

STATE OF COLORADO MINIMUM SETBACK REQUIREMENTS:

Table 7-1: Minimum Horizontal Distances in Feet Between Components of an OWTS and Water, Physical and Health Impact Features

Component	Spring, Well, Suction Line, Potable Water Supply Cistern*	Potable Water Supply Line*	Structure with basement, crawl space or footing drains	Structure without basement, crawl space or footing drains	Property Line, Piped or Lined Irrigation Ditch, uplope curtain drain	Subsurface Drain, Intermittent Irrigation Lateral, Drywell, Stormwater Structure	Lake, Water Course, Irrigation Ditch, Stream, Wetland	Dry Gulch, Cut Bank, Fill Area (from Creek)	Septic Tank, Higher Level Treatment Unit, Dosing Tank, Vault Privy
Septic Tank, Higher Level Treatment Unit, Dosing Tank, Vault Privy	50'	10'	5	5	10	10	100 (state is 50)	10	--
Building Sewer or Effluent Lines	50'	5'	0	0	10'	10'	50'	10'	--
STA Trench or Bed, Un-lined Sand Filter, Sub-surface Dispersal System	100'	25'	20	10	10	25	100 (state is 50')	25	5
Lined Sand Filter	60	10'	15	10	10	10	100 (state is 25)	10	5
Lined Evapotranspiration Field	60	10'	15	15	10	10	100 (state is 25)	10	5
Un-lined Sand Filter in Soil with a Percolation Rate < 60 MPI, Un-lined or Partially Lined Evapotranspiration System, System not relying on STA for Treatment other than Aerosol	100	25'	15	15	10	25	100 (state is 25)	15	10
Pit Privy	100	50'	25	25	25	25	100 (state is 25')	25	N/A
System not relying on STA for dispersal	100'	10'	125'	125'	10	0	100 (state is 25')	10	10

NOTE: The minimum distances shown above shall be maintained between the OWTS components and the features described. Where soil, geological or other conditions warrant, greater distances may be required by the local board of health or by the Water Quality Control Commission pursuant to C.R.S. §25-8-206 and applicable regulations. For repair or upgrading of existing OWTS where the size of lot precludes adherence to these distances, a repaired OWTS shall not be closer to setback features than the existing OWTS, as reviewed and approved by the Department. Components that are not watertight should not extend into areas of the root system of trees or trees.

1. Includes potable wells, irrigation wells and monitoring wells set within a potable aquifer and infiltration galleries permitted as wells by the Division of Water Resources.

2. Crossings or encroachments may be permitted at the points as noted above provided that the water or wastewater conveyance pipe is enclosed for the minimum setback distance on each side of the crossing. A length of pipe with a minimum Schedule 40 rating of sufficient diameter to easily slide over and completely encase the conveyance shall be used. Rigid end caps of at least Schedule 40 rating shall be placed and secured in a watertight fashion to the ends of the encasement pipe. A hole of sufficient size to accommodate the pipe shall be drilled in the lowest section of the rigid cap so that the conveyance pipe rests on the bottom of the encasement pipe. The area in which the pipe passes through the end cap shall be sealed with an approved underground sealant compatible with the piping used. Other methods of encasement that provide equal protection are allowed. These methods shall be reviewed and approved for by the local public health agency.

3. Add eight feet additional distance for each 100 gallons per day of design flow between 1,000 and 2,000 gallons per day, unless it can be demonstrated by a professional engineer or geologist or the use of a barrier consisting of a minimum 30 mil PVC liner or equivalent that contamination will be minimized. Flows greater than 2,000 gallons per day shall be hydrologically analyzed for flow, velocity, hydraulic head, and other pertinent characteristics as means of estimating distances required to minimize contamination as part of the Division site application and permitting process.

4. All horizontal setbacks to a potable water supply system shall be met unless a variance by the Board of Examiners of Water Well Construction and Pump Installation Contractors is granted per section 15.2 of the Water Well Construction Rules, 2 CCR 402-2. Setback requirements which may necessitate a variance are found within section 10.2 or 11.4 of the Water Well Construction Rules, as applicable. The minimum horizontal setback that may be granted through a variance is 20 feet.

5. If the structure is not used as a habitable unit, the isolation may be reduced by the local board of health to no less than 50 feet.

6. Building sewer installations shall meet the design requirements of the Colorado Plumbing Code.

ELJEN G5F A42 INSTALLATION GUIDELINES (COLORADO AS OF JAN. 2017):

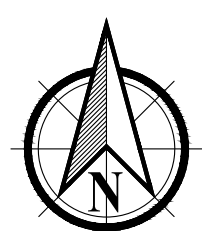
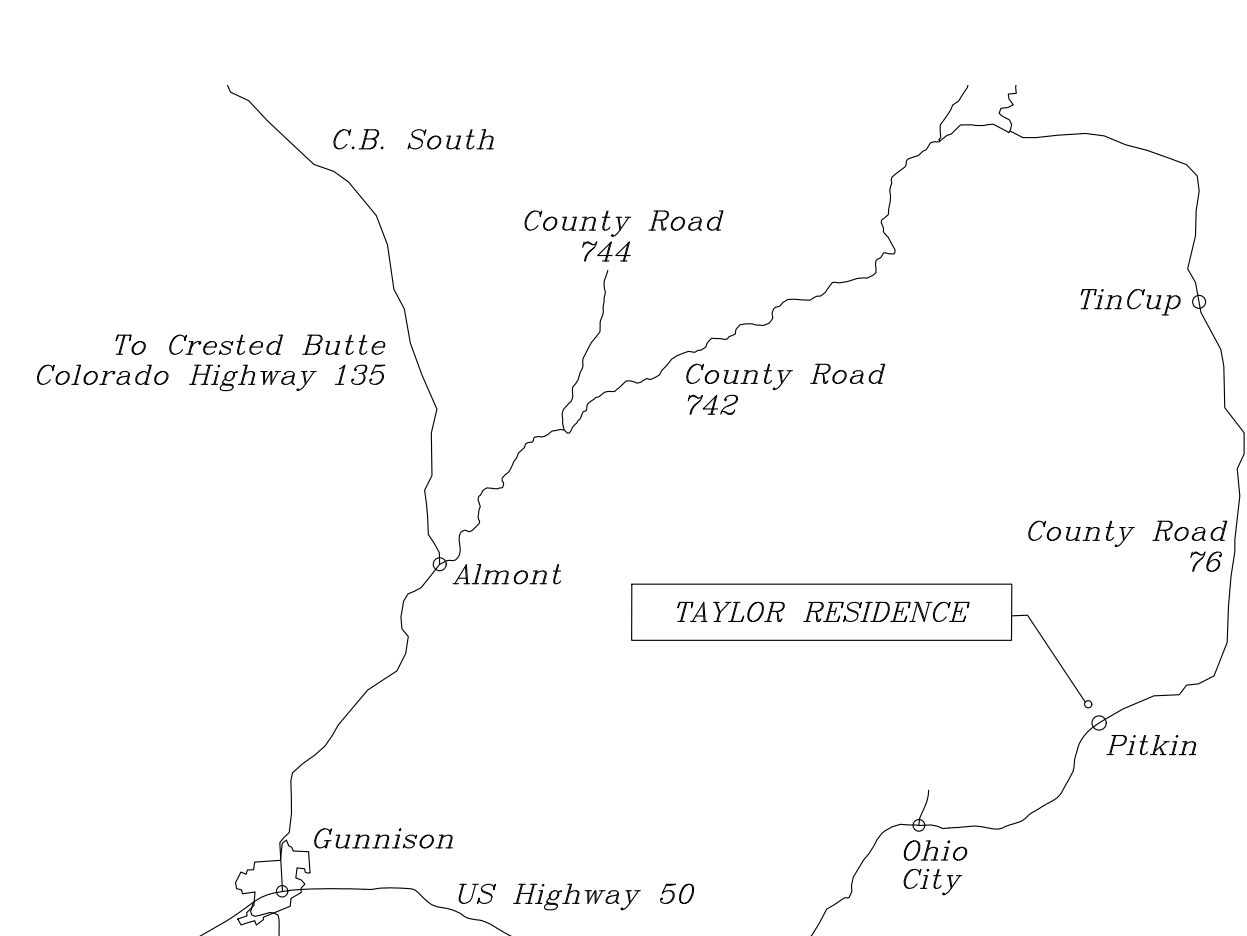
- INSURE ALL COMPONENTS LEADING TO G5F SYSTEM ARE INSTALLED PROPERLY. SEPTIC TANK EFFLUENT FILTERS (OR SCREENED EFFLUENT PUMPS) ARE REQUIRED WITH THE G5F SYSTEM.
- DETERMINE THE NUMBER OF G5F MODULES REQUIRED PER DESIGN.
- PREPARE SITE. DO NOT INSTALL A SYSTEM IN SATURATED GROUND OR WET SOILS THAT ARE SMEARED DURING EXCAVATION. KEEP MACHINERY OFF INFILTRATIVE AREAS.
- PLAN ALL DRAINAGE REQUIREMENTS ABOVE (UP-SLOPE) OF THE SYSTEM. SET SOIL GRADES TO ENSURE THAT STORM WATER DRAINAGE AND GROUND WATER IS DIVERTED AWAY FROM THE ABSORPTION AREA ONCE THE SYSTEM IS COMPLETE.
- EXCAVATE THE BED ABSORPTION AREA: SCARIFY THE RECEIVING LAYER TO MAXIMIZE THE INTERFACE BETWEEN THE NATIVE SOIL AND SPECIFIED SAND.
- MINIMIZE WALKING IN THE ABSORPTION AREA PRIOR TO PLACEMENT OF THE SPECIFIED SAND TO AVOID SOIL COMPACTION.
- PLACE SPECIFIED SAND IN SIX (6) INCH LIFTS, STABILIZE BY FOOT, A HAND HELD TAMPING TOOL OR A PORTABLE VIBRATING COMPACTOR. THE STABILIZED HEIGHT MUST BE BELOW THE G5F MODULE MUST BE LEVEL.
- PLACE G5F MODULES WITH PAINTED STRIPE FACING UP, END TO END ON TOP OF THE SPECIFIED SAND ALONG THEIR 4 FOOT LENGTH.
- A STANDARD 4-INCH PERFORATED PIPE, SDR 35 OR EQUAL, IS CENTERED ALONG THE MODULES 4-FOOT LENGTH. ORIFICES ARE SET AT THE 4 & 8 O'CLOCK POSITION.
- ALL 4-INCH PIPES ARE SECURED WITH MANUFACTURERS SUPPLIED WIRE CLAMPS, ONE PER MODULE.
- (PRESSURE DISTRIBUTION SYSTEMS ONLY) INSERT A PRESSURE PIPE (SIZE AND ORIFICES PER DESIGN) INTO THE STANDARD 4-INCH PERFORATED PIPE. THE PRESSURE PIPE ORIFICES ARE SET AT THE 12 O'CLOCK POSITION AS SHOWN ON THE PLANS. EACH PRESSURE LATERAL WILL HAVE A DRAIN HOLE AT THE 6 O'CLOCK POSITION. EACH PRESSURE LATERAL SHALL HAVE A CLEAN OUT AT THE END OF EACH MODULE.
- COVER FABRIC SUBSTITUTIONS IS NOT ALLOWED. THE INSTALLER SHOULD LAY THE ELJEN PROVIDED GEOTEXTILE COVER FABRIC LENGTHWISE DOWN THE ROW, WITH THE FABRIC FITTED TO THE PERFORATED PIPE ON TOP OF THE G5F MODULES. FABRIC SHOULD BE NEITHER TOO LOOSE, NOR TOO TIGHT. THE CORRECT TENSION OF THE COVER FABRIC IS SET BY:
 - SPREADING THE COVER FABRIC OVER THE TOP OF THE MODULE AND DOWN BOTH SIDES OF THE MODULE WITH THE COVER FABRIC TENTED OVER THE TOP OF THE PERFORATED DISTRIBUTION PIPE.
 - PLACE OCCASIONAL SHOVELFULS OF SPECIFIED SAND DIRECTLY OVER THE PIPE AREA ALONG THE COVER FABRIC TO FORM A MOSTLY VERTICAL ORIENTATION ALONG THE SIDE OF THE PIPE. REPEAT THIS STEP MOVING DOWN THE PIPE.
- PLACE 1 2-INCHES OF SPECIFIED SAND ALONG THE SIDES OF THE MODULE EDGE. A MINIMUM OF 6-INCHES OF SPECIFIED SAND IS PLACED AT THE BEGINNING AND END OF EACH ROW. A MINIMUM OF 24-INCHES OF SPECIFIED SAND IS PLACED BETWEEN MODULE ROWS.
- CALL TO SCHEDULE THE REQUIRED INSPECTIONS.
- COMPLETE BACKFILL WITH A MINIMUM OF 12-INCHES OF CLEAN POROUS FILL MEASURED FROM THE TOP OF THE MODULES. BACKFILL EXCEEDING 18-INCHES REQUIRES VENTING AT THE FAR END OF THE BED. USE WELL GRADED NATIVE SOIL FILL THAT IS CLEAN, POROUS AND DEVOID OF LARGE ROCKS. DO NOT USE WHEELED EQUIPMENT OVER THE SYSTEM.
- DIVERT SURFACE RUNOFF FROM THE SYSTEM. FINISH GRADE TO PREVENT SURFACE PONDING. TOPSOIL AND SEED SYSTEM AREA TO PROTECT FROM EROSION.

INSPECTION NOTES:

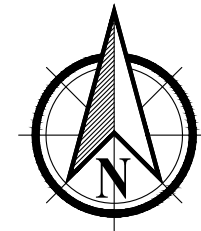
- A FINAL INSPECTION PRIOR TO BACKFILLING THE SYSTEMS SHALL BE CONDUCTED BY THE LOCAL PUBLIC HEALTH AGENCY AND SCJ ALLIANCE CONFIRMING THE ON SITE WASTE WATER TREATMENT SYSTEM WAS INSTALLED ACCORDING TO THE PERMIT REQUIREMENTS AND REGULATIONS OR VARIANCES TO THE REGULATIONS.
- ALL COMPONENTS MUST BE INSTALLED PRIOR TO INSPECTION.
- IF A PRESSURIZED SYSTEM IS DESIGNED: THE PUMP AND CONTROL BOX INCLUDING THE ALARM SHALL BE PERMANENTLY WIRED, BY A LICENSED ELECTRICIAN, AND READY TO CYCLE PRIOR TO INSPECTION.
- IF A PRESSURIZED SYSTEM IS DESIGNED: ALL CHAMBERS OF THE SEPTIC TANK MUST BE FILLED WITH WATER AND ADDITIONAL WATER MUST BE ON-SITE TO CYCLE PUMPS AND TEST THE SOIL TREATMENT AREA PRIOR TO INSPECTION.

GENERAL NOTES:

- THE HOMEOWNER OR CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO MAKING ANY CHANGES TO PLANS.
- SEWAGE TREATMENT SYSTEM TO BE INSTALLED IN ACCORDANCE WITH STATE OF COLORADO REGULATION 43.
- COUNTY SHALL BE NOTIFIED FOR INSPECTION PRIOR TO COVERING LATERALS AND WITH ALL SYSTEM COMPONENTS IN PLACE.
- CONTRACTOR SHALL PRECLUDE ALL VEHICULAR TRAFFIC AND MATERIALS STORAGE ON THE SOIL TREATMENT AREA.
- PVC SEWER PIPE IS TO BE SDR 35 MEETING ASTM SPECIFICATION D3034.
- PREPARE TRENCHES BOTTOM AND SIDES BY CAREFULLY LEVELING, RAKING, AND SCARIFYING INFILTRATIVE SURFACES. AVOID COMPACTING TRENCH BOTTOM BY OPERATING HEAVY EQUIPMENT IN THE TRENCHES.
- INSTALL ALL SEWER LINES AT A MINIMUM SLOPE OF 1/4" DROP PER FOOT.
- GEOGRID SHALL BE TRIAX TX140 GEOGRID OR EQUAL.
- NOTIFY ENGINEER IF SOILS TYPES AND CHARACTERISTICS CHANGE IN SOIL TREATMENT AREA.
- FILTER FABRIC SHALL BE ELJEN COVER FABRIC.
- PROVIDE ADEQUATE DRAINAGE IN ALL DIRECTIONS OVER SOIL TREATMENT AREA AND PLANT WITH NATIVE PRODUCTS.
- ALL SUBSTITUTIONS SHALL BE APPROVED BY THE ENGINEER.
- DO NOT PROVIDE MORE THAN 2 TO 3 FEET OF FILL OVER SEPTIC TANK.
- IT IS THE SOLE RESPONSIBILITY OF THE SYSTEM INSTALLER TO VERIFY AND CONFIRM THE REQUIRED HORIZONTAL SETBACK DISTANCES ARE MET PRIOR TO EXCAVATION. IF THE DESIGNED PLANS DO NOT REFLECT THE FIELD CONDITIONS THE ENGINEER MUST BE NOTIFIED PRIOR TO PLACEMENT OF ANY ON SITE WASTE WATER TREATMENT SYSTEM COMPONENTS.
- SEPTIC TANK & PUMP SUPPLIER IS VALLEY PRECAST, INC., 28105 COUNTY ROAD, BUENA VISTA, CO 81211. PHONE # (719) 395-6764. OR GRAND JUNCTION PIPE & SUPPLY.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL BURIED PIPING IS PROPERLY FROST PROTECTED. MINIMUM COVER FOR UNINSULATED GRAVITY PIPE IS 4 FT. MINIMUM COVER FOR ALL UNINSULATED PRESSURE PIPE IS 7 FT.



VICINITY MAP
SCALE: N.T.S.



SANITATION PLAN
SCALE: 1" = 20.0'

NO.	DATE	REVISIONS

SCJ ALLIANCE
CONSULTING SERVICES

400 NORTH MAIN STREET, GUNNISON, CO 81230
P: 970.561.2499
SCJALLIANCE.COM

ON-SITE WASTEWATER TREATMENT SYSTEM

TAYLOR RESIDENCE
329 MAIN STREET, PITKIN
GUNNISON COUNTY, COLORADO

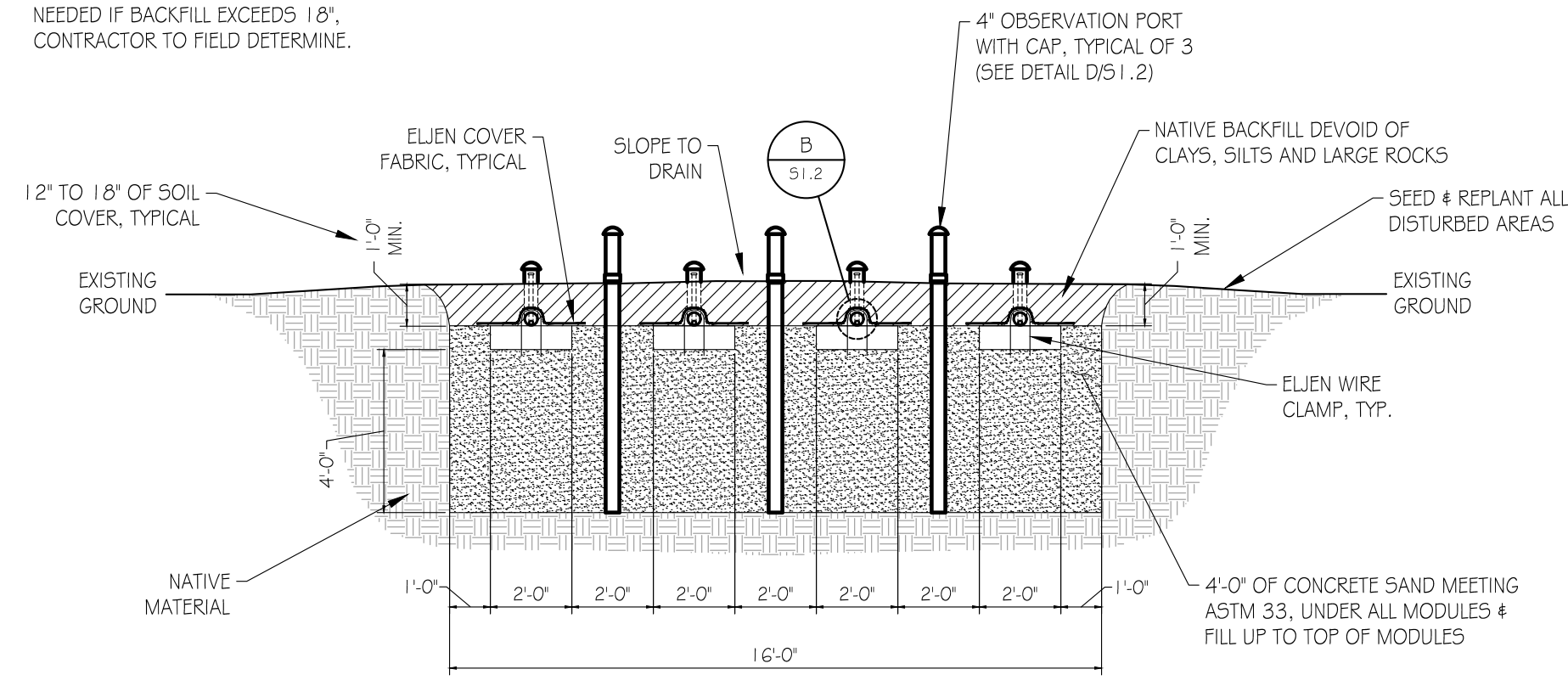
SHEET TITLE: PROJECT NAME



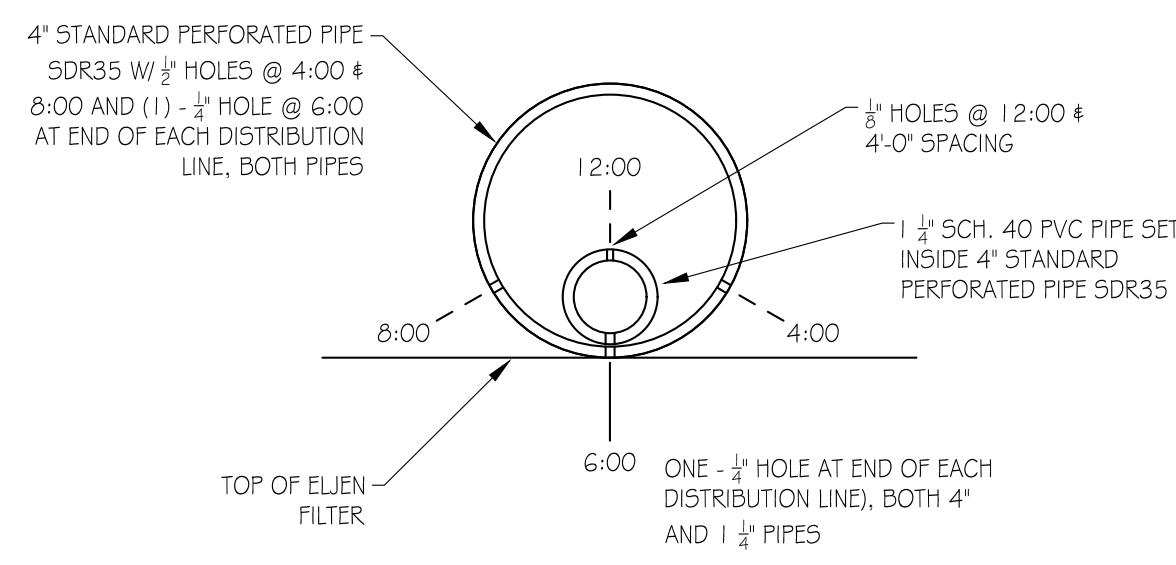
DESIGNER:	CSF
DRAWN BY:	CSF
APPROVED BY:	MM
DATE:	FEBRUARY 7, 2024
JOB NO.:	22-000619
DRAWING NO.:	S1.1

S1.1

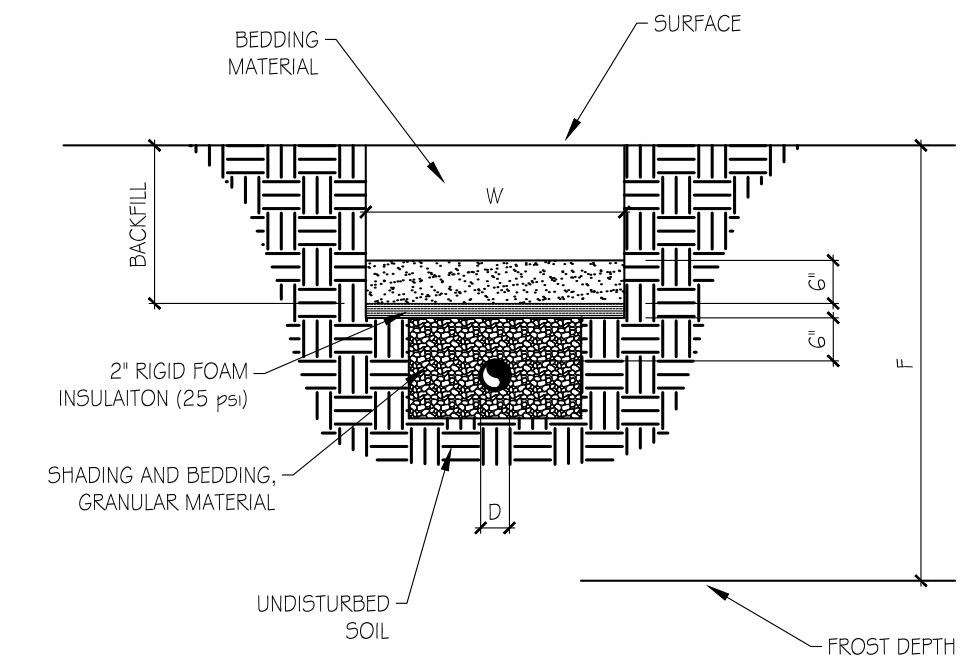
NOTE:
OBSERVATION PORT/VENT ONLY
NEEDED IF BACKFILL EXCEEDS 18".
CONTRACTOR TO FIELD DETERMINE.



SECTION A-A
SCALE: 1/4" = 1'-0"

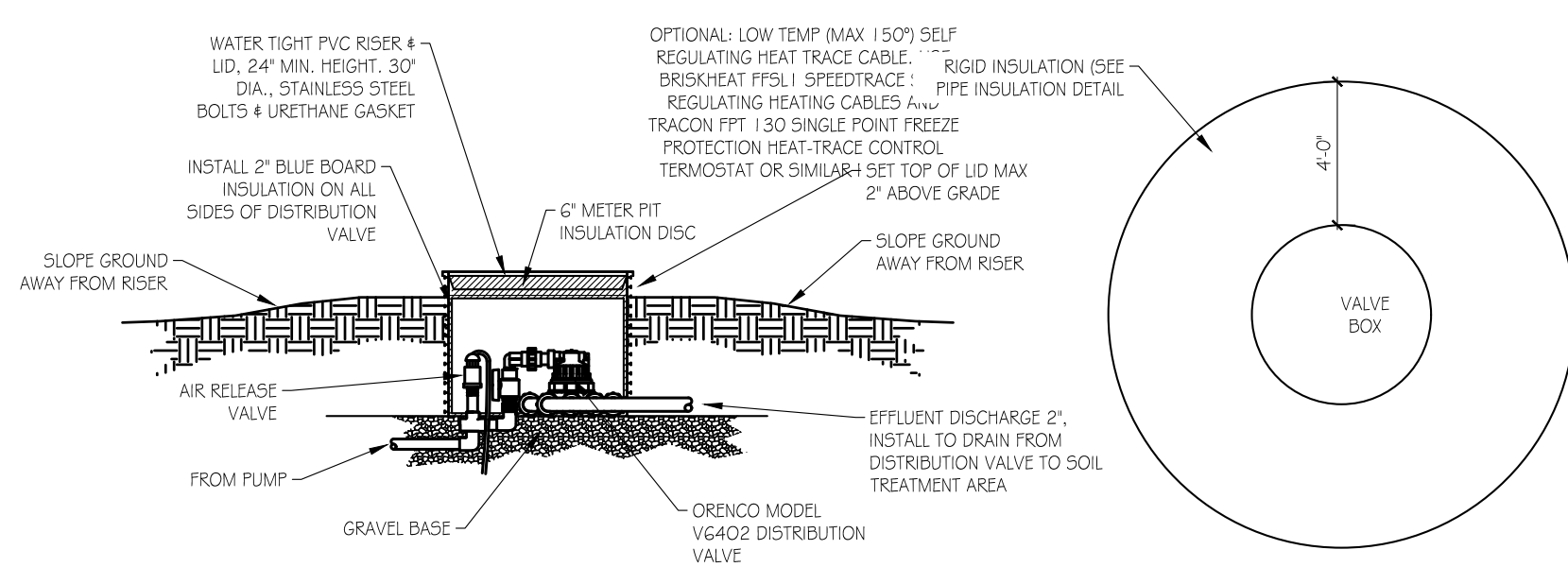


DETAIL B
SCALE: 1/4" = 1'-0"

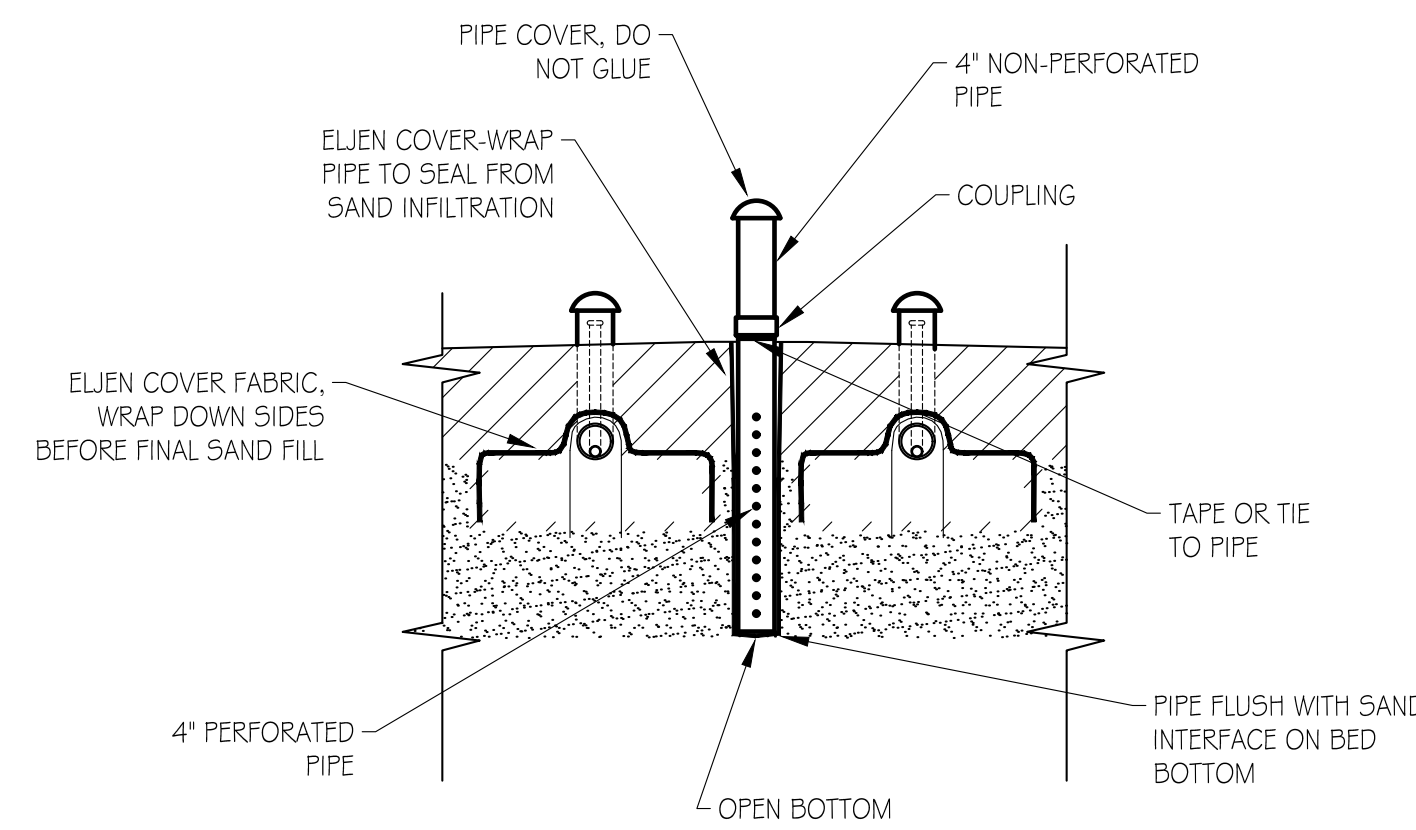


WIDTH OF INSULATION: $W = 3D + 2(F - (X + D + 0.5))$ (IN FT.)
WHERE:
W = WIDTH OF INSULATION (FT.)
D = PIPE DIAMETER (FT.)
X = INSULATION DEPTH
F = ESTIMATED FROST DEPTH
*INSULATION MIN. 2" THICK
FROM "INSULATION FOR GEOTECHNICAL APPLICATIONS"
DOW/STYROFOAM HIGH LOAD INSULATION

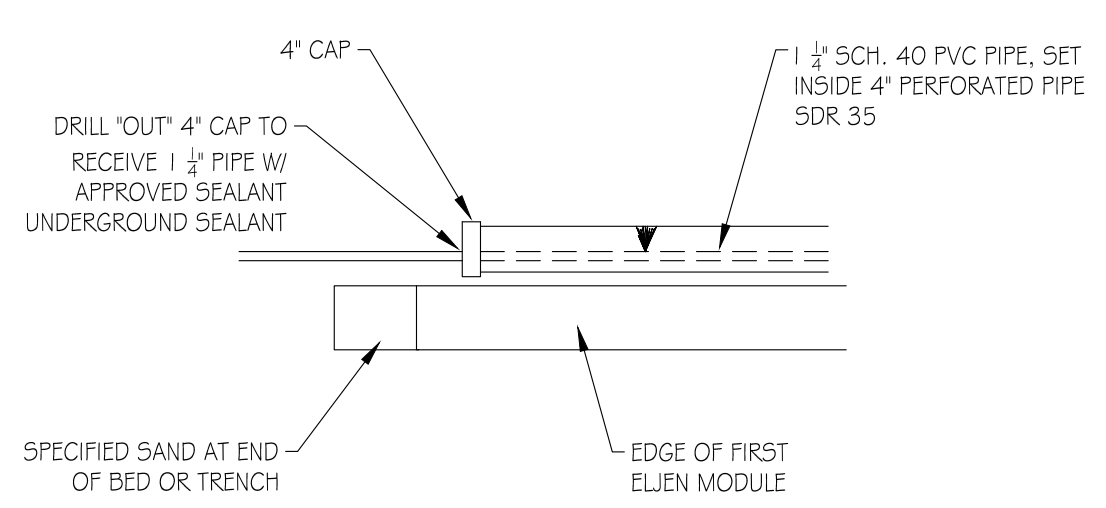
PIPE INSULATION DETAIL
SCALE: N.T.S.



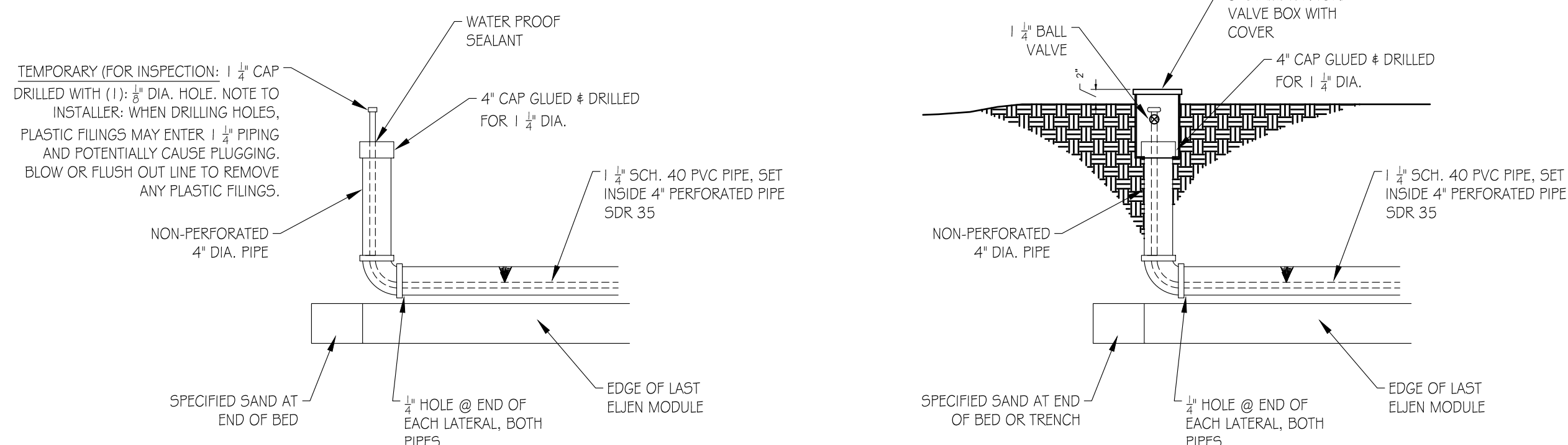
ORENCO MODEL 6402 DISTRIBUTION VALVE
SCALE: N.T.S.



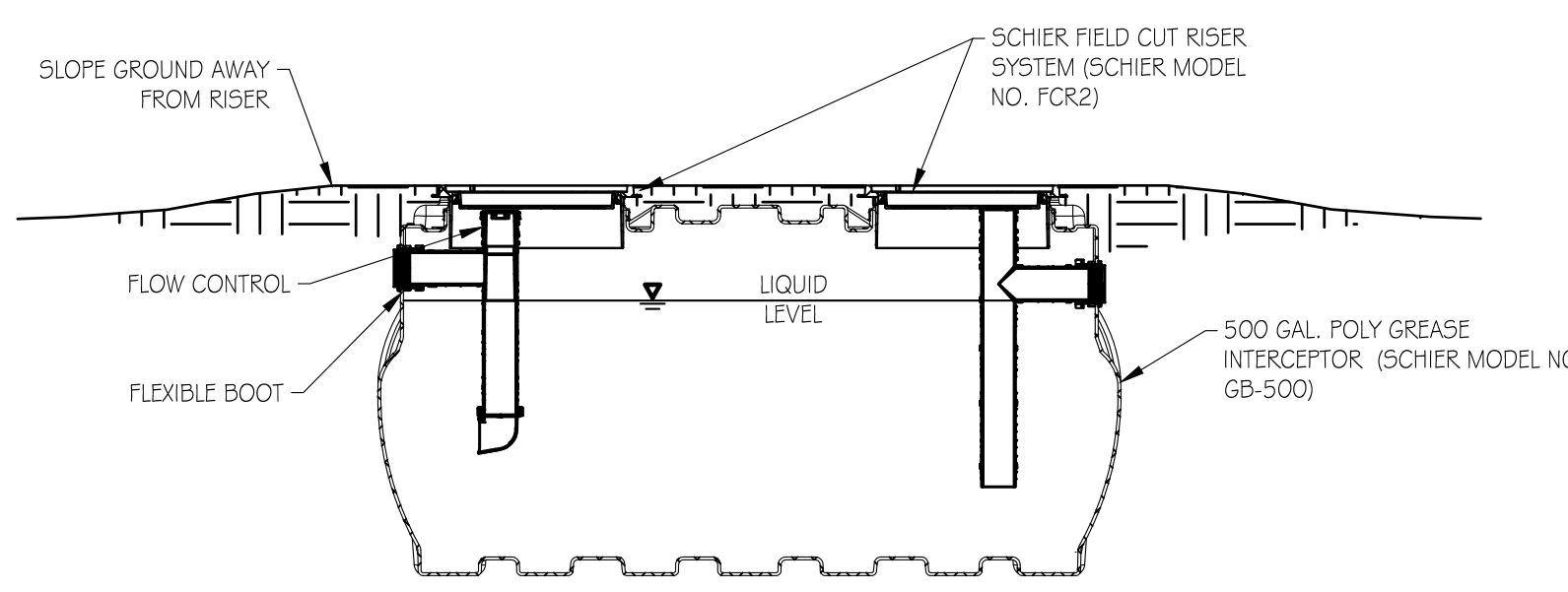
DETAIL D
SCALE: N.T.S.



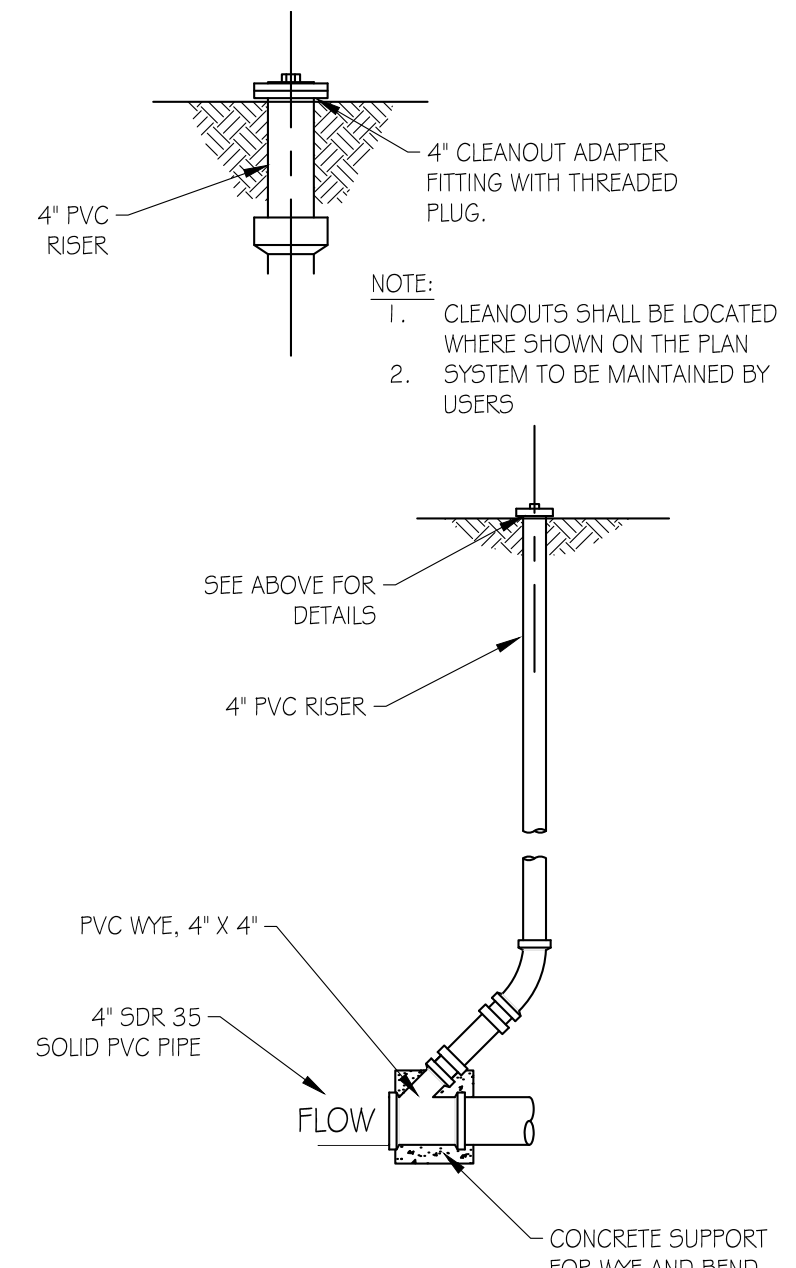
DETAIL E
SCALE: 1/4" = 1'-0"



FOR INSPECTION
FINAL
DETAIL C
SCALE: 1/4" = 1'-0"



500 GAL. GREASE INTERCEPTOR
SCALE: N.T.S.



SEWER CLEANOUT DETAIL
SCALE: N.T.S.

REVISIONS	DATE	BY

SCJ ALLIANCE
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400 NORTH MAIN STREET, GUNNISON, CO 81230
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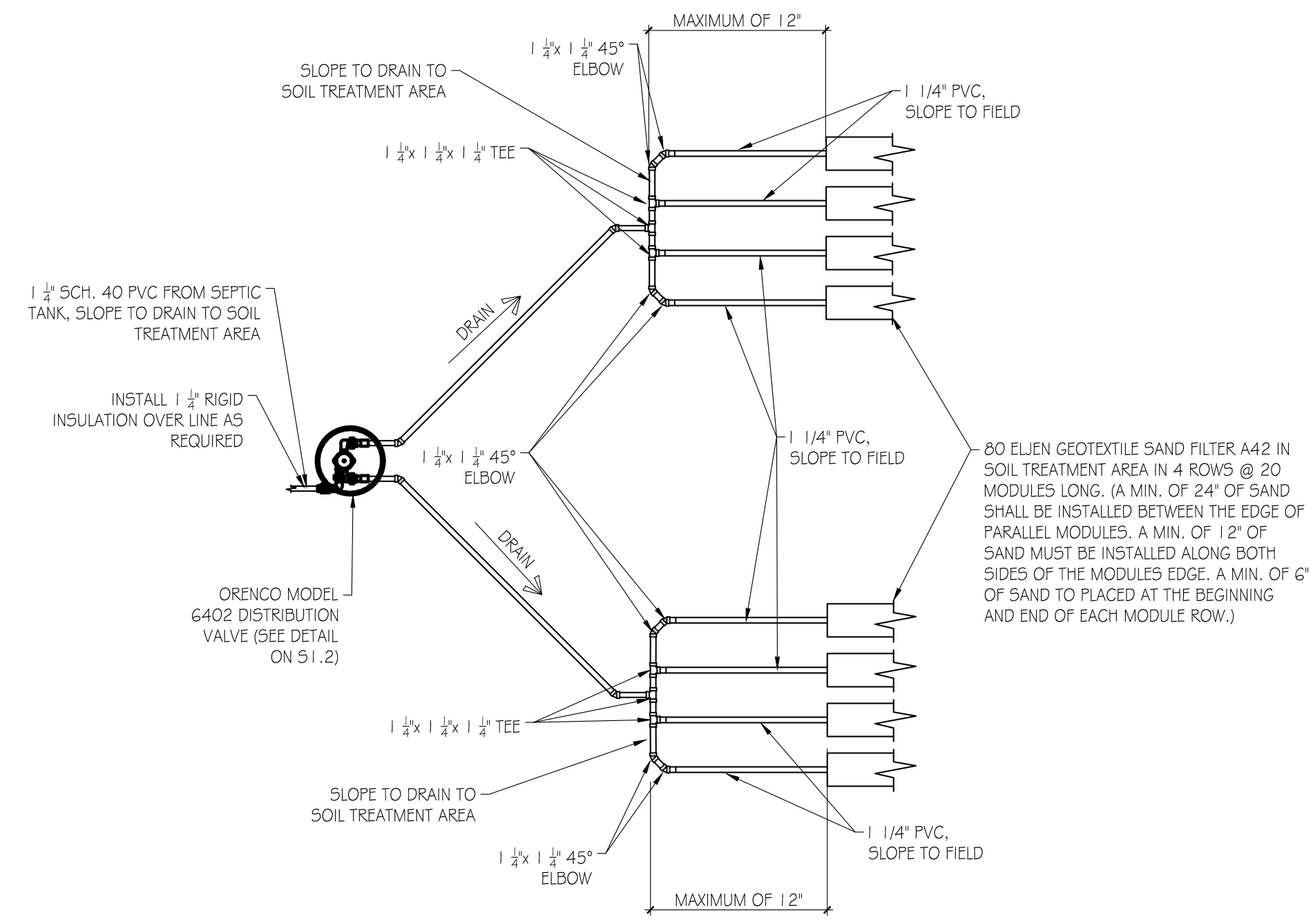
ON-SITE WASTEWATER TREATMENT SYSTEM DETAILS
TAYLOR RESIDENCE
329 MAIN STREET, PITKIN GUNNISON COUNTY, COLORADO

SHEET TITLE:
PROJECT NAME:
SCALE:

DESIGNER: CSF
DRAWN BY: CSF
APPROVED BY:
DATE: FEBRUARY 7, 2024
JOB NO: 22-000619
DRAWING NO:

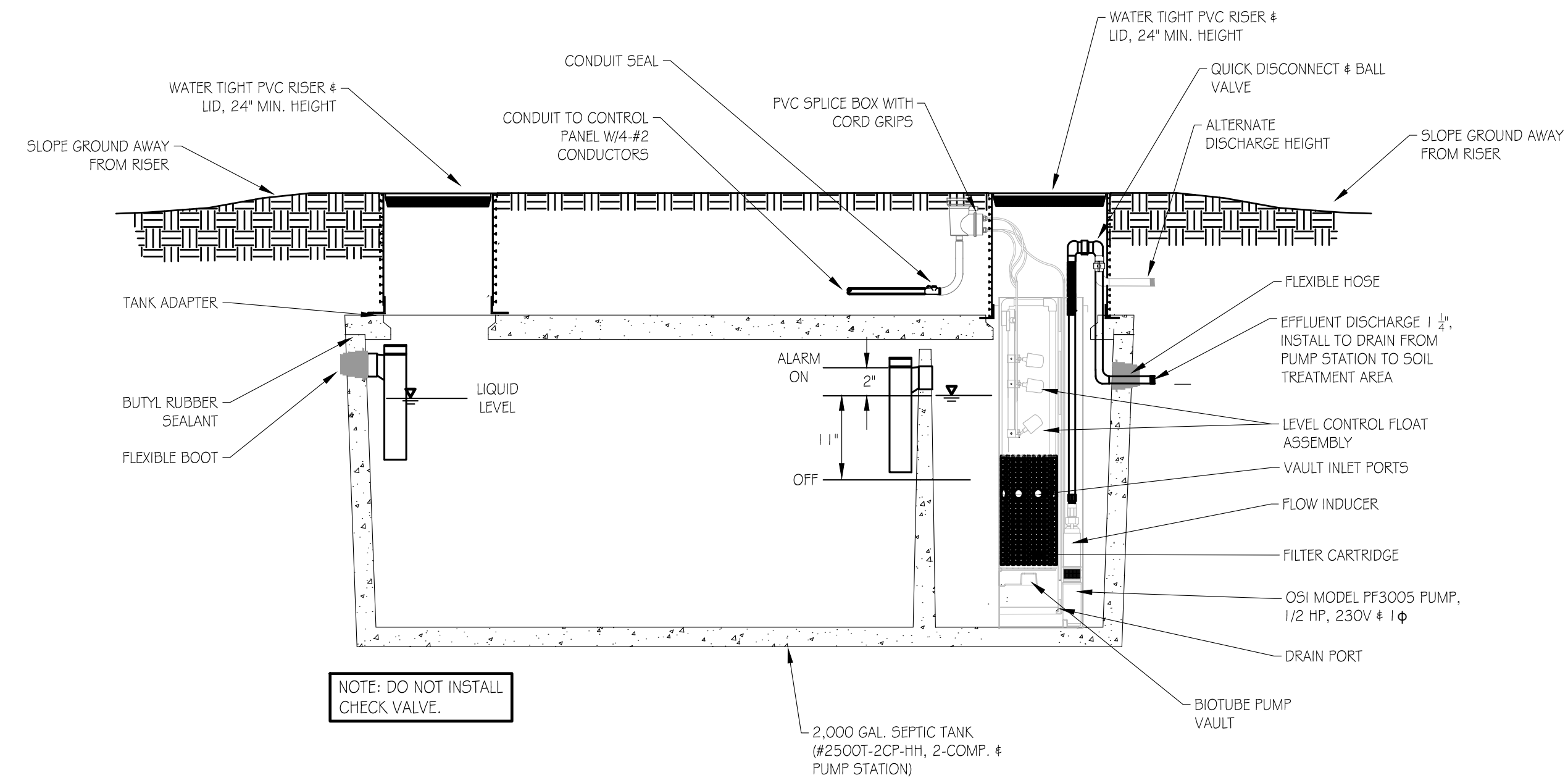
S1.2

FEB 07, 2024 11:52:22am - User: cameron_loggery
C:\USERS\CAMERON\LOCAL APPDATA\LOCAL TEMP\ACPI\BIBLSH_268A\24-010 23-000619 OWS SITE AND SYSTEM DETAILS.DWG



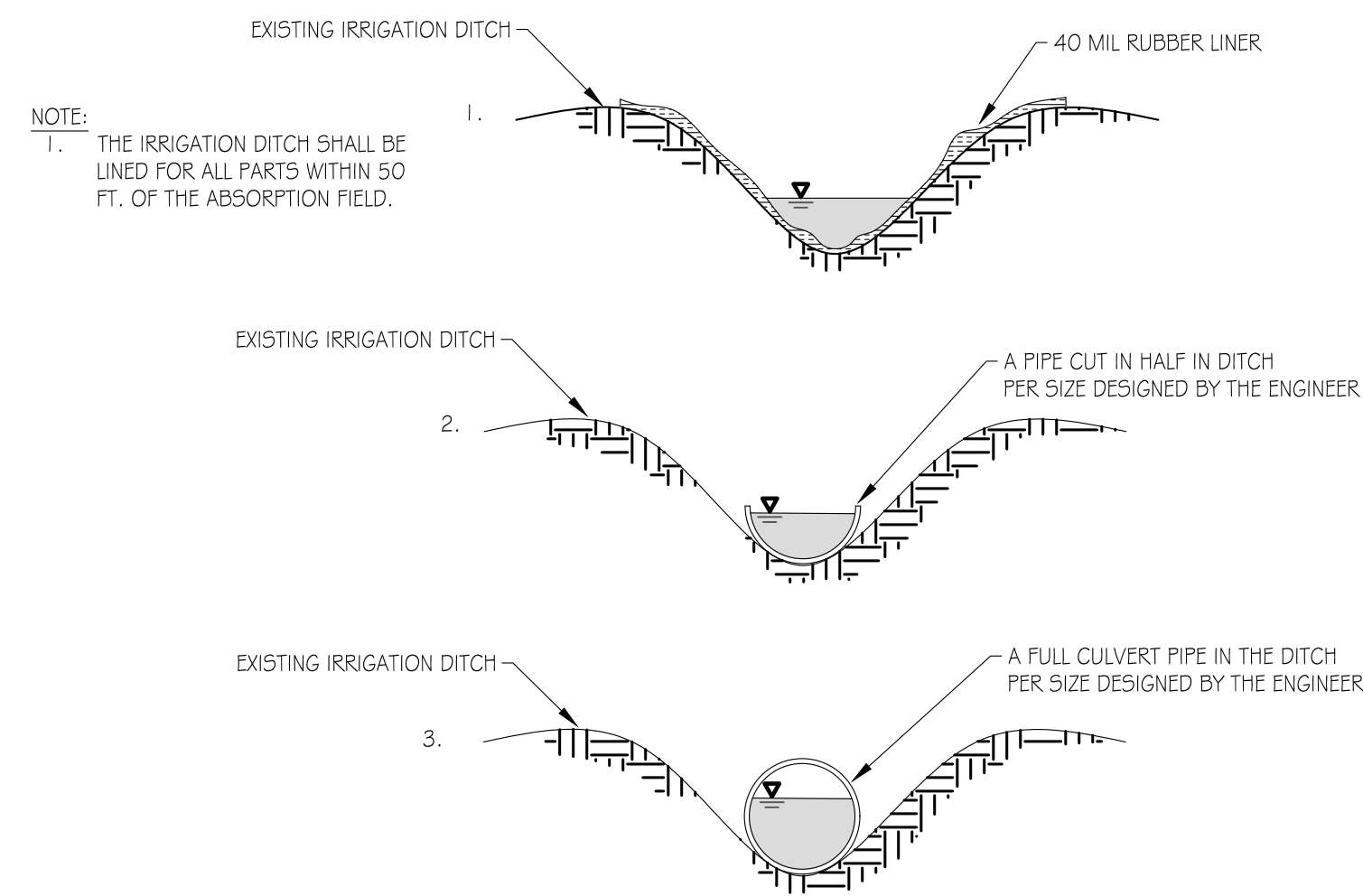
DISTRIBUTION LATERAL

SCALE: 1/8" = 1'-0"



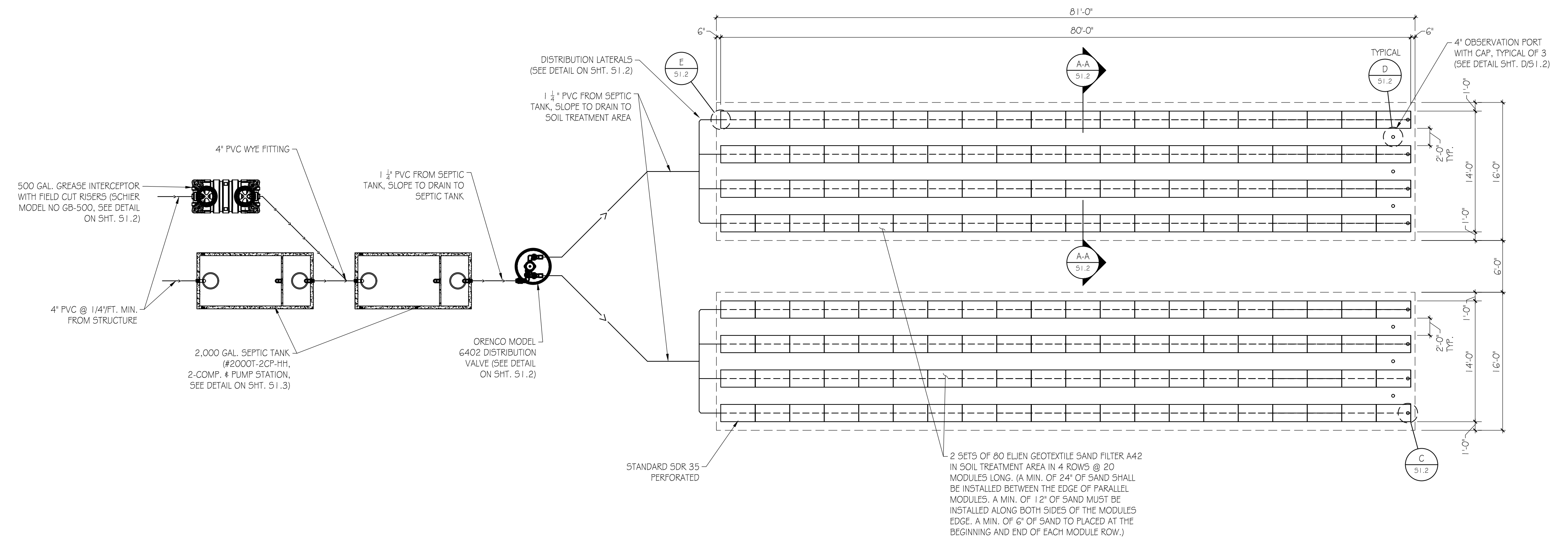
2,000 GAL. SEPTIC TANK AND PUMP STATION

SCALE: NTS



LINED DITCH DETAIL

SCALE: N.T.S.



SOIL TREATMENT AREA

SCALE: NTS

REVISIONS	DATE	BY

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400 NORTH MAIN STREET, GUNNISON, CO 81230
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SCALLIANCE.COM

ON-SITE WASTEWATER TREATMENT SYSTEM DETAILS
TAYLOR RESIDENCE
329 MAIN STREET, PITKIN GUNNISON COUNTY, COLORADO

SHEET TITLE: ON-SITE WASTEWATER TREATMENT SYSTEM DETAILS
PROJECT NAME: TAYLOR RESIDENCE
SEAL: COLORADO LICENSED PROFESSIONAL ENGINEER 64292 02/07/2024

DESIGNER: CSF
DRAWN BY: CSF
APPROVED BY:
DATE: FEBRUARY 7, 2024
JOB NO: 22-000619
DRAWING NO:

S1.3



OWTS Design Report

For: Taylor, Bob & Pam
329 Main Street, Pitkin
Gunnison County, Colorado

Ref: SCJ Alliance Job No. 22-000619

Prepared By: SCJ Alliance
400 North Main Street
Gunnison, Co. 81230
970-641-2499

Date: February 7, 2024

I. Design Conditions:

This design is submitted in accordance with the applicable regulations of the Colorado Department of Public Health & Environment (CDPHE) Regulation #43 On-Site Wastewater Treatment System (OWTS) Regulations. This system was designed for an existing commercial hotel using a loading rate for a 13-bedroom hotel, as well as confirming that the existing OWTS is satisfactory for the existing kitchen, dining, and laundry facilities (per CDPHE Design criteria).

Soils:

1. A soils profile hole was conducted on January 17, 2024. Visually, the soil profile exhibited 0-6" organic layer underlain to 5.0' with a sandy loam/silty loam and large blocky rock. Seasonal high ground water was not encountered at the site reconnaissance visit. The soil is classified as type R-2 soil. Dispersal of the effluent to the surface of the sand filter must be by a pressurized system to provide equal distribution with a long-term acceptance rate (LTAR) of 0.8.

Hotel & Bath House OWTS Design

Design Flow:

Design flows are determined for the number of hotel rooms and residential laundry, and number of seats in a restaurant from Regulation 43, Table 6-2, and empirical data provided by the client, respectively. The flows per seat for the restaurant are determined from the maximum month average daily flow for the largest application, i.e. February for the Mobile, AL location and rounded up to 15 GPD. Flows for the residential laundry are estimated to be 18 loads of laundry per day: one for each hotel room plus extra.

A. Commercial Residence

Hotels and motels per room = 13 rooms x 75 GPD = **975 GPD**

Restaurant open 1 or 2 meals per seat = 15 GPD x 44 seats = **660 GPD**

Residential laundry washer = 2 washers x 19.5 GPD x 9 cycles = **351 GPD**

- **Total Design Flows (Q): = 1986.0 GPD (Per Table 6-2)**

TABLE 6-2 For Design Purposes, the Estimated Daily Wastewater Flow and BOD₅ Load Per Person Unless Otherwise Noted

RESIDENTIAL WASTEWATER	GPD	BOD ₅ IN POUNDS PER DAY
Single-family dwellings	75	.20
Auxiliary buildings, by fixture type		
Bath/Shower	14.7	.014
Dishwasher	1.8	.002
Kitchen sink with garbage grinder	5.8	.052
Laundry washer	19.5	.037
Lavatory	8.4	.021
Water closet (toilet)	24.8	.029
Hotels and motels per room	75	.15

Empirical Water Usage Data from Client:

Mobile, AL Location 2023 Water Usage					
Month	# days	Usage	Avg/day	# seats	Gallons/seat
January	35	82600	2360	170	13.88
February	29	71200	2455	170	14.44
March	25	58300	2332	170	13.72
April	35	77500	2214	170	13.03
May	30	59500	1983	170	11.67
June	33	70400	2133	170	12.55
July	30	59000	1967	170	11.57
Aug	30	57600	1920	170	11.29
Sept	30	62100	2070	170	12.18
Oct	30	53700	1790	170	10.53
Nov	30	59400	1980	170	11.65
Dec	30	64700	2157	170	12.69

Covington, LA 2023 Water Usage					
Month	# days	Usage	Avg/day	# seats	Gallons/seat
January	30	44900	1497	162	9.24
February	32	47500	1484	162	9.16
March	27	45500	1685	162	10.40
April	32	48100	1503	162	9.28
May	25	42700	1708	162	10.54
June	31	54400	1755	162	10.83
July	35	52800	1509	162	9.31
Aug	29	44300	1528	162	9.43
Sept	33	46600	1412	162	8.72
Oct	26	28800	1108	162	6.84
Nov	35	38900	1111	162	6.86
Dec	25	28800	1152	162	7.11

Hattiesburg, MS 2023 Water Usage					
Month	# days	Usage	Avg/day	# seats	Gallons/seat
January	28	33029	1180	170	6.94
February	35	50876	1454	170	8.55
March	29	46486	1603	170	9.43
April	30	52182	1739	170	10.23
May	33	57231	1734	170	10.20
June	29	54611	1883	170	11.08
July	30	45803	1527	170	8.98
Aug	33	55987	1697	170	9.98
Sept	29	50982	1758	170	10.34
Oct	31	47271	1525	170	8.97
Nov	31	45658	1473	170	8.66
Dec	30	46934	1564	170	9.20

B. Septic Tank Sizing:

- Use two (2) 2000-gallon, 2 compartment tank, Valley Precast Item No. 2000T-2CP-HH.
- Minimum tank size based upon detention time:

$$D_t \geq 48 \text{ Hours}$$

$$D_t = \frac{4000 \text{ gal} \times 24 \text{ hrs}}{1986 \text{ gpd}} = 48.34 \text{ hours}$$

C. Wastewater Strength from Fats, Oils, and Grease (FOG)

Schier's grease interceptor sizing service was used to determine the minimum size needed for a grease interceptor servicing the restaurant attached to the Pitkin Hotel. Based on the equipment proposed for the dining and kitchen area a Schier GB-75, 75-gallon grease interceptor, was recommended; however, a Schier GB-500, 500-gallon grease interceptor, will be installed to account for additional flows from the dining area. This grease interceptor is designed to handle high strength waste that accumulates from high concentrations of FOG with additional organic load. It is recommended that the interceptor be pumped seasonally to avoid solidification of retained FOG. See attached grease interceptor summary for additional details.

D. System Sizing: Soil Type R-2, Treatment Level 2, Pressure Dosed Bed, using 2' X 4' Eljen A42 Modules

$$Q = 1986 \text{ GPD}$$

$$\text{Rocky classification: Type R-2, Treatment Level 2, hydraulic loading rate} = 0.8 \frac{\text{gal}}{\text{ft}^2 \text{ day}}$$

(LTAR applied for secondary sand media)

$$\frac{1986 \text{ gpd}}{0.8 \frac{\text{gal}}{\text{ft}^2 \text{ day}}} = 2482.50 \text{ ft}^2$$

Table 10-2 and 10-3 (Regulation 43, pg. 60): This size adjustment factor cannot be applied for rock classified soils (Regulation 43, Table 10-1A, general note #2, pg. 59).

Number of Eljen A42 Modules: $\frac{2482.50 \text{ ft}^2}{16 \text{ ft}^2} = 155.16$

Use at least 160 Eljen A42 modules, in two (2) 4-lateral beds; 20 modules long each.

E. Pump Station & Distribution Laterals, Orenco PF3005 Effluent pump:

a. 2,000 Gallon Tank

- Draw down per inch (2nd chamber of 2000 gal. tank) = 9.39 gallons
- Pump rate = 28.4 gpm
- 11" draw down = 103.28 gallons
- Pump time = 3.64 minutes
- Average pump cycles per day = $19.37 \frac{\text{cycles}}{\text{day}}$
- See attached orifice calculation and pump curve.
 - Orifice size = 1/8"
 - Orifice Spacing = 4.0' (4' - 0")
 - Distal (Residual) head pressure = 3.00' (3'-0")
 - Total Dynamic Head = 43.6'

Design: 160 Eljen Module A42 modules (24" wide X 48" long) installed in two 4-lateral beds.

A minimum of 36" of additional sand shall be installed for the unlined sand filter for treatment level 2 (Table 10.-1A).

Table 10-1A Design Criteria for Soils with High Rock Content (Type "R" Soils) 1,2,3,4

Soil Type, Percentage of Rock, LTAR, Distribution				Required Sand or Media Depth Relative to the Quality of Effluent Applied to the Distribution System				
Soil Type	Percentage and Size of Rock ²	Maximum LTAR (Gal./sq.ft./ day)	Type of Distribution Required	Treatment Level 1 ⁵	Treatment Level 2	Treatment Level 2N	Treatment Level 3	Treatment Level 3N
R-0	Soil Type ⁷ 1 with more than 35% Rock (>2mm)	Unlined Sand Filter: 1.0 for "Preferred Sand Media"; 0.8 for "Secondary Sand Media"	Pressure Distribution ⁸	Minimum 3-foot deep Unlined Sand Filter	Minimum 3-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2-foot deep Unlined Sand Filter
R-1; Option 1	Soil Type ⁷ 2 - 5, >35 - 65% Rock (>2mm); with ≥50% of the Rock <20 mm (3/4 inch)	Use TL1 LTAR from Table 10-1 for the soil type corresponding to the soil matrix, with a maximum LTAR of 0.8	Pressure Distribution ⁸	Minimum 2-foot deep Unlined Sand Filter	Minimum 1-foot deep Unlined Sand Filter	Minimum 1-foot deep Unlined Sand Filter	Sand media not required	Sand media not required
R-1; Option 2	Soil Type ⁷ 2 and 2A, >35 - 65% Rock (>2mm); with ≥50% of the Rock <20 mm (3/4 inch)	The allowable LTAR's are defined in each individual treatment level column in this Table	Pressure Distribution ⁸	Remove, mix, replace 4 feet of existing material; with a maximum LTAR of 0.6	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.7	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.7	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.8	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.8
R-2	Soil Type ⁷ 2 - 5, >65% Rock (>2mm), OR ≥50% of Rock >20 mm (3/4 inch)	Use TL1 LTAR from Table 10-1 for the soil type corresponding to the soil matrix, with a maximum LTAR of 0.8	Timed, Pressure Distribution ⁸	Minimum 3-foot deep Unlined sand filter	Minimum 3-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2-foot deep Unlined Sand Filter

A minimum of 12" of sand must be installed between the edge of each A42 module and the sidewall of excavation. A minimum of 24" of sand shall be installed between the edges of parallel A42 modules. A minimum of 6" of sand to be places at the beginning and end of each module row. Pumped system with 2 sets of 4 laterals at a total length of 80' long (see construction drawings).

II. Construction Drawing:

Enclosed herewith is a drawing titled Onsite Wastewater Treatment System for the Pitkin Hotel, dated February 7, 2024, which sets forth the details for construction of the system.

2000 Gallon Top Seam - 2CP with High Head Pump

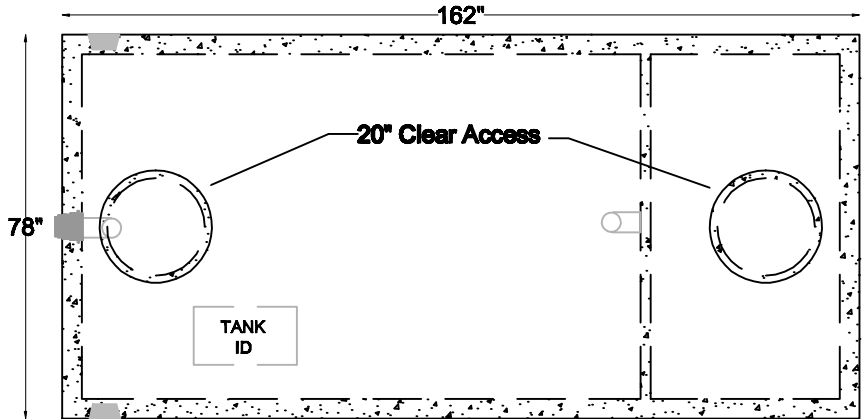
Item #
2000T-2CP-HH

DESIGN NOTES

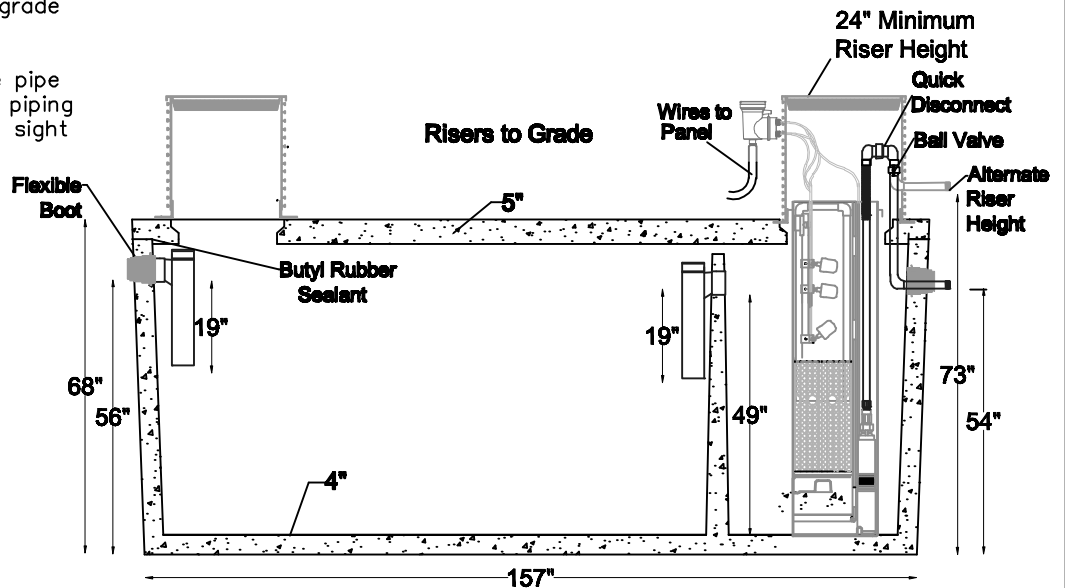
- Design per performance test per ASTM C1227
- Top surface area 87.75 ft²
- f'c @ 28 days; concrete = 6,000 PSI Min.

Installation:

- Tank to be set on 5" min. sand bed or pea gravel
- Tank to be backfilled uniformly on all sides in lifts less than 24" and mechanically compacted
- Excavated material may be used for backfill, provided large stones are removed
- Excavation should be dewatered and tank filled with water prior to being put in service for installation with water table less than 2' below grade
- Meets C1644-06 for resilient connectors
- Inlet and Outlet identified above pipe
- Delivered complete with internal piping
- Control Panel to be mounted in sight line of tank
- 4' Maximum bury depth



Top View



Section View

ALLOWABLE BURY (Based on Water Table)	
WATER TABLE	ALLOWABLE EARTH FILL
0' - 0"	3' - 0"
1' - 0"	3' - 0"
2' - 0"	4' - 0"
3' - 0"	4' - 0"
DRY	4' - 0"

Pump:

- Lowers TSS and improves effluent quality to field
- Complete installation (wiring, panel, mounting and start-up procedures)
- Complete warranty

Service contracts available for maintenance

Digging Specs	Invert		Dimensions			Net Capacity			Net Weight		
	Inlet	Outlet	Length	Width	Min. Height	Inlet Side	Outlet	Total	Lid	Tank	Total
15' Long x 8' Wide	56"	54" or 73"	162"	78"	92"	1559 gal	507 gal	2066 gal	5420 lbs	15530 lbs	21150 lbs



Phone: 719-395-6764
Fax: 719-395-3727
Website: www.valleyprecast.com
Email: frontdesk@valleyprecast.com

Pump Selection for a Pressurized System - Single Family Residence Project

Parameters

Discharge Assembly Size	1.25	inches
Transport Length Before Valve	211	feet
Transport Pipe Class	40	
Transport Line Size	1.25	inches
Distributing Valve Model	6402	
Transport Length After Valve	15	feet
Transport Pipe Class	40	
Transport Pipe Size	1.25	inches
Max Elevation Lift	5	feet
Manifold Length	20	feet
Manifold Pipe Class	40	
Manifold Pipe Size	1.25	inches
Number of Laterals per Cell	8	
Lateral Length	80	feet
Lateral Pipe Class	40	
Lateral Pipe Size	1.25	inches
Orifice Size	1/8	inches
Orifice Spacing	4	feet
Residual Head	3	feet
Flow Meter	None	inches
'Add-on' Friction Losses	0	feet

Calculations

Minimum Flow Rate per Orifice	0.34	gpm
Number of Orifices per Zone	84	
Total Flow Rate per Zone	28.4	gpm
Number of Laterals per Zone	4	
% Flow Differential 1st/Last Orifice	3.4	%
Transport Velocity Before Valve	6.1	fps
Transport Velocity After Valve	6.1	fps

Frictional Head Losses

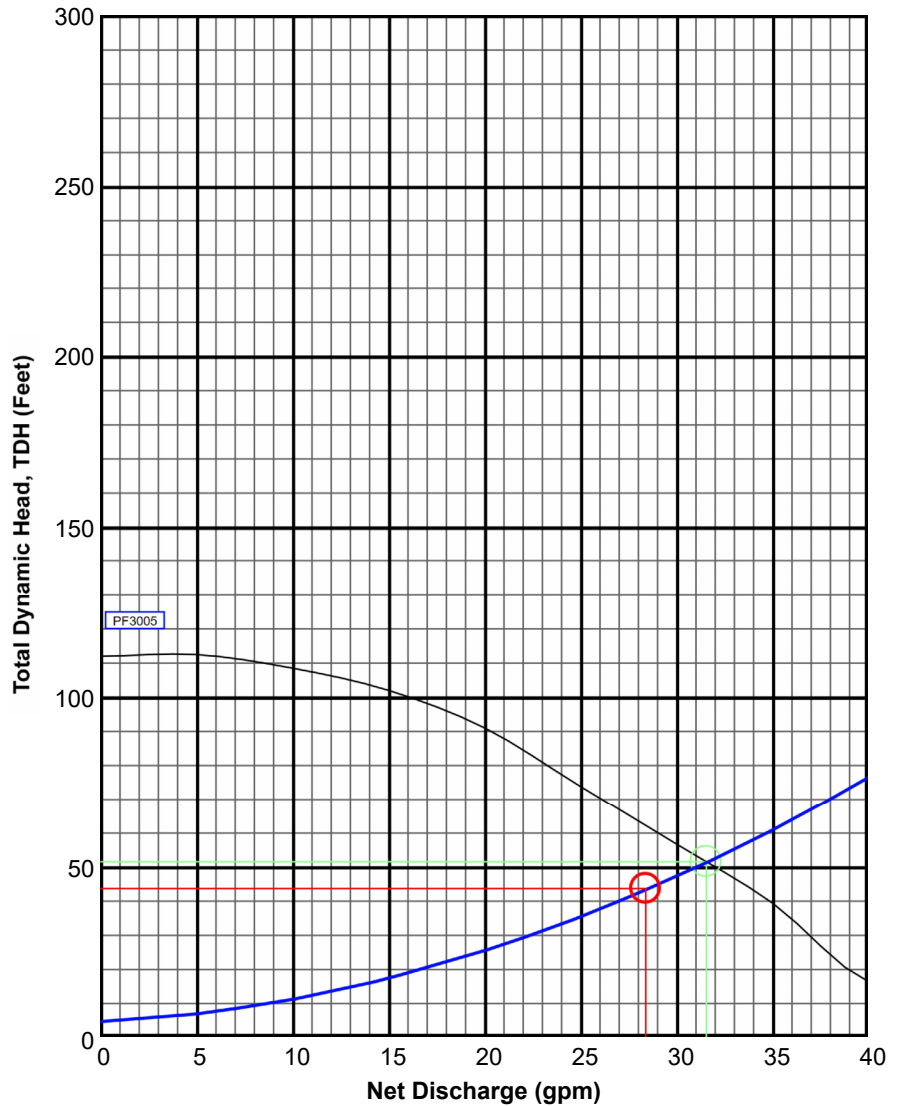
Loss through Discharge	5.7	feet
Loss in Transport Before Valve	21.2	feet
Loss through Valve	6.5	feet
Loss in Transport after Valve	1.5	feet
Loss in Manifold	0.6	feet
Loss in Laterals	0.2	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	0.0	feet

Pipe Volumes

Vol of Transport Line Before Valve	16.4	gals
Vol of Transport Line After Valve	1.2	gals
Vol of Manifold	1.6	gals
Vol of Laterals per Zone	24.9	gals
Total Vol Before Valve	16.4	gals
Total Vol After Valve	27.6	gals

Requirements

28.4	gpm
43.6	feet



PumpData

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

Legend

System Curve:	—
Pump Curve:	—
Pump Optimal Range:	—
Operating Point:	○
Design Point:	○



GREASE INTERCEPTOR CALCULATIONS

Reference No. 62654

Project Name: Pitkin Hotel

Step 1: Flow rate to grease interceptor

Fixture flow rate: $(cu\ in / 231) = gal \times 0.75 / 2\ min = 2\ min\ flow\ rate$

NAME	TYPE	DIMENSIONS	QTY	CU IN	FLOW RATE
3 Compartment Sink	3 Compartment Sink	21" x 21" x 14" (3)	1	18,522	30.07 GPM
3 Compartment Sink	3 Compartment Sink	10" x 10" x 14" (3)	1	4,200	6.82 GPM
Hand Sink	Hand Sink	10" x 10" x 6"	3	1,800	2.91 GPM
Pre-Rinse Sink One Bowl	Pre-Rinse Sink One Bowl	20" x 20" x 8"	1	3,200	5.19 GPM

Total

45 GPM

Step 2: Grease Production

Number of Seats x 4 turns per seat x Grease Production Value x Days between pump-out = Grease output

Number of seats in facility: 40

Grease production value: 0.0455 lbs per serving (Don't Know Yet: High / Flatware)

Days between pump-outs: 90 days

40 x 4 x 0.0455 x 90 = 655.2 lbs of FOG

SCHIER MODEL	Description: GREASE INTERCEPTOR 75 GPM, 4" PLAIN/FPT CONNECTIONS, H-20 RATED PICKABLE CAST IRON COVER
GB-75	<p>Dimensions: Length: 47", Width: 33", Height: 39.75"</p> <p>Flow Rate/Grease Capacity: 75 GPM / 861 lbs</p> <p>Liquid Capacity: 125 gal</p>

Specification Note: This Great Basin model has been sized to the flow rate and grease production requirements of the application and may not be substituted by liquid capacity alone. Any substitution requests must be approved by the specifying engineer and the authority having jurisdiction.

Please contact support@schierproducts.com for technical and procurement support for the specified Great Basin model.

Schier prescribes a GB-75 for this application; therefore, a GB-500 is adequate for this design so long as it is pumped seasonally.

SPECIFICATIONS

Notes:

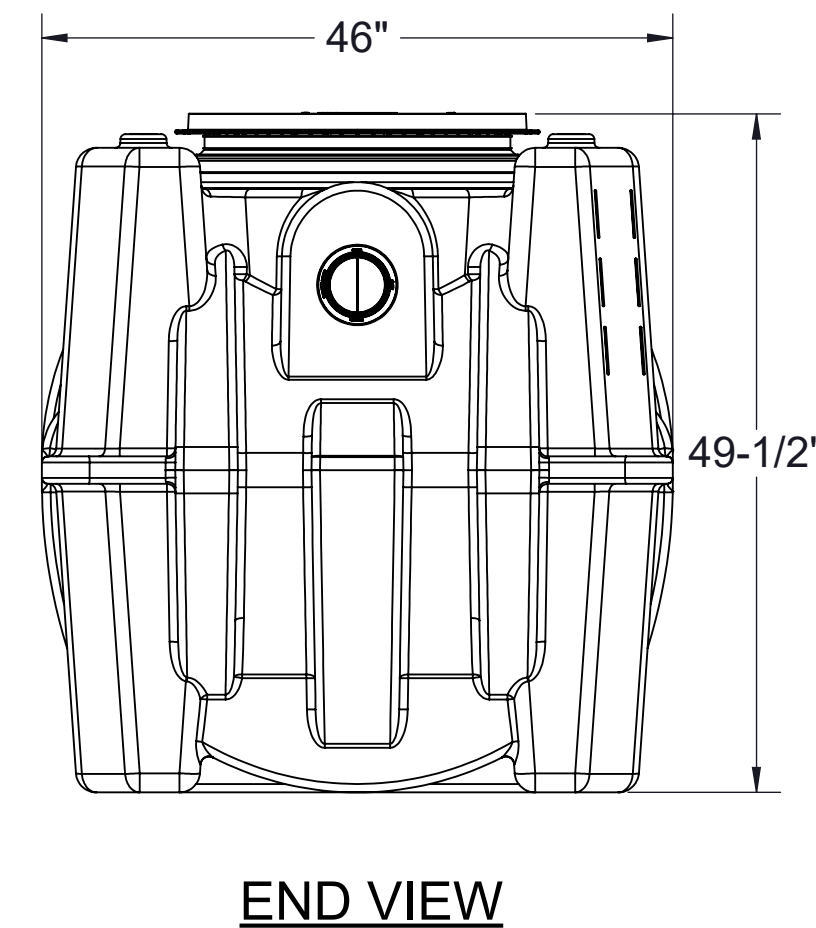
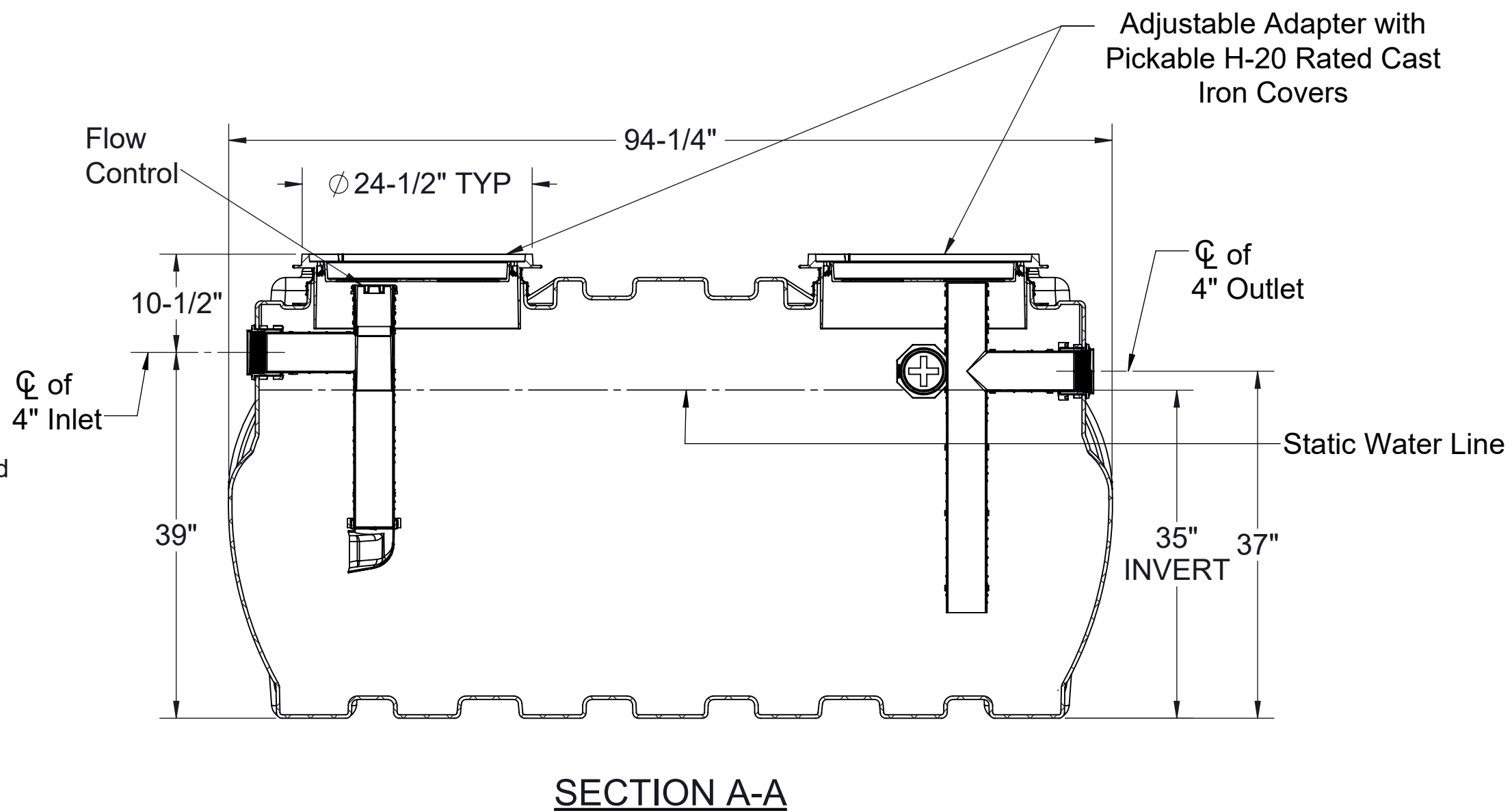
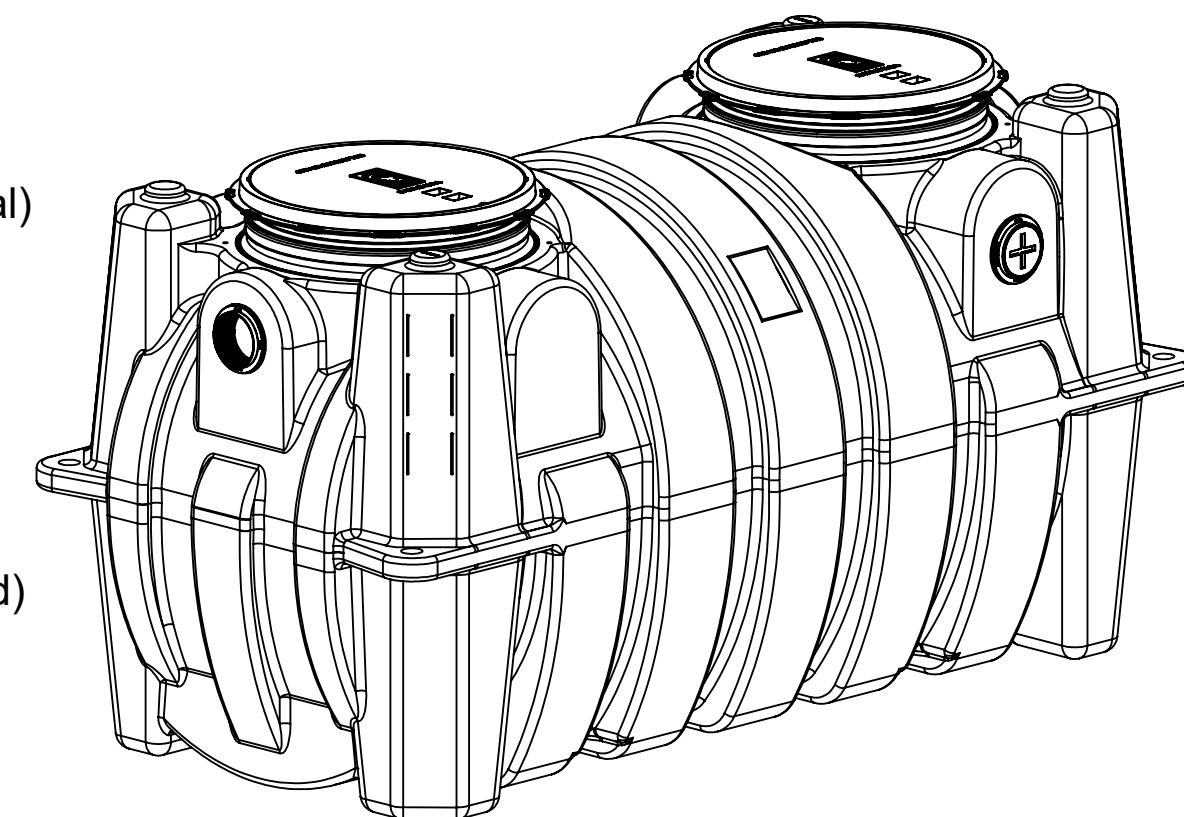
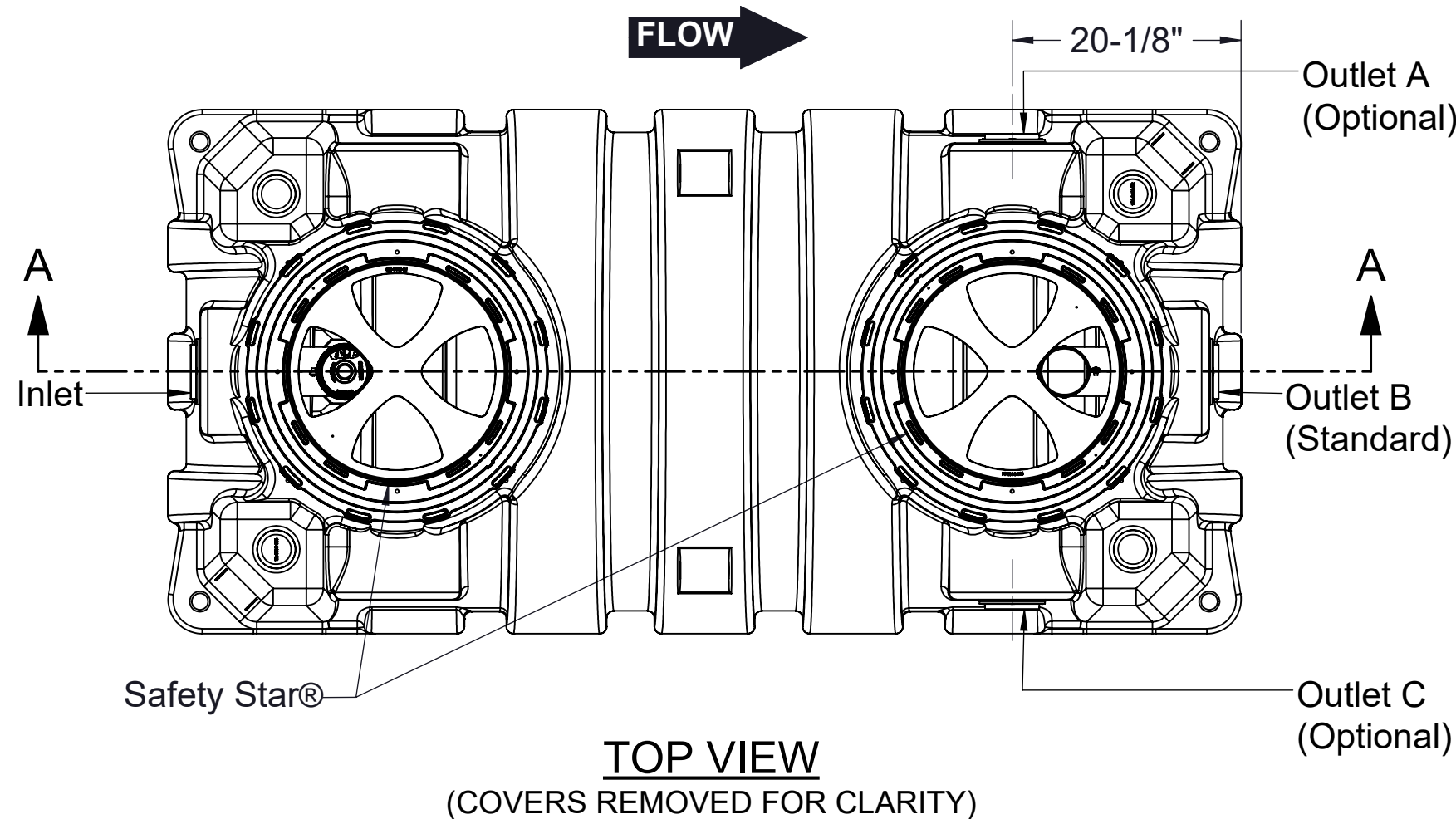
- 4" FPT inlet/outlet with 4" plain end adapters, single inlet and triple outlet.
- Unit weight - w/ cast iron covers: 528 lbs. (For wet weight add 4,254 lbs.)
- Maximum operating temperature: 150° F continuous
- Capacities - Liquid: 510 gal.
Grease: 3,048 lbs. (417 gal.) @100 GPM
Solids: 128 gal.
- Built-in flow control. For series installations, only install flow control on the first unit in the series if necessary.
- For gravity drainage applications only.
- Do not use for pressure applications.
- Cover placement allows full access to tank for proper maintenance.
- Vent not required unless per local code.
- Engineered inlet and outlet diffusers with inspection ports are removable to inspect / clean piping.
- Integral air relief / Anti-siphon / Sampling access.
- Adjustable cover adapters provide up to 4" of additional height.
- Designed for below-grade, above-grade, indoor or outdoor installations.
- Safety Star®, access restrictor built into each cover adapter, prevents accidental entry to tanks (450 lb rating).

ENGINEER SPECIFICATION GUIDE

Schier Great Basin™ grease interceptor model # GB-500 shall be lifetime guaranteed and made in USA of seamless, rotationally-molded polyethylene with minimum 7/16" uniform wall thickness. Flow control cartridge shall be PVC. Interceptor shall be furnished for above or below-grade installation with adjustable cover adapter, Safety Star® access restrictor built into each cover adapter, and three outlet options. Interceptor shall be certified to ASME A112.14.3 (Type C) and CSA B481.1. Interceptor flow rate shall be 100 GPM. Interceptor grease capacity shall be 3,048 lbs. Cover shall provide water/gas-tight seal and have minimum 16,000 lbs. load capacity.

CERTIFIED PERFORMANCE

Great Basin™ hydromechanical grease interceptors are third party performance-tested and listed by IAPMO to ASME #A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.



SPECIFICATION SHEET

MODEL NUMBER:

GB-500

PART NUMBER: 4075-001-01

DESCRIPTION:

GB-500 GREASE INTERCEPTOR 100 GPM, 4" INLET/OUTLET, H-20 RATED CAST IRON COVERS

PROPRIETARY AND CONFIDENTIAL

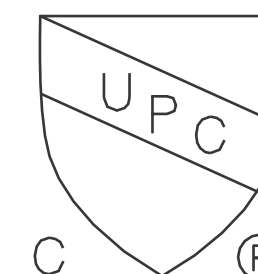
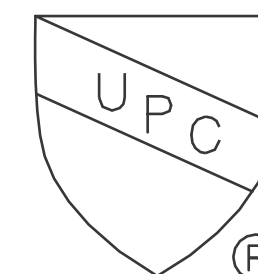
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DATE: 4/14/2022

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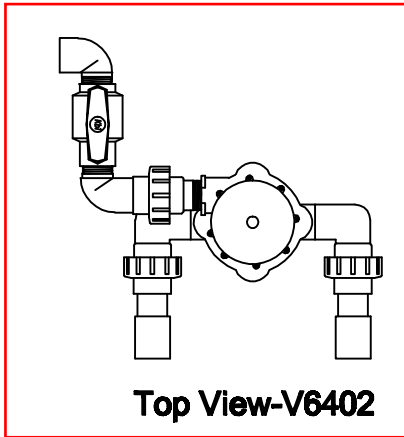
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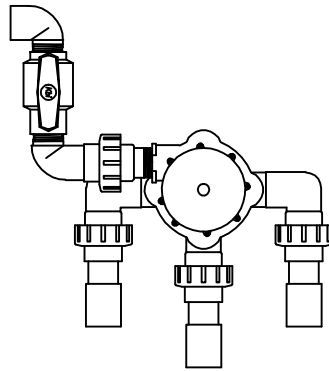
SCHIER

6455 Woodland Dr
Shawnee, KS 66218
Tel: 913-951-3300
Fax: 913-951-3399
schierproducts.com

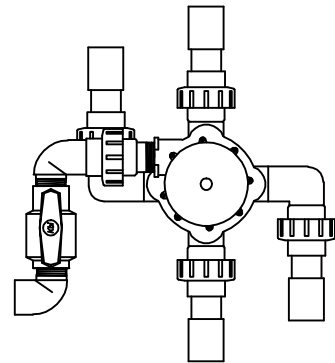
Automatic Distributing Valves



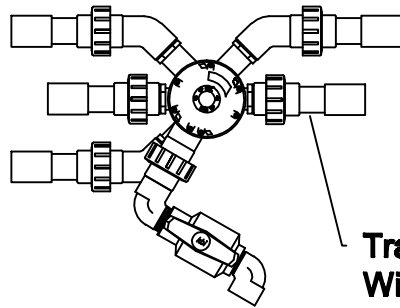
Top View-V6402



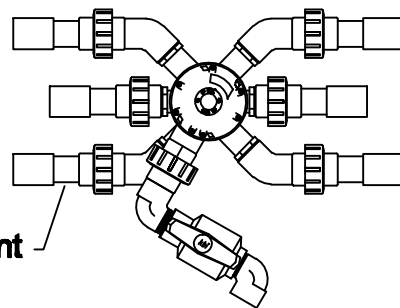
Top View-V6403



Top View-V6404



Top View-V6605



Top View-V6606

Transparent Window

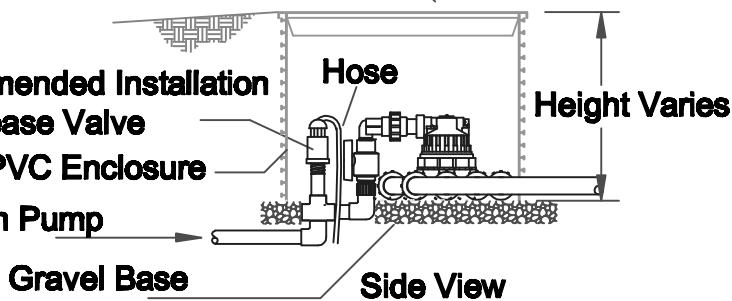
PVC Enclosure in 30" Diameter only
Stainless Steel Bolts
and Urethane Gasket

6000 Series

1.5" inlet & outlet

15 - 100 gpm flowrate

Recommended Installation
Air Release Valve
30" PVC Enclosure
From Pump



Orenco Systems®
Incorporated

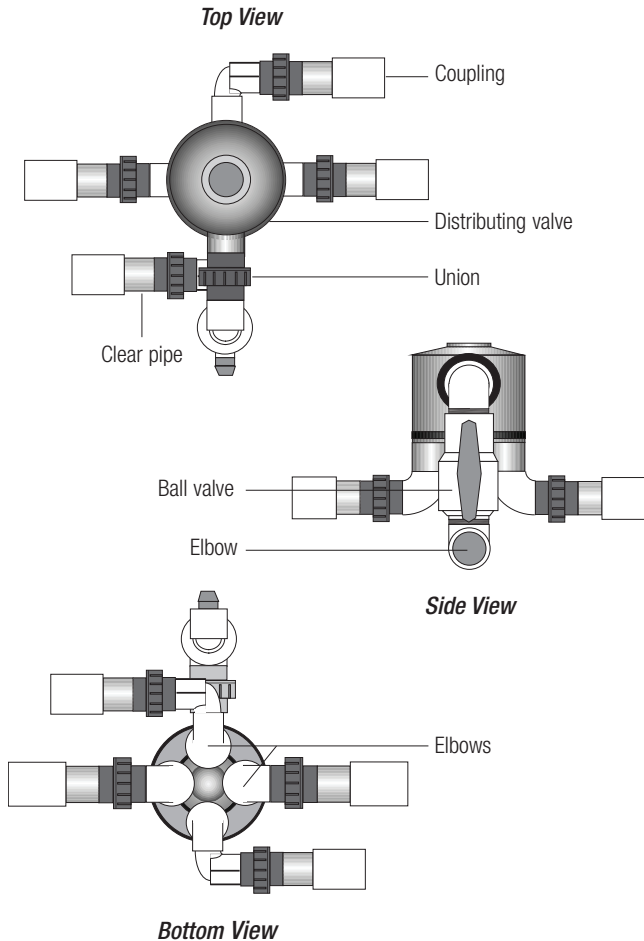
**VALLEY
PRECAST, Inc.**
Buena Vista, Colorado

Phone: 719-395-6764
Fax: 719-395-3727
Website: www.valleyprecast.com
Email: frontdesk@valleyprecast.com

Distributing Valves

Applications

Automatic Distributing Valve Assemblies are used to pressurize multiple zone distribution systems including textile filters, sand filters and drainfields.



General

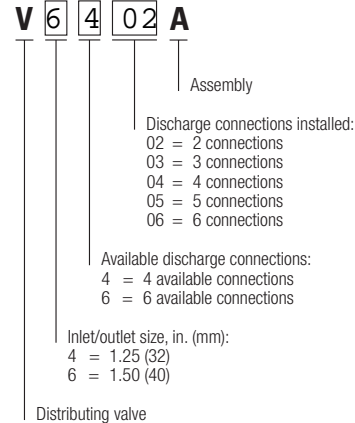
Orenco's Automatic Distributing Valve Assemblies are mechanically operated and sequentially redirect the pump's flow to multiple zones or cells in a distribution field. Valve actuation is accomplished by a combination of pressure and flow. They allow the use of smaller horsepower pumps on large sand filters and drainfields. For example, a large community drainfield requiring 300 gpm (18.90L/sec) can use a six-line valve assembly to reduce the pump flow rate requirement to only 50 gpm (3.14L/sec).

Orenco only warrants Automatic Distributing Valves when used in conjunction with High-Head Effluent Pumps with Biotube[®] pump vaults to provide pressure and flow requirements, and to prevent debris from fouling valve operation. An inlet ball valve, a section of clear pipe, and a union for each outlet are provided for a complete assembly that is easy to maintain and monitor. Ideal valve location is at the high point in the system. Refer to Automatic Distributing Valve Assemblies (NTP-VA-1) for more information.

Standard Models

V4402A, V4403A, V4404A, V4605A, V4606A, V6402A, V6403A, V6404A, V6605A, V6606A.

Product Code Diagram



Materials of Construction

All Fittings	Sch. 40 PVC per ASTM specification
Unions	Sch. 80 PVC per ASTM specification
Ball Valve	Sch. 40 PVC per ASTM specification
Clear Pipe	Sch. 40 PVC per ASTM specification

Specifications

Model	Inlet Size, in. (mm)	Outlets Size, in. (mm)	Flow Range, gpm (L/sec)	Max Head, ft (m)	Min. Enclosure*
V4402A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4403A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4404A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4605A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	RR2418
V4606A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	RR2418
V6402A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6403A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6404A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6605A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6606A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418

* When using an enclosed basin, choose the next larger-sized diameter.

Table 1. Automatic Distributing Valve Assembly Headloss Equations

Model Series	Equation	Operating Range, gpm (L/sec)
V4400A	$H_L = 0.085 \times Q^{1.45}$	10 - 40 (0.63 – 2.52)
V4600A	$H_L = 0.085 \times Q^{1.58}$	10 - 25 (0.63 – 1.57)
V6400A	$H_L = 0.0045 \times Q^2 + 3.5 \times (1 - e^{-0.06Q})$	15 - 70 (0.95 – 4.42)
V6600A	$H_L = 0.0049 \times Q^2 + 5.5 \times (1 - e^{-0.1Q})$	15 - 70 (0.95 – 4.42)

