



Chelan-Douglas Health District

200 Valley Mall Parkway, East Wenatchee, WA98802

New Construction Application

This application will expire within one year.

Please note CDHD does not accept incomplete applications. Please provide Design, Site Evaluation, and Water Availability prior to submitting application.

Homeowner installations and designs are required to come in for a consultation with an inspector prior to submitting application.

Chelan Douglas Health District New Construction Application is required for the Health District to even a New Construction Design for a septic system and issue a permit. New Construction <1,000 gpd Fee \$790 Internal Code 546

Intermediate Systems >=1,000 gpd / Homeowner Fee \$1,115 Internal Code 549

Section 1: Applicant/Owner Information

Date of Application: 12/4/2023	Name of Applicant: Gary Fowler	Contact Phone Number: (425) 350-5400	Contact Email Address: gmf350@gmail.com
Mailing Address: 11104 18th St. NE	City: Lake Stevens	State: WA	Zip Code: 98258

Section 2: Project Information

Site Address: 68 Adel Lane	
Parcel Number: 232008542255	Additional Comments: (Subdivision Name, Lot #, etc.)
Water Availability Information: <input checked="" type="checkbox"/> Public Water Availability (Serving 3 or more homes) <i>Please attach water availability checklist from water purveyor</i> Name of Water System: Chelan County PUD	<input type="checkbox"/> Private Water System (Serving one of two homes) <i>Refer to Private Water Application for required components.</i> Private Water Review Fee \$330 Internal Code 520 for inspector to review and approve potable water adequacy.

Section 3: Septic Design Details (Check if applicable)

<input checked="" type="checkbox"/> Residential (Single Family) Number of bedrooms: 3	Licensed Designer Information: Zachary Tower-Tower Designs
<input type="checkbox"/> Commercial or Multi-Family <i>Please describe number of bedrooms, employees, units, shifts, type of business, etc.</i>	Licensed Installer Information:

Applicant's Statement: I will comply with the rules and regulations of Chelan Douglas Health District for on-site sewage systems in the installation and maintenance of this system. I understand that any alterations of building size or location, misrepresentation or concealment of material fact, or any filling or grading in or below the drain field area may invalidate any approval granted for this application. In the event my permit is denied, I understand I have the option of appeal. I also understand that additional inspections will be required where any part of the installation is performed by someone other than a person licensed under the above regulation.

Applicant's Signature: 	Date: 12/4/23
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Effective 01/01/2023



Chelan-Douglas Health District

200 Valley Mall Parkway, East Wenatchee, WA 98802

OFFICE USE ONLY:

Date Paid:	Receipt #:	Date bldg. Dept. Notified:
Project Decision: <input type="checkbox"/> Approved OR <input type="checkbox"/> Denied	Date project reviewed:	Reviewed by:
EHS Comments:		
Inspector Signature:		

Effective 01/01/2023

Until this copy has been reviewed and approved by the Health District (look for their approval on this title page), do not use for construction

On-site Sewage System Design

Gary Fowler
11104 18th St. NE
Lake Stevens, WA 98258

12-4-2023

68 Adel Lane
1.5 acres
Parcel #232008542255

TOWER DESIGNS, INC.
P.O. BOX 2022
LEAVENWORTH, WA 98826
509-548-4496

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TOWER DESIGNS, INC.
509-548-4496



2/24

July 13, 2022

Lori Knerr
18516 Hazel St.
Leavenworth, WA 98826

Re: Site Evaluation of Lot 25B, Eaglerock 1st Addition, Parcel #232008542255, Chelan County, WA, 68 Adel Lane

Ms. Knerr,

At your request we have made an evaluation of the above property for suitability for development of a single-family residence utilizing an on-site sewage disposal system. The type of septic system required on a property is based on the type and depth of the soil on the property in the area of the proposed septic system. To determine the soil profile on the property one or more test holes were dug. The following are the results of the soil observations.

- Test Hole #1: 0-36" – brown, blocky (moderately structured), clay loam (Type 5)
36"+ - brown, massive, clay, restrictive
- Test Hole #2: 0-22" – brown, blocky (moderately structured), clay loam (Type 5)
22"+ - sandstone, restrictive
- Test Hole #3: 0-13" – brown, massive, clay, restrictive
13-24" – brown, blocky (moderately structured), clay loam (Type 5)
24"+ - brown, massive, clay, restrictive
- Test Hole #4: 0-23" – brown, blocky (moderately structured), clay loam (Type 5)
23"+ - brown, massive, clay, restrictive

slope = see site plan

These holes were dug in the area shown on the site plan. The site plan is approximate and does not constitute a survey.

In an on-site sewage disposal system, the soil is used to provide treatment of the effluent from the septic tank. The regulations (WAC 246-272A) require that 3 feet of a suitable soil be present between the bottom of a drainfield trench and any restrictive layer or unsuitable soil for a conventional gravity system. The soil observed in test hole 3 contains too much clay to allow for placement of a system. The extent of this area of heavy clay is roughly sketched out on the attached site plan based on the lack of vegetation observed on site. Any drainfield installed on this property must avoid the area indicated because of the presence of this unsuitable soil.

3/24

Suitable soils were observed in test holes 1, 2 and 4, however they were quite shallow at between 22-36".

With a soil depth of 22-36" in the potential drainfield areas, effluent must meet treatment level B before it is applied to the soil. A couple methods that meet this treatment level would be a sand filter or an Advantex filter. A sand filter septic system functions by spreading septic tank effluent over a bed of washed gravel and ASTM C-33 sand. There is a liner under this sand filter, which collects the treated effluent, and disposes of the treated water in a drainfield located in the area of the test holes. The Advantex filter is placed adjacent to the septic tank and filters the effluent before discharging the treated effluent to a disposal field near the test holes. Any system must meet the requirements of the Washington State Technical Review Committee Guidelines for alternative treatment devices.

Because of the shallow soil depth and slope, a conventional gravel filled drainfield trench would not be possible. A subsurface drip disposal field would be the only method to dispose of the treated effluent on this lot. This system uses of a series of sub surface irrigation tubes spread across the slope with no gravel under the pipes.

The following parameters would need to be followed for the disposal field.


Disposal field loading rate = .5 gallons/day/square foot (Type 5 soils, subsurface drip RS&G's)
Maximum dripline installation depth = 10", a minimum of 6" of select fill (Type 4 or coarser) would need to be placed over the dripfield after installation.

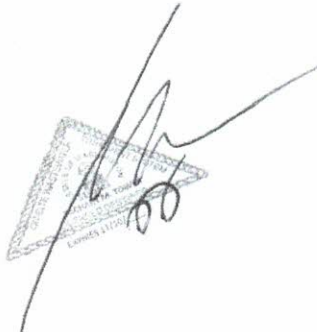
The Advantex system would be recommended over the sand filter system. The sand-filter system takes up a large additional area and tends to have a life span of approximately 20 years. After that it may need to be replaced to great expense and disruption. The Advantex system requires an ongoing maintenance contract as part of the permit. With proper maintenance this unit is very reliable, however it is quite expensive.

You indicated on your application a desire for a 5-bedroom system. Based on the evaluation there appears to be only enough area to place a maximum of a 3-bedroom system on the property. Either the initial or reserve would need to be placed in the area of test holes 1 and 2 with the other located at test hole 4. No system can be placed in the vicinity of test hole 3 or the area of heavy clay identified by the lack of vegetation. Due to the complex slopes on the site a topographical survey would need to be provided in order to prepare a design for this property.

If you have any questions please feel free to contact us.

Sincerely,

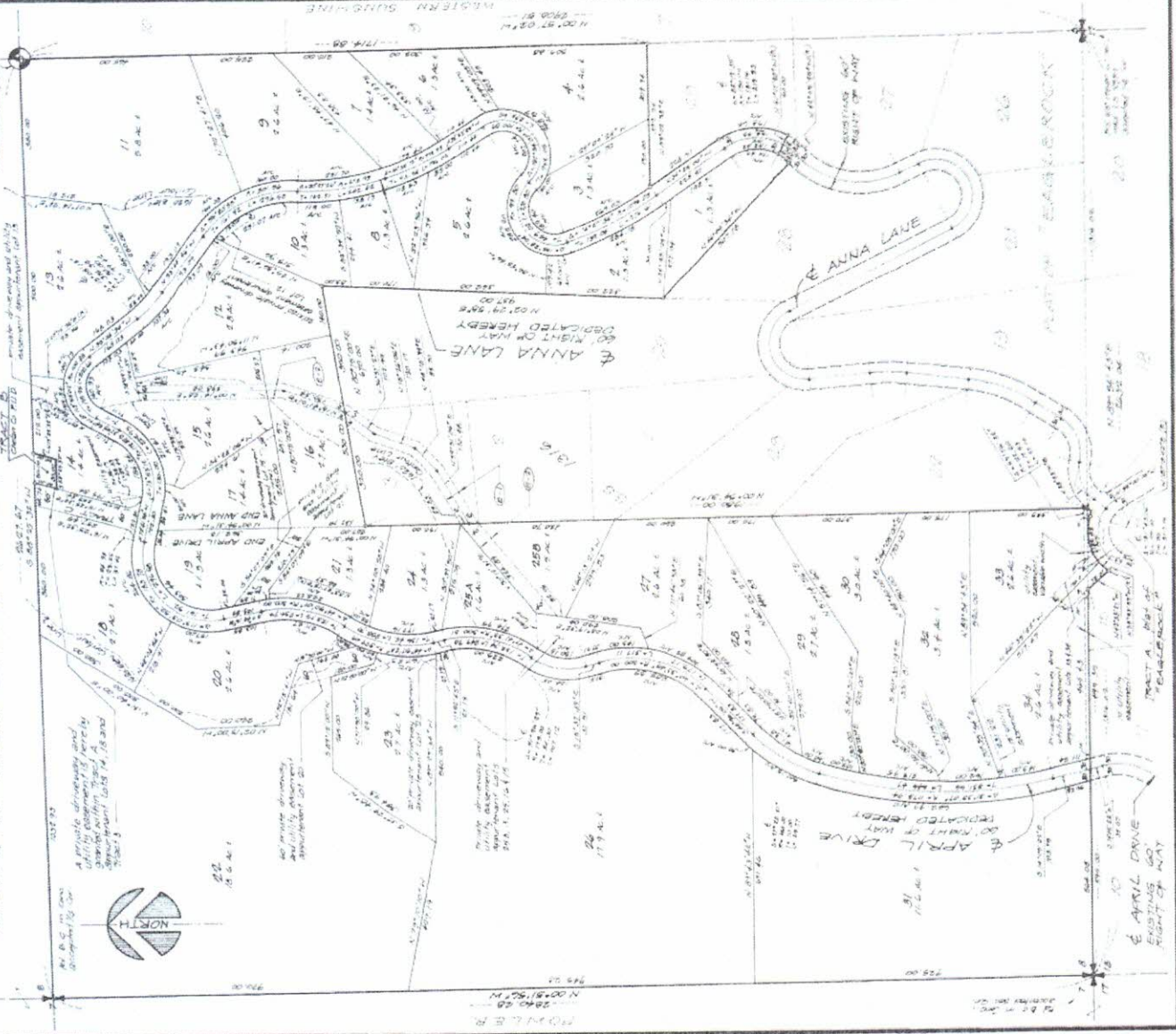

Zachary Tower
Tower Designs, Inc.
P.O. Box 2022
Leavenworth, WA 98826





4/24

FLAT OF SCALE 1" = 200' UNIT = FEET AND DECIMAL FOOT SHEET 1 OF 2
EAGLE ROCK • FIRST ADDITION
 PORTION OF SW 1/4 SECTION 8, TWP 23 N, RANG 20 E, N.M. CHELAN COUNTY, WA



DESCRIPTION

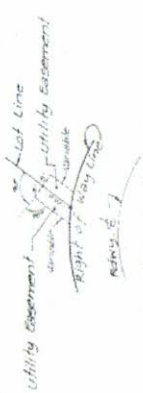
IN THE COUNTY OF CHELAN, STATE OF WASHINGTON; THE SOUTHWEST QUARTER OF SECTION 8, TOWNSHIP 23 NORTH, RANGE 20 EAST OF THE WILLAMETTE MERIDIAN, EXCEPT THEREFROM "EAGLE ROCK" ACCORDING TO PLATS THEREON RECORDED IN VOLUME 175 OF PLATS AT PAGES 20-24, RECORDS OF SAID COUNTY; TOGETHER WITH TRACT A OF SAID PLAT WHICH IS SUBJECT TO A PRIVATE DRIVEWAY EASEMENT OVER SAID TRACT AND ADJACENT LOT 15 OF SAID PLAT, AND TRACT B AND EXCEPT THEREFROM TRACT B AS SET FORTH HEREON.

GENERAL NOTES & PROVISIONS

- 1) Chelan County will not maintain private driveway easements hereon.
- 2) Tract B is a water reservoir site which has been conveyed to the Chelan Co. P.U.D. pursuant to this plat.
- 3) Tract C, not a building lot, to be retained by owner to provide future access to adjacent lands.
- 4) Drilling, siting, installing, operating, and maintaining hereon all wells for water pressure, and other pumps to provide adequate flow to the rear parcelation characteristics of the soils within this plat further subdivision of some lots herein may not be practical.
- 5) Easement of bearing = plat of "EAGLE ROCK", the exterior boundary of which is within acceptable limits, therefore retained courses are divided hereon.
- 6) Street name change shall occur as noted hereon, at the line between Lots 17 & 19.
- 7) Restrictive covenants pursuant to this plat shall be recorded with the County Auditor. Subsequently the recording of this plat, all areas of lots was measured topographically with four parameters within ± 1% and expressed to 0.1 Acre.

EASEMENT PROVISIONS

1) Utility easements appurtenant lots 1 through 34 are hereby granted in accordance DETAIL A set forth below.



- 2) Private driveway and utility easement to be granted by the owners of lots 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, and 34 in accordance the width and location shown and designated hereon as (E-3).

LEGEND

- 1) Bound section control monument as noted.
- 2) Set 24 x 2' rebar N/Cops met. L.S. ROAD at 20' ± ft. of centerline roadway except along driveway easmt.
- 3) Rebar N/Cops met. L.S. ROAD at 25' previously set 20' ± ft. of "CENTERLINE".
- 4) Set 2.5' rebar as noted above of all lot and tract cove.
- (N) Denotes north bearing.

SURVEYOR'S CERTIFICATE

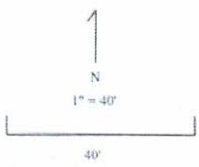
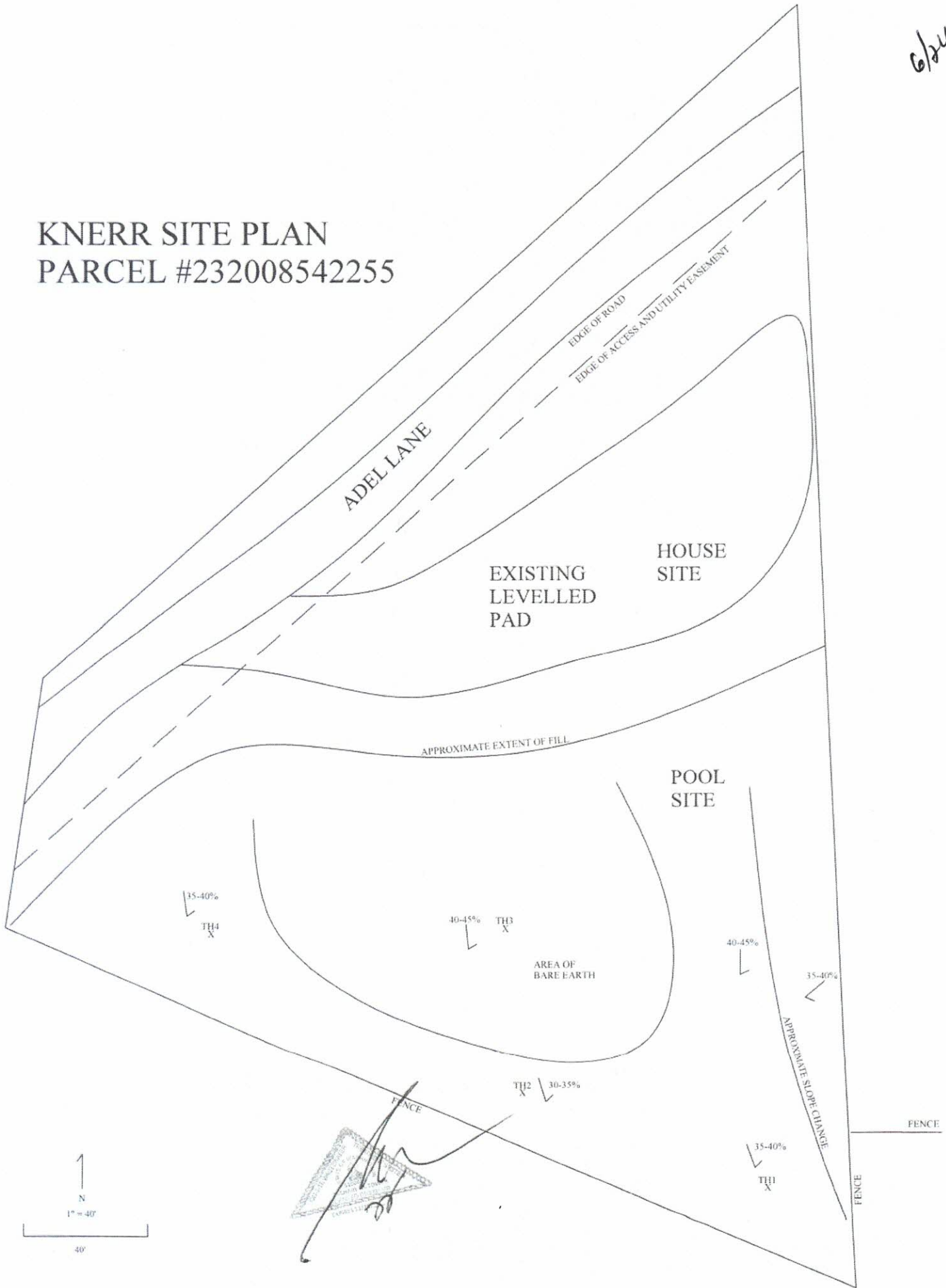
I, John C. Repass, registered as a Land Surveyor by the State of Washington, certify that this plat is based upon an actual survey of the land described herein, conducted by me or under my supervision, and that the same is in accordance with the laws of this State, and that the monuments, other than those monuments approved for setting at a later date, have been set and lot corners marked on the ground as indicated on the Plat.

John C. Repass, Reg. No. 45 17680
JOHN REPASS & CO.
 120 RIVERVIEW DR. • EAST WENATCHEE, WA • (509) 884-1487
LAND SURVEYOR



6/24

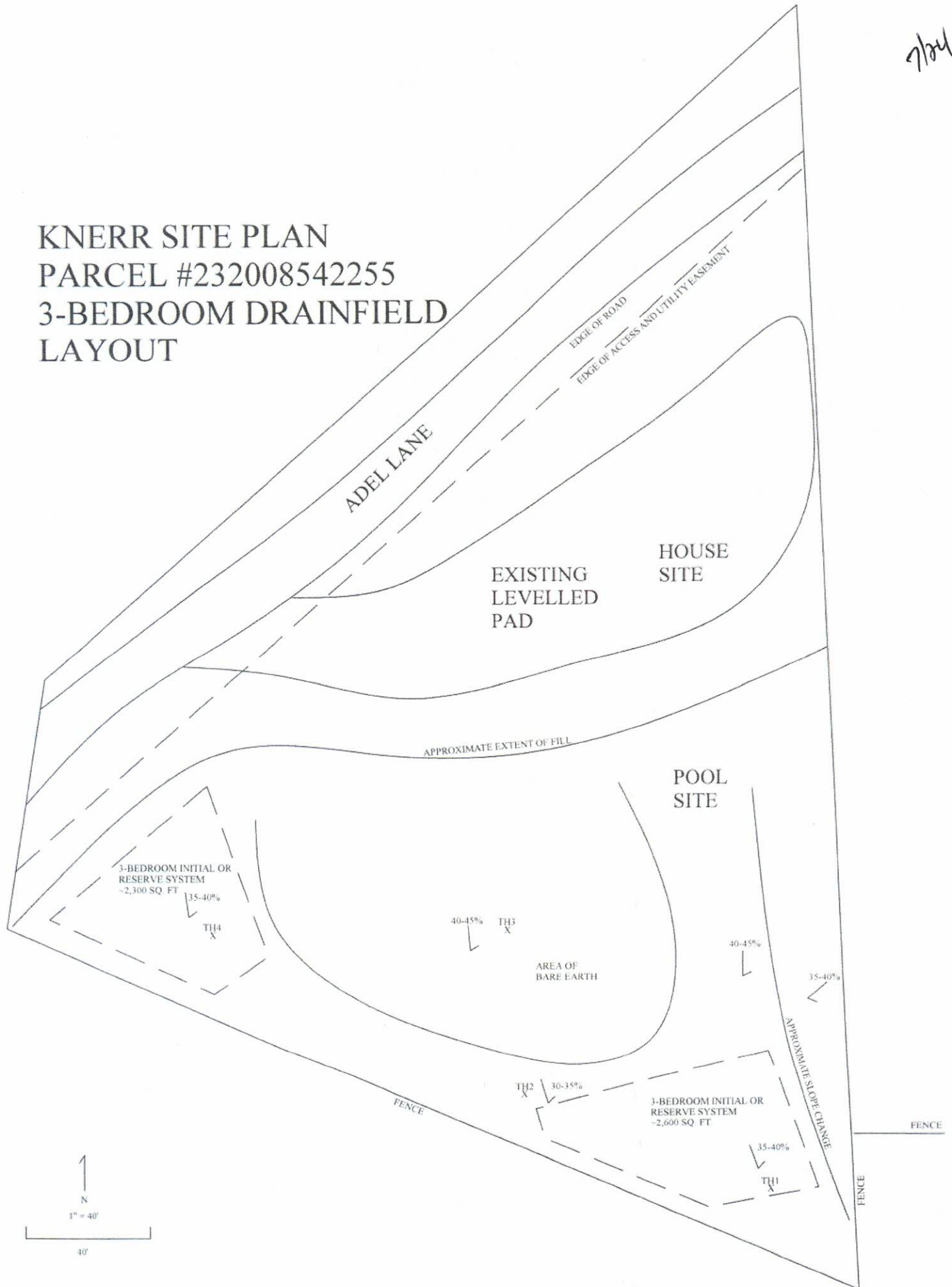
KNERR SITE PLAN PARCEL #232008542255



[Signature]
A triangular stamp with illegible text inside.

7/24

KNERR SITE PLAN PARCEL #232008542255 3-BEDROOM DRAINFIELD LAYOUT



N
↑

1" = 40'



40'

8/24

DESIGN CRITERIA

Gary Fowler
68 Adel Lane

Gallons/bedroom = 120
Number of bedrooms per applicant = 3
Daily design flow = 360 gallons/day

Soil depth = 22-36" over massive clay

Use a sand filter to meet treatment level B and a subsurface drip disposal field.

Septic Tank & Dose Tank

Use a WA approved 1000 gallon septic tank and a 1000 gallon dose tank.

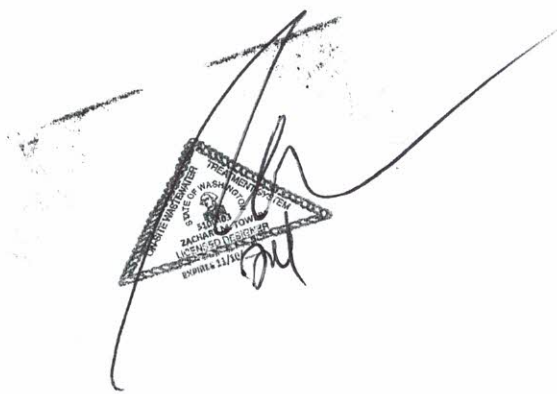
Sand Filter- Use a 10' X 36' sand filter to meet treatment level B.

PRESSURE SYSTEM PARAMETERS - all pipe Schedule 40

Pipe function	size	length
Transport line	2"	20' approx.
Manifold	2"	7.5'
Laterals	1"	35'

Number of laterals = 4, end manifold configuration
Orifice size = 1/8", oriented at 6 o'clock
Orifice discharge rate = .43 gallons/minute = 5 feet residual head
Orifice spacing = 2'4" or 28"
Number of orifices/lateral = 15
Lateral discharge rate = 6.45 gallons/minute
System discharge rate = 25.80 gallons/minute

Residual head = 5 feet
Elevation head = 5 feet
Transport head = 0.24 feet
Manifold head = 0.09 feet
Lateral head = 0.86 feet
Valve/fitting headloss = 3 feet
Discharge headloss = 5.5 feet
Total dynamic head = 19.69 feet



9/24

Use an Orenco PF 300511 pump or equivalent

Dose volume = 60 gallons, 6 times/day

Use an Orenco MVP-SSF-2PTRO/PTRO (or equivalent) panel to control both the dose tank pump and the sandfilter pump.

Dose Tank Timer set for	On - 2 minutes, 19 seconds
	Off - 3 hours, 58 minutes

Drip Field -

Soil loading rate from site evaluation = .5 gallons/day/square foot (Type 5 soil)

Area required for initial field 2160 square feet. Area required for replacement field is 2160 square feet. 720 emitters required.

Use 720 emitters minimum (~800 shown) with 3' line spacing.

Place drip lines 6-10" deep. 6-12" of select fill (sandy loam/loamy fine sand brought to site, native material not suitable for cover). Sod or other vegetative cover must be placed on top of the dripfield.

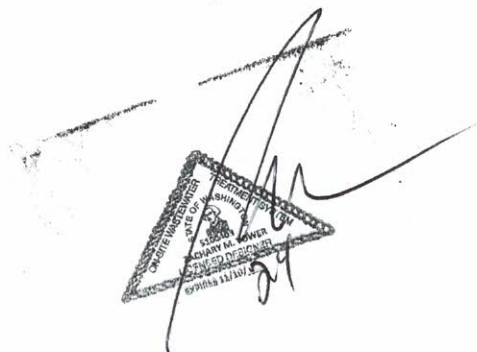
Emitter flow rate = 0.42 gallons/hour

Total flow = 800 X 0.42 = 336 gallons/hour (5.6 g.p.m.)

Pump time/day = 360 gallons /356 gallons/hour = 1 hr./day

Headloss – from Netafim spreadsheet = 152.3 feet

Discharge rate (including flush back to dose tank) = 13.6 g.p.m.



Pump in Sand Filter –

Dripfield will be demand dosed from the sand filter.

Use an Orenco PF 201012 (230v) pump or equivalent in the sandfilter. This pump to be controlled from the same panel as the dose tank pump.

Use 1" supply and flush lines.

Use a Lowridge Technologies 1" continuous flush head works (LOT-HWN-1-CON). Install air release valves immediately after the headworks at the high point of the system.

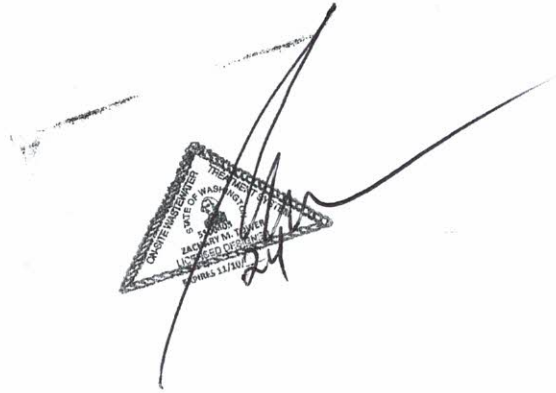
Dose dripfield 12 times per day @ 30 gallons/dose. A timer will be used to ensure a 30 gallon dose is delivered to the dripfield. Set the on-time to 5 minutes, 21 seconds. The off time will be set to 5-minutes to allow the dripfield dose to function as on-demand.

System must be adjusted to drain both supply and flush line after every dose because of freeze potential. Air vacuum breaker must be adequately sized.

10/24

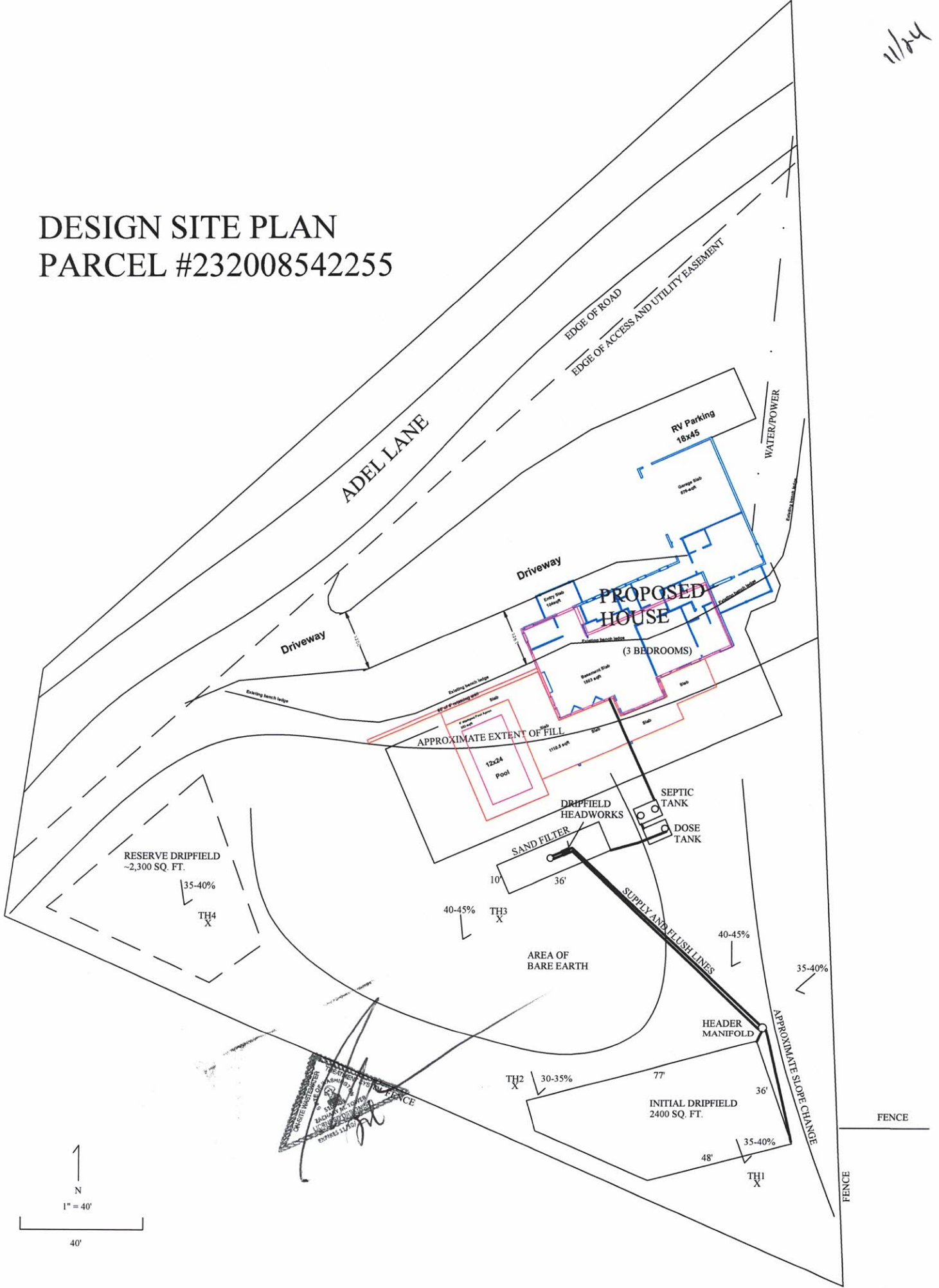
Drip system (Netafim) must be installed by approved installers and monitored by approved monitoring personnel.

The discharge assembly on the transport line from dose tank to sand filter will not have a check valve and will drain. The discharge assembly on the transport line from the sand filter to the headworks must not have a check valve on it either, but will need a siphon breaker.



1/24

DESIGN SITE PLAN PARCEL #232008542255



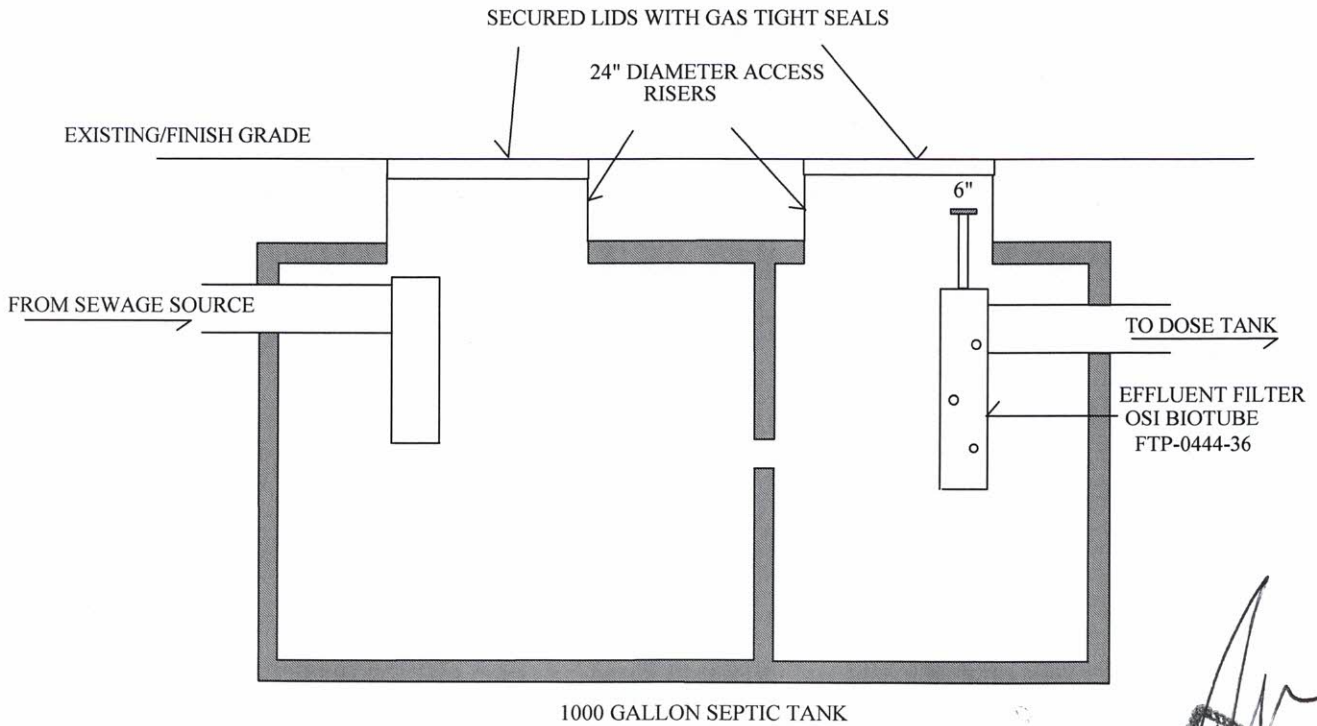
N
1" = 40'

40'

PROFESSIONAL SEAL
 JACOB W. ...
 ...
 ...

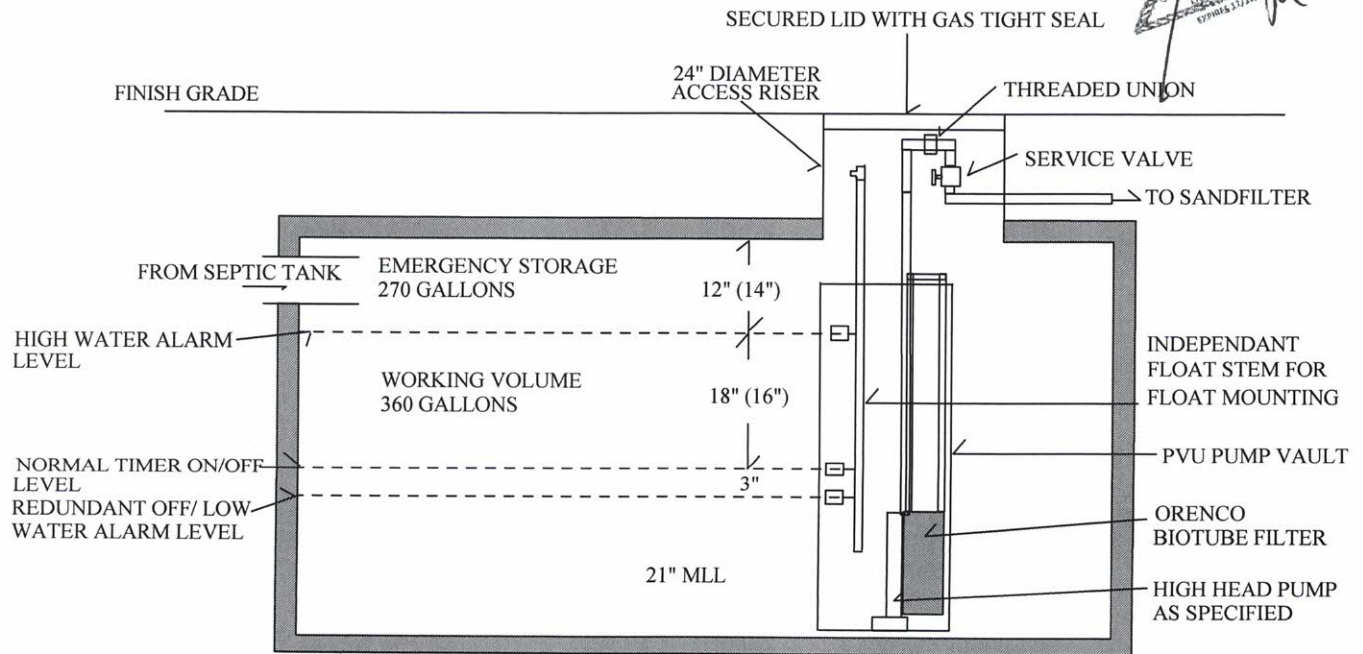
12/24

SEPTIC TANK DETAIL

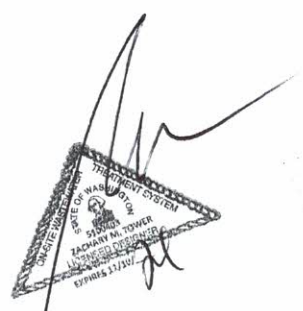


DOSE TANK DETAIL

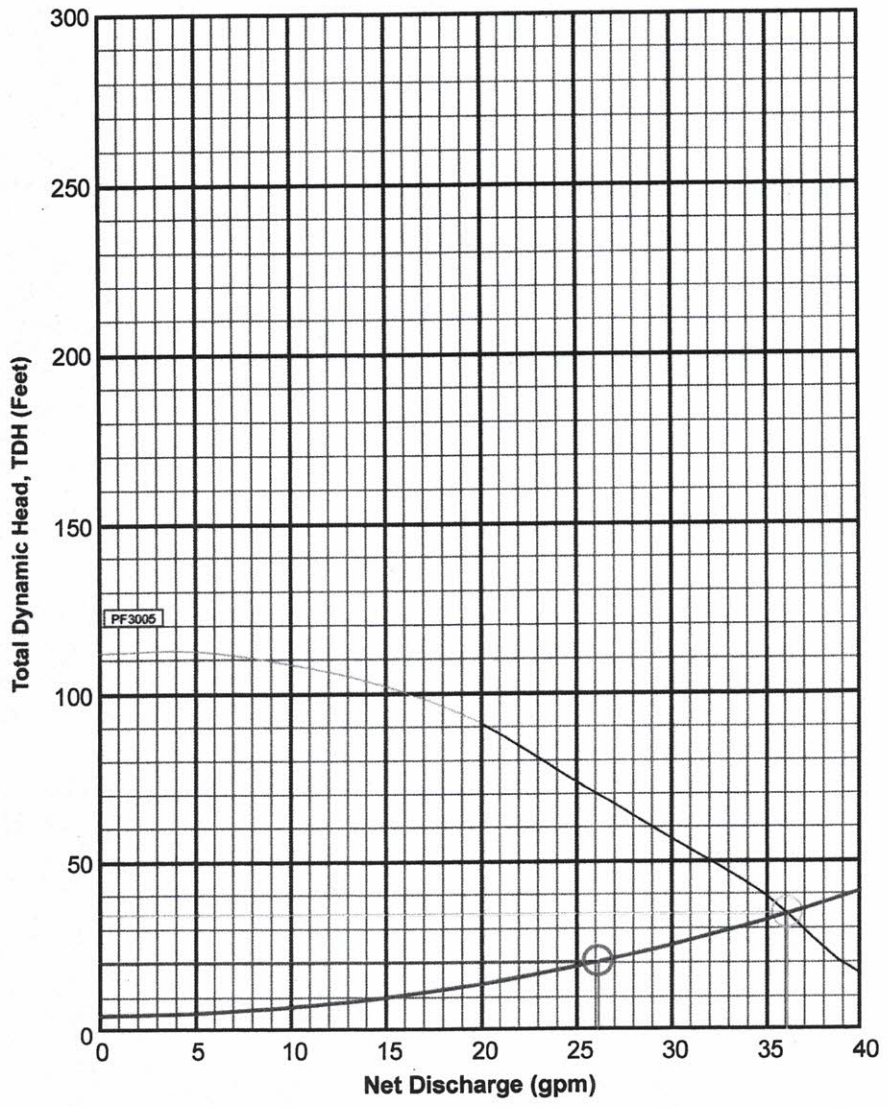
NO SCALE



1000 GALLON DOSE TANK
 FLOAT MEASUREMENTS SHOWN
 FOR CONCRETE TANKS. MEASUREMENTS
 IN () ARE FOR INFILTRATOR TANKS



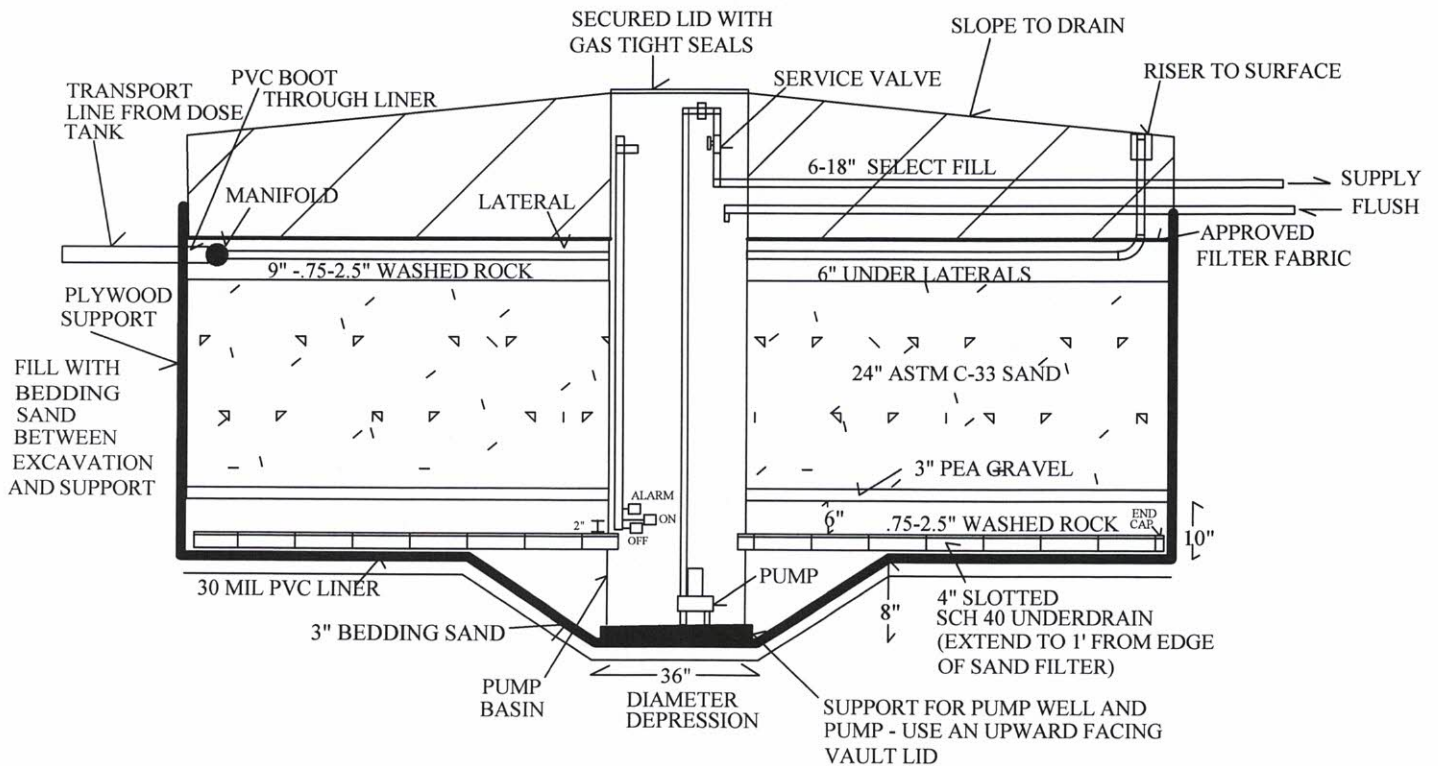
13/24



Dose Tank Pump

14/24

SAND FILTER WITH PUMP CROSS SECTION



PVC BOOT TO BE INSTALLED AS PER MANUFACTURERS REQ.

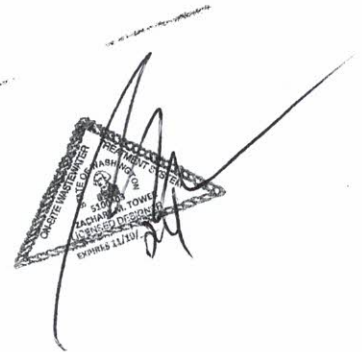
UNDERDRAIN MAY BE LAID FLAT.

SLOTS TO BE 1/8" x 2 1/2" DEEP - 4" ON CENTER @ 12 O'CLOCK.

PLYWOOD MAY NOT BE NECESSARY IF SIDE IS FREE OF ROOTS AND EDGE IS FIRM AND SMOOTH.

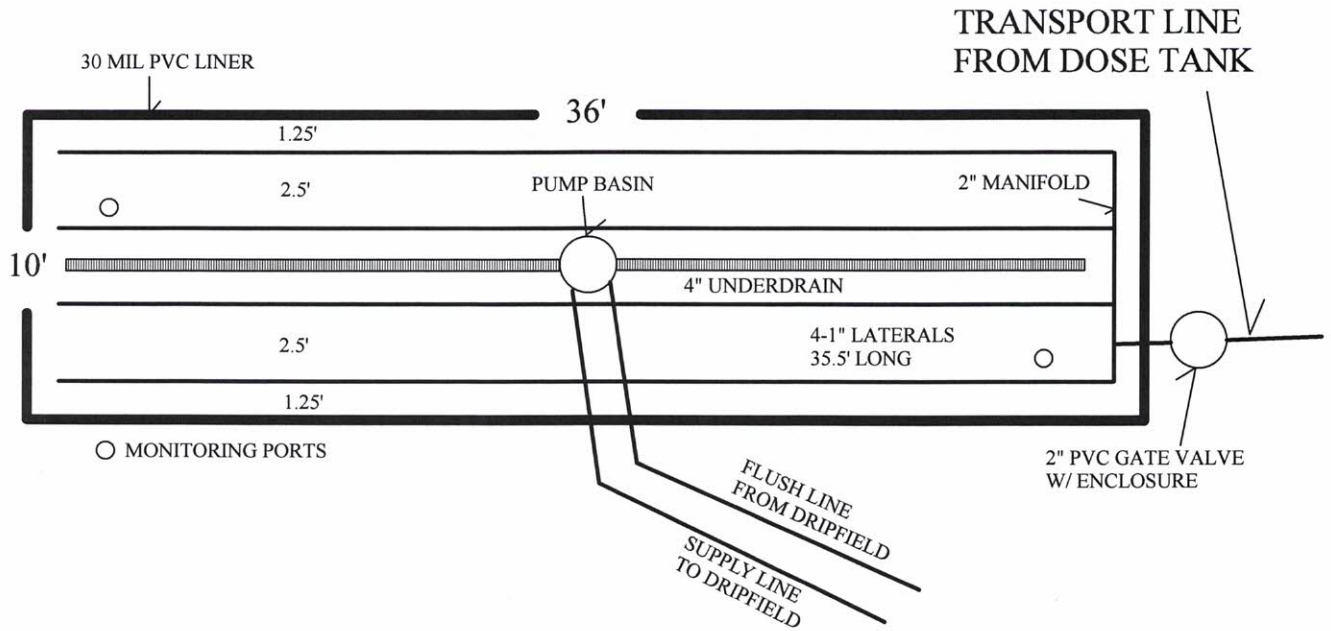
SELECT FILL TO BE SANDY LOAM OR LOAMY SAND.

NO SCALE

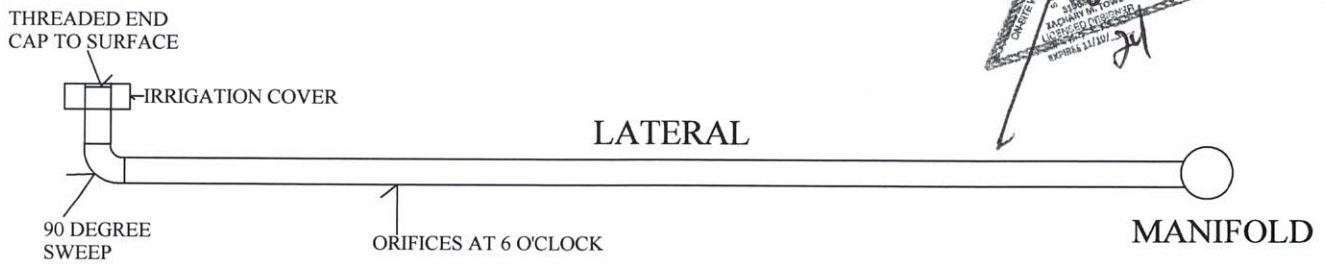


15/24

PLAN VIEW OF SAND FILTER

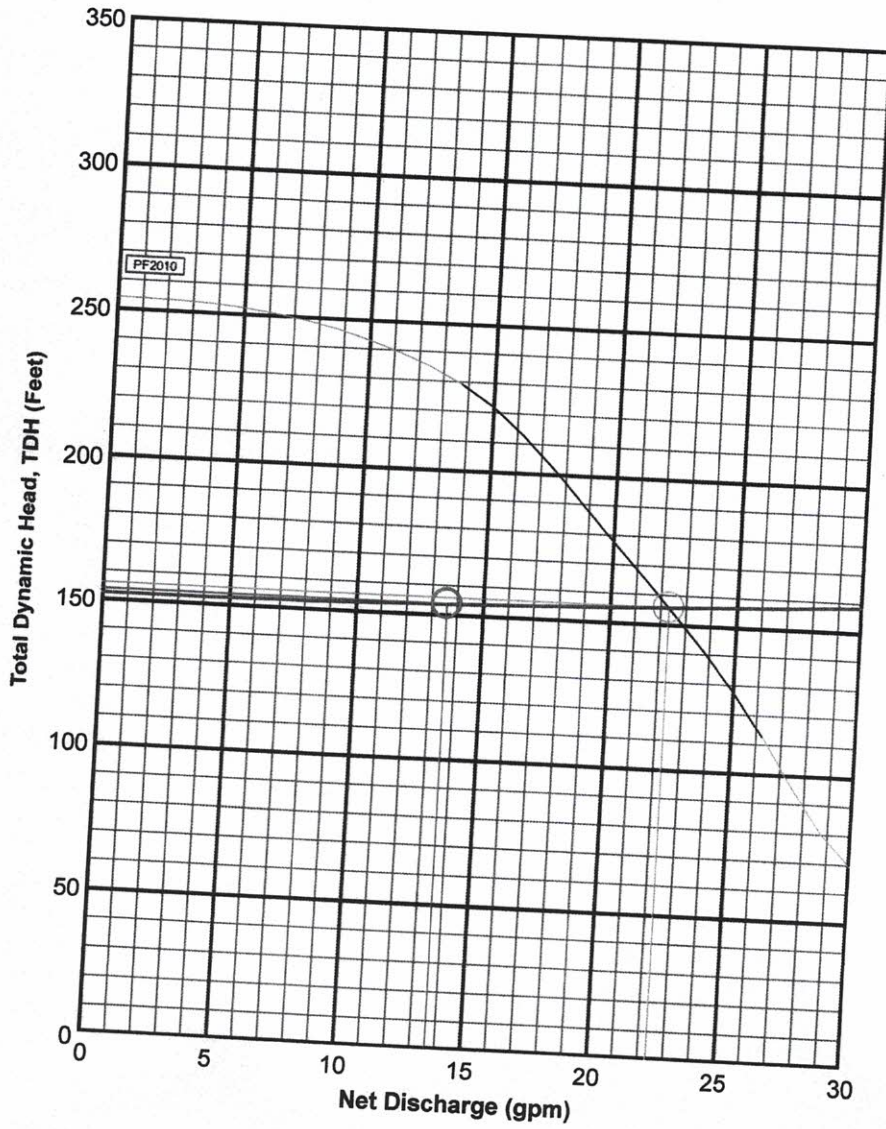


END MANIFOLD CONSTRUCTION



NO SCALE

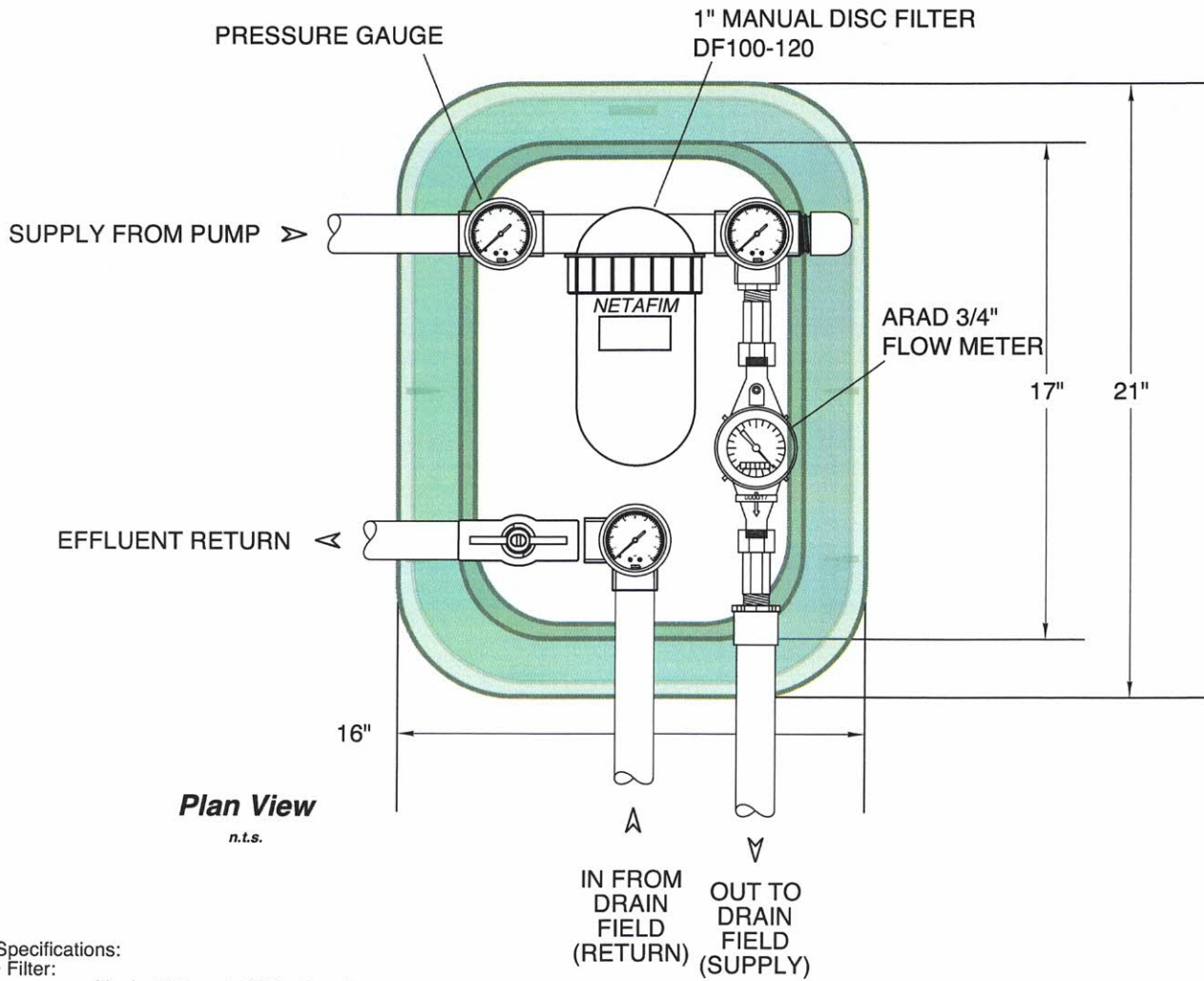
16/24



Sandfilter Pump

17/24

LOWRIDGE ONSITE TECHNOLOGIES, LLC LOT-HWN-1-CON Continuous Flush Headwork



Plan View
n.t.s.

Specifications:

- Filter:
 - Mesh: 120 mesh (130 micron)
 - Filter Body and Cover: Reinforced Polyamide
 - Disc Rings: Polypropylene
 - O-Rings and Seals: Nitrile & EPDM
 - Clamps, Spring and Bolts: Stainless Steel
 - Temperature Range: -40° - 160°F (-40° - 70°C) • Maximum Pressure: 140 psi (9.65 bar)
- Meter:
 - Size: 3/4" Composite Plastic
 - Register: Includes reed switch and measures in 1 gallon per pulse increments
 - Maximum Pressure: 145 psi (10 bar)
- Gauges:
 - 0 - 100 psi range (0 - 6.9 bar) • 2" Glycerin filled
 - Flow Range: 2 - 20 GPM (7.6 - 76 liters/minute)
 - Maximum Pressure: 100 psi (6.9 bar)
 - Inlet / Outlet Pipe & Diameter: 1" Sch 40 PVC
- Valve Box:
 - NDS Pro Series rectangular 14" x 19" valve box with bolt down cover

Ordering Information:

Model Number: LOT-HWN-1-CON
Description: Continuous Flush Headwork

PVC SDR Pressure Pipe and Schedule 40 Fittings:
Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform with National Sanitation Foundation (NSF) standards 14 and 61. Pipe shall be iron pipe size (IPS) conforming to ASTM D 2241 for plain-end pipe and ASTM D 2672 for bell-end pipe. PVC Schedule 40 fittings shall conform to ASTM D 2466.

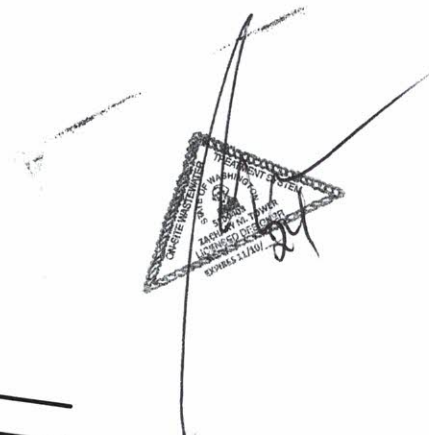
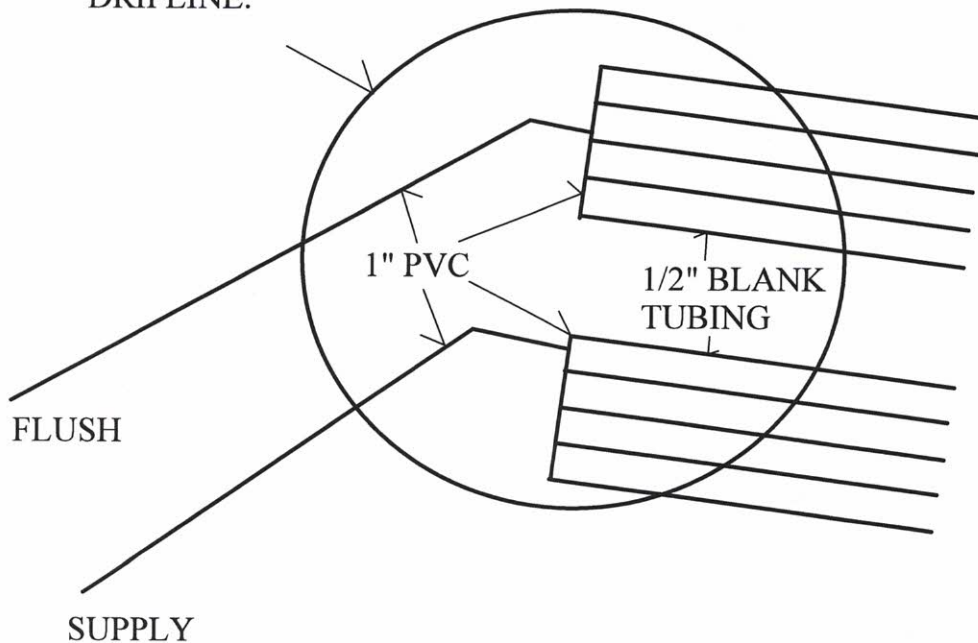
All pipe and fittings to be installed in accordance with manufacturer's recommendations and local code requirements. Buried pipe shall be installed in accordance with ASTM F 1688. Solvent cements shall conform to ASTM D 2564 or equivalent. Pipe and fittings are intended for pressure applications where the temperature will not exceed 140°F.

Lowridge Onsite Technologies, LLC
Lake Stevens, WA 877-476-8823
www.lowridgetech.com
info@lowridgetech.com

18/24

HEADER MANIFOLD DETAIL

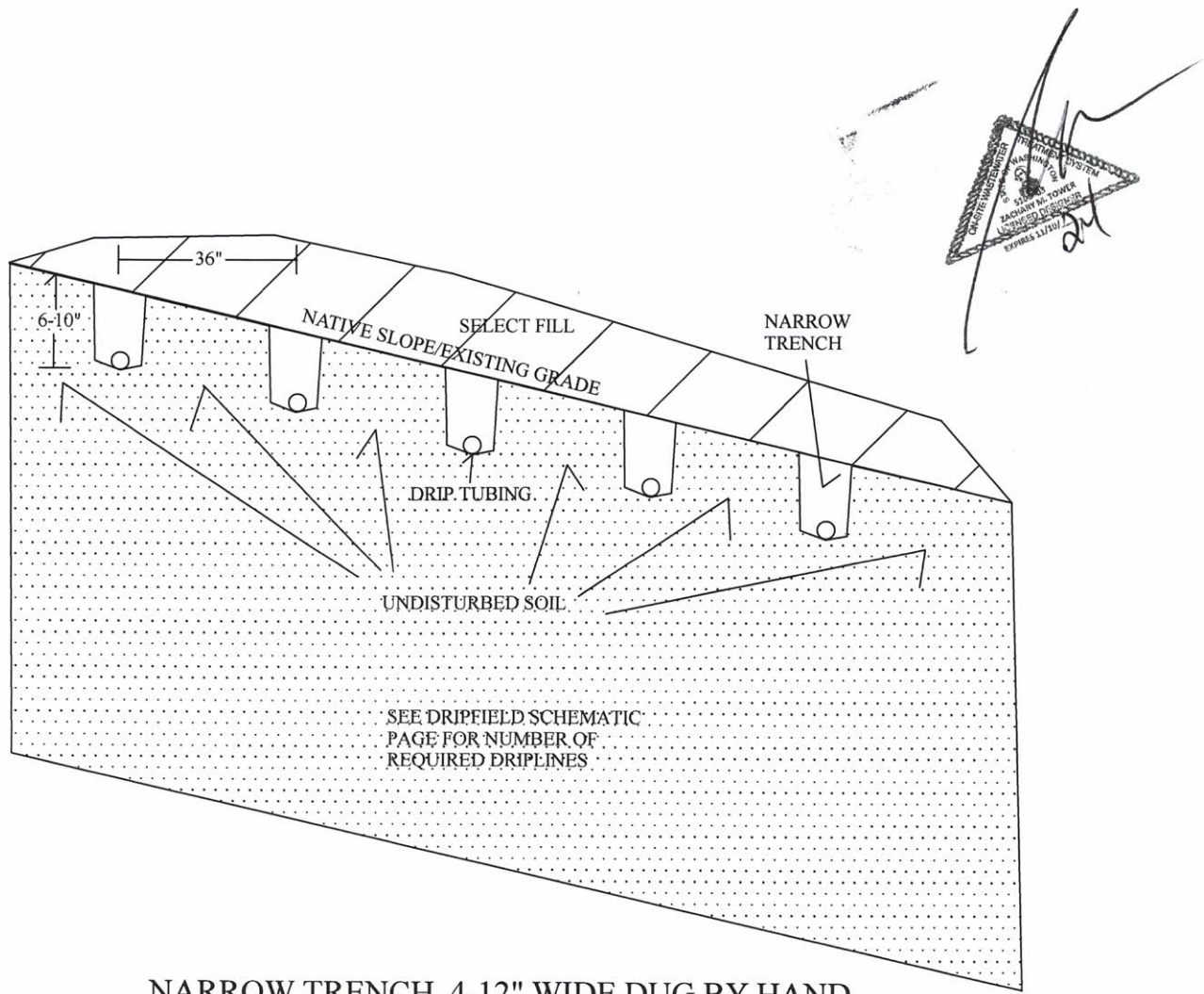
RISER WITH LID TO
SURFACE. LOCATE
ABOVE UPPERMOST
DRIPLINE.



TO DRIP LINES

19/24

DRIPLINE DETAIL-CROSS SECTION

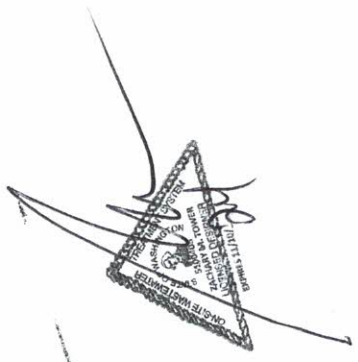
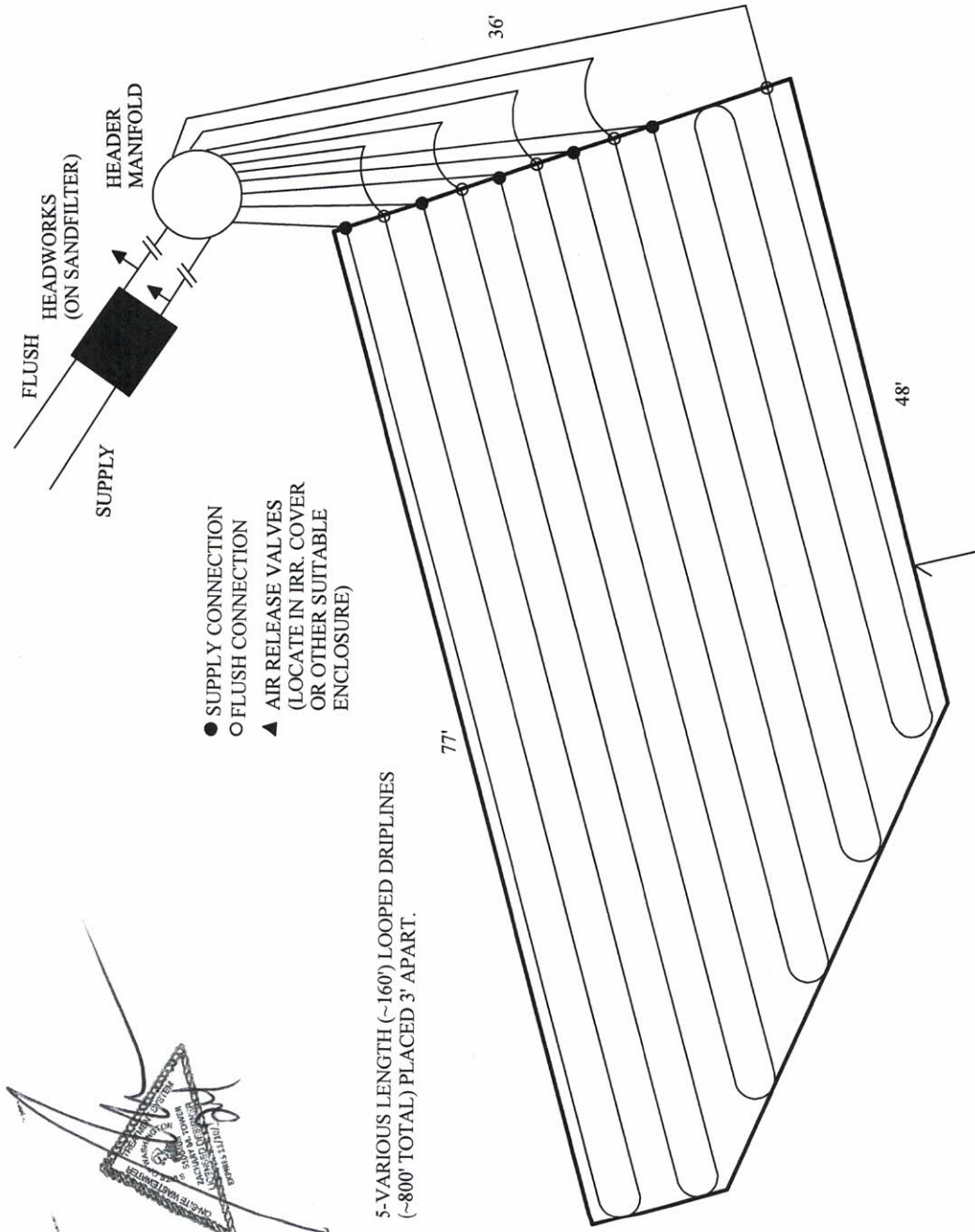


NARROW TRENCH, 4-12" WIDE DUG BY HAND,
WITH A TRENCHER OR OTHER APPROVED DEVICE
MAXIMUM TRENCH DEPTH = 10"
MINIMUM TRENCH DEPTH = 6"
MINIMUM 6" OF COVER REQUIRED OVER ALL
SYSTEM COMPONENTS.
INSTALL TRENCH LENGTHS AS SHOWN.
RESERVE AREA AS SHOWN.
6-12" OF SELECT FILL (SANDY LOAM) REQUIRED
OVER DRIPFIELD

NO SCALE

20/24

DRIPFIELD SCHEMATIC



EMITTER LINES TO APPROX. FOLLOW CONTOURS. USE 1" PVC FLUSH AND SUPPLY LINES. USE PVC AIR RELEASE VALVES SUITABLE FOR SITE CONDITIONS. USE NETAFIM BIOLINE 1/2" DRIPLINE. 1' EMITTER SPACING, 42 GALLONS/HOUR MAX. EMITTER DISCHARGE. MAX. LENGTH OF LINE BETWEEN SUPPLY CONNECTION AND FLUSH CONNECTION IS 220'.

DRIPFIELD PERIMETER 2400 SQ. FT.

NO SCALE

BIOLINE® DRIPLINE

THE WORLD'S MOST ADVANCED CONTINUOUS
SELF-CLEANING, PRESSURE COMPENSATING DRIPLINE
SPECIFICALLY DESIGNED FOR WASTEWATER

CROSS SECTION OF BIOLINE DRIPLINE

Bioline dripper inlets are positioned in the center of flow where water is the cleanest



PRODUCT ADVANTAGES

- Pressure compensation - all drippers deliver equal flow, even on sloped or rolling terrain.
- Unique flow path - Turbonet technology provides more control of water and a high resistance to clogging.
- Continuous self-flushing dripper design - flushes debris, as it is detected - throughout operation, not just at the beginning or end of a cycle. Ensures uninterrupted dripper operation.
- Single hole dripper outlet from tubing:
 - Better protection against root intrusion
 - Allows the dripline to be used in subsurface applications without need for chemical protection
- Drippers capture water flow from the center of the tubing - ensures that only the cleanest flow enters the dripper.
- Built-in physical root barrier - drippers are protected from root intrusion without the need for chemical protection. Water exits dripper in one location while exiting the tubing in another.
- Three dripper flow rates - provides the broadest range of flow rates available. Allows the designer to match the dripline to any soil or slope condition.
- Bioline tubing is completely wrapped in purple - easily identifying it for non-potable use, regardless of how the tubing is installed.
- Anti-bacterial-impregnated drippers - prevents buildup of microbial slime.
- Can be used subsurface - Bioline can be installed on-surface, under cover or subsurface.
- No special storage requirements - does not degrade if stored outdoors.

APPLICATIONS

- Typically installed following a treatment process
- Can be used with domestic septic tank effluent with proper design, filtration and operation
- Reuse applications including municipally treated effluent designated for irrigation and other disinfected and non-disinfected water sources.

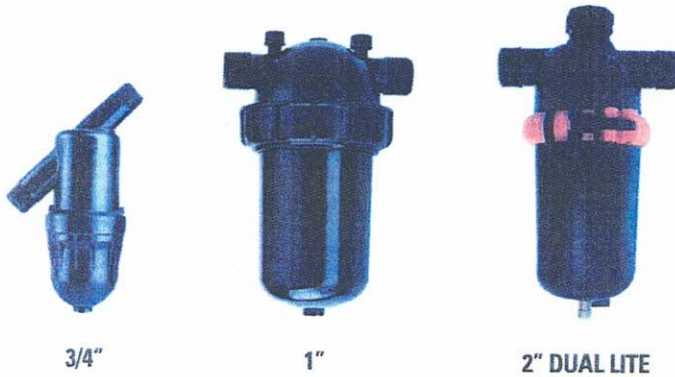
SPECIFICATIONS

- Dripper flow rates: 0.4, 0.6 or 0.9 GPH
- Dripper spacings: 12", 18" or 24" dripper spacings and blank tubing
- Pressure compensation range: 7 to 58 psi
- Maximum recommended system pressure: 58 psi
- Tubing diameter: 0.66" OD, 0.56" ID
- Tubing color: Purple color indicates non-potable
- Coil lengths: 500' or 1,000' (Blank tubing in 250')
- Recommended filtration: 120 mesh
- Bending radius: 7"
- UV resistant
- Tubing material: Linear low-density polyethylene

Additional spacing and pipe sizes available by special order. Please contact Netafim USA Customer Service for details.

MANUAL DISC FILTERS

RELIABLE, EFFICIENT PLASTIC DISCS
CREATE SUPERIOR FILTRATION



PRODUCT ADVANTAGES

- Highly effective multiple disc ring design captures and holds more debris.
- Low friction loss keeps system costs down
- Greater holding capacity of the rings vs. screen filters mean less frequent cleaning.
- Rings are easily removed for fast cleaning without the need for scrubbing.
- Color-coded disc rings make identification of mesh rating fast and easy.

APPLICATIONS

- Wastewater
- Reuse/recycled/reclaimed water
- Spray tanks
- Wherever very effective removal of debris is required
- Works well as stand-alone units or combined to form filter batteries



MESH/MICRON		
MESH	MICRON	DISC COLOR
040	400	Blue
080	200	Yellow
120	130	Red
140	115	Black
200	55	Green

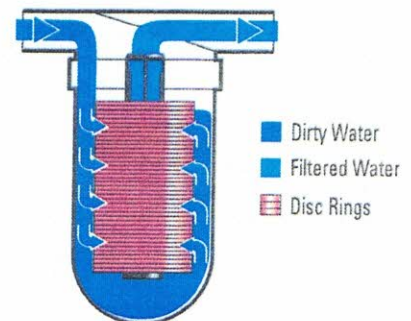
Substitute *** in Model Number for proper mesh.

THE FILTERING PROCESS

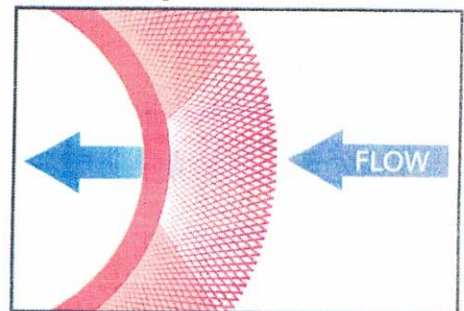
Grooved, compressed plastic disc rings produce a deep filtration process. As dirty water is pumped into the filter and pressure increases on the outside of the filter, the water pressure compresses the rings together tightly.

Grooves in the disc rings crisscross, forming a three dimensional network that traps particles. The number of crisscrossed intersection points on each groove varies, depending on filtration grade. The turbulence in the varying paths and the large number of intersections create an environment where particles are eventually trapped.

This design filters the dirty water thoroughly, not only on the outer surface of the cylindrical disc filter, but through the entire depth of every ring's grooves. The result is a larger, more efficient filtering area (when compared to screen filters) with more debris being captured and cleaner water exiting from the filter.



Top view of disc ring



AIR VENTS

COMBINATION AIR/VACUUM & CONTINUOUS ACTING AND GUARDIAN AIR/VACUUM AIR VENTS

PROVEN DESIGN PROVIDES MORE AIR RELEASE CAPACITY THAN OTHER VENTS OF SIMILAR SIZES



2" COMBINATION



2" COMBINATION with Vacuum Guard



1" COMBINATION



3/4" & 1" AUTOMATIC



3/4" & 1" AUTOMATIC



3/4" & 1" GUARDIAN



3/4" & 1" GUARDIAN with Shradar Valve



2" & 3" GUARDIAN

PRODUCT ADVANTAGES

- Ensures maximum protection of irrigation system with proper sizing and placement.
- Aerodynamic float design ensures vent closure as water fills the system, remains open when air pressure reaches 5-12 psi depending on model.
- Large capacity vents dampen water hammer preventing pipes and fittings from cracking or bursting.
- Unique rolling seal feature allows gradual opening, closing and self-cleaning.
- Made of corrosion-resistant reinforced UV protected nylon - no metal parts to rust or corrode, no need for spare parts.
- Guardian with shradar valve is ideal for measuring local line pressure.
- Five year warranty.

APPLICATIONS

- **1" & 2" COMBINATION AIR/VACUUM AND CONTINUOUS ACTING AIR VENTS**
 - For discharge and intake of large volumes of air at pump and filter stations, along mains and at the end of mainlines.
 - For continuous air release at high points in pipe network or upstream of manifolds.
 - Every 1,500 feet along mainlines.
- **2" COMBINATION AIR RELEASE/VACUUM GUARD & CONTINUOUS ACTING AIR VENT**
 - Releases air at pump priming and maintains the prime by not allowing air intake in long and/or undulating suction lines to pump stations.
 - Releases entrapped air while ensuring continuous prime at centrifugal pumps.
 - Builds up siphons with air release, maintains the siphon by continuously releasing air and not allowing air intake.
- **3/4" & 1" AUTOMATIC CONTINUOUS ACTING AIR VENTS**
 - For high spots where air accumulates.
- **3/4" & 1" CONTINUOUS ACTING/VACUUM GUARD AIR VENTS**
 - For release of entrapped air while ensuring continuous pump prime with no air intake in centrifugal pumps and pump suction lines.
 - Protects mechanical seals in vertical pumps by not allowing air to accumulate in the stuffing boxes.
 - Maintain siphons with continuous air release while not allowing air intake.
- **3/4", 1", 2" & 3" GUARDIAN AIR/VACUUM RELIEF AIR VENTS**
 - Commonly used downstream of valves, primarily at manifolds, to break vacuum caused by system draining.
 - On sloping terrain to prevent collapsing of pipes caused by vacuum when pipe networks drain.
 - Upstream of valves for air discharge during system start-up.

24/2/21

CONSTRUCTION NOTES

TANKAGE

- ◆ Use a WA approved 2-compartment septic tank and dose tank.
- ◆ Tanks are to be sealed with Tamoseal or Thoroseal brand sealer.
- ◆ An OSI Biotube or equivalent outlet filter as specified in the design is required on the septic tank.

SAND FILTER

- ◆ Select fill sand will meet all requirements of ASTM C-33 sand and the Washington Technical Review Committee Guidelines. The manufacturer will provide written verification that the sand meets these requirements.
- ◆ Observation ports are required in the filter. One shall extend to the top of the filter media, the other will be to the bottom of the sand.
- ◆ Sand is to be placed into the bed in 6" lifts. Each lift will be settled by walking on the sand, then raking with hand tools into the corners, along the sides, and around the monitor ports.
- ◆ Select fill over sand filter shall be sandy loam or coarser in texture.
- ◆ The installation of the sand filter shall comply with the WSDOH guidelines for Intermittent Sand Filter Systems.
- ◆ Boots and exit pipes shall meet all requirements.

NETAFIM SUBSURFACE DRIP SYSTEM

- ◆ System to be installed in undisturbed soil unless design specifies otherwise.
- ◆ System to be installed in conditions acceptable to the local Health District.
- ◆ System to be installed as per manufacturer's specifications.
- ◆ The pump (in sand filter) will be placed as per the manufacturer's requirements.
- ◆ All electrical connections shall meet state and local electrical codes.
- ◆ All setback requirements of WAC 246-272 shall be met where possible
- ◆ All elevations are to be verified before construction begins.
- ◆ One foot of fill is recommended over the entire drainfield area for frost protection. Fill to be sandy loam or coarser in texture.

PRESSURE DISTRIBUTION

- ◆ All orifices are to be drilled with a new bit and de-burred.
- ◆ The pump in the dose tank will be placed as per the manufacturer's requirements.
- ◆ All electrical connections shall meet state and local electrical codes. **Alarm panel to be installed within line sight of dose tank and must meet all local requirements. It is recommended that the panel not be placed on a wall outside a bedroom**

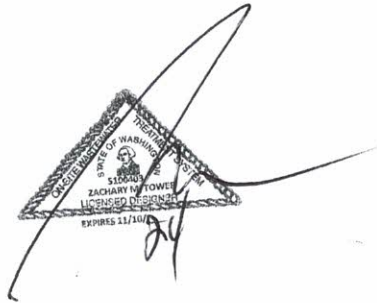
All site plans within the design are approximate and do not constitute a survey.

OPERATION AND MAINTENANCE MANUAL

68 Adel Lane

SEWAGE TREATMENT AND DISPOSAL SYSTEM

December 2023



TOWER DESIGN, INC.
P.O. BOX 2022
LEAVENWORTH, WA 98826
509-548-4496

USER'S MANUAL

YOUR SEPTIC SYSTEM

Please refer to the as-built drawing presented to you from the Chelan Douglas Health District to determine the location of the system components. If you do not have a copy of this drawing, please contact the Health District at 509-886-6450.

SEPTIC SYSTEM

Your septic system is an intermittent sand filter septic system. Typically these are required when native soils are too shallow above a restrictive layer to properly treat septic tank waste. In your case, the system is being used since the soil profile includes fill and a waiver is required.

SEPTIC TANK

The first component of your system is the septic tank. In the septic tank, primary treatment of the sewage from the house occurs. Solids settle to the bottom and form the sludge. Greases and fats float to the surface and form scum. If the tank is not pumped frequently enough, the separation of the waste cannot occur in the tank and these materials can enter your dosing tank. To help prevent this, a filter is located on the outlet end of the septic tank. This filter is designed to need maintenance as frequently as the septic tank needs pumped (see maintenance schedule). If this filter or the septic tank is not maintained, the filter is designed to "clog" which will create a high water condition in your septic tank. If failure of the outlet filter occurs, small particles can reach the dosing tank.

DOSING TANK

From the septic tank the effluent flows by gravity to the dosing tank. The dose tank has several purposes. The primary purpose is to store effluent between doses. The other purpose of the dosing tank is to provide an adequate quantity of water around the pump to cool the pump and to provide a minimum amount of space above the operating range of the pump to provide emergency storage in the event of a pump failure.

The effluent pump and float switches are located inside the dosing tank. There is only one pump. The floats within the dose tank are primarily used to activate a timer that in turn activates the pump and to activate alarms if the liquid level in the dose tank reaches certain points. There are three floats in the dose tank. The lowermost float is a redundant off float. This float sounds an audible and visible alarm if the liquid level drops below this point. This alerts the operator if for some reason the pump does not shut off or if the dose tank is leaking. The second float from the bottom activates the timer. The third

float from the bottom activates the audible and visible alarm to let the operator know that too much water is being used in the system or the pump has failed.

The filter around the pump serves to protect the pump and the pressure distribution system in the sand filter from large particles.

SAND FILTER

From the dosing tank, the effluent is applied to an intermittent sand filters. The dimension of this sand filter is shown on the "as-built" form and in the design. The dosing tank pressurizes the piping network in the sand filters by means of the pump located in the dosing tank.

The sand filter is lined with a 30-mil PVC liner. Placed on top of the liner on the bottom of the sandfilter is a slotted, 4 inch PVC pipe called the underdrain. This connects to the pump well located near the center of the sand filter. Around the underdrain and over the underdrain is washed gravel. Above the gravel is a thin (3-inch) layer of pea gravel. Above the pea gravel is 2 feet of ASTM C-33 sand which acts as the filter media to treat the effluent. Over the sand is a 9-inch layer of washed rock. The pressure pipe is placed upon and surrounded by the washed rock with a minimum of 6" of gravel located under the pressure pipe. The pressure pipe is used to uniformly disperse the effluent over the entire sand filter.

Once the effluent passes through the sand, the effluent is pumped to the subsurface drip disposal field.

SUBSURFACE DRIP DISPOSAL FIELD

From the sand filter, the effluent is applied to the subsurface drip disposal field. The dimensions of the field are shown on the "as-built" form and in the design. The pump in the sand filter pressurizes the piping network in the drip field by means of the pump located in the sand filter pump basin.

The drip disposal field is installed about 6-10" into the existing soil. 6-12" of was required over the field to increase the frost protection. No vehicular traffic at all is allowed in this area.

MAINTENANCE

A qualified individual should perform maintenance. The same individual should perform all of the maintenance on this system for continuity of operation. Sewer gasses are both toxic and explosive. Maintenance personnel should never enter a septic tank or dose tank without proper respiratory equipment and care should be taken when removing tank lids due to the explosive nature of sewer gasses.

Sewage carries pathogenic organisms. For that reason proper precautions should be taken when maintaining this system. All lids to tanks and the cover of the alarm panel should be locked to prevent unauthorized entry.

Cleanouts

Cleanouts are located at the end of each distribution pipe in the sand filters. Cleanouts are to be brought to the surface with a screw cap attached to the end. An irrigation box may be located over each cleanout.

Inspection Ports

There are four-four inch inspection ports located in the sand filter. Two penetrate to the bottom of the sand and the other two penetrate to the bottom of the gravel layer. These should be brought to the surface.

Septic Tank

The septic tank should be cleaned before too much sludge and scum are allowed to accumulate. In no case should the bottom of the scum layer be closer than 3 inches to the tank outlet and sludge should not be allowed to be closer than 12 inches from the bottom of the outlet. The required frequency for pumping septic tanks varies drastically depending on use. The suggested schedule below should be revised if use indicates a need. Please contact the Health department for a method to determine whether a septic tank needs pumped.

Dosing Tank and Sand Filter Pumping System

Solids should not be entering the dosing tank if the septic tank is operating properly. The dosing tank should be periodically checked for solids and if a build up is noted the dosing tank should be cleaned or pumped.

As long as the pump in the dose tank is operating no maintenance should be required. If the pump fails to operate it should be replaced as quickly as possible. There is adequate storage in the dosing tank to continue using a normal amount of water for 3/4 of one day. After that sewage may begin surfacing or backing up into the house. A licensed electrician should be consulted for pump or control panel failures.

Sand Filter

The sand filter area should be allowed to return to its natural state. Sod should be placed over the surface as soon as possible. It is recommended that you do not plant trees over the sand filter. Surface water should be diverted away from the sand filter to prevent additional water entering the system. No heavy vehicles should be allowed on top of the sand filter since this may compact the soil and crush the piping.

Subsurface drip disposal field

The area should be allowed to return to its natural state. It is recommended that you do not plant trees over the drip field. Surface water should be diverted away from the drip field to prevent additional water entering the system. No heavy vehicles should be allowed to operate; near the drip field since this may compact the soil and affect its function.

OPERATION AND MAINTENANCE SCHEDULE

The following is a recommended timetable for maintenance on this system. Actual use may indicate the need for a revised schedule.

Septic tank - inspect yearly for structural integrity, proper baffling, ground water intrusion. Inspect and clean effluent baffle screen and pump as needed (every 2-3 years for most users).

Dosing tank - Inspect and clean the pump switches and floats yearly. Pump the accumulated sludge from the bottom of the chamber whenever the septic tank is pumped or more often if necessary and clean the biotube effluent filter.

Sand filter pump well – inspect and clean the pump switches and floats yearly. Observe the water to verify that it is clear and that it has a minimal odor.

Monitoring ports - Check monitoring ports for ponding quarterly. Conditions in the monitoring ports must be observed and recorded by the service provider during all operation and maintenance activities.

Timers, pump switches, floats, alarm system or other electrical components - Inspect and test yearly for malfunctions.

TROUBLESHOOTING

Any time a malfunction occurs the system should be evaluated to determine the cause and correct the problem. The most common malfunction most homeowners will experience will be a ringing alarm. Here is some advice to determine the cause.

Alarm sounds - In order to determine what is wrong, it must be determined if the alarm is for the dose tank or the sand filter pump well. There are individually labeled lights on the outside of the alarm panel. Whichever light is flashing indicates which alarm is ringing (dose tank or sand filter pump well).

If the alarm is for the dose tank - The lid over the dosing tank must be removed. There are two floats that can cause the alarm to sound. If the uppermost float is "up", this can

cause the alarm to sound. If the lowermost float is "down" this can cause the alarm to sound also.

If you open the lid and the uppermost float is "up", you need to determine why the liquid level in the tank is high enough to lift this float. At the alarm panel, switch the operation to manual. If the pump works, you know the pump is not malfunctioning (do not leave the operation in manual mode, switch back to auto). If the pump is functioning, check to see that the middle float is not stuck in the "down" position. If the middle float is in the "down" position, the timer is not being activated and therefore the pump does not know there is sewage to pump. If the middle float is stuck it will need to be adjusted to not get stuck in the future or it may need cleaned off. If the middle float is not stuck in the "down" position, the most likely reason the alarm is sounding is because you have generated more sewage in the last 24 hours than the septic system was designed to accommodate. If this is the case, reduce your water usage. Some tips for reducing water usage are available at the Health Department. **Do not adjust the timer to pump more sewage at the dose tank. If you continue to generate more sewage than your system can handle, the system should be expected to fail.**

Another cause for high water at the dose tank can be if the sand filter pump well alarm is activated. No water will be pumped from the dose tank to the sand filter if the alarm float in the sand filter pump well is activated. If the alarm at the drip field dose tank is activated you must determine why this alarm is activated (see below).

If you open the lid and the lowermost float is "down", you need to determine why the liquid level in the tank is low enough to drop this float in the "down" position. If the pump is running when you open the lid, the float switch or timer is malfunctioning and is not allowing the pump to shut off. Turn the operation of the system at the alarm panel to off (so you do not burn up the pump) and contact an electrician as soon as possible. With the system in the off position, no sewage will be pumped to the drainbed, so you will need to limit water usage until the problem is solved. If the pump is not running and the lowermost float is in the "down" position, the most likely cause is a leaky tank allowing the effluent to leak into the surrounding soil. You will need to contact a septic tank pumper to pump the dose tank and repairs will need to be made to the tank. **Do not enter the tank without proper respiratory equipment.**

If the alarm is for the sand filter pump well, the lid for this item must be removed. If the upper float is "up", the pump must be malfunctioning since this item is on demand and will pump water whenever there is water to pump. If the lower most float is down and the pump is running, the floats are not functioning properly. Turn off this pump and call an electrician. With this pump off, no effluent will go to the drip field so all water usage in the home must be stopped.

If sewage is observed over the drainfield or over any portion of the system you should contact the Installer, Designer, or Health District for their advice.

The maintenance and operation of the headerworks and the drip field will be provided by the manufacturer.

RECORDS

Record Keeping

The operator should keep a log listing all aspects of operation including all maintenance items performed and any unusual occurrences. This logbook should stay with the system for future reference.

SPECIFICATIONS

These items are as specified in the design and should be filled in here by your installer.

Dose Tank Pump – Orenco PF 300511
Drip field pump – Orenco PF 201012

Septic tank effluent screen – FTP 0444-36

IMPORTANT NUMBERS

Chelan -Douglas Health District - 509-886-6450

Tower Designs - 509-548-4496

Installer –

A copy of the system design is on file at the Chelan Douglas Health District with any alterations approved by the designer so noted.