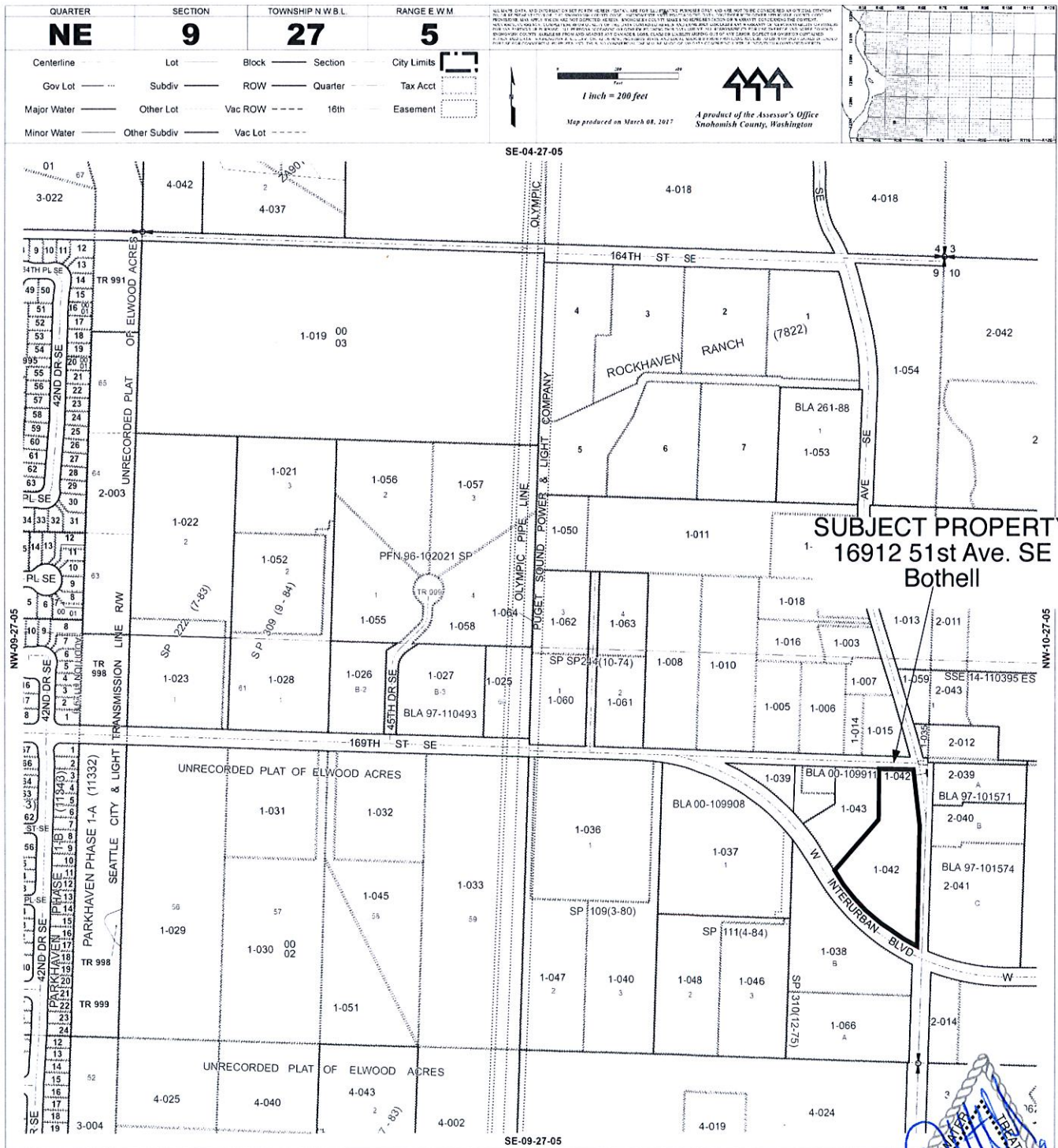




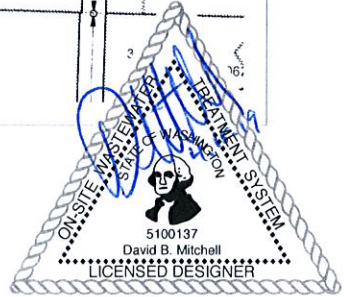
GENERAL APPLICATION INFORMATION			
PROPERTY TAX ACCOUNT NUMBER: 27050900104200			LOT #: NA
<input checked="" type="checkbox"/> New <input type="checkbox"/> Renewal <input type="checkbox"/> Redesign <input type="checkbox"/> Alteration <input type="checkbox"/> Revision <input type="checkbox"/> Repair <input type="checkbox"/> Waiver Request Submitted			
Applicant Name: Craig Bunney			
Mailing Address: 2828 Baker Ave	City: Everett	State: WA	Zip: 98201
Applicant Phone: 425-530-7373		Applicant Email: craigbunney@gmail.com	
Installation Address: 16912 51st Ave. SE		Installation City: Bothell	
Water Supply: Individual Well <input checked="" type="checkbox"/> Public <input type="checkbox"/> Name _____			
SEWAGE DISPOSAL SYSTEM DESIGN INFORMATION			
Type of Building: <input type="checkbox"/> New <input checked="" type="checkbox"/> Existing <input checked="" type="checkbox"/> SFR <input type="checkbox"/> Duplex <input type="checkbox"/> Commercial <input type="checkbox"/> Other <u>ADU</u> # of Bedrooms <u>3 + 2</u>			
Pretreatment Type: <input type="checkbox"/> SF <input type="checkbox"/> ATU <input type="checkbox"/> PBF <input type="checkbox"/> N/A <input type="checkbox"/> Other _____			
Dispersal Type: <input type="checkbox"/> Gravity <input checked="" type="checkbox"/> LPD <input type="checkbox"/> SSD <input type="checkbox"/> Mound <input type="checkbox"/> SLB <input type="checkbox"/> Other _____			
Lot Size: <u>5.0 AC</u> Operating Capacity: <u>300</u> (gallons/day) Design Flow: <u>600</u> (gallons/day)			
% Slope in Drainfield Area: <u>15%</u> Depth to Water Table/Restrictive Layer: <u>+/-43</u> (inches) Soil Texture Type (1-6): <u>3</u>			
Application Rate: <u>.8</u> (gal/sq ft/day) Absorption Area: <u>750</u> (sq ft) Installation Depth: <u>12"</u> (inches)			
Septic Tank Size: <u>+1000</u> (gallons) Pump Chamber Size: <u>1750</u> (gallons) Date Soils Logged: <u>03.27.2019</u>			
Required Cover Soil: Volume: <u>36</u> (cubic yards)			
DESIGNER INFORMATION			
Designer Name (Printed): <u>David Mitchell</u>		Designer Signature: 	
Address: <u>19712 E. Conway Hill Ln. Mount Vernon Washington 98274</u>		License Number: <u>5100137</u>	
Email: <u>david@mitchellseptic.com</u>		Phone: <u>360 421-3600</u>	
Fee Simple Owner, Contract Purchaser or Owner's Authorized Agent's Name (Printed): <u>David Mitchell</u>		Fee Simple Owner, Contract Purchaser or Owner's Authorized Agent's Signature: 	
Designer Comments: <u>New 3 bedroom SFR + connection with existing 2 bedroom ADU</u>			
HEALTH DISTRICT USE ONLY			
<input checked="" type="checkbox"/> APPLICATION APPROVED Sanitarian <u></u> Date <u>07/22/2019</u>			
Comments/Conditions: <u>Prior to clearance approval, well site application with two connection documentation must be submitted. Please refer to enclosed attachment.</u>			
<input type="checkbox"/> APPLICATION DISAPPROVED Sanitarian _____ Date _____			

Environmental Health Division

Section Map

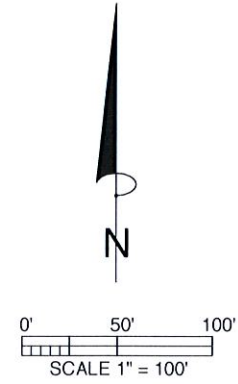
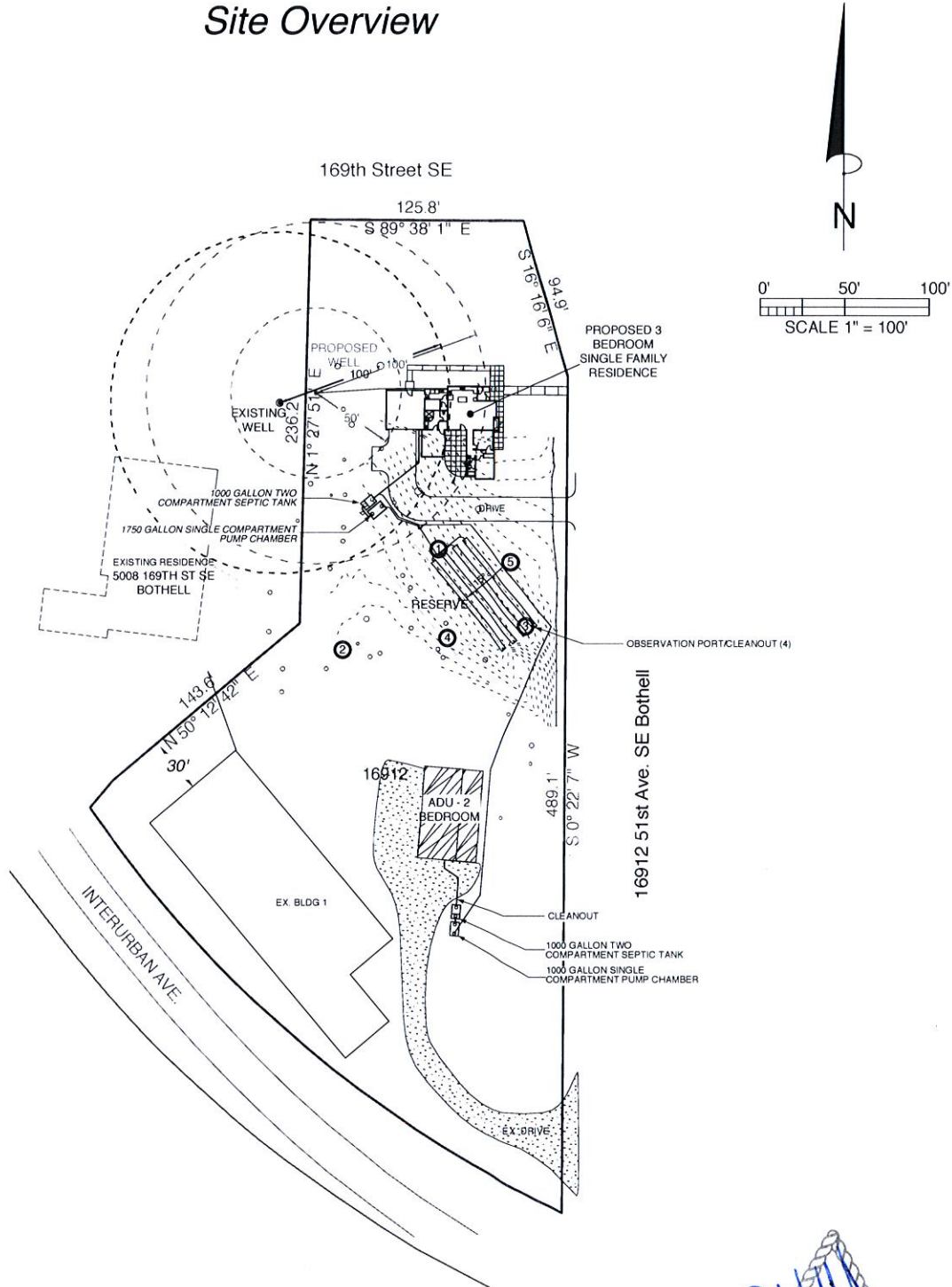


- Section map source: Snohomish County Assessor's GIS office. Accuracy is not guaranteed.
- All bearings, dimensions and locations are approximate.
- Map is intended to show parcel in context of neighboring properties and to assist in site location.



EXPIRES 03/18/2020

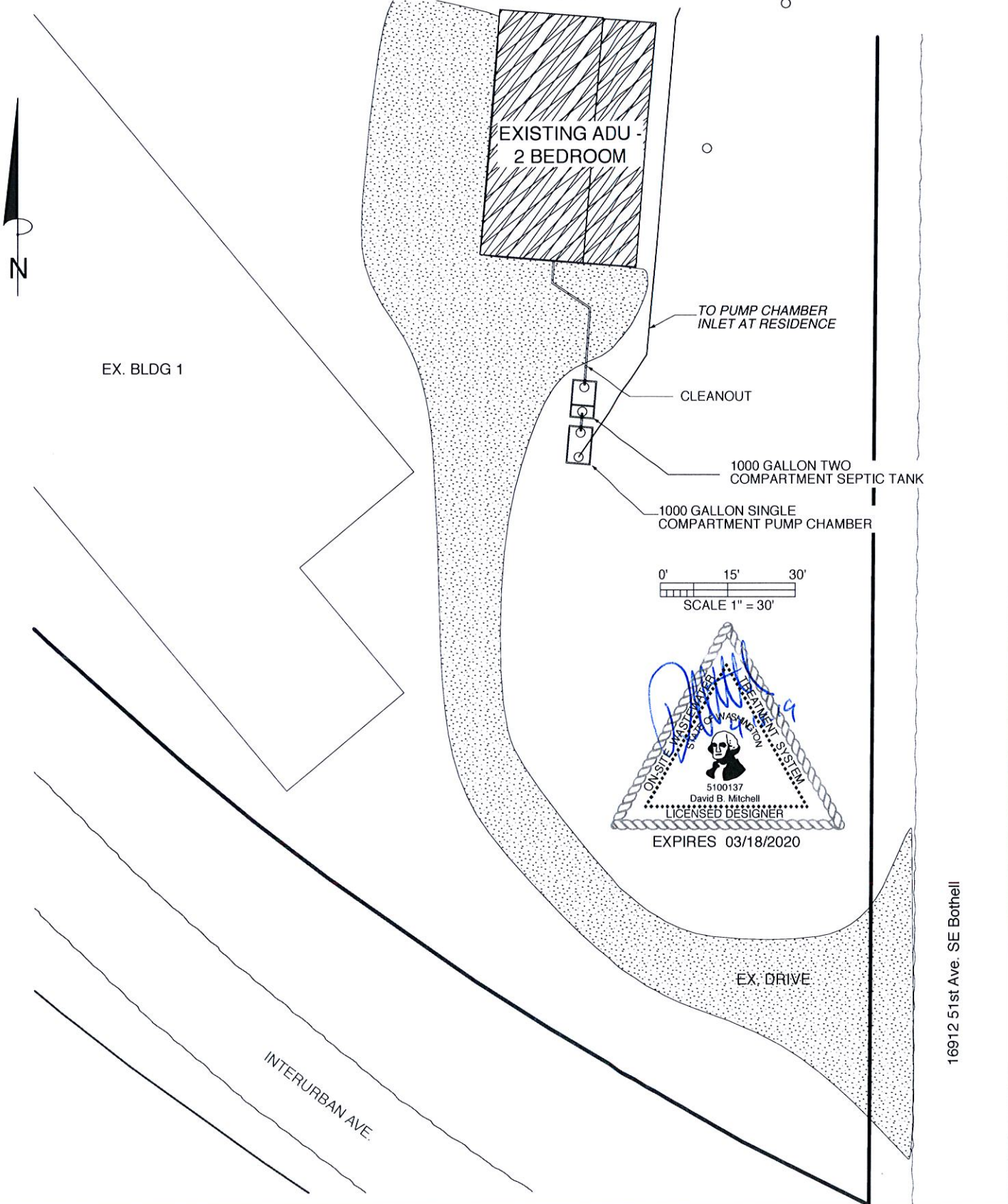
Site Overview




- ① = Soil log hole - see attached sheet for descriptions.
 - Site features and relative elevations established using a Leica 1103 total station and allegro CX data collector
 - This document is NOT a survey and is not intended as such. Property corner, boundary, topography, and site feature depictions are derived from field measurements, client representation, and public documents. This drawing is intended ONLY for the evaluation, review, and/or approval of an on-site septic system and should not be relied on for other purposes.
 - All bearings, dimensions, and locations are approximate.
 - Grading, clearing or other soils alteration/movement in the drain field area can destroy the sites ability to support an on-site septic system. Clearing shall be performed only after consultation with a licensed designer or installer.
 - Minimum County in state code requirements shall be met whether described in this document or not.
 - Call the Washington Utilities Coordinating Council BEFORE YOU DIG at 1-800-424-5555. This service is free and requires 48 hour notice.
 - Waste water entering the system is expected to have the consistency and strength typical of domestic households, (AKA "residential sewage") with septic tank effluent parameters not to exceed the following ranges: BOD5: 130-200 mg/L; CBOD5: 108-191 mg/L; TSS: 49-150 mg/L; Oil and Grease: 10-25 mg/L.
- IMPORTANT REFER TO ATTACHED DESIGN COMMENTARY**




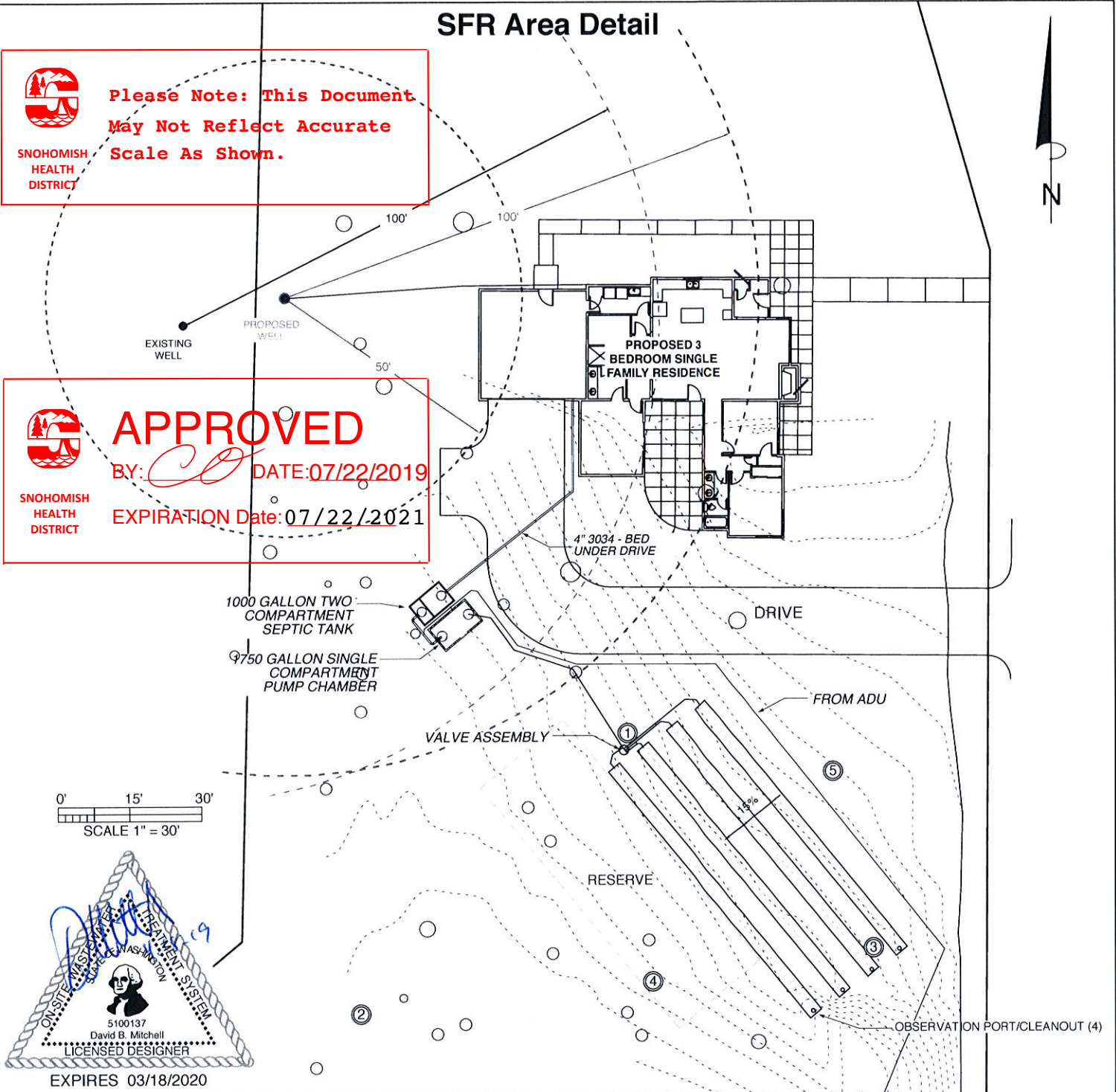
ADU Area Detail



SFR Area Detail

 **Please Note: This Document May Not Reflect Accurate Scale As Shown.**

 **APPROVED**
 BY: *[Signature]* DATE: **07/22/2019**
 EXPIRATION Date: **07/22/2021**



ON-SITE WASTEWATER TREATMENT SYSTEM
 SNOHOMISH COUNTY, WASHINGTON
 5100137
 David B. Mitchell
 LICENSED DESIGNER
 EXPIRES 03/18/2020

- NOTES:**
- = Tree
 - ① = Soil log hole - see attached sheet for descriptions.
 - Site features and relative elevations established using a Leica 1103 total station and allegro CX data collector
 - This document is NOT a survey and is not intended as such. Property corner, boundary, topography, and site feature depictions are derived from field measurements, client representation, and public documents. This drawing is intended ONLY for the evaluation, review, and/or approval of an on-site septic system and should not be relied on for other purposes.
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- IMPORTANT REFER TO ATTACHED DESIGN COMMENTARY**

Soil Log Detail

EXAMINATION DATE: February 15, 2018 & and March 27, 2019
 PREVIOUS WEEK PRECIPITATION: SEASONALLY NORMAL
 EXPECTED WATER TABLE CONDITIONS: SEASONALLY NORMAL

HORIZON DEPTH	COLOR, MODIFIER	TEXTURE	APP. RATE	TYPE
---------------	-----------------	---------	-----------	------

SOIL LOG 1

0 TO 5 INCHES	BLK	SL	0.60	4
5 TO 21 INCHES	ORG BRN, GRAV.	LMS	0.80	3
21 TO 45 INCHES	OLIVE, GRAV.	LMS	0.80	3
45 TO 46 INCHES	GREY, COMPACT - HP	FS	--	--

MAX. ROOT DEPTH: 42 SYSTEM TYPE: LPD
 MIN. MOTTILING DEPTH: 29+
 DEPTH TO STANDING WATER: NONE

SOIL LOG 2

0 TO 7 INCHES	BRN	SL	0.60	4
7 TO 18 INCHES	ORG BRN, GRAV.	LMS	0.80	3
18 TO 44 INCHES	OLIVE, GRAV.	LCS	0.80	3
44 TO 45 INCHES	GREY, COMPACT - HP	FS	--	--

MAX. ROOT DEPTH: 28 SYSTEM TYPE: LPD
 MIN. MOTTILING DEPTH: 25+
 DEPTH TO STANDING WATER: NONE

SOIL LOG 3

0 TO 5 INCHES	BRN	SL	0.60	4
5 TO 18 INCHES	ORG BRN, GRAV.	LMS	0.80	3
18 TO 38 INCHES	OLIVE GREY, GRAV.	LCS	0.80	3
38 TO 41 INCHES	GREY, COMPACT - HP	FS	--	--

MAX. ROOT DEPTH: 36 SYSTEM TYPE: LPD
 MIN. MOTTILING DEPTH: 36+
 DEPTH TO STANDING WATER: NONE

SOIL LOG 4

0 TO 5 INCHES	BLK	SL	0.60	4
5 TO 36 INCHES	ORG BRN, GRAV.	LMS	0.80	3
36 TO 43 INCHES	OLIVE, GRAV.	LMS	0.80	3
43 TO 46 INCHES	GREY, COMPACT - HP	FS	--	--

MAX. ROOT DEPTH: 36 SYSTEM TYPE: LPD
 MIN. MOTTILING DEPTH: 36+
 DEPTH TO STANDING WATER: NONE

SOIL LOG 5

0 TO 9 INCHES	BRN	SL	0.60	4
5 TO 22 INCHES	ORG BRN, GRAV.	LMS	0.80	3
18 TO 43 INCHES	OLIVE, GRAV.	LMS	0.80	3
43 TO 44 INCHES	GREY, COMPACT - HP	FS	--	--

MAX. ROOT DEPTH: 36 SYSTEM TYPE: LPD
 MIN. MOTTILING DEPTH: 43+
 DEPTH TO STANDING WATER: NONE

PCS DESIGNATION: NOT DETERMINED

KEY TO ABBREVIATIONS:

Soil Textures: C = CLAY; CL = CLAY LOAM; CS = COARSE SAND; FS = FINE SAND; L = LOAM; LFS = LOAMY FINE SAND;

CS = LOAMY COARSE SAND; LMS = LOAMY MEDIUM SAND; LVFS = LOAMY VERY FINE SAND; MS = MEDIUM SAND;
 M = ORGANIC MATERIAL; SCL = SANDY CLAY LOAM; SICL = SILTY CLAY LOAM; SIL = SILT LOAM; SL = SANDY LOAM;

Soil Colors: BLK = BLACK; BRN = BROWN; DK = DARK; GRY = GRAY; OL = OLIVE; ORG = ORANGE; Y = YELLOW
 Soil Modifiers: BLKY = BLOCKY; CMT = CEMENTED; COB = COBBLY; CPT = COMPACT; GRAN = GRANULAR;
 RK = ROCKY; GRV = GRAVELLY; HP = HARD PAN; MT = MOTTLED; V = VERY; X = EXTREMELY;

*M = DOUGLAS FIR; TP = WESTERN RED CEDAR; TH = WESTERN HEMLOCK; AR = RED ALDER; AM = BIG LEAF MAPLE

*B = COTTONWOOD; RS = SALMONBERRY; OC = INDIAN PLUM; GS = SALAL; SW = SWORD FERN

Soil logs, as described, support the specification of drain field depth and loading rate requirements pursuant to WAC 246-272A and Skagit County Health Department regulation
 DO NOT alter soil conditions in in designated drain field or reserve area including by vegetation removal.
 Grading, clearing, compaction, or other soils alteration/movement in the drain field area can destroy the site's ability to support an on-site septic system.
 Drain field site preparation shall be performed only under the direction of the designer or licensed installer of record
 Application Rate is expressed in gallons/square foot/day



EXPIRES 03/18/2020

Design Commentary

Project Description: On-site septic system to support a building permit for a 3 bedroom single family residence (SFR) and connection to a 2 bedroom Accessory Dwelling Unit (ADU):

Connect ADU to new septic system:

4" 3034 PVC gravity line:

- Connect ADU to septic tank using 4" 3034 PVC per SDR 35 maintaining 1/4"/foot minimum fall between building and septic tank inlet and such that new tanks are no greater than 12" deep.
- Install cleanout as indicated on attached detail

ADU Septic tank: concrete, 1000 gallon, two compartment

- Install as shallow as possible while maintaining gravity fall from ADU - top of septic tank lid shall be no greater than 12" deep
- Tank to have 24" (min.) diameter, cast in place risers with gasketed lids extending to finished grade
- Fit outlet with Zabel A100-8 outlet baffle filter or approved equivalent
- Tank elevation shall be carefully established prior to digging the tank hole

gravity feeds, via 4" 3034 PVC with 1/8"/foot minimum fall:

ADU Pump chamber: concrete, 1000 gallon, single compartment tank with risers to grade;

- Tank to have 24" (min.) diameter, cast in place risers with gasketed lids extending to finished grade
- Houses pump and transducer
- Adjust flow to ~5 gallons/minute using valve and such that pump run time is ~ 2 minutes;

connects via **1.25" PVC Sch 40 Transmission Line** to outlet side of Tank #1

Install New SFR system

4" 3034 PVC gravity line:

- Replace line residence to septic tank using 4" 3034 PVC per SDR 35 maintaining 1/4"/foot minimum fall such that new tanks are no greater than 12" deep.
- Install cleanout as indicated on attached detail

SFR Septic Tank:

- 1000 gallon, two compartment concrete tank approved for use in Washington State
- Tank to have 24" (min.) diameter, cast in place risers with gasketed lids extending to finished grade
- Fit outlet with Zabel A100-8 outlet baffle filter or approved equivalent
- Tank elevation shall be carefully established prior to digging the tank hole

gravity feeds, via 4" 3034 PVC with 1/8"/foot minimum fall:

SFR Pump chamber:

- 1750 gallon concrete, single compartment tank
- Tank to have 24" (min.) diameter, cast in place risers with gasketed lids extending to finished grade
- Houses pump and controls

feeds via **1.25" PVC Sch 40 Transmission Line**

Valve Assembly: 1.25" header feeding 1.25 inch dia. laterals. Fit lines with ball valves. Use ball valves to adjust residual dynamic head to 60" in each trench

- Extend access to grade.

Pressure drain field: Designed for 5 bedroom x 120 gallons/bedroom/day equals peak loading of 600 gallons per day/ .8 gal/sq. ft./ day = 750 square feet. Configure as 4 pressurized trenches, each 3 feet wide, lengths as shown, totaling 267 lineal feet.

- Spacing between 1/8 inch orifices shall be 60" which implies a total of 56 orifices
- Orient orifices at 12 o'clock position and install orifice shields
- 4.5' minimum wall to wall spacing
- Install using Hancor ARC 36 gravel-less vaults or pre-approved equivalent

TANEX Cintoflex E mesh required on trench bottom prior to placing gravel-less vault to act as rodent barrier.

- Install clean out at distal end of each lateral (4 total)

Pump: OSI high head PF3005 or pre-approved equivalent

Control Panel: Aquaworx IPC-S01 panel featuring simplex pump operation, data collection, and transducer.

• **The transducer is manufactured with a shielded, fixed length cable. The cable can be cut but not spliced.** The installer shall determine the required cable length prior to installation.

- Theoretical timer settings are shown on attached timer calculations sheet
- Actual settings are determined by on-site drawdown test not to exceed daily design flow
- Avoid placement of panel on exterior bedroom walls

Reserve: LPD system area shown

Pressure Fittings: PVC Fittings Sch 40 per ASTM D-2466.

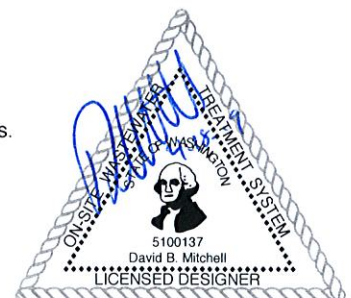
Piping: Gravity sewer: 4" PVC D-3034 ; Pressurized pipe: PVC Pipe Sch 40 per ASTM D-1785.

Encasing: Water lines shall maintain a minimum horizontal separation of 10' from septic system components.

NOTES:

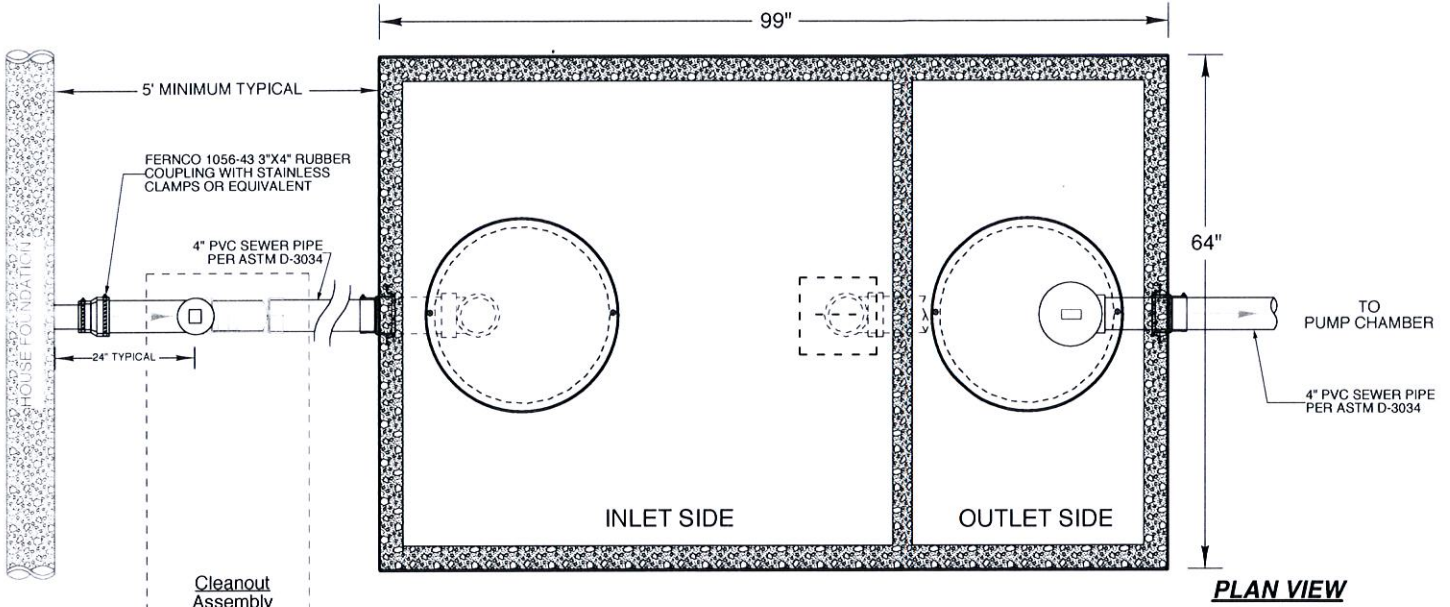
• **All tanks are to be water tested prior to backfill. All tanks to have risers to finished grade.**

• **It is the Licensed Installer's responsibility to supply the pump, floats, and alarm panel and plumb the pump and floats. Wiring the pump, floats, and alarm panel is the responsibility of a Licensed Electrician. All bid documents should reflect consideration of necessary wiring work.**

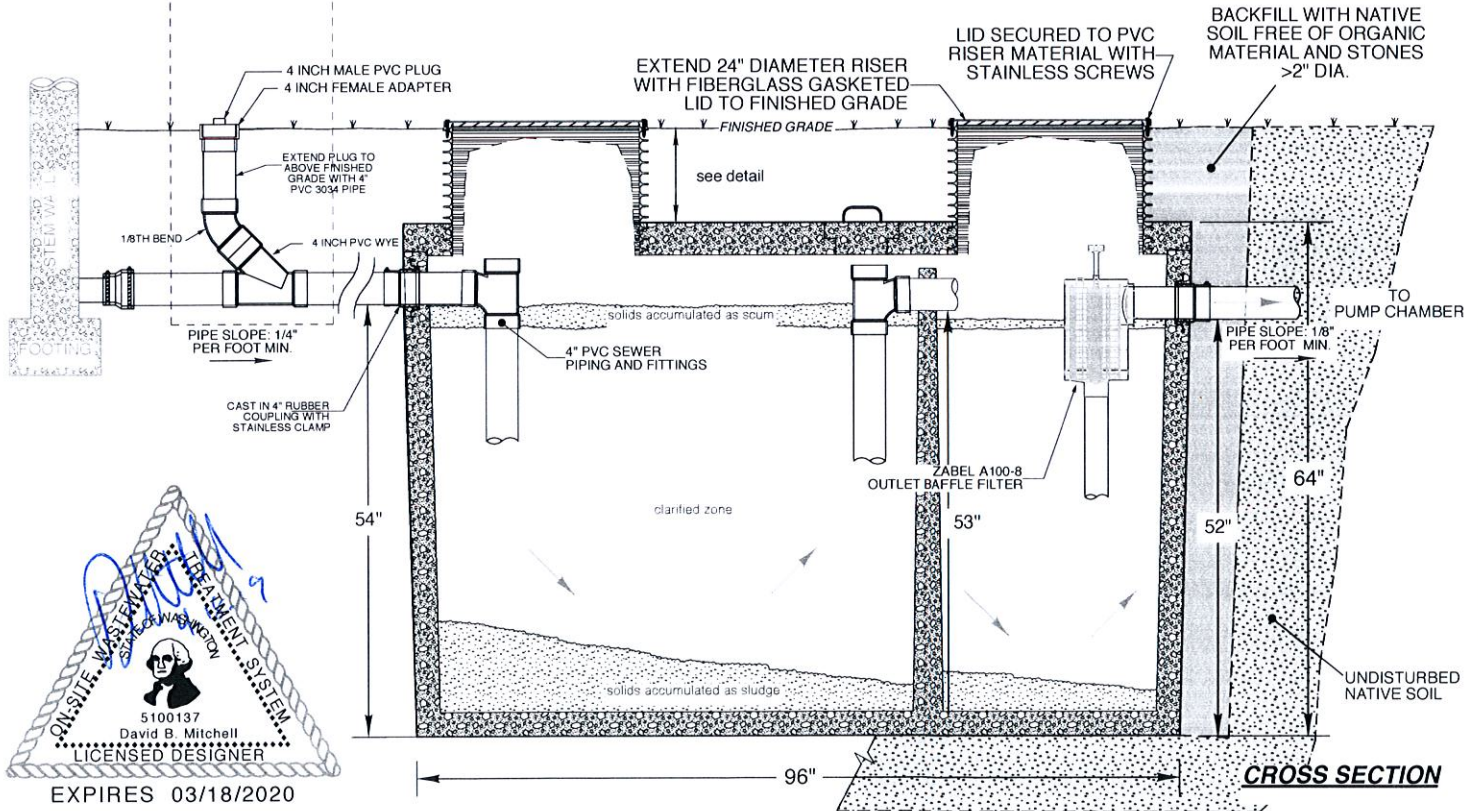


EXPIRES 03/18/2020

ADU and SFR 1000 Gallon Pre-Cast Concrete Two Compartment Septic Tank



PLAN VIEW



CROSS SECTION

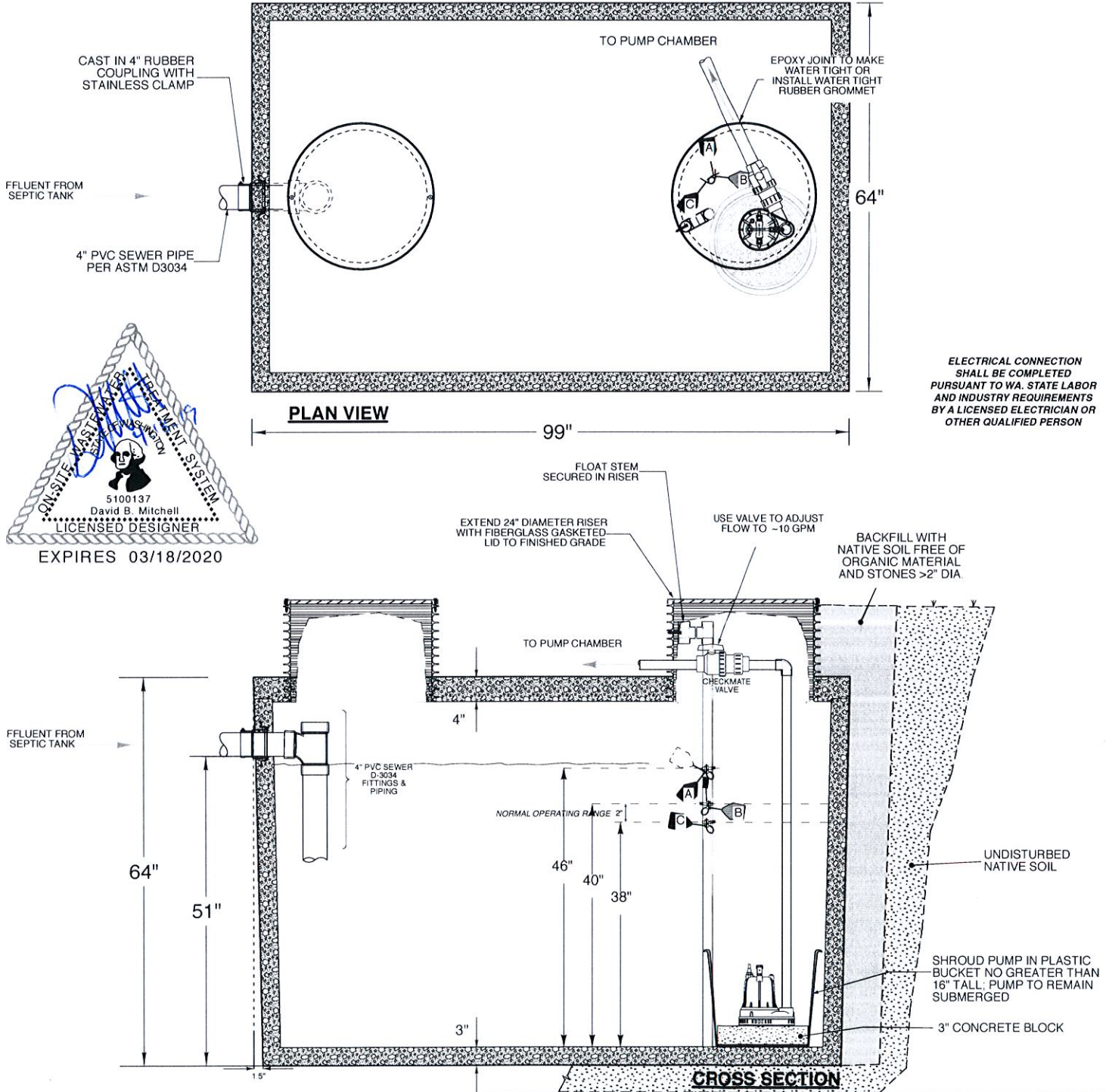


- NOTES:
- CONFIRM DIMENSIONS WITH TANK MANUFACTURER PRIOR TO INSTALLATION.
 - TANK SHALL BE WATERTIGHT AS INSTALLED.
 - CALL THE WASHINGTON UTILITIES COORDINATING COUNCIL BEFORE YOU DIG AT 1-800-424-5555. THIS SERVICE IS FREE AND REQUIRES 48 HOUR NOTICE.
 - WASTE WATER ENTERING THE SYSTEM IS EXPECTED TO HAVE THE CONSISTENCY AND STRENGTH TYPICAL OF DOMESTIC HOUSEHOLDS. (AKA: RESIDENTIAL SEWAGE) WITH SEPTIC TANK EFFLUENT PARAMETERS NOT TO EXCEED THE FOLLOWING RANGES: BOD5: 130-200 MG/L; CBOD5: 108-191 MG/L; TSS: 49-150 MG/L; OIL AND GREASE: 10-25 MG/L.
 - INDICATES DIRECTION OF WASTE WATER FLOW

THE DIMENSIONS SHOWN IN THIS DRAWING REPRESENT A TANK PRODUCED BY BERG VAULT COMPANY (360-424-4999). A SAME VOLUME CUZ CONCRETE (360-435-5531), WATER TIGHT SEPTIC TANK IS AN ACCEPTABLE ALTERNATIVE.

ADU PUMP CHAMBER

1000 Gallon Pre-cast Concrete Single Compartment Pump Chamber



ELECTRICAL CONNECTION SHALL BE COMPLETED PURSUANT TO WA. STATE LABOR AND INDUSTRY REQUIREMENTS BY A LICENSED ELECTRICIAN OR OTHER QUALIFIED PERSON

NOTES:
 CONFIRM DIMENSIONS WITH TANK MANUFACTURER PRIOR TO INSTALLATION.
 PIPING & FITTINGS IN AND AROUND TANKS SHALL BE 4" PVC SEWER PER ASTM D-3034 SDR 35
 TANK SHALL BE WATER TIGHT AS INSTALLED.
 CALL THE WASHINGTON UTILITIES COORDINATING COUNCIL BEFORE YOU DIG AT 1-800-424-5555.
 HIS SERVICE IS FREE AND REQUIRES 48 HOUR NOTICE.
 WASTEWATER ENTERING THIS SYSTEM IS EXPECTED TO HAVE THE CONSISTENCY AND STRENGTH TYPICAL
 F DOMESTIC HOUSEHOLDS. (AKA "RESIDENTIAL SEWAGE") WITH SEPTIC TANK EFFLUENT PARAMETERS NOT
 EXCEEDING THE FOLLOWING RANGES: BOD5: 130-200 MG/L; CBOD5: 108-191 MG/L; TSS: 49-150 MG/L; OIL AND
 GREASE: 10-25 MG/L
 ——— DESIGNATES DIRECTION OF LIQUID WASTE FLOW

FLOAT A = HIGH WATER ALARM
 FLOAT B = GREY ON FLOAT
 FLOAT C = BLACK OFF FLOAT

THE DIMENSIONS SHOWN IN THIS DRAWING REPRESENT A TANK PRODUCED BY BERG VAULT COMPANY (360-424-4999). A SAME VOLUME CUZ CONCRETE (360-435-5531), WATER TIGHT SEPTIC TANK IS AN ACCEPTABLE ALTERNATIVE.

ADU PUMP CHAMBER ELECTRONICS



PUMP

Submersible Effluent Pump

MODEL
PE31

SPECIFICATIONS

Pump - General:

- Discharge: 1/2" NPT
- Temperature: 104°F (40°C) maximum, continuous when fully submerged.
- Solids handling: 3/4" maximum sphere.
- Automatic models include a float switch.
- Manual models available.
- Pumping range: see performance chart or curve.

PE31 Pump:

- Maximum capacity: 53 GPM
- Maximum head: 25' TDH

PE41 Pump:

- Maximum capacity: 61 GPM
- Maximum head: 29' TDH

PE51 Pump:

- Maximum capacity: 70 GPM
- Maximum head: 37' TDH

MOTOR

General:

- Single phase
- 60 Hertz
- 115 and 230 volts
- Built in thermal overload protection with automatic reset.
- Class B insulation.
- Oil-filled design.
- High strength carbon steel shaft.

PE31 Motor:

- 33 HP, 3000 RPM
- 115 volts
- Shaded pole design

PE41 Motor:

- 40 HP, 3400 RPM
- 115 and 230 volts
- PSC design

PE51 Motor:

- 50 HP, 3400 RPM
- 115 and 230 volts
- PSC design

FEATURES

- Corrosion resistant construction.
- Cast iron body.
- Thermoplastic impeller and cover.
- Upper sleeve and lower heavy duty ball bearing construction.
- Motor is permanently lubricated for extended service life.
- Powered for continuous operation.
- All ratings are within the working limits of the motor.
- Quick disconnect power cord, 20' standard length, heavy duty 16/3 SJTW with 115 or 230 volt grounding plug.
- Complete unit is heavy duty, portable and compact.
- Mechanical seal is carbon, ceramic, BUNA and stainless steel.
- Stainless steel fasteners.

AGENCY LISTINGS

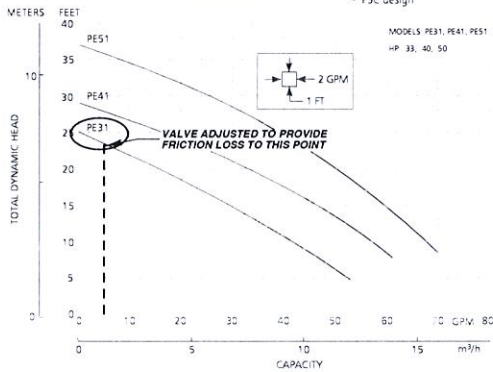
SP US
 Tested to UL 778 and CSA 22.2 108 Standards
 By Canadian Standards Association
 File #LR18549
 Goulds Pumps is ISO 9001 Registered

Goulds Pumps
 ITT Industries

APPLICATIONS

Specially designed for the following uses:

- Mound Systems
- Effluent/Dosing Systems
- Low Pressure Pipe Systems
- Basement Draining
- Heavy Duty Sump/Dewatering



© 2004 ITT Water Technology, Inc.
 Effective June, 2004
 BP31/41

CONTROL FLOATS

DOUBLE FLOAT™ pump switch

Mercury-activated, wide-angle switch designed to control pumps up to 1 HP at 120 VAC and 2 HP at 230 VAC.

This mercury-activated, wide-angle pump switch provides automatic control of pumps in non-potable water and sewage applications. It is well-suited for confined applications requiring an accurate pumping range. It is not sensitive to rotation or turbulence.

The Double Float™ consists of two floats. Each float contains a heavy-duty mercury switch. One of the two floats contains a holding relay which enables the floats to function in series.

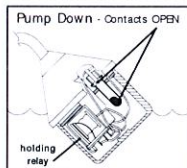
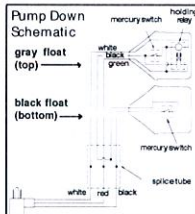
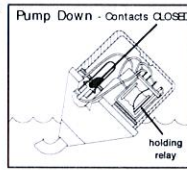
The holding relay eliminates pump chatter in turbulent conditions allowing the Double Float™ to operate relay control panels for larger pump applications.



U.S. Patent No. 4,262,216 and 4,201,261

FEATURES

- Controls pumps up to 1 HP at 120 VAC and 2 HP at 230 VAC.
- Adjustable pumping range of 1.75 to 48 inches (4.45 to 122 cm) with increased pumping range up to 6 feet (1.8 meters) available.
- Includes standard mounting clamps and boxed packaging.
- UL Listed for use in non-potable water and sewage.
- CSA Certified
- Three-year limited warranty.



SPECIFICATIONS

- Cable attached to float housing:** flexible 14 gauge, 2 and 3 conductor (UL, CSA) SJOW, water-resistant (CPE)
- Cable above patented splice:** flexible 14 gauge, 3 conductor (UL, CSA) SJTW, water-resistant, thermoplastic
- FLOATS:** 3.38 inch diameter x 4.55 inch long (8.58 x 11.56 cm) high impact, corrosion resistant, PVC housing for use in sewage and non-potable water up to 140°F (60°C)
- MERCURY SWITCH:** mercury-to-mercury contacts, hermetically sealed in a steel capsule
- ELECTRICAL:**
 - 120 VAC 50/60Hz Single Phase:**
 - Maximum Pump Running Current: 15 amps
 - Maximum Pump Starting Current: 55 amps
 - Recommended Pump HP: 1 HP or less
 - 230 VAC 50/60Hz Single Phase:**
 - Maximum Pump Running Current: 15 amps
 - Maximum Pump Starting Current: 35 amps
 - Recommended Pump HP: 2 HP or less

Note: This switch must be used with pumps that provide integral thermal overload protection.



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

ALARM



TANK ALERT® XT Alarm Installation Instructions

This alarm system monitors liquid levels in lift pump chambers, sump pump basins, holding tanks, sewage, agricultural, and other non-potable water applications.

The Tank Alert® XT indoor/outdoor alarm can serve as a high or low level alarm depending on the float switch model used. The alarm horn sounds and the red beacon illuminates when a potentially threatening liquid level condition occurs. A "power on" light on the switch indicates power to the alarm panel.

TANK ALERT® XT ALARM



- Voltage: 120 VAC, 50/60 Hz, 8.5 watts maximum (alarm condition) (circuit not supervised)
- Enclosure meets Type 3R water-tight standard
- Automatic alarm reset, horn silence switch, and alarm test switch
- Alarm horn sounds at 85 decibels at 10 feet (3 meters)
- Alarm system (when installed on separate circuit) operates even if pump circuit fails
- Maximum line impedance for initiating device: 100 ohms
- Complete package includes standard Sensor Float® control switch with 15 feet (4.57 meters) of cable (other lengths available) and mounting clamp
- Three-year limited warranty

OPTIONS

When ordered with the alarm, the system is available with:

- alternate float switch models for high or low liquid level warning
- auxiliary alarm contacts for easy attachment of remote devices (circuit not supervised) 120 VAC, 5 amps max, 50/60 Hz
- premounted terminal block so enclosure can also be used as a junction box for splicing pump, pump switch, and pump power. Meets NEC standard for junction boxes 20 amps, 120/230 VAC
- 6 foot (1.8 meter) power cord with 120 VAC plug and liquid-tight connectors

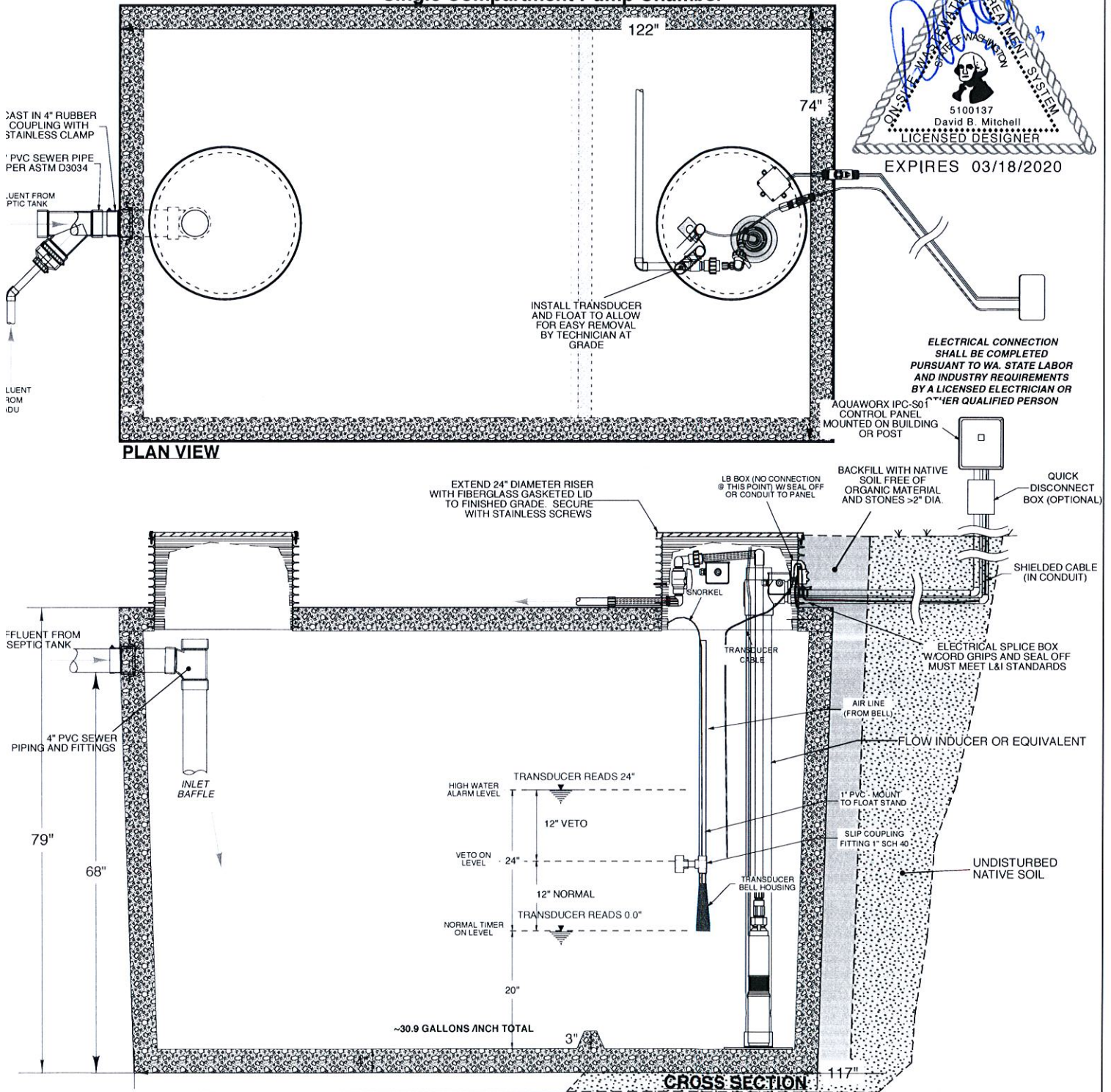


EXPIRES 03/18/2020

SFR PUMP CHAMBER

1750 Gallon Pre-cast Concrete

Single Compartment Pump Chamber



NOTES:
 1. CONFIRM DIMENSIONS WITH TANK MANUFACTURER PRIOR TO INSTALLATION.
 2. PIPING & FITTINGS IN AND AROUND TANKS SHALL BE 4" PVC SEWER PER ASTM D-3034 SDR 35.
 3. TANK SHALL BE WATER TIGHT AS INSTALLED.
 4. CALL THE WASHINGTON UTILITIES COORDINATING COUNCIL BEFORE YOU DIG AT 1-800-424-5555.
 5. SERVICE IS FREE AND REQUIRES 48 HOUR NOTICE.
 6. WASTEWATER ENTERING THIS SYSTEM IS EXPECTED TO HAVE THE CONSISTENCY AND STRENGTH TYPICAL OF DOMESTIC HOUSEHOLDS. (AKA "RESIDENTIAL SEWAGE") WITH SEPTIC TANK EFFLUENT PARAMETERS NOT EXCEEDING THE FOLLOWING RANGES: BOD5: 130-200 MG/L; CBOD5: 108-191 MG/L; TSS: 49-150 MG/L; OIL AND GREASE: 10-25 MG/L.
 7. -> DESIGNATES DIRECTION OF LIQUID WASTE FLOW.

THE DIMENSIONS SHOWN IN THIS DRAWING REPRESENT A TANK PRODUCED BY BERG VAULT COMPANY (360-424-4999). A SAME VOLUME CUZ CONCRETE (360-435-5531). WATER TIGHT SEPTIC TANK IS AN ACCEPTABLE ALTERNATIVE.

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Pressure Distribution and Timer Setting Calculations

System Summary Data:

Gallons per day	600
Soil loading rate	0.8 gal/sq. ft./day
Drain field size	750.0 sq. ft.
Trench width	3 ft.
Lineal feet of trench	250 ft.
Maximum orifice spacing	60 inches
Minimum # orifices	52
Number of laterals	4
Number of orifices/lateral	13
Total number of orifices	52
Trench length	67.0 feet each trench
Lateral length for orifice calculations	65.0 (~1/2 orf. spacing removed at both ends)
Calculated orifice spacing	60 inches
Orifice diameter	0.125 1/8
Dynamic residual head in feet	5 aka 'distal head' (ft)
Flow per orifice at residual head	0.43 flow of .125 dia. orifice at 5' residual head**
Total flow at 2' head	22.36 gpm

Pressure Distribution Calculations:

4 laterals end fed by a manifold adjusted with valves to 5 feet dynamic residual head.
 Spacing between orifices shall be 60 inches which implies a total of 52, 1/8 inch orifices
 5 feet residual head yields 0.43 gallons per minute times 52 orifices equals 22.36 gallons per minute.

	# orifices	Pipe Dia. inches	Pipe Spec.	Pipe Length (ft)	Flow (gpm)	Pipe/Fitting Head Loss (ft)*	Elevation Difference	Total Head
Pump to Manifold		1.25	Sch 40	60	22.36	3.88	10	13.88
Valve Assembly	-	1.25	Sch 40	--	22.36	2.00	0	2.00
Lateral 1	13	1.25	Sch 40	65	5.59	0.32	0	0.32
Lateral 2	13	1.25	Sch 40	65	5.59	0.32	0	0.32
Lateral 3	13	1.25	Sch 40	65	5.59	0.32	0	0.32
Lateral 4	13	1.25	Sch 40	65	5.59	0.32	0	0.32
Residual Head								5.0
Totals	52				22.60			22.90

*Friction loss formula

$f = L (Q/K)^{1.85}$
 where
 f = friction loss through pipe
 L = length of pipe (ft)
 Q = flow (gpm)
 K = constant from Table

**Discharge formula

$Q = 11.79 * d^2 * h^{.5}$
 where
 Q = orifice discharge rate (gpm)
 d = orifice diameter in inches
 h = residual pressure head in feet

Theoretical Timer Settings

	('normal' time regime)		('Veto' time regime)	
assumed usage per day	240	gal/day	600	gal/day
flow to drain field	22.6	gal/min	22.6	gal/min
total minutes on to DF per day	11	min/day	26.5	min/day
on time	2.0	minutes	2.0	minutes
dose volume	45	gal	45	gal
cycles / day	5		13	
off time	4.5	hours	1.8	hours

Note: set timer based on actual performance to drain field



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Pump Specification

Parameters

Discharge Assembly Size	1.25	inches
Transport Length	60	feet
Transport Pipe Class	40	
Transport Line Size	1.25	inches
Distributing Valve Model	None	
Max Elevation Lift	10	feet
Manifold Length	20	feet
Manifold Pipe Class	40	
Manifold Pipe Size	1.25	inches
Number of Laterals per Cell	4	
Lateral Length	64	feet
Lateral Pipe Class	40	
Lateral Pipe Size	1.25	inches
Orifice Size	1/8	inches
Orifice Spacing	5	feet
Residual Head	5	feet
Flow Meter	None	inches
'Add-on' Friction Losses	0	feet

Calculations

Minimum Flow Rate per Orifice	0.43	gpm
Number of Orifices per Zone	52	
Total Flow Rate per Zone	22.6	gpm
Number of Laterals per Zone	4	
% Flow Differential 1st/Last Orifice	1.0	%
Transport Velocity	4.9	fps

Frictional Head Losses

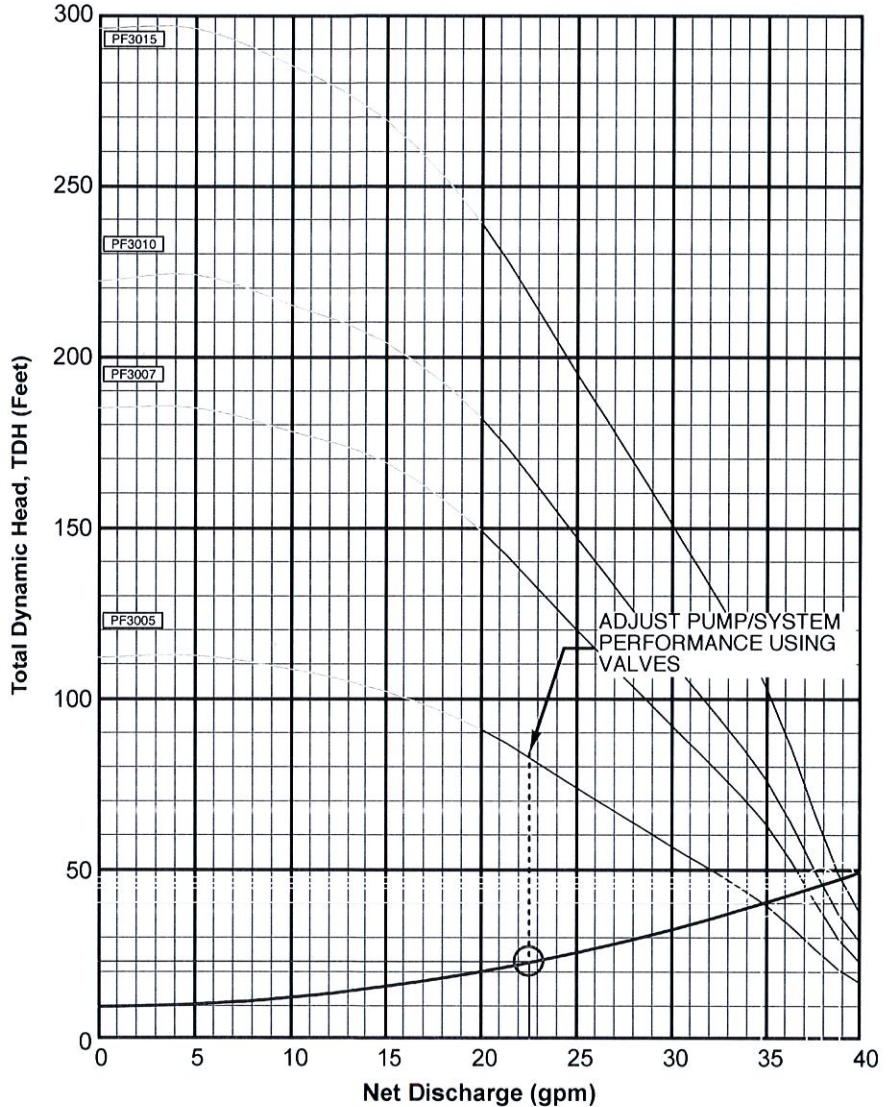
Loss through Discharge	3.6	feet
Loss in Transport	3.9	feet
Loss through Valve	0.0	feet
Loss in Manifold	0.4	feet
Loss in Laterals	0.1	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	0.0	feet

Pipe Volumes

Vol of Transport Line	4.7	gals
Vol of Manifold	1.6	gals
Vol of Laterals per Zone	19.9	gals
Total Volume	26.1	gals

Minimum Pump Requirements

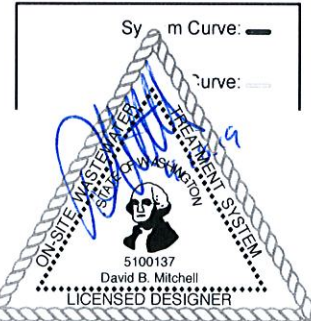
Design Flow Rate	22.6	gpm
Total Dynamic Head	22.9	feet



PumpData

PF3005 High Head Effluent Pump
 30 GPM, 1/2HP
 115/230V 1Ø 60Hz, 200V 3Ø 60Hz

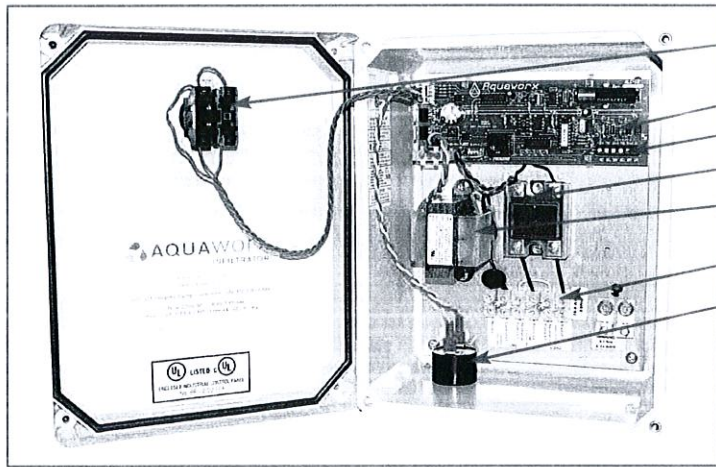
Legend



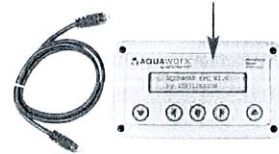
EXPIRES 03/18/2020

Aquaworx IPC-S01 Control Panel

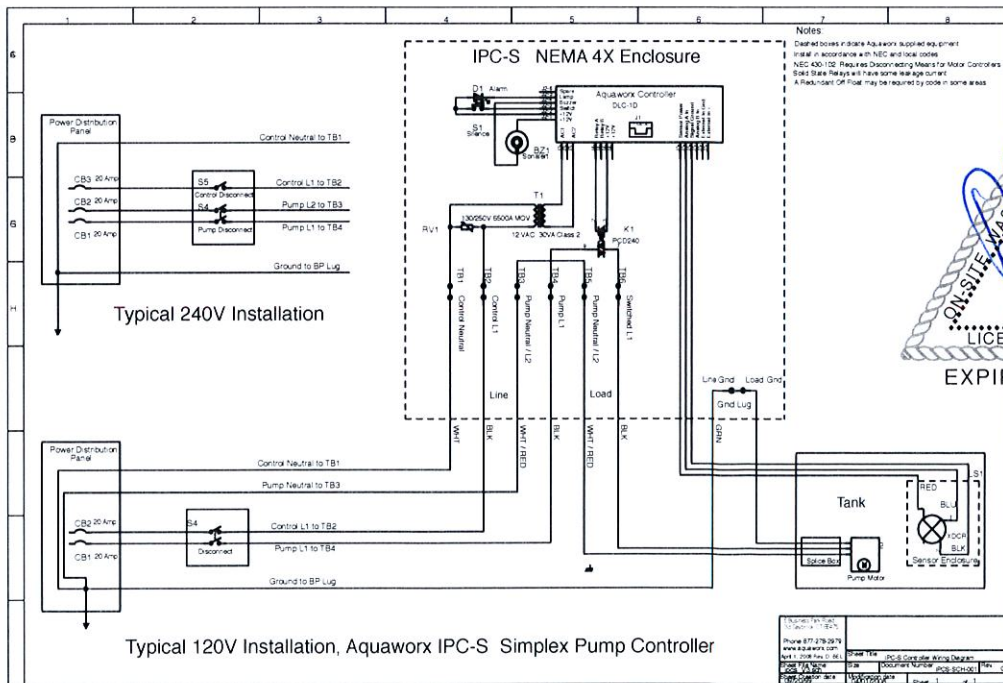
The Aquaworx Intelligent Pump Controller (IPC) Panel provides an innovative approach to time controlled pumping. It is used with a single pump operation - (on demand/time dose, lift stations, pump to gravity, etc.) Designed specifically for the onsite industry, the IPC Panel leverages floatless pressure transducer technology. The IPC Panel monitors liquid levels, controls pumping time intervals, and logs events in real time. Using the MARC (Mountable and Removable Controller) as the user interface, the Aquaworx IPC Panel offers a cost-effective solution with expanded capability. The data logging capabilities of the IPC Panel enables monitoring of multiple types of system events, which enhances operational assessment, troubleshooting, and maintenance of the onsite system.



1. Visual Alarm
2. Microprocessor
3. Transducer Wire Terminal
4. Solid State Relays
5. Transformer
6. Wire Terminal Block
7. Audio Alarm
8. MARC Controller



Wiring Diagram For Simplex Applications



Note: Two circuits should be provided to the panel one for control, one for the pump.

Aquaworx IPC-S01 Control Panel

AQUAWORX IPC PANEL INSTALLATION INSTRUCTIONS

The Aquaworx IPC (Intelligent Pump Control) Panel provides an innovative approach to pump control. Designed specifically for the onsite industry, the IPC Panel leverages simple pressure transducer technology for the enhancement of pump system performance, and ease of installation. Relying on an embedded microprocessor in the pump controller and a floatless pressure transducer in the pump chamber, the IPC Panel monitors liquid levels, controls pumping time intervals, and logs events in real time. Using the Mountable and Removable Controller (MARC) as the user interface, the IPC Panel offers a cost-effective solution with expanded capability.

Aquaworx offers three models of the IPC Panel; Simplex, Duplex and Sand Filter, to meet a variety of system design requirements. The Simplex Panel has the ability to time control a single pump, while the Duplex Panel can control two pumps in an alternating design with independent timing. The Sand Filter Panel has the ability to time control two individual pumps having independent level sensors, allowing for a design which can time-dose a treatment system and drainfield.

II. Installing the IPC Panel

NOTE: A qualified electrician must perform all wiring. Complete wiring diagram available at www.aquaworx.com

The following components and tools may be required for installation:

- Screwdriver (sm and med size flat head)
- Pipe cutter and tape measure
- Fish tape
- Wire strippers/cutters
- Electrical tester
- Drill
- 3/4" to 1" screws
- 1" PVC coupler

I. General

Unpack the Aquaworx IPC Panel and check for any visible damage both external and internal. Also verify that there are no cracks or damage to the pressure transducer bell. **Note:** You will need to identify the number on the pressure transducer bell as it is needed during the MARC setup. Notify Aquaworx immediately at 1-877-278-2979 if any damage has occurred.

ALL INSTALLATIONS MUST BE COMPLETED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODE.



- Step bit
- Hole saw
- Electrical conduit
- Electrical tape
- Splice box for pump connection
- Waterproof wire connectors
- 1" PVC (for transducer handle, amount determined by tank depth (6" length typical))

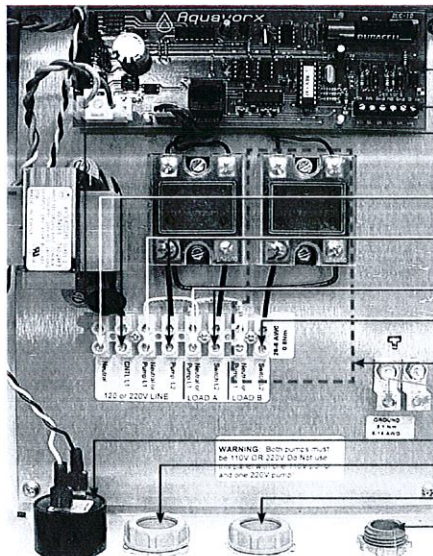


FIGURE 2: IPC PANEL WIRING SETUP AND TRANSDUCER 3-WIRE CONNECTION

- Circuit board
- Transducer signal wire terminal strip
- Varistor surge suppressor
- Dedicated alarm from supply (#1) (120 volt, 20 amp source)
- Dedicated pump circuit from supply (#2) (120 or 220 volt, 20 amp source; up to a 2 HP pump)
- Power from panel to pump (pump A for duplex)
- Power from panel to pump B (duplex only)
- This section required for a duplex system only
- Ground terminals
- Audible alarm unit
- Power in
- Power out
- Transducer signal wire

1. Mount the IPC Panel to the wall or post. Position the IPC Panel so that the power supply enters the IPC Panel through the bottom approximately 1" to the right of the audible alarm unit.

2. On Simplex Panels drill two holes (3 holes for duplex) in the bottom of the enclosure spaced approximately 2" apart and in line with the audible alarm unit. When facing the panel, the order of conduit connections from left to right is shown below, as well as illustrated in Figure 2:

Power in: 2 dedicated 20 amp circuits from house to power the panel, 120V (1) and pump, 120V or 220V(2)
Power out: Power supply from panel to pump
Transducer signal wire: Signal transmission from panel to pump

NEMA 4X fittings must be installed in each field-drilled hole to retain the integrity of the enclosure's 4X rating.

3. Power to pumps: run the panel (s) power wires from the IPC Panel to the septic tank riser. Connect the wiring in the splice box using water-tight connectors. Connect pump wires to the IPC Panel by carefully following the wiring diagram enclosed with the panel. A gas-tight seal (see Figure 1) is required to prevent corrosive septic gases from migrating into the IPC Panel.

4. Power to controller: wire the supply circuit to the panel. Aquaworx recommends that the panel be wired to two designated circuits. An external disconnect should be incorporated into the supply circuit and mounted within easy reach of the IPC Panel. **Note:** Site specific codes have final authority on external wiring requirements.

III. Installing the Pressure Transducer and Bell Assembly

The pressure transducer bell assembly replaces the traditional float free assembly. The 1" PVC stand pipe may be mounted by applying the same methods used to install a float free assembly.

1. Determine the position of the pressure transducer bell assembly. The pressure transducer bell assembly must be mounted so that it allows the liquid level to pump below the bottom of the pressure transducer bell. This allows the pressure transducer bell to get a fresh air bubble.

2. Feed the transducer signal wire and snorkel tube through the 1" PVC stand pipe and glue to the pressure transducer bell using a 1" tee. The length of the stand pipe when secured should position the bottom of the pressure transducer bell above the top of the pump.

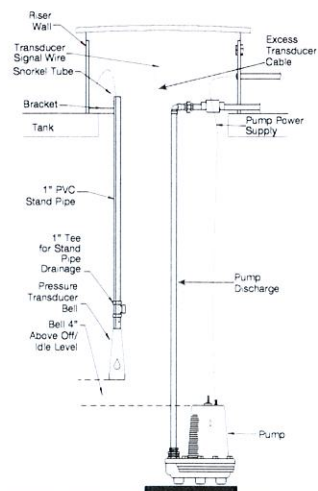
3. Cut off the snorkel tube approximately 9" lower than the top of the stand pipe and secure it to the transducer signal wire. The snorkel tube should be positioned in the form of an upside-down U as high as possible in the riser. This allows the snorkel tube to create an air lock in the event of a flooded tank.

4) **NOTE:** The Z-bias value labeled on the side of the pressure transducer bell. Later in the set-up, you will be instructed to program the Z-bias into the IPC Panel.

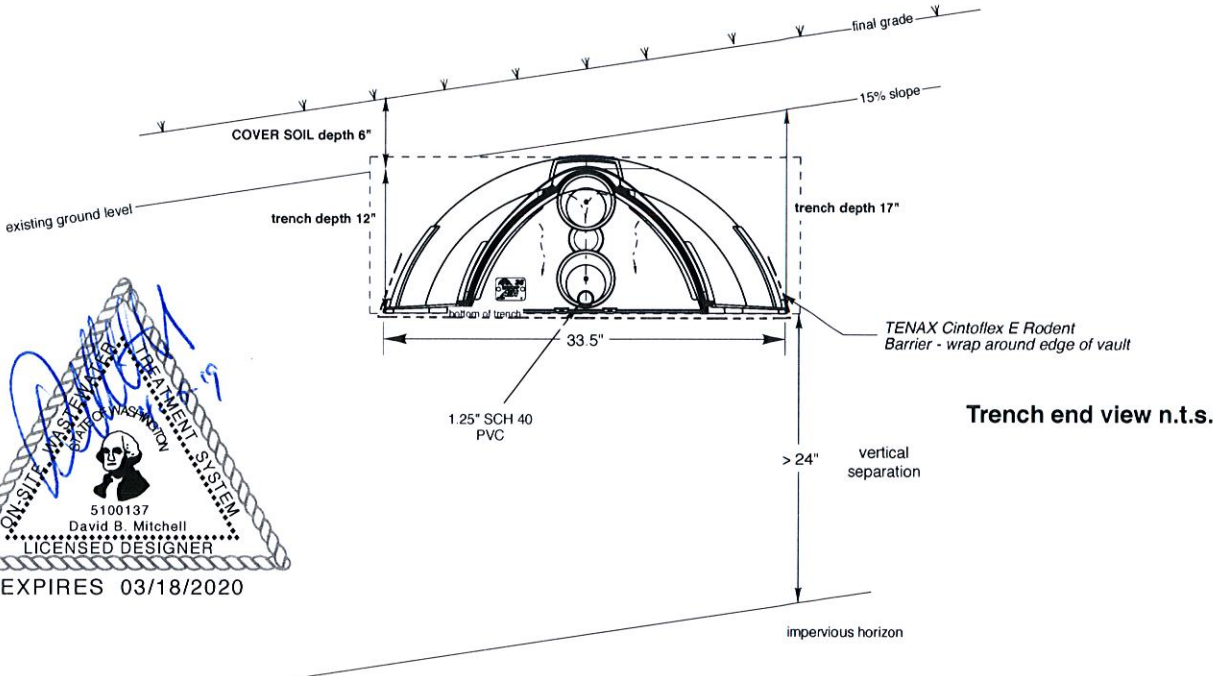
5. Run the transducer signal wire back to the IPC Panel and connect to the transducer signal wire terminal strip. Connect Red to RD, blue to BL and black to BK (first three positions). Make sure to leave enough cable in the riser to allow for removal of the pressure transducer bell assembly during maintenance. The transducer signal wire is rated for direct burial. However, it can be run in a conduit. Site specific codes have final authority on installation requirements.

NOTE: Do not attach the pressure transducer bell assembly to the pump discharge pipe. Do not pinch or crimp the snorkel tube tubing.

FIGURE 3: TRANSDUCER

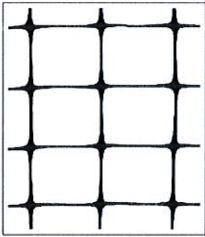


Hancor ARC 36 Gravel-less Vault End Section and Drain Field Area Details



TENAX Cintoflex E

Bi-oriented Net



AVAILABLE ROLL DIMENSIONS AND WEIGHT			
ENGLISH		METRIC	
Dimensions	Weight	Dimensions	Weight
3.3' x 330.0'	18.74 lbs	1.0m x 100.0m	8.5 kg
4.0' x 330.0'	22.70 lbs	1.2m x 100.0m	10.3 kg
6.5' x 330.0'	38.14 lbs	2.0m x 100.0m	17.3 kg

PHYSICAL CHARACTERISTICS		NOTES	
POLYMER TYPE	Polypropylene		
STRUCTURE	Quadrangular		
COLOR	Black		
PACKAGING	Rolls in Clear Bags with Label		

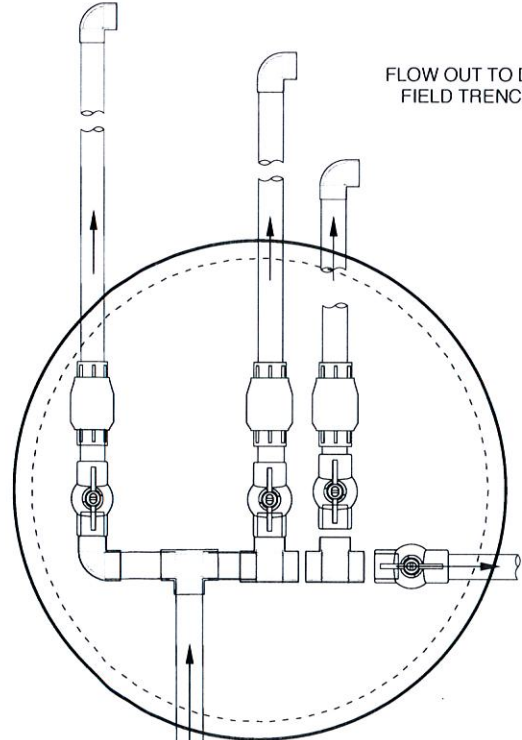
DIMENSIONAL CHARACTERISTICS	ENGLISH		METRIC		NOTES
	UNIT		UNIT		
MD PITCH	in	0.51	mm	13.0	a
TD PITCH	in	0.59	mm	15.0	b

TECHNICAL CHARACTERISTICS	ENGLISH		METRIC		NOTES
	UNIT		UNIT		
MD TENSILE STRENGTH	lbs / ft	308	kN/m	4.5	a
MD ELONGATION	%	15	%	15.0	a
TD TENSILE STRENGTH	lbs / ft	411	kN/m	6.0	b
TD ELONGATION	%	10	%	10	b

NOTES:
 a Longitudinal direction
 b Transversal direction

Barrier - place on bottom of trench excavation prior to placing gravel-less vault. Extend/wrap excess material around sides of vault

TANEX Cintoflex E
 Available at
 BERG VAULT 360-424-4999



- Valve Assembly:** 1.25" header feeding 1.25 inch diameter laterals.
- Use ball valves to adjust residual head to 60" in each trench
 - **Fit all uphill lines with check valves** and all lines with ball valves.
 - Extend lockable access to at or above final grade

Hancor ARC 36 Gravel-less Vault Plan View

