



City of Shasta Lake – Public Works Department

4477 Main Street, Shasta Lake, CA 96019
(530) 275-7400

Pavilions & Restrooms Project

Bid No. 2026-04

Addendum No. 1 – March 20, 2026

TO ALL PROSPECTIVE CONTRACTORS:

Addendum No. 1 provides for deletions, corrections, and/or clarifications to the Contract Documents for the Pavilions & Restrooms project. The Contractor shall acknowledge receipt of this Addendum on the first page of the Proposal in the location provided.

The deletions, corrections, and/or clarifications shall apply to the Pavilions & Restrooms project in the same manner as if they were originally part of the printed Contract Documents.

-
1. Construction Plan Sheets – Replace construction plan sheets **MP-A020, MP-A060, MP-C2.0, MP-C3.0, MP-4.0, MP-4.1, MP-5.0, MP-E100, MP-E230, MP-PB2, MP-PB-3, CH-A020, CH-E200 & CH-PB-3** with the attached sheets showing Addendum No. 1. All revisions to sheets are clouded.
 2. Construction Plan Specifications – Add construction plan specs: **Section 13 34 23 - Pre-Engineered Romtec Building** & Replace construction plan specs **Sections 33 34 00 Wastewater Disposal**, with the attached specifications showing Addendum No. 1.

Addendum Approval:

March 20, 2026

Will Bond, PE
City Engineer, City of Shasta Lake

PAVILION : O.F.C.I.



NICHOLS MELBURG & ROSSETTO
ARCHITECTS + ENGINEERS
300 Knollcrest Drive
Redding, CA 96002
(530) 222-3300 (530) 222-3538 Fax
http://www.nmrdesign.com

REVISIONS		
Delta	Description	Date
ADDENDUM #1		03/20/26

If drawing is not 42" x 30" it is a reduced print
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LICENSE STAMPS

4 COLUMN FOOTING DETAIL
SCALE: 1" = 1'-0"

2 EDGE OF CONC. WALKWAY
SCALE: 1" = 1'-0"

3 SAWCUT JOINT
SCALE: 1" = 1'-0"

PROJECT: CS102
DATE: 6/10/2025
DRAWN BY: ZN
CHECKED BY: JN

57.2

1 ROOF FRAMING PLAN
SCALE: 3/16" = 1'-0"

PROJECT: CS102
DATE: 6/10/2025
DRAWN BY: ZN
CHECKED BY: JN

59.1

1 EAVE-BEAM CONNECTION
SCALE: 1" = 1'-0"

PROJECT: CS102
DATE: 6/10/2025
DRAWN BY: ZN
CHECKED BY: JN

510.1

1 MID-BEAM CONNECTION
SCALE: 1" = 1'-0"

2 GABLE DETAIL, TYP
SCALE: 1 1/2" = 1'-0"

PROJECT: CS102
DATE: 6/10/2025
DRAWN BY: ZN
CHECKED BY: JN

510.2

KEY PLAN

PROJECT NAME
PAVILIONS & RESTROOMS



SHEET TITLE
MARGARET POLF PARK PAVILION BUILDING PLANS

DRAWING STATUS
CONSTRUCTION DOCUMENTS

Drawn By	NMR
Date Issued	12/12/2025
Scale	AS NOTED
Project No.	24-6556

SHEET No.
MP - PB3

PAVILION : O.F.C.I.



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LICENSE STAMPS

2 EDGE OF CONC. WALKWAY
SCALE: 1" = 1'-0"

3 SAWCUT JOINT
SCALE: 1" = 1'-0"

4 COLUMN FOOTING DETAIL
SCALE: 1" = 1'-0"

PROJECT: CITY OF SHASTA LAKE (CITY HALL PAVILION)
SHEET TITLE: FOUNDATION DETAILS
PROJECT NO: CSLO1
DATE: 6/9/2025
DRAWN BY: ZN
CHECKED BY: JN
DATE: 6-25-2025
SCALE: 1" = 1'-0"

57.2

1 ROOF FRAMING PLAN
SCALE: 3/16" = 1'-0"

PROJECT: CITY OF SHASTA LAKE (CITY HALL PAVILION)
SHEET TITLE: ROOF FRAMING PLAN
PROJECT NO: CSLO1
DATE: 6/9/2025
DRAWN BY: ZN
CHECKED BY: JN
DATE: 6-25-2025
SCALE: 1" = 1'-0"

S9.1

1 EAVE-BEAM CONNECTION
SCALE: 1" = 1'-0"

PROJECT: CITY OF SHASTA LAKE (CITY HALL PAVILION)
SHEET TITLE: ROOF CONNECTION DETAILS
PROJECT NO: CSLO1
DATE: 6/9/2025
DRAWN BY: ZN
CHECKED BY: JN
DATE: 6-25-2025
SCALE: 1" = 1'-0"

S10.1

1 MID-BEAM CONNECTION
SCALE: 1" = 1'-0"

2 GABLE DETAIL, TYP
SCALE: 1 1/2" = 1'-0"

PROJECT: CITY OF SHASTA LAKE (CITY HALL PAVILION)
SHEET TITLE: ROOF CONNECTION DETAILS
PROJECT NO: CSLO1
DATE: 6/9/2025
DRAWN BY: ZN
CHECKED BY: JN
DATE: 6-25-2025
SCALE: 1" = 1'-0"

S10.2

KEY PLAN

PROJECT NAME

PAVILIONS & RESTROOMS

FOR

CITY OF

SHASTA LAKE

FOUNDED JULY 2, 1898

SHEET TITLE

CITY HALL PARK PAVILION BUILDING PLANS

DRAWING STATUS

CONSTRUCTION DOCUMENTS

Drawn By: NMR

Date Issued: 12/12/2025

Scale: AS NOTED

Project No: 24-6556

SHEET No.

CH - PB3

A-7588

SECTION 13 34 23**PRE-ENGINEERED ROMTEC BUILDING****PART 1: BUILDING PACKAGE OVERVIEW**

1.1 SUMMARY

- A. **Owner** will provide a pre-engineered **Romtec** building package for onsite installation by the **building installer** and/or **contractor** (see definitions and scope of work in sections below).
- B. The following is an overview of the scope and products included in the **Romtec** building package.

1.2 OVERVIEW

- A. Building package design, engineering, and furnishing all specified building package components shall be provided by Romtec, Inc.
- B. The building and its concrete footings, foundation, and slab shall be engineered by **Romtec** to meet site specific conditions including wind and snow loading, local frost depth, and ground conditions.
- C. Building shall be designed to meet local codes and permitting authority approvals for permanent structures.
- D. The reviewing authority reserves the right to review or reject all submittals at its sole discretion.
- E. All work and materials shall comply with the latest industry building codes and regulations for the state where the project is located.
- F. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.

1.3 DESIGN & SUBMITTAL DOCUMENTATION

- A. **Romtec's** work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.
- B. The building will be designed as a complete building package to be delivered to the job site for construction on-site by the **building installer** and/or **contractor**.
- C. **Romtec** shall submit the packaged restroom building preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.
- D. **Romtec** will provide complete submittal documentation in Romtec's standard electronic submittal format for review.
- E. The preliminary SSDS will be reviewed by relevant parties and returned to **Romtec** with any required revisions to the terms, product data sheets, and/or building plan view and elevation drawings noted as comments.

- F. **Romtec** shall make any required corrections or revisions and resubmit the preliminary SSDS until the preliminary SSDS is approved by the relevant parties.
- G. Once the preliminary SSDS has been approved, **Romtec** will provide full sealed plan sets stamped by an engineer licensed in the state that the building is located for review by the permitting authority.
- H. Up to three (3) wet-stamped sets of the plans and structural calculations shall be provided by **Romtec** before any additional fees apply. Standard plan set size is 11" x 17".
- I. Permitting authority will review the full sealed plan set and return with any required revisions or corrections noted as comments.
- J. **Romtec** shall provide one full round of sealed plan revisions in response to permitting authority comments before any additional fees are allowed.
- K. The following sections shall be included in **Romtec's** preliminary Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned for revision.

1. INTRODUCTION

2. BUILDING DESIGN,

(a) SUPPLIED ITEMS

(b) EXCLUDED ITEMS

(c) PLAN VIEW AND ELEVATION DRAWINGS

3. PRODUCT DATA

4. WARRANTY & LIMITATIONS

Note: Overall site plan is not part of Romtec's scope.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. **Romtec's** freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close to those dimensions as can legally access the site. Overall dimensions of the truck and trailers are: 70' overall length, 102" wide and 168" high.
- B. **Romtec** shall deliver organized building package components in stages as shrink-wrapped pallets that correspond to a typical sequence of construction. A bill of material stating the stages of palletized components shall be included with every delivery. All stages as applicable.
 - 1. Stage 1 pallets shall include structural components such as block, frames, vents, beams, connectors, trusses, etc.
 - 2. Stage 2 pallets shall include second stage structural components such as filler wall material, windows, skylights, roofing, etc.
 - 3. Stage 3 pallets shall include structural finish components such as siding material, tile, doors etc.
 - 4. Stage 4 pallets shall include plumbing and electrical fixtures and other finish materials such as toilets, sinks, drinking fountains, electrical fixtures, accessories, etc.

- C. **Romtec** shall coordinate the delivery with the receiving entity (**owner, building installer, and/or contractor**) as appropriate.

1.5 WARRANTY

- A. The building package and all associated components provided by **Romtec** shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from the date of acceptance. Acceptance is the date of delivery of the building package, or, if delivery is delayed for any reason beyond **Romtec's** control, the date that the building and all its associated components were ready to deliver.
- B. **Romtec** shall pass through to owner all relevant manufacturers' warranties for individual products and components of the building package.

PART 2: BUILDING PACKAGE PRODUCTS

2.1 MANUFACTURER

- A. Romtec, Inc.,
18240 North Bank Road, Roseburg, OR 97470
Tel: 541-496-3541; Fax: 541-496-0803; Email: RIsales@romtec.com
Web: www.Romtec.com

2.2 BUILDING DESCRIPTION

- A. Refer to plans for quantities, dimensions, locations, and installation methods for the materials and items described in this section.
- B. Building dimensions shall match what is indicated on drawings.
- C. **Romtec** will supply the building package products to **owner**.
- D. **Owner** will supply the Romtec building package products to **building installer** and/or **contractor**.

2.3 STRUCTURE

- A. Steel columns to be powder coated RAL 8028.
- B. Concrete Masonry Units (CMU).
 - 1. Column bases shall be constructed of 8"W x 16"L x 8"H smooth-face mortar joint concrete masonry units (concrete blocks).
 - 2. Blocks shall be manufactured to ASTM C90 designation for load bearing concrete masonry units.
 - 3. Block color to be **Gray**.
- C. Exterior CMU finish to be stone veneer.
 - 1. Cultured Stone – **Lakeshore River Rock**
 - 2. Peir caps to be **tan**

2.4 ROOFING

- A. Roof system.
 - 1. Glulam beam shall be 24F-V4 and architectural grade.
 - 2. Tongue & groove decking shall be 2x6 V-edge deck boards, select deck Douglas fir.
- B. Roofing shall be Fabral, 26-gauge, Horizon 16, standing seam panels, with 16 in. coverage width.
 - 1. Roofing package shall include inside and outside foam closures, matching trim (eaves, gables, and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).
 - 2. Roofing color to be **Burnished Slate 446**.

PART 3: BUILDING INSTALLER SCOPE

The installing contractor or subcontractor, hereafter designated as the **building installer**, is responsible for building package installation. **Building installer** work will generally include foundation/pad construction and building package assembly/construction.

Note: Romtec's scope is separate from the building installer's scope. Romtec, Inc., is the approved building package supplier, not a designated building installer.

3.1 CONSTRUCTION SUBMITTALS

- A. If required by **owner** and/or reviewing authority, **building installer** shall submit product data sheets and relevant information about the specified **building installer** supplied products below for review and approval.

3.2 WARRANTY

- A. **Building installer's** work shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from the date of acceptance. Acceptance is the date that installation work for the building package is completed, including any relevant final punch list. If final acceptance of the completed building is delayed for reasons beyond **building installer's** control, the warranty shall be one (1) year from the completion of **building installer's** installation work and demobilization.
- B. **Building installer** shall pass through to owner all relevant manufacturers warranties for individual products and components supplied by **building installer**.

3.3 STRUCTURE

- A. Interior floors to be sealed concrete finish supplied by **building installer**.
- B. Sealant for all exposed wood shall be supplied and installed by **building installer**.

3.4 CAST IN-PLACE CONCRETE FOR BUILDING PACKAGE

- A. All equipment, labor, trades, and materials for cast-in-place concrete shall be provided by **building installer**.

1. Includes all materials and labor for building package foundations/footings and interior slabs.
- B. Footings for the building package are to be dug by the **building installer** and poured on-site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.
- C. Engineered fill shall be ¾" minus crushed aggregate around footings, foundations, and slabs, or as required in the final approved plans.
- D. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab, or as required in the final approved plans.
- E. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified, or as required in the final plans.
 1. Footings will be built to minimum 24" depth or greater if required by local frost depth or permitting authority.
 2. Minimum compressive strength of foundation concrete shall be 3,000 psi at 28 days, 4" +/-1" slump, with max ¾" aggregate, cured in accordance with ACI 308, or as required in approved final plans.
 3. Slabs shall have a fine broom finish with joints required in flat work as shown on plans.
 4. Steel rebar shall be installed as specified in final plans.
- F. **Building installer** shall supply and install concrete slab sealer.
 1. Concrete slab sealer shall be a water-based, transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.

3.5 OTHER MATERIALS & EQUIPMENT

- A. Unless otherwise specified, the following products and materials are supplied by **building installer** (if applicable).
 1. Building package installation
 2. Cast-in-place concrete foundations, footings, interior slabs.
 3. Concrete slab sealer
 4. Concrete grout
 5. Rebar
 6. Typical fasteners; for example: roofing nails, staples, etc.
 7. Fasteners not included in product packaging.
 8. Wood sealant for all decking, glulam beams, posts, and extensions

9. All other items within the building footprint indicated on final plans or required by building codes to complete installation of the building package which are not specifically stated as supplied by **owner** or **contractor**.

3.6 DELIVERY, STORAGE, AND HANDLING

- A. The **building installer** will coordinate with **owner** and/or **Romtec** to receive delivery of the building package onsite. This includes all equipment and labor required for off-loading of the delivered building package.
- B. The **building installer** will assume responsibility for adequate protection and maintenance of delivered building package materials from weather, damage, and pilferage during installation work. Any failure to adequately protect building package materials that affects the warranty of those materials will be at **building installer's** expense.
- C. **Building installer** shall collect and maintain for final delivery to owner any operation & maintenance manuals included by individual product manufacturers with their respective product packaging. Any failure to collect, maintain, and/or deliver these O&M manuals to the **owner** that results in fees from **Romtec** for additional copies shall be at **building installer's** expense.
- D. See BOM of each site immediately following this specification.
An 8,000lb forklift with extended forks is required to offload the building kit upon delivery.

PART 4: CONTRACTOR SCOPE ITEMS

The items in this section may be provided by the same **building installer** as defined in Section 3 above (typically when a single entity is acting as both the **building installer** and **contractor**), or the items in this section may be provided by a separate entity such as a general contractor or site contractor, hereafter designated as **contractor** (typically when the **building installer** is a separate subcontractor). **Contractor** work will generally include site preparation and grading, excavations for structures, backfill and/or structural backfill, and any site or utility work outside the building package footprint.

Items in this section are generally to be completed prior to **building installer** beginning its installation work described in Section 3 above.

4.1 CONSTRUCTION SUBMITTALS

- A. If required by **owner** and/or reviewing authority, **contractor** shall submit product data sheets and relevant information about the specified **contractor** supplied products below for review and approval.

4.2 WARRANTY

- A. **Building installer's** work shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from the date of acceptance. Acceptance is the date that installation work for the building package is completed, including any relevant final punch list. If final acceptance of the completed building is delayed for reasons beyond **building installer's** control, the warranty shall be one (1) year from the completion of **building installer's** installation work and demobilization.
- B. **Building installer** shall pass through to owner all relevant manufacturers warranties for individual products and components supplied by **building installer**.

4.3 CAST IN-PLACE CONCRETE FOR BUILDING EXTERIOR

- A. All equipment, labor, trades, and materials shall be supplied by **contractor**.
 - 1. Includes all materials and labor for exterior/entry slabs and sidewalks.
- B. Refer to drawings for sidewalks and entry slabs.
 - 1. Minimum concrete compressive strength of 2,500 psi at 28 days.
 - 2. Remesh or rebar reinforcement shall be used in sidewalks.
 - 3. All sidewalks shall be finished with a fine broom with control joints installed per the final approved site plan.

4.4 OTHER MATERIALS & EQUIPMENT

- A. Unless otherwise specified, the following products and materials are supplied by **contractor**.
 - 1. All items not specifically listed as supplied by **owner** or **building installer**.
 - 2. Any item listed as supplied by “contractor” or “others.”
- B. Unless specified in the plans or submittals, **contractor** supplies the following (if applicable):
 - 1. Incoming electrical, water, sewer, and gas utilities.
 - 2. Asphalt paving
 - 3. Masonry pavers
 - 4. Sidewalks
 - 5. Landscaping
 - 6. Site grading
 - 7. Exterior/entry slabs
 - 8. Drain valves and backflow check valves.
 - 9. Branch circuit breakers
 - 10. Irrigation Equipment
 - 11. Fire alarm and fire suppression equipment.
 - 12. Lighting equipment not attached to the building.
 - 13. All other items exterior of the building footprint indicated on final plans or required by building codes which are not specifically stated as supplied by **owner** or **building installer**.

4.5 DELIVERY, STORAGE, AND HANDLING

- A. The **contractor** will assume responsibility for adequate protection and maintenance of the installed building package materials after completion of installation work by **building installer**. Any failure to adequately protect building package materials that affects the

warranty of those materials will be at **contractor's** expense.

SECTION 5: OWNER'S SCOPE

5.1 ONGOING MAINTENANCE

- A. **Owner** is responsible for ongoing maintenance of the completed restroom building after completion of work by building installer and contractor.

5.2 SITE PLAN

- A. **Owner** (or owner's site engineer) is responsible for providing the final approved site plan to **Romtec** and/or **building installer**.

5.3 SPECIAL INSPECTION

- A. If required, special inspection(s) services shall be provided by **owner**.
- B. If special inspection(s) are required by the permitting authority or relevant agency(ies), then **Romtec, building installer**, and/or **contractor** shall provide reasonable assistance to the **owner** to accommodate the special inspection(s).

5.4 DELIVERY, STORAGE, AND HANDLING

- A. **Owner** will coordinate with **Romtec, building installer**, and/or **contractor** to receive delivery of the building package onsite.

**** END OF SECTION ****

JOB NUMBER:	20407-1	ORIGINAL BOM DATE:	2/10/2026	COLOR KEY
DESCRIPTION:	Pavilion	REVISION DATE:		
MODEL #:	3014M			
BUILDING QTY:	1			
JOB NAME:	City of Shasta Lake - Margaret Polf (CA)			

CATEGORY	PART	QTY	UOM	DESCRIPTION	COLOR	COMMENTS	WET SET	MFG
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STAGE 1

101 - Block	STAGE 1	216	Ea	BLOCK; SMOOTH, 8X8X16, GRAY	GRAY		WET SET	LOCAL DROP SHIP
105 - Beams/Brackets	5682	80	LFT	LUMBER; GLB 5 1/8" X 9"		2 AS SHOWN, 2 OPPOSITE 4@ 1'-3 11/16"L, B01, EAVE EXT 4@9'-3"L, B02, EAVE 4@ 9'-2 3/4"L, B03, EAVE		AMLAM
105 - Beams/Brackets	5684	280	LFT	LUMBER; GLB 5 1/8" X 12"		2 AS SHOWN, 2 OPPOSITE 4 @ 1'-3 11/16"L, B04, LWR MID 4 @ 9'-3"L, B05, LWR MID 4 @ 9'-2 3/4"L, B06, LWR MID		AMLAM
105 - Beams/Brackets	5722	55	LFT	LUMBER; GLB 6 3/4 X 9"		4 AS SHOWN, 4 OPPOSITE 8 @ 1'-3 11/16"L, B07, UPPR MIDS 8 @ 9'-3"L, B08, UPPR MIDS 8 @ 9'-2 3/4"L, B09, UPPR MIDS		AMLAM
105 - Beams/Brackets	5726	208	LFT	LUMBER; GLB 6 3/4 X 18"		1 AS SHOWN, 1 OPPOSITE 2 @ 1'-3 11/16"L, B10, RIDGE 2 @ 9'-3"L, B11, RIDGE 2 @ 9'-2 3/4"L, B12, RIDGE		AMLAM
105 - Beams/Brackets	5679	623	LFT	GLULAM FACTORY BEVEL		5 AS SHOWN, 5 OPPOSITE 10 @ 20'-9 9/16"L, R01, RAFTER		AMLAM
105 - Beams/Brackets	STAGE 1	10	EA	STEEL COLUMN w/ EAVE BRACKET; HSS 8" x 8"; 9'-5 3/4" L	PC-E, RAL 8028		WET SET	METAL SHOP
105 - Beams/Brackets	STAGE 1	30	EA	BRACKET; SIMPSON CJT4Z W/ 4 LONG PINS & SCREWS		QC to verify pins & screws included		SIMPSON
105 - Beams/Brackets	STAGE 1	5	EA	RIDGE BRACKET W/ SADDLE; Z3-CSL02	PC-C, RAL 8028			METAL SHOP
105 - Beams/Brackets	STAGE 1	10	EA	RIDGE BRACKET PLATE				METAL SHOP
105 - Beams/Brackets	STAGE 1	5	EA	RIDGE BRACKET BOTTOM PLATE				METAL SHOP
105 - Beams/Brackets	BT-000-3006	10	EA	SADDLE WELDMENT; 5-1/8" GLULAM BEAMS, 5-1/2"H				METAL SHOP
105 - Beams/Brackets	STAGE 1	20	EA	COLLAR TIE PLATE; Z4-CSL02	PC-B, RAL 8028			METAL SHOP
105 - Beams/Brackets		40	EA	BOLT; 3/4" X 7" BOLT W/ WASHERS & NUT				
105 - Beams/Brackets		340	EA	BOLT; 3/4" X 9" BOLT W/ WASHERS & NUT				
105 - Beams/Brackets		80	EA	THREADED ROD; 24" W/ WASHER, NUTS & LEVELING NUT				

STAGE 2

206 -T&G	5439	103	Ea	LUMBER; DF, T&G, 2X6X12, V-EDGE, SEL/DEK		103 @ 11'-11 5/8"		
206 -T&G	5441	155	Ea	LUMBER; DF, T&G, 2X6X16, V-EDGE, SEL/DEK		103 @ 14'-3 13/16"		
206 -T&G	5443	52	Ea	LUMBER; DF, T&G, 2X6X20, V-EDGE, SEL/DEK		103 @ 5'-11 13/16"		
206 -T&G	7043	62	Ea	OSB; 5/8"(19/32) X 4' X 8'		103 @ 8'-4"		
206 -T&G	7071	16	Ea	LUMBER; 2X6X12' STK CEDAR, FREE OF HEART/WANE, #1BTR, NO SPLITS		FASCIA		
206 -T&G	5439	15	Ea	LUMBER; DF, T&G, 2X6X12, V-EDGE, SEL/DEK		SUBFASCIA		
209 - Roof Systems	5518	1348	LFT	ROOFING; HORIZON 16, 26 GA	BURNISHED SLATE 446	66 @ 20'-5"		FABRAL
209 - Roof Systems	5519	9	Ea	EAVE TRIM; WEF1, 10'-6"L, 26GA	BURNISHED SLATE 446	6:12 PITCH		FABRAL
209 - Roof Systems	5520	9	Ea	GABLE TRIM; WGF2, 10'-6"L, 26GA	BURNISHED SLATE 446			FABRAL
209 - Roof Systems	5521	5	Ea	RIDGECAP; WRH5, 10'-6"L, 26GA	BURNISHED SLATE 446	6:12 PITCH		FABRAL
209 - Roof Systems	5522	66	Ea	OUTSIDE CLOSURE, HORIZON, RIDGE				FABRAL
209 - Roof Systems	5523	6	Ea	#10 X 1" WAFER HEAD SCREWS; SQUARE DRIVE (250/BAG)				FABRAL
209 - Roof Systems	5542	1	Ea	#12-3/4" STITCH SCREWS (250/BAG)	BURNISHED SLATE 446			FABRAL
209 - Roof Systems	5524	2	Ea	#14-1" WOODTITE SCREWS (250/BAG)	BURNISHED SLATE 446			FABRAL
209 - Roof Systems	5544	5	Ea	BUTYL TAPE, 40' ROLL				FABRAL
209 - Roof Systems	5545	5	Ea	BUTYL SEALANT				FABRAL
209 - Roof Systems	9208	9	Ea	FELT; 36"X72', 30#				FABRAL
209 - Roof Systems	5528	1348	LFT	5/8" Wide Closed Cell Backer Rod Bulk Roll 775'				FABRAL
209 - Roof Systems	5190	4	Ea	Ice & Water Shield, High Temp for Metal Roofing, 36"x66.8'				FABRAL

STAGE 3

301 - Siding	STAGE 3	396	SQFT	STONE; RIVER ROCK	LAKESHORE RIVER ROCK			Willamette Graystone Inc
301 - Siding	STAGE 3	154	LFT	STONE; RIVER ROCK- CORNER	LAKESHORE RIVER ROCK			Willamette Graystone Inc
301 - Siding	STAGE 3	10	Ea	PIER CAP; 32x32, PEAKED & CHISELED; CAST BY KBI PER PRODUCTION DRAWING	TAN	KBI TO CAST PER PRODUCTION DRAWING		KB INDUSTRIES
301 - Siding	5367	39	Ea	MORTAR; SPEC MIX TYPE S80; 10SQFT				SPEC MIX

JOB NUMBER:	20407-2	ORIGINAL BOM DATE:	2/12/2026	COLOR KEY
DESCRIPTION:	Pavilion	REVISION DATE:		
MODEL #:	3014M			
BUILDING QTY:	1			
JOB NAME:	City of Shasta Lake - City Hall (CA)			

STAGE 1

CATEGORY	PART	QTY	UOM	DESCRIPTION	COLOR	COMMENTS	WET SET	MFG
101 - Block	STAGE 1	216	Ea	BLOCK; SMOOTH, 8X8X16, GRAY	GRAY	QUOTE ON FILE 7/03/2025 IV	WET SET	LOCAL DROP SHIP
105 - Beams/Brackets	5682	90	LFT	LUMBER; GLB 5 1/8" X 9"		2 AS SHOWN, 2 OPPOSITE 4 @ 1'-3 11/16" L, B01, EAVE 4 @ 10'-5 15/16" L, B02, EAVE 4 @ 10'-5 13/16" L, B03, EAVE		AMLAM
105 - Beams/Brackets	5684	315	LFT	LUMBER; GLB 5 1/8" X 12"		2 AS SHOWN, 2 OPPOSITE 4 @ 1'-3 11/16" L, B04, MID LWR 4 @ 10'-5 15/16" L, B05, MID LWR 4 @ 10'-5 13/16" L, B06, MID LWR		AMLAM
105 - Beams/Brackets	5722	85	LFT	LUMBER; GLB 6 3/4 X 9"		4 AS SHOWN, 4 OPPOSITE 8 @ 1'-3 11/16" L, B07, MID UPR 8 @ 10'-5 15/16" L, B08, MID UPR 8 @ 10'-5 13/16" L, B09, MID UPR		AMLAM
105 - Beams/Brackets	5726	225	LFT	LUMBER; GLB 6 3/4 X 18"		1 AS SHOWN, 1 OPPOSITE 2 @ 1'-3 11/16" L, B10, RIDGE 2 @ 10'-5 15/16" L, B11, RIDGE		AMLAM
105 - Beams/Brackets	5679	715	LFT	GLULAM FACTORY BEVEL		2 @ 10'-5 13/16" L, B12, RIDGE 2 @ 10'-5 13/16" L, B13		AMLAM
105 - Beams/Brackets	STAGE 1	10	Ea	STEEL COLUMN W/ EAVE BRACKET; HSS 8" x 8", 9'-5 3/4" L	PC-E, RAL 8028	5 AS SHOWN, 5 OPPOSITE 10 @ 22'-5 11/16" L, R01	WET SET	METAL SHOP
105 - Beams/Brackets	STAGE 1	30	Ea	BRACKET; SIMPSON CIT4Z W/ 4 LONG PINS & SCREWS				SIMPSON
105 - Beams/Brackets	STAGE 1	5	EA	RIDGE BRACKET W/ SADDLE; Z3-CS102	PC-C, RAL 8028			METAL SHOP
105 - Beams/Brackets	STAGE 1	10	EA	RIDGE BRACKET BOTTOM PLATE				METAL SHOP
105 - Beams/Brackets	STAGE 1	5	EA	RIDGE BRACKET BOTTOM PLATE				METAL SHOP
105 - Beams/Brackets	BT-000-3006	10	EA	SADDLE WELDMENT; 5-1/8" GLULAM BEAMS, 5-1/2"H				METAL SHOP
105 - Beams/Brackets	STAGE 1	20	EA	COLLAR TIE PLATE	PC-B, RAL 8028			METAL SHOP
105 - Beams/Brackets		340	EA	BOLT; 3/4" X 9", HEX BOLT W/ WASHERS & NUT				
105 - Beams/Brackets		40	EA	BOLT; 3/4" X 7" BOLTS W/ WASHERS & NUT				

CATEGORY	PART	QTY	UOM	DESCRIPTION	COLOR	COMMENTS	WET SET	MFG
105 - Beams/Brackets		80	EA	THREADED ROD, 3/4" x 24" W/ WASHER, NUTS & LEVELING NUT				

STAGE 2

206 - TR&G	5441	290	Ea	LUMBER; DF, TR&G, 2X6X16, V-EDGE, SEL/DEK		116 @ 15'-5 15/16"		
206 - TR&G	5443	58	Ea	LUMBER; DF, TR&G, 2X6X20, V-EDGE, SEL/DEK		116 @ 6'-5 13/16"		
206 - TR&G	7043	74	Ea	OSB; 5/8"(19/32) X 4' X 8'		116 @ 12'-11 11/16"		
206 - TR&G	7071	17	Ea	LUMBER; 2X6X12; STK CEDAR, FREE OF HEART/WANE, #1BTR, NO SPLITS		116 @ 9'-0 1/16"		
206 - TR&G	5439	17	Ea	LUMBER; DF, TR&G, 2X6X12, V-EDGE, SEL/DEK		FASCIA SUBFASCIA		
209 - Roof Systems	5518	1590	LFT	ROOFING; HORIZON 16, 26 GA		BURNISHED SLATE 44 72 PANELS @ 22'-1"		FABRAL
209 - Roof Systems	5519	10	Ea	EAVE TRIM; WEF1, 10'-6"L, 26GA		BURNISHED SLATE 44 72 PANELS @ 22'-1"		FABRAL
209 - Roof Systems	5520	10	Ea	GABLE TRIM; WGF2, 10'-6"L, 26GA		BURNISHED SLATE 44 72 PANELS @ 22'-1"		FABRAL
209 - Roof Systems	5521	5	Ea	RIDGE CAP; WRH5, 10'-6"L, 26GA		BURNISHED SLATE 446		FABRAL
209 - Roof Systems	5522	72	Ea	OUTSIDE CLOSURE, HORIZON, RIDGE		BURNISHED SLATE 44 6:12 PITCH		FABRAL
209 - Roof Systems	5523	7	Ea	#10 X 1" WAFER HEAD SCREWS; SQUARE DRIVE (250/BAG)				FABRAL
209 - Roof Systems	5542	1	Ea	#12-3/4" STITCH SCREWS (250/BAG)		BURNISHED SLATE 446		FABRAL
209 - Roof Systems	5524	2	Ea	#14-1" WOODITTE SCREWS (250/BAG)		BURNISHED SLATE 446		FABRAL
209 - Roof Systems	5544	5	Ea	BUTYL TAPE, 40' ROLL				FABRAL
209 - Roof Systems	5545	5	Ea	BUTYL SEALANT				FABRAL
209 - Roof Systems	9208	10	Ea	FELT; 36"X72", 30#				FABRAL
209 - Roof Systems	5528	1590	LFT	5/8" Wide Closed Cell Backer Rod Bulk Roll 775'				
209 - Roof Systems	5190	5	Ea	Ice & Water Shield, High Temp for Metal Roofing, 36"X66, 8'				FABRAL

STAGE 3

301 - Sliding	STAGE 3	396	SOFT	STONE: RIVER ROCK	LAKE SHORE RIVER ROCK			Williamette Graystone In
301 - Sliding	STAGE 3	154	LFT	STONE: RIVER ROCK- CORNER	LAKE SHORE RIVER ROCK			Williamette Graystone In
301 - Sliding	STAGE 3	10	EA	PIER CAP; 32X32, PEAKED & CHISELED; CAST BY KBI PER PRODUCTION DRAW TAN		KBI TO CAST PER PRODUCTION DRAWING		KB INDUSTRIES
301 - Sliding	5367	39	Ea	MORTAR; SPEC MIX TYPE S80; 10SQFT				SPEC MIX

SECTION 33 34 00**ONSITE WASTEWATER DISPOSAL****PART 1 - GENERAL**

1.01 DESCRIPTION

This section includes the onsite wastewater disposal system including the dispersal mound, pump tank, septic tank, pumps, filters, controls, valves, piping, electrical connections and all accessories necessary for a complete functioning system.

1.02 SUBMITTALS

- A. Product Data: Submit product information cut sheets, installation instructions, wiring diagrams and maintenance requirements for all products used in system.
- B. Shop Drawings: Submit shop drawings that include diagrammatic layout and connections of all components. Provide mounting details for all equipment.

PART 2 – CONSTRUCTION MATERIALS

2.01 GRAVITY-FLOW, NON-PRESSURE SEWER PIPING

- A. PVC Piping, ASTM D1785

2.02 DISTRIBUTION PIPING

- A. Pressure rated PVC pipe, rated at a minimum of 150 PSI.
- B. Gate valve and back flow, check valve at each lateral.
- C. 90 degree long sweep, ball valve and threaded end cap/plug at the end of each lateral.

2.03 FILTER FABRIC

- A. Non-woven geotextile fabric.

2.04 MOUND FILL MATERIAL

- A. Sand Media: Coarse Sand
 - 1. Less than 5% fines
 - 2. No more than 20% (by weight) material greater than 2mm in diameter.
 - 3. Concrete sand from Westside Aggregate, bedding sand from Crystal Creek Aggregate or accepted equal.
- B. Pea Gravel: 3/8 inch double washed, free of fines.
- C. Soil Cover: Sandy Loam
 - 1. Erosion control planting

2.05 MONITORING WELLS

- A. Schedule 40 PVC pipe.

2.06 DISTRIBUTION VALVE

- A. Orenco 4404 Distribution Valve or accepted equal.

2.07 SEPTIC TANK

- A. 3,000 gallon, concrete tank.
- B. Two compartments.
- C. Effluent filter in the outlet "T"
- D. Watertight.
- E. Grade rings, risers and manhole covers.
- F. Traffic rated.

2.08 PUMP TANK

- A. 3,000 gallon, concrete tank.
- B. Two compartments.
- C. Watertight.
- D. Two pump units installed in outlet compartment.
- E. Grade rings, risers and manhole covers.
- F. Traffic rated.

2.09 PUMP UNIT (2)

- A. Orenco Biotube Propak Pump Package Units or accepted equal.
- B. All accessories, wires and mounting equipment necessary for complete operation.

2.10 CONTROL PANEL

- A. Orenco MVP-DAX DM or accepted equal
- B. All accessories, wiring, mounting equipment and programming necessary for a complete installation.

PART 3 – CONSTRUCTION METHODS

Refer to attached report "Margaret Polf Park – Septic System" dated February 24, 2026 for installation instructions and additional information.

City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

System Design

SEPTIC SYSTEM DESIGN

Margaret V. Polf Park

Pressure Dose Mound Design

By Mark Cramer, REHS

Shasta Dam Blvd.
APN 006-790-016

revised Date 02/28/2026
Community Park

PROJECT GENERAL DESCRIPTION

The onsite wastewater system described here is for the construction of a public flush toilet facility and snack bar. The project site is located at Margaret V. Polf Park off of Shasta Dam Boulevard, City of Shasta Lake. This onsite wastewater treatment system design is to mitigate redoximorphic soil features at approximately 24-inches below ground surface (bgs).

Redoximorphic soil features are a strong indication that seasonal saturated soils/groundwater is present as shallow as 24-inches below the ground surface. The average soil percolation rate was determined to be 27.44 minutes per inch (mpi) at 12 inches below ground surface (bgs).

Set back issues to be considered at this site include maintaining the dispersal bed 100 feet from a creek, 50 feet from an ephemeral waterway. The septic tank and pump tank will need to be set back 50 feet from a storm drain grate that is located near the proposed snack bar/bathroom facility. To maintain the tanks 50 feet from an ephemeral waterway, an additional 50 feet of culvert will need to be added to an existing culvert adjacent and below the basketball court. The septic tank and pump tank is required to be set back 50 feet from waterways and the terminal end of the culverts.

There are numerous trees in the area of the proposed dispersal mound. Trees that are within 10 feet of the sand edges of the mound shall be cut off as close to the ground as possible.

The BMX track area is elevated above the ground where the mound will be placed. The BMX race track area on the north side of the fence may allow storm water to naturally drain towards the mound. Storm water flows should be observed after storm events to ensure that water does flow into the dispersal mound or pond up against the side of the dispersal mound.

This design is for the construction of an above ground dispersal system (mound) to mitigate groundwater anticipated to be at approximately 24-inches below ground surface (bgs). See Shasta County Technical Guidance Manual, section 1.G, page 74 for mound design and requirements. The mound design and dimensions were designed using Shasta County requirements for mounds and information found in the manual titled "Wisconsin Mound Soil Absorption System: Siting, Design and Construction Manual" by Converse and Tyler, 2000.

During wet periods, saturation may occur at the sand soil interface at the toe of the mound as the effluent is restricted from moving away from the mound. This effluent is usually extremely low in fecal bacteria but may have high nitrates and chlorides (Wisconsin Mound Soil Absorption Systems: Siting, Design and Construction Manual by Converse and Tyler, 2000). Under

saturated conditions such as during and after major rain events there is a possibility of leakage of this water from the toe of the mound for a few days.

WATER USE

1000 GPD Peak Flow

Determining the daily water use is critical for designing the wastewater treatment system. Water use was determined after reviewing water use records from a similar park site in the City of Shasta Lake. The past 3 years water use data records were reviewed for this design estimate. The source water is from the City of Shasta Lake public water system. Clair Engle Park on Front Street was used as our estimate for water use. There is a 1-inch water meter dedicated to the sole use of the bathroom at the park. No irrigation water is associated with this water meter. Use at Clair Engle Park includes bathroom use, food and drink sales from food trucks. Activities at Clair Engle Park include Friday Nights in the Park free concert events. During these events, the City of Shasta Lake Public Works Department estimated attendance at about 300 persons. There are approximately 70 parking spaces within walking distance to Clair Engle park.

The maximum monthly water use for the past 3 years from Clair Engle Park is used for estimating water use at Polf park. The highest monthly water use was for the month of July 2024 at Clair Engle Park in the City of Shasta Lake. The monthly total was 7630 gallons. The daily average use is calculated at $7630 \text{ gallons} / 31 \text{ days} = \underline{246 \text{ gallons per day (gpd) average use}}$. Typical average daily water use throughout the year at Cair Engle Park is 116 gpd.

A peak day use design flow is calculated to assume occasional high peak flows and provides for a design safety factor. A peak day use of 1000 gallons was estimated for this design to anticipate very high use days during BMX bike events and other occasional events. This peak day use has a very conservative peaking factor of 4.07.

$$246 \text{ gallons} \times 4.07 = 1001 \text{ gallons peak water use}$$

It should be noted that the peak day use will be for only 1 to 3 days consecutively and numerous very low flow days between peak flows. This scenario will allow for the dispersal system to rest until the next peak flow event. It is expected that peak flow events will occur only a few times per year.

The hand sinks in the bathrooms should be fitted with push buttons or motion activated faucets to limit the water use. Faucets, toilets and urinals should be low flow units.

NOTE: This capacity of this onsite wastewater treatment system has limitations. The operator shall be aware of these limitations for proper operation of the septic system and to prevent failure of the system. See the attached Operations and Maintenance guide.

Install a 2-inch Seametrics effluent flow meter (model WMP101-200-GPM-GT-Hf) in the transport pressure line just after the pump tank. Place the meters in protected valve boxes for easy access.

The effluent flows should be measured routinely to help in the operation of the onsite wastewater treatment system. This will help in determining maximum use of the park activities and associated flush toilet facility for planning future events.

DESIGN

Primary treatment consists of a minimum 3000 gallon concrete septic tank. A dual compartment 3000 gallon concrete pump tank will be installed to house the pumps and cartridge filters. The pumping units (2 alternating pumps) will have audio/visual alarms to alert the operator of pump failures. An electrical permit should be obtained from the local building code authority for electrical additions/construction. The pump units will deliver the septic effluent to the mound multiple times per day. Dosing of the sand/gravel media is completed with the use of a programmable timer. An Orenco 4404 distributing valve will be used to create cells that can be sequentially dosed. Follow the Orenco installation requirements (attached) for the proper installation of the Orenco 4404 distributing valve.

The completed mound will be approximately 118-feet long by 39-feet wide and 46.25-inches high. The mound will be constructed by importing sand to a depth of 34.25-inches as specified in this design. Within the top of this sand mound, a 9.25-inch deep bed will be constructed for the addition of pea gravel to support the pressure distribution piping (laterals). This piping will be 1.25 inch diameter pvc with 1/8-inch diameter orifices drilled every 2 feet along the pipe/lateral. A pump unit will be used to pressurize the perforated pipe to achieve broad uniform distribution of wastewater to the pea gravel / absorption area. Each orifice will have a cap placed over it (orifice shield). A filter fabric will be placed over the top of the pea gravel. This fabric must allow air to pass. The pea gravel layer will be pressure dosed using a timer system by Orenco.

TANKS

A minimum 3000 gallon two compartment concrete septic tank shall be installed for this design. Effluent from the septic tank will gravity flow into a concrete 3000 gallon concrete pump tank. The septic tank shall have an effluent filter installed in the outlet "T". Tanks shall be watertight and all tank penetrations shall be sealed and made watertight. The septic tank must have at-grade access with watertight lids and risers if the top of the tanks are 6-inches or greater below ground surface.

A 3000 gallon concrete pump tank shall be installed for housing two Orenco pump units. The pump units shall be fitted with an audio/visual alarm to alert the operator when a pump is failing. Pumps shall be installed in the outlet compartment of the pump tank. Add water to tanks after installation to prevent movement of tanks. The pumps will be operated with the use of an Orenco Duplex pump controller to alternate pumps between pump cycles.

NOTE: Shasta County requires an effluent filter be placed in the outlet "T" of the septic tanks. The effluent filter should be checked every 6 months and cleaned or replaced as needed.

LINEAR LOADING RATES

Linear loading is the amount of effluent (gallons) applied per day per linear foot of the system (gpd/Lf). This is a function of effluent movement rate away from the system and direction of movement away from the system. This calculation is used to determine an appropriate mound length.

Maximum Linear Loading Rates

NATIVE SOIL & SAND DEPTH above the limiting layer	GROUND SLOPE %	PERCOLATION RATE MPI		
		1 - 30	30 - 60	60 - 120
LINEAR LOADING RATES gpd/lf				
2.0 - 2.5	0 - 10	5	4	3
	10 - 20	6	5	4
2.5 - 3.0	0 - 10	7	6	5
	10 - 20	8	7	6
3.0 - 4.0	0 - 10	9	8	7
	10 - 20	10	9	8
>4.0	0 - 10	11	10	9
	10 - 20	12	11	10

Chart is from Shasta County LAMP document, Appendix 1G, Guidelines for Mound Systems
1000 gpd for each mound / 11gpd/Lf = 91 feet minimum sand basal mound length

MOUND SIZING AND FILL MATERIAL

The required square footage of the absorption bed infiltrative surface material was calculated as follows:

ABSORPTION AREA SIZE (pea gravel bed area): The design wastewater flow is 1000 gpd. The application rate for medium sand is predetermined in literature (Wisconsin Mound Soil Absorption Systems: Siting, Design and Construction Manual, Converse and Tyler, 1990 or Shasta County LAMP,2018) at 0.80 gpd/ft² for commercial applications.

WIDTH : LLR / sand loading rate, 11 gpd/lf / 0.8 gpd/ft² = **13.75 ft wide pea gravel bed**
 LENGTH: design flow rate / LLR, 1000 gpd / 11gpd/lf = 91 ft long pea gravel bed
This design will use a 93 foot long gravel bed

SAND BASAL WIDTH SIZE: Soil percolation tests were completed at a depth of 12-inches bgs. The average soil percolation rate is 27.44 mpi @ 12"bgs (see soil percolation data attached). The basal width was calculated using the wastewater flow rate and native soil percolation rate.

The soil percolation rate was used to determine an application rate to the basal area. The soil percolation rate was used to determine an application rate for sizing the sand basal area (where sand meets native soils). This was completed by using Table 2B from the Shasta County LAMP Technical Guidance Manual. For a perc rate of 27 mpi the chart indicates an application rate of 0.567 g/ft²/day.

$$\text{SAND BASAL WIDTH} = \frac{\text{Linear Loading Rate}}{\text{Soil Loading Rate}}$$

$$\text{SAND BASAL WIDTH} = 11 \text{ gpd/lf} / .567 \text{ gpd/ft}^2 = \text{minimum } \mathbf{19.40 \text{ feet wide}}$$

The sand only portion of the mound basal area was calculated to meet absorption area, sand basal width requirements and slope requirements. See the enclosed mound diagram for dimensions. A 1764 ft² minimum area for the sand basal area is required (1000 gpd / 0.567 gpd/ft² = 1764 ft²). This design will use a sand basal area of 112.4 ft long X 33.15 ft wide = 3726 ft².

ABSORPTION BED (Pea Gravel Bed)

A pea gravel bed 93-feet long by 13.75-feet wide and 9.25 inches deep will be constructed on top of the sand bed. The bottom of the gravel distribution bed shall be level. Pressurized laterals will be positioned on the gravel bed. The laterals shall be covered with pea gravel. Pea gravel shall be 3/8-inch double-washed pea gravel substantially free of fines. There shall be 6-inches of pea gravel below the laterals and another 2-inches of pea gravel on top of the laterals for a total of 9.25-inches of pea gravel. The pea gravel distribution bed shall be covered in its entirety with a geotextile ("filter fabric") silt barrier. The distance between dispersal cells laterals in the center of the sand bed shall be 1 foot.

DISTRIBUTION PIPING

All pipe, fitting and valves shall be pressure rated PVC pipe rated at a minimum of 150 psi. All joints shall be solvent welded. Sharp turns of pressurized piping shall be protected with the use of thrust blocks or equivalent restraints. Pipe sizes shall be 2.0-inch for the pressure line between the pump unit to the Orenco 4404 distributing valve. The manifold and pressurized laterals shall be 1.25-inch diameter and placed over 6-inches of pea gravel. Two inches of additional pea gravel shall be placed over the top of the lateral for cover. Laterals shall have 1/8-inch diameter holes drilled with a new drill bit facing up every 2-feet. Use a 7/64-inch diameter drill bit to drill holes. Each orifice shall be covered with a tight fitting orifice shield. The absorption bed/pea gravel shall be covered with a filter fabric to keep fines (silts, clays, debris) from contaminating the pore spaces. At the beginning of each distribution lateral a gate valve and back-flow check valve shall be installed and placed in a protective valve box. The gate valves will be used to adjust the flow of individual laterals during a squirt test. Valves will be located in utility/valve boxes for easy access. The terminal end of each lateral will be fitted with a 90 degree long sweep to facilitate line cleaning and flushing. The end riser shall be threaded to facilitate an end cap/plug and squirt testing adapter. This end riser shall be housed in a protective utility/valve box brought to grade. There will be four distribution cells in the mound.

Each cell will have 2 laterals. Each lateral will be 46-feet long. Laterals will be 3.43 feet apart from each other. An Orenco 4404 distributing valve will be used to alternate dosing to each of the 4 cells within the mound.

FLOW RATES / DOSING / PUMP SIZING per Mound

(16 doses per day)

The flow rate design is based on 1000 gpd peak flow.

Use 4 cells with the mound. Each cell has 2 laterals, each lateral 46 feet long with orifices drilled every 2 feet.

(23 orifices per lateral) X 2 lateral = 46 orifices

From pump program (0.43gpm/orifice)

0.43gpm/orifice X 46 orifices = 19.78 gpm per dose

1000 gpd / 4 cells = 250 gpd for each cell in a 24 hour period

250 gpd / 4 doses per day for each cell = 62.5 gallons per dose

62.5 gallons per dose / (19.78 gpm / dose) = Pump ON for 3.2-minutes per pump cycle.

A total of 4 doses for each cell throughout a 24 hour period if peak flow is achieved. Fewer doses will be activated when water use is much lower than 1000 gpd.

Dosing timing and volume pumped during a cycle can be verified in the field by measuring the drawdown in the pump tank during the squirt test. See the attached Pump System Float Switch Settings by Orenco, Biotube ProPak design Criteria.

Two Orenco Biotube ProPak Pump Package units will be used for this project (BPP3005TDD, 30 gpm, 1/2 HP). Two pumps will be placed in the 3000 gallon two compartment pump tank. Pumps will operate via an Orenco MVP-DAX DM control panel for timed dosing of the dispersal bed. There shall be 2 pumps installed in the pump tank. An Orenco Duplex control panel will allow the pumps to alternate between pumping cycles. See attached Orenco Biotube ProPak Design Criteria for more information for timed-dose systems.

Control panels for the pumps and alarm system may be installed inside the snack bar in a convenient location for easy access.

SQUIRT TEST

Effluent will flow from the septic tank by gravity into the single compartment concrete pump tank with cartridge filters. The filter will remove suspended solids from effluent, helping extend the life of the constructed mound media. Uniform dosing of the effluent will be field tested by visual inspection of a squirt test. The squirt height of the effluent from each pressure lateral will be adjusted to make sure all areas of the distribution system receive a uniform amount of effluent. A minimum of a 5-foot squirt height is required from each orifice. Squirt heights are considered to be equal when the squirt heights of all the orifices differ by no more than 10% during the initial construction field test. Minor adjustment can be made in the field with the use of gate valves installed at the beginning of each pressurized lateral. NOTE: You must have a representative of Shasta County Environmental Health Division onsite to witness a squirt test.

SAND MEDIA

The recommendation is to use coarse sand with a minimum amount of fines (<5%). Also, it is recommended that the sand have no more than 20% (by weight) material greater than 2 mm in diameter and not more than 5% silt and clays (<.53 mm). Sand shall be purchased from either Westside Aggregate (concrete sand) or Crystal Creek Aggregate (bedding sand). If other sources of sand are to be used, a sieve analysis report from the sand supplier will be required to be reviewed by Mark Cramer Consulting before using the sand for this design. Care shall be taken to keep the sand clean and free of fines and silts, clays during transport, storage and handling. Sand should meet the following sieve specifications;

<u>Sieve size</u>	<u>Recommended Percent Passing</u>	<u>Westside Aggregate (Concrete Sand)</u>	<u>Crystal Creek Aggregate (Grey/Bedding Sand)</u>
¾ inch	100	100	100
#4	90 - 00	98	98
#8	-----	80	74
#10	62-100	89	---
#16	45-82	58	44
#30	25-55	37	24
#50	5-20	17	11
#100	0-2	5	4
#200	0-1	2.7	2.6

MOUND CONSTRUCTION TECHNIQUE

Minimize vehicular traffic over the proposed mound area during other construction activity. Cut and remove any excessive vegetation. Trees shall be cut at ground surface and the stumps may remain in place. Construction of the mound shall not be started if rain is anticipated.

Install the delivery pipe from dosing tank location to the mound location. Lay pipe with a slope back towards the dosing tank or lay pipe below frost line. Backfill and compact soil around the pipe.

Plow the mound site basal area. To prepare the native soil for receiving fill, the entire basal area shall be grubbed, scraped to remove the organic top layer and vegetation/grasses. Roughening the soil surface to 4-6 inches below ground surface with backhoe teeth is a satisfactory plowing technique. Plowing shall only be completed when soil moisture content is sufficiently low. If after plowing the soil becomes wet, construction shall be postponed until the soil has dried down to plow depth. Plowing shall be parallel with the elevation contours. The native soil shall be plowed to a depth of 4-6 inches.

Place the sand as specified in these plans around the perimeter of the plowed mound area. Move the sand into place using a track type tractor with a blade. Always keep a minimum of 6-inches of sand under the tracks of the tractor to minimize compaction. The sand shall be worked in this manner until the height of the sand reaches the elevation of the top of the absorption bed. Add to the sand depth in order to keep the top of the sand layer level in all directions. With the blade of the tractor or hand tools, shape the fill material to the proper slope

(3:1, 3 horizontal to one vertical).

Within the sand fill, create the gravel absorption bed 9.25-inches deep. The bottom of the gravel bed shall be level. This will require careful hand work and measurements. Place 6-inches of gravel in bed with a tractor. The bed is approached by traveling up the sand fill slope, filling the bed from the sides. Fill the bed with gravel specified in these plans.

Assemble the distribution network on the gravel bed. The laterals shall be laid level. Drill orifices every 3 feet along the laterals (Lateral Detail Sheet). Prior to covering the laterals, place clean water in the pump chamber and test the pump unit. Check for uniform streams of water from each orifice. Call the County inspector to witness a squirt test after adjustments have been made to obtain uniform stream heights.

Place an additional 2-inches of pea gravel over the laterals after installing orifice caps/shields. Place a suitable backfill barrier (filter fabric) over the gravel.

Complete Installation of monitoring wells, valves, valve boxes. Place a minimum of 12-inches of topsoil as specified in these plans over the mound.

MOUND COVER

A continuous soil cover shall be placed over the entire disposal field. The soil shall consist of a medium loamy textured soil (sandy loam) and be at least 12-inches thick over the top of the gravel and sand. Soil cover shall be crowned or sloped to promote rainfall runoff. The soil cover shall extend beyond the perimeter edge of the sand fill as shown in the mound overhead diagram. Provide erosion controls to the mound. Landscape the mound with grasses.

The mound shall be capable of maintaining vegetative growth. Turf grasses are the best. If rain is expected before grasses have time to propagate, erosion controls shall be installed. Erosion controls shall be applied over the top of the completed fill to prepare the site for winter rains and to prevent fill material soils from moving downslope during the first winter rains. Erosion controls may also help to hold grass seeds in place. Acceptable erosion controls include straw blankets, coconut blankets or 1 to 2-inch thick layer of straw broadcast over the fill area and secured with jute small mesh netting. Blankets and jute netting are to be staked to prevent movement from rain and wind throughout the winter.

MONITORING WELLS / OBSERVATION PORTS

Four monitoring wells shall be installed within the mound as follows:

1. One monitoring well (MW1) shall be located $\frac{1}{8}$ the length of the gravel bed between cells in the middle of the gravel bed.
2. One monitoring well (MW2) shall be located $\frac{3}{8}$ way along the length of the gravel bed between cells in the middle of the gravel bed.
3. One monitoring well (MW3) shall be located $\frac{5}{8}$ the length of the gravel bed between cells in the middle of the gravel bed.

4. One monitoring well (MW3) shall be located $\frac{7}{8}$ the length of the gravel bed between cells in the middle of the gravel bed.

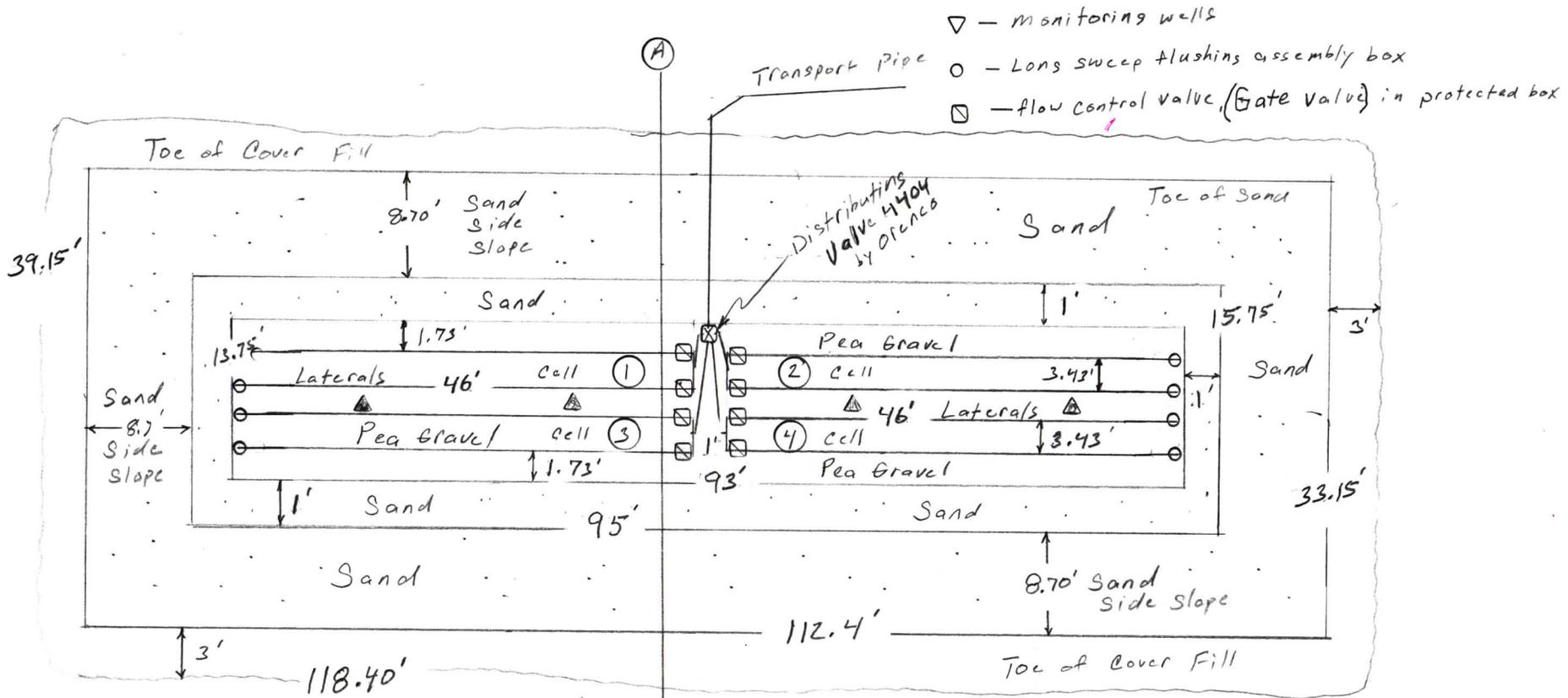
Monitoring wells/observation ports shall be constructed of four (4) inch diameter schedule 40 pvc pipe, equipped with a tight fitting cap or plug and a bottom cap. All wells shall be perforated in the bottom (6) inches. Wells shall extend from the sand/native ground interface to the top of the completed mound. The monitoring pipe shall be secured to prevent movement. Monitoring pipe shall extend to the mound surface for access and be located in a valve box. The top of the valve box shall be flush with the top of the completed mound surface. Perforations shall consist of hacksaw slots at a nominal one (1) inch spacing, or equivalent commercially slotted pipe, or holes drilled into pipe with hole diameters smaller than drain rock diameter and the pipe blanketed in cloth to prevent gravel from entering the monitoring pipe.

City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

System Layout



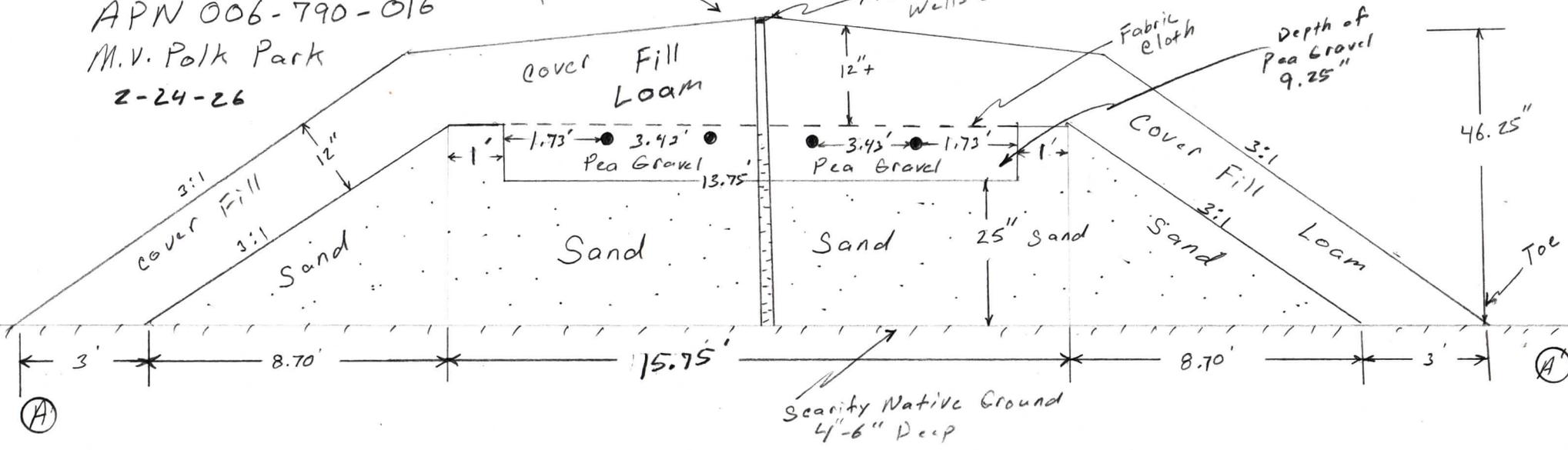
Mound Layout
 APN 006-790-016
 M.V. Polk Park
 2-24-26

Crown to promote runoff

monitoring wells (4)

Fabric cloth

Depth of Pea Gravel 9.25"



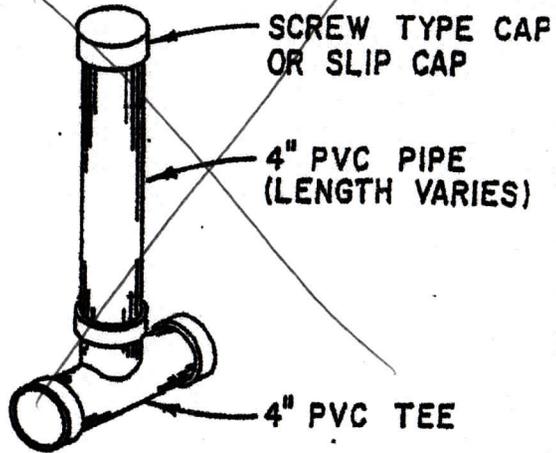
Lateral Pressure Line Details

2-24-26

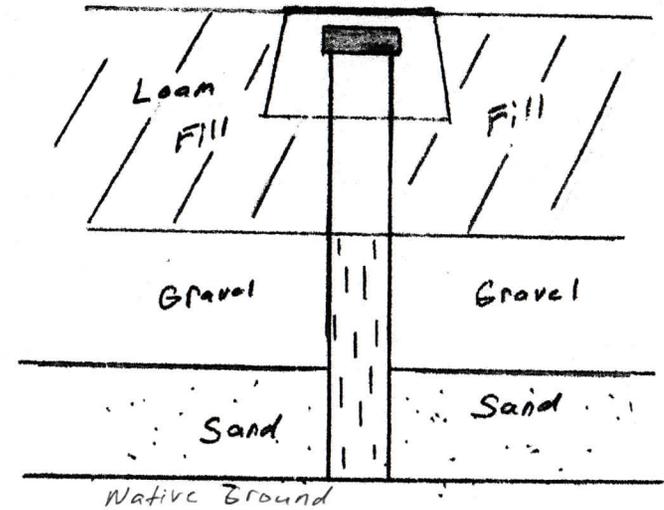
Drill $\frac{1}{8}$ - inch diameter holes every 2 feet apart for a total of 23 orifices per lateral.
 Each lateral to be 46 feet long.

M.V. Polk Park

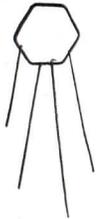
APN 006-790-016



Monitoring Well Design



4404 Valve



Valve Box

$\frac{1}{8}$ - inch holes facing up with orifice shields

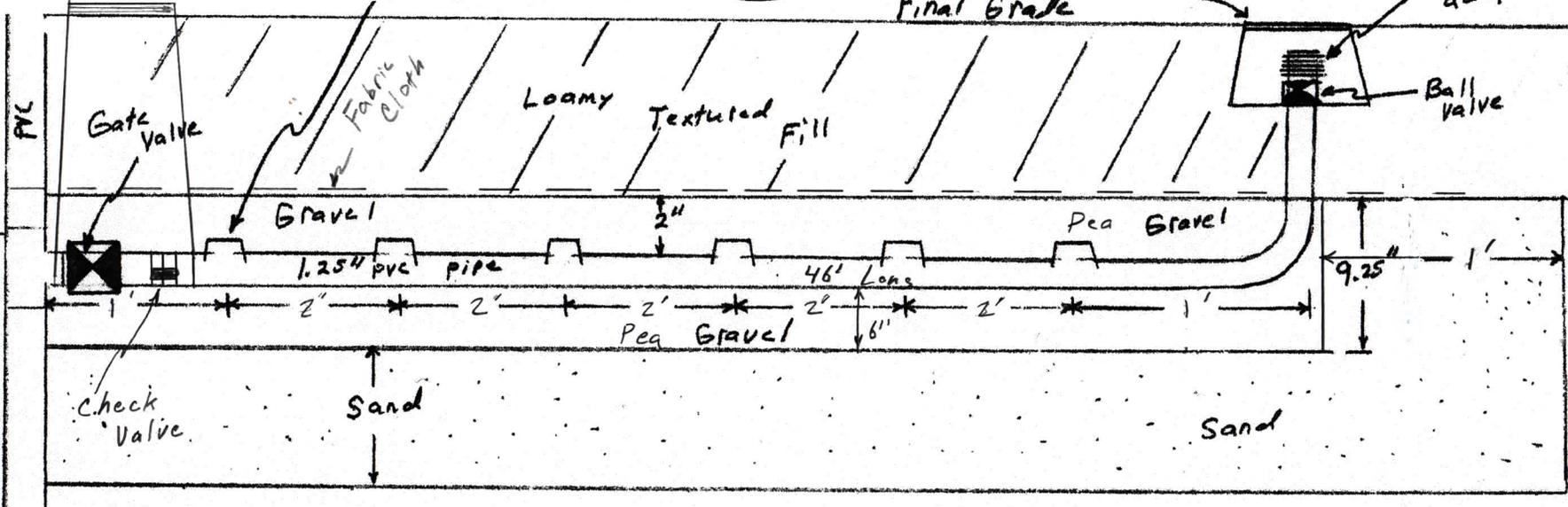
Final Grade

Valve Box

Threaded end for cap and adaptors

Ball Valve

Fill



City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

O & M Manual

OPERATION AND MAINTENANCE

PRESSURE DOSE MOUND SEPTIC SYSTEM

Margaret V. Polf Park

APN 006-790-016

5-16-2025

Shasta Dam Blvd

Periodic observations and inspections of the septic system should be performed by a qualified service provider/maintenance operator. A maintenance agreement with a qualified service provider should be in place at all times. The property owner shall repair as soon as possible the wastewater treatment system that has pooling effluent or discharges of wastewater to the ground surface. The service provider shall be contacted immediately to assess any unusual operating conditions and make adjustments or repairs to the wastewater treatment system as soon as possible.

Maintenance intervals may be identified in the permit conditions issued by the regulatory authority (Shasta County). Maintenance may include:

- A. Purge laterals, squirt test, and balance the lateral valves using the gate valves.
- B. Exercise valves
- C. Maintain mound area landscape as needed.
- D. Repair erosion of the mound from winter storms if needed.
- E. Measure and record water levels in observation wells annually.
- F. Record all work done.
- G. Record effluent meter readings.

The operator shall make efforts to eliminate and prevent runoff water from reaching the disposal area. This includes making sure that runoff from roofs, gutters, the BMX race track and driveways/parking areas are directed away from the disposal field. Runoff from future construction sites shall not cause runoff to be directed to the disposal field. Irrigation water shall be kept at least 50 feet from the perimeter of the mound.

Do not drive or park heavy machinery or vehicles over the top of the mounds. Do not allow large animals (cows, horses) to have access to the mound. Do not cultivate crops or gardens on the mound.

Minimize the liquid load to the septic system. Repair leaky fixtures. Use water saving/low flow fixtures. The public sinks and toilets should have push buttons or motion detected metering devices to limit water use. Do not pour grease or chemicals into your septic system. This design is for domestic type waste only (handwashing, toilets, limited kitchen waste from pre packaged food sales only,). Allowing chemicals such as paint, automotive cleaning solutions, petroleum products, caustic chemicals, cleaning chemicals, water softening solutions or allowing high volumes of liquids or solids to enter the septic system beyond the design capacity is considered abuse of the septic system. Overuse of bleach and antibacterial products can harm the septic system.

The sludge and scum depths in the septic tank and pump tank shall be checked yearly. When the depth of sludge/scum reaches $\frac{1}{3}$ of the liquid depth of the tank or the depth of sludge interferes with pump operations, the tank(s) shall be pumped to remove this sludge/scum. The septic tank will have an effluent filter located in the outlet "T" fitting. This effluent filter shall be checked routinely and cleaned or replaced as necessary (monthly).

The septic tank and pump tank are to remain watertight to prevent storm water, irrigation water from entering the septic system which can lead to premature failure. Exfiltration from leaky tanks allows the septic tank contents to go directly into the ground without any treatment and contaminate groundwater and surface waters. Visually inspect tank lids and risers for leaks routinely.

The pump tank is equipped with a cartridge filter surrounding the Orenco pump units. The filters are to be checked and cleaned once each quarter the first year. After the first year of operation the filter cleaning can be increased or reduced based on the first year quarterly findings. Damaged filters shall be replaced. Cleaning is completed by hosing off the filter with clean water and allowing the waste water from the filter to drain back into the septic tank. The overflow pump alarm shall be checked routinely to ensure proper function at the time of cartridge cleaning.

Each end of a pressurized lateral is equipped with a turned up end located in a valve box. The valve box houses the pressurized leach line end cap. The purpose of the end cap is to allow line flushing and cleaning if required. It is possible for debris to clog the orifices located along the laterals. Flushing the line can remove this debris. It is recommended that each leach line is flushed yearly to prevent biological material from accumulating in the lines. A snake or bottle brush can be introduced into the lateral end for additional cleaning to remove debris every 2-3 years or as often as needed. The monitoring wells can be inspected when leach line failure is suspected to determine if one or more lines are saturated. Monitoring wells are installed to measure the performance of the septic system and observe ponding.

If the gravel bed is saturated as observed in monitoring wells, leaks are observed on the mound surface or poor performance of plumbing fixtures is observed, adjustments to the timed dosing scheme is one action that can be completed by a qualified person to correct the performance of the septic system.

The operator shall inspect plumbing fixtures routinely to verify that there are no leaking fixtures. Leaking fixtures can cause premature failure of septic systems by overloading the system with excess waste water.

The owner shall keep and maintain a record of wastewater system performance. The operation, monitoring and maintenance records should include the following:

1. Equipment maintenance and replacement record
2. Calendar schedule of maintenance
3. Record pump on/off settings
4. Septic tank pump outs including dates and volume and any conditions discovered

- during the pump out. (every 7-10 years)
5. Sludge depth measurements
 6. Monitoring well notes such as liquid depths from a fixed reference point (top of well casing).
 7. Record effluent water flows from the effluent flow meter. Record daily during events and weekly during the first few years of operation. This will give the operators a baseline from which water flow can be anticipated for various future events.

The record may be modified to best suit the needs of the septic system. It is very important that the operator keep records up to date by recording and filing all relevant data, information and problems associated with the septic system. These records can be very useful for future troubleshooting problems that may occur. Regular review of the records can alert the system owner of problems which might be developing in the system, so they can be corrected before costly emergency repairs are required.

Should a failure of the septic system occur, the property owner shall make every effort to investigate the cause of the failure and make the repair in a timely manner. Until such repair can be completed, the septic tank shall be pumped as necessary to prevent wastewater from continuing to fail to the ground surface. Qualified septic repair persons or consultants shall be contacted to address the failing system.

LIMITATIONS

The onsite wastewater treatment system is designed for a maximum use of 1000 gallons per day. Exceeding this wastewater flow can cause premature failure of the system. Failures may be exhibited as ponding effluent in and around the mounds, wastewater backing up into the pump tank, septic tank and even water fixtures in the bathroom or snack bar facility. The operators of the facility should be aware of these wastewater limitations when planning events at the park. Planning events larger than the septic system can handle can cause failure.

This design is for domestic type wastewater only such as typical bathroom waste for park users (handwashing and toilets use). Only prepackaged food shall be sold in the snack bar. This onsite wastewater design is not designed to handle wastewater from kitchen cooking processes and food preparation. Treating effluent with cooking grease and oily food waste is not part of this design. Allowing chemicals such as cooking/food waste grease, paint, automotive cleaning solutions, petroleum products, caustic chemicals, cleaning chemicals in high concentration or water softening solutions is considered abuse of the septic system. Allowing high volumes of liquids or solids to enter the septic system beyond the design capacity is considered abuse of the septic system.

City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

Soils Testing

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
ENVIRONMENTAL HEALTH DIVISION

1 of 2

Parcel/Lot # 006-790-016

Land Use Percolation Test

Date:

5-23-24

Property Owner: _____

Weather:

Sunny Warm

Location: Shasta Dam Blvd, M.V. Poff Park

Performed by:

M. Cramer

	Number of Fillings	Time of Measurement	Water Level From Surface	Drop In Water Level	Comments & Observations
Hole No:	1	30min	6"	2 10/16	Two soil pits inspected with very similar soils. Depth to limiting layers bot at 24" b.s.
Depth:	2			2 5/16	
Diameter or size:	3			2 3/16	
Pre-soak start time:	4			2 2/16	
Soaked overnight?	5			2 2/16	
Location:	6			1 15/16	
Remarks:	7			1 15/16	
	8			1 15/16	
Results: 15.48 minutes/inch					
Hole No:	2	30min	6"	12/16	Comments & Observations
Depth:	—	—	—	—	
Diameter or size:	10"				
Pre-soak start time:	5-22-24				
Soaked overnight?	Yes				
Location:					
Remarks: Water in hole after overnight pre-soak					
Results: 410.0 minutes/inch					
Hole No:	3	30min	6"	1 14/16	x̄ = 27.44
Depth:	2			1 11/16	
Diameter or size:	3			1 10/16	
Pre-soak start time:	4			1 10/16	
Soaked overnight?	5			1 9/16	
Location:	6			1 9/16	
Remarks:	7			1 8/16	
	8			1 8/16	
Results: 20.0 minutes/inch					



I hereby certify under penalty of perjury that these data are true and correct, and that correct test procedures have been followed.

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
ENVIRONMENTAL HEALTH DIVISION

2 of 2

Parcel/Lot # 006-790-016

Land Use Percolation Test

Date:

5-23-24

Property Owner: _____

Weather:

Sunny Warm

Location: Shasta Dam Blvd, N.V. Palf Park

Performed by:

M. Evans

	Number of Fillings	Time of Measurement	Water Level From Surface	Drop In Water Level	Comments & Observations
Hole No: <u>4</u>	<u>1</u>	<u>30 min</u>	<u>6"</u>	<u>14/16</u>	
Depth: <u>12"</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
Diameter or size: <u>10"</u>					
Pre-soak start time: <u>5-22-24</u>					
Soaked overnight? <u>Y/N</u>					
Location:					
Remarks: <u>water in hole after overnight pre-soak</u>					
Results: <u>34.29</u> minutes/inch					
Hole No:					Comments & Observations
Depth:					
Diameter or size:					
Pre-soak start time:					
Soaked overnight?					
Location:					
Remarks:					
Results: _____ minutes/inch					
Hole No:					
Depth:					
Diameter or size:					
Pre-soak start time:					
Soaked overnight?					
Location:					
Remarks:					
Results: _____ minutes/inch					

I hereby certify under penalty of perjury that these data are true and correct, and that correct test procedures have been followed.

Depth: 0-24" M.V. Polk Park SAMPLE: 1277

Color/chip 12ed Brown

Gravelly very extremely BE Pea 3/4 1-1/2 2-3
15-35% 35-50% >50%

Texture: Loam

Mottles: few 2% common 2-20% many >20%
fine <5 mm medium 5-15mm large >15 mm
faint distinct prominent

Structure: Massive, single grain, weak, moderate, strong
granular, platy, prismatic, columnal, abk, sbk

Consistence: lo, so, sh, h, vhy, exh
lo, vy frb, frb, frm, v frm, exfrm
na, sa, s, va, rp, sp, p, vp

Roots:	vy fine 1 mm	fine 1-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<10	<10	<1	<1
Common	10-100	10-100	1-10	1-5
Many	>100	>100	>10	>5

Pores:	vy fine 0.1-0.5 mm	fine 0.5-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<25	<10	<1	<1
Common	25-200	10-50	1-5	1-2.5
Many	>200	>50	>5	>2.5

Boundary: abrupt <1 clear 1" to 2.5" gradual 2.5" to 5" diffuse >5"

0 10 20 30 O 2 mm O 5 mm

Depth: 45" SAMPLE: 1277

Color/chip yellow, gray Brown

Gravelly very extremely BE Pea 3/4 1-1/2 2-3
15-35% 35-50% >50%

Texture: Clay & Saprolite Rock

Mottles: few 2% common 2-20% many >20%
fine <5 mm medium 5-15mm large >15 mm
faint distinct prominent

Structure: Massive, single grain, weak, moderate, strong
granular, platy, prismatic, columnal, abk, sbk

Consistence: lo, so, sh, h, vhy, exh
lo, vy frb, frb, frm, v frm, exfrm
na, sa, s, va, rp, sp, p, vp

Roots:	vy fine 1 mm	fine 1-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<10	<10	<1	<1
Common	10-100	10-100	1-10	1-5
Many	>100	>100	>10	>5

Pores:	vy fine 0.1-0.5 mm	fine 0.5-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<25	<10	<1	<1
Common	25-200	10-50	1-5	1-2.5
Many	>200	>50	>5	>2.5

Boundary: abrupt <1 clear 1" to 2.5" gradual 2.5" to 5" diffuse >5"

0 10 20 30 O 2 mm O 5 mm

Depth: 24"-45" Limiting Layer SAMPLE: DRY

Color/chip yellow Brown, pale Brown, Gray

Gravelly very extremely BE Pea 3/4 1-1/2 2-3
15-35% 35-50% >50%

Texture: Clay, clay loam

Mottles: few 2% common 2-20% many >20%
fine <5 mm medium 5-15mm large >15 mm
faint distinct prominent

Structure: Massive, single grain, weak, moderate, strong
granular, platy, prismatic, columnal, abk, sbk

Consistence: lo, so, sh, h, vhy, exh
lo, vy frb, frb, frm, v frm, exfrm
na, sa, s, va, rp, sp, p, vp

Roots:	vy fine 1 mm	fine 1-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<10	<10	<1	<1
Common	10-100	10-100	1-10	1-5
Many	>100	>100	>10	>5

Pores:	vy fine 0.1-0.5 mm	fine 0.5-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<25	<10	<1	<1
Common	25-200	10-50	1-5	1-2.5
Many	>200	>50	>5	>2.5

Boundary: abrupt <1 clear 1" to 2.5" gradual 2.5" to 5" diffuse >5"

0 10 20 30 O 2 mm O 5 mm

Depth: SAMPLE:

Color/chip

Gravelly very extremely BE Pea 3/4 1-1/2 2-3
15-35% 35-50% >50%

Texture:

Mottles: few 2% common 2-20% many >20%
fine <5 mm medium 5-15mm large >15 mm
faint distinct prominent

Structure: Massive, single grain, weak, moderate, strong
granular, platy, prismatic, columnal, abk, sbk

Consistence: lo, so, sh, h, vhy, exh
lo, vy frb, frb, frm, v frm, exfrm
na, sa, s, va, rp, sp, p, vp

Roots:	vy fine 1 mm	fine 1-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<10	<10	<1	<1
Common	10-100	10-100	1-10	1-5
Many	>100	>100	>10	>5

Pores:	vy fine 0.1-0.5 mm	fine 0.5-2 mm	medium 2-5 mm	coarse 5-10 mm
Few	<25	<10	<1	<1
Common	25-200	10-50	1-5	1-2.5
Many	>200	>50	>5	>2.5

Boundary: abrupt <1 clear 1" to 2.5" gradual 2.5" to 5" diffuse >5"

0 10 20 30 O 2 mm O 5 mm

City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

Usage Calculations

EXHIBIT A

Clare Engle Park Restroom's - 1" Meter #82251752

Total consumption in Cubic Feet
(1 CUBIC FEET = 7.48052 GALLONS)

Month	Date	Read		Total
		Previous	Current	Consumption
Year : 2025 Total 3				
Mar	04/14/2025	122913	123118	205
Feb	03/14/2025	122772	122913	141
Jan	02/14/2025	122663	122772	109
Year : 2024 Total 12				
Dec	01/14/2025	122563	122663	100
Nov	12/14/2024	122467	122563	96
Oct	11/14/2024	122110	122467	357
Sep	10/14/2024	121791	122110	319
Aug	09/14/2024	121524	121791	267
Jul	08/14/2024	120504	121524	1020
Jun	07/14/2024	120118	120504	386
May	06/14/2024	119601	120118	517
Apr	05/14/2024	119337	119601	264
Mar	04/14/2024	119172	119337	165
Feb	03/14/2024	119032	119172	140
Jan	02/14/2024	118912	119032	120
Year : 2023 Total 12				
Dec	01/14/2024	118498	118912	414
Nov	12/14/2023	114951	118498	3547
Oct	11/14/2023	114360	114951	591
Sep	10/14/2023	113871	114360	489
Aug	09/14/2023	113463	113871	408
Jul	08/14/2023	112881	113463	582
Jun	07/14/2023	112101	112881	780
May	06/14/2023	111437	112101	664
Apr	05/14/2023	110882	111437	555
Mar	04/14/2023	110595	110882	287
Feb	03/14/2023	110481	110595	114
Jan	02/14/2023	110266	110481	215
Year : 2022 Total 9				
Dec	01/14/2023	110124	110266	142
Nov	12/14/2022	109908	110124	216
Oct	11/14/2022	109209	109908	699
Sep	10/14/2022	108899	109209	310
Aug	09/14/2022	108503	108899	396
Jul	08/14/2022	107791	108503	712
Jun	07/14/2022	107089	107791	702
May	06/14/2022	106644	107089	445
Apr	05/14/2022	106111	106644	533
				Avg 472

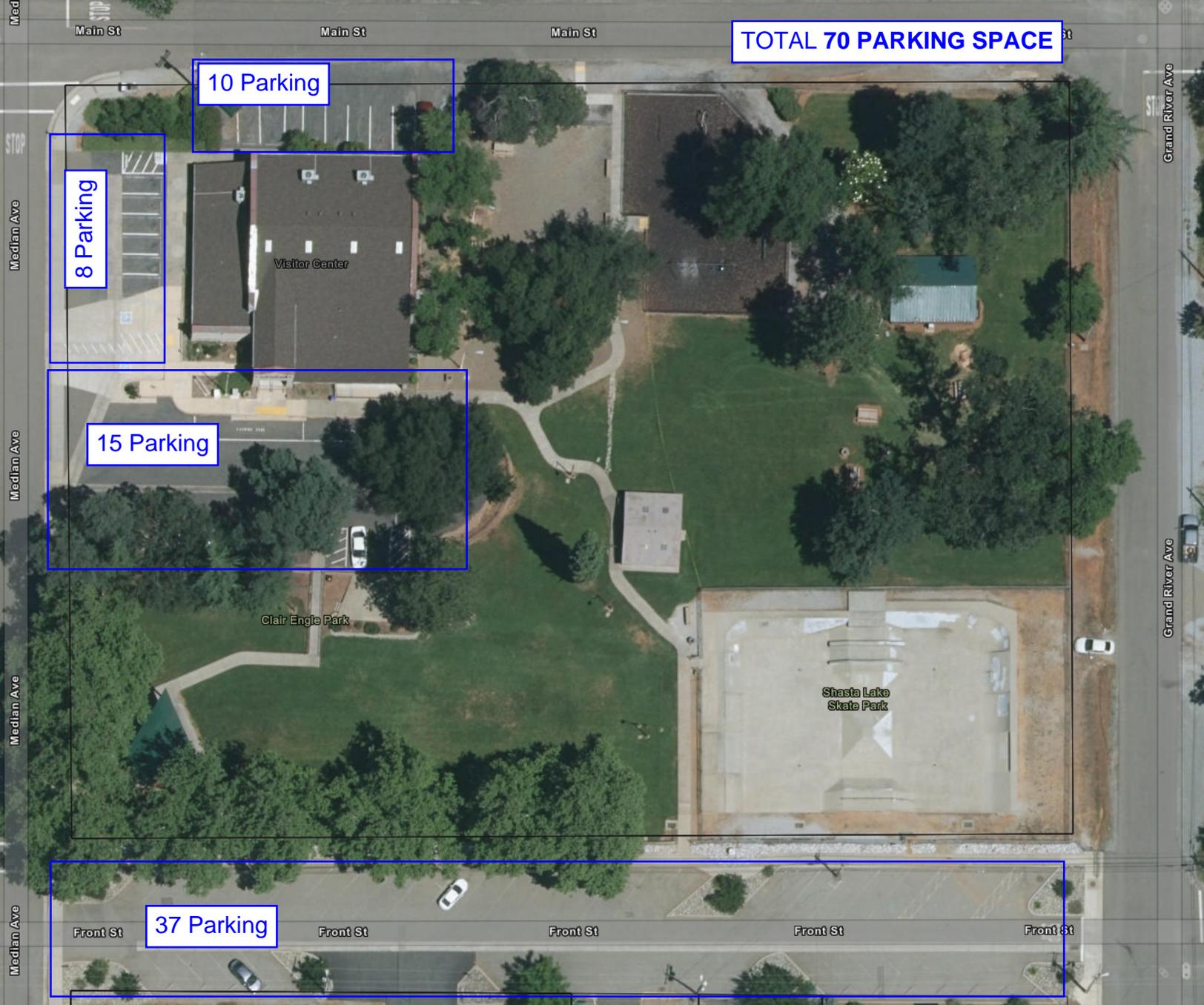
(A) Monthly TOTAL min: 96 ft³
96 ft³ / 30.43 Days = 3.15 ft³ per Day
3.15 x 7.48 = **23.56 Gallon Per Day**

(B) Monthly TOTAL max: 1020 ft³
1020 ft³ / 30.43 Days = 33.51ft³ per Day
33.51 x 7.48 = **250.67 Gallon Per Day**

WATER LEAK EVENT, valued at 384.55 (all other value divided by 35) assumed in scenario (C)

(C) Monthly TOTAL avg: 13844 / 36 Mo.
= 384.5 ft³
384.5 / 30.43 Days = 12.63 ft³ per Day
12.63 x 7.48 = **94.47 Gallon Per Day**

(D) Monthly TOTAL act: 472 ft³
472 / 30.43 Days = 15.51ft³ per Day
15.51 x 7.48 = **116.02 Gallon Per Day**



(A) 23.56 Gallon Per Day
 $23.56 / 70 = 0.33$ GALLON PER PARKING SPACE
 23.56×2.3 peaking factor = **54.18 Gallons per Day**
 $54.18 \text{ gpd} / 11\text{gdp/Lf} = 4.92$ feet min sand basal mound length

(B) 250.67 Gallon Per Day
 $250.67 / 70 = 3.58$ GALLON PER PARKING SPACE
 250.67×2.3 peaking factor = **576.54 Gallons per Day**
 $576.54 \text{ gpd} / 11\text{gdp/Lf} = 52.41$ feet min sand basal mound length

(C) 94.47 Gallon Per Day
 $94.47 / 70 = 1.34$ GALLON PER PARKING SPACE
 94.47×2.3 peaking factor = **217.28 Gallons per Day**
 $217.28 \text{ gpd} / 11\text{gdp/Lf} = 19.75$ feet min sand basal mound length

(D) 116.02 Gallon Per Day
 $116.02 / 70 = 1.65$ GALLON PER PARKING SPACE
 116.02×2.3 peaking factor = **266.84 Gallons per Day**
 $266.84 \text{ gpd} / 11\text{gdp/Lf} = 24.25$ feet min sand basal mound length

City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

Control Panel

MVP-Duplex Control Panel

Applications

Orenco's MVP-Duplex control panel has a dual-mode feature, making it ideal for both timed- and demand-dosing in two-pump alternating systems. All MVPs include an easy-to-use, programmable logic unit that incorporates many timing and logic functions, such as multiple timing intervals to adjust for changing flow conditions and a built-in elapsed time meter and counter.



The programmable logic unit is the brain of the MVP-Duplex control panel



Orenco® MVP-DAX1DM control panel accommodates both timed- and demand-dosing applications



Features/Unique Specifications

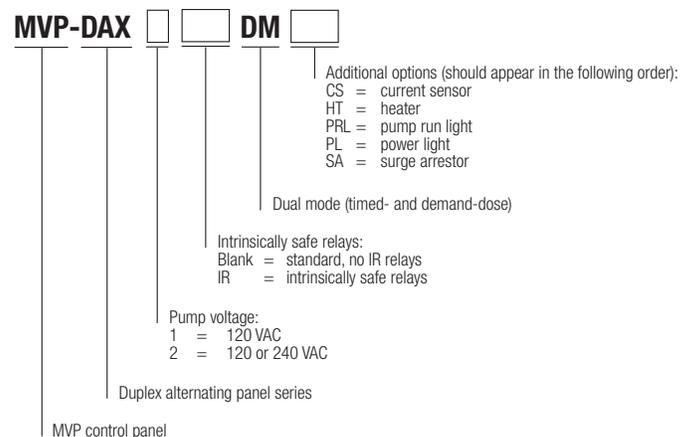
To specify this panel for your installation, require the following:

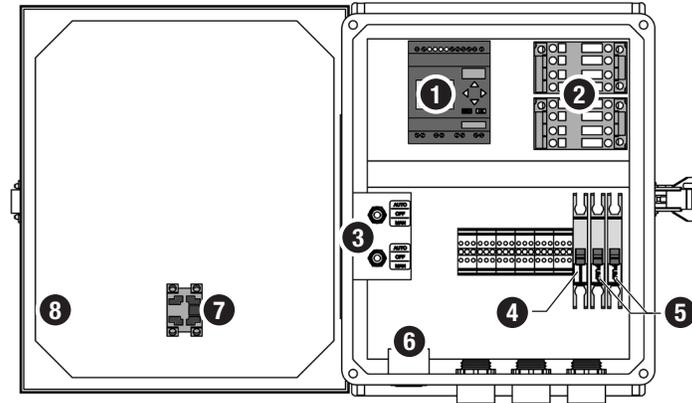
- Programmable for timed- or demand-dosing applications
- Built-in elapsed time meter and counters
- Digital timed-dose function accurate within 1%
- Multiple timer settings for optimum dosing during normal and peak flow conditions
- Pump alternation continues during override conditions
- Built-in programming keys for field-adjustable timer settings without a portable computer
- Ability to use EEPROM card to change panel functions
- High- and low-level alarm conditions differentiated by steady or blinking LED light
- Silenced alarms automatically reactivated after 12 hours if condition is not corrected
- Standard 120 VAC output for remote alarm activation
- Timed delays on float inputs to prevent chattering
- Ability to use one model of float for all functions
- Visual indicators of float positions
- Redundant-off function as standard
- UL 508 listing in US and Canada

Standard Models

MVP-DAX1DM, MVP-DAX2DM

Product Code Diagram





Orenco® MVP-DAX1DM 120 V panel

Standard Components

Feature	Specification(s)
1. Programmable Logic Unit	120 VAC programmable logic unit with built-in LCD screen and programming keys. Provides control functions and timing for panel operation.
2. Motor-Start Contactors	120 VAC: 16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA) 240 VAC: 16 FLA, 3 hp (2.24 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA)
3. Toggle Switches	Single-pole, double-throw HOA switch. 20 A, 1hp (0.75 kW).
4. Controls Circuit Breaker	10 A, OFF/ON switch. Single-pole 120 V*. DIN rail mounting with thermal magnetic tripping characteristics.
5. Pump Circuit Breakers	20 A, OFF/ON switches. Single-pole 120 V or double-pole 240 V. DIN rail mounting with thermal magnetic tripping characteristics.
6. Audible Alarm	95 dB at 24 in. (610 mm), warble-tone sound.
7. Visual Alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence." UL Type 4X rated, 1 W LED light, 120 VAC.
8. Panel Enclosure	Measures 11.5 in. high × 9.5 in. wide × 5.4 in. deep (290 × 240 × 135 mm). UL Type 4X rated. Constructed of UV-resistant fiberglass; hinges and latch are stainless steel. Conduit couplings provided.
Dual-Mode Operation	Programmable for timed- and demand-dosing.
MVP-DAX1DM Panel Ratings	120 VAC, 1 hp (0.75 kW), 16 A, single phase, 60 Hz.
MVP-DAX2DM Panel Ratings	240 VAC, 3 hp (2.24 kW), 16 A, single phase, 60 Hz.

Optional Components

Feature	Specification(s)	Product Code Adder
Intrinsically Safe Control Relays	120 VAC. Listed per UL 698A, for Class 1 Div. 1, Groups A, B, C, D hazardous locations. Larger enclosure required.	IR
Current Sensor	120 VAC. Go/no-go operation. Pump fail indicator light on panel. Manual reset switch.	CS
Heater	Anti-condensation heater. Self-adjusting; radiates additional wattage as temperature drops.	HT
Pump Run Lights	7/8-in. (22-mm) diameter green lens. UL Type 4X rated, 1 W LED light, 120 VAC.	PRL
Power Light	7/8-in. (22-mm) diameter green lens. UL Type 4X rated, 1 W LED light, 120 VAC.	PL
Surge Arrestor	120 V. Status light on unit. Protects incoming power supply from electrical surges.	SA

* 240 VAC units available for int'l markets

** 120 VAC output for remote alarms comes standard.

City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

Pump Information

Pump Selection for a Pressurized System - Commercial Project

2-24-26

Polk Park

Parameters

Discharge Assembly Size	2.00	inches
Transport Length Before Valve	360	feet
Transport Pipe Class	40	
Transport Line Size	2.00	inches
Distributing Valve Model	4404	
Transport Length After Valve	11	feet
Transport Pipe Class	40	
Transport Pipe Size	2.00	inches
Max Elevation Lift	15	feet
Manifold Length	3	feet
Manifold Pipe Class	40	
Manifold Pipe Size	1.25	inches
Number of Laterals per Cell	8	
Lateral Length	46	feet
Lateral Pipe Class	40	
Lateral Pipe Size	1.25	inches
Orifice Size	1/8	inches
Orifice Spacing	2	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	48	
Total Flow Rate per Zone	20.9	gpm
Number of Laterals per Zone	2	
% Flow Differential 1st/Last Orifice	2.5	%
Transport Velocity Before Valve	2.0	fps
Transport Velocity After Valve	2.0	fps

Frictional Head Losses

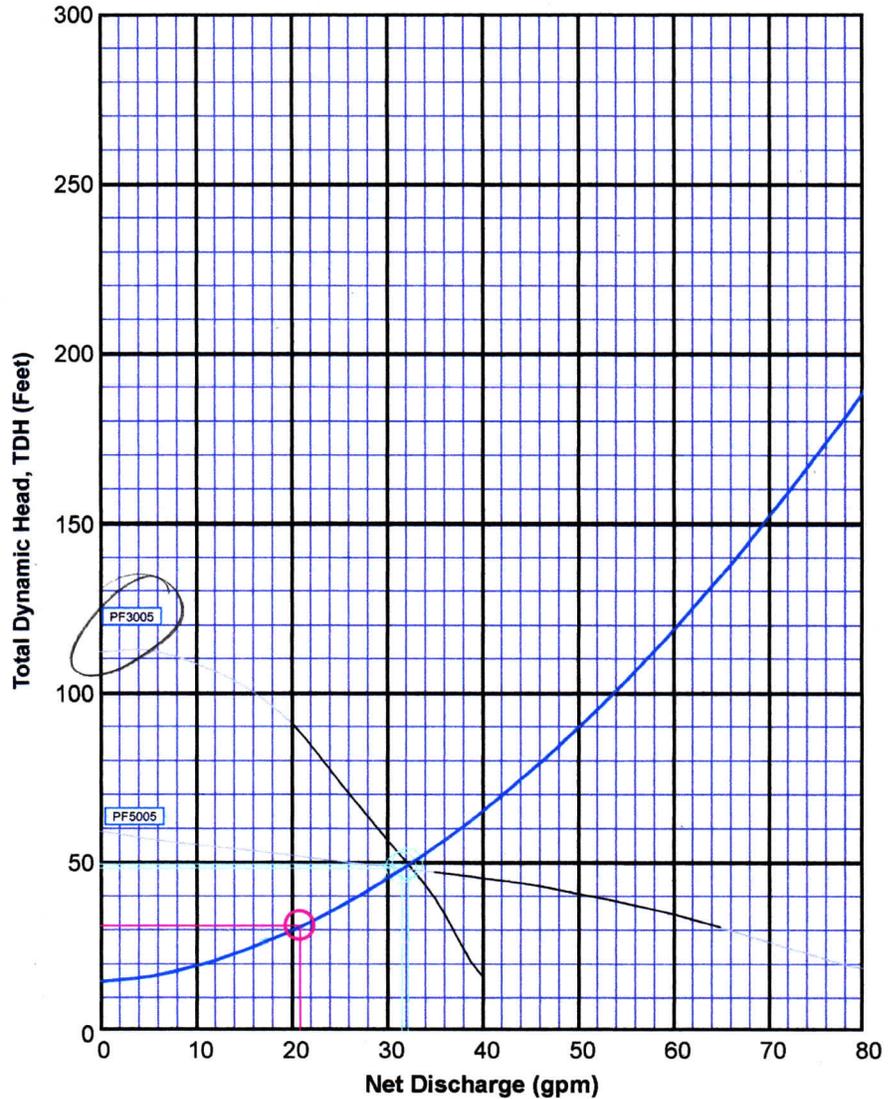
Loss through Discharge	0.9	feet
Loss in Transport Before Valve	2.9	feet
Loss through Valve	6.9	feet
Loss in Transport after Valve	0.1	feet
Loss in Manifold	0.0	feet
Loss in Laterals	0.3	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	0.0	feet

Pipe Volumes

Vol of Transport Line Before Valve	62.8	gals
Vol of Transport Line After Valve	1.9	gals
Vol of Manifold	0.2	gals
Vol of Laterals per Zone	7.1	gals
Total Vol Before Valve	62.8	gals
Total Vol After Valve	9.3	gals

Requirements

	20.9	gpm
	31.1	feet



PumpData

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

PF5005 High Head Effluent Pump
50 GPM, 1/2HP
115/230V 1Ø 60Hz, 200/230V 3Ø 60Hz

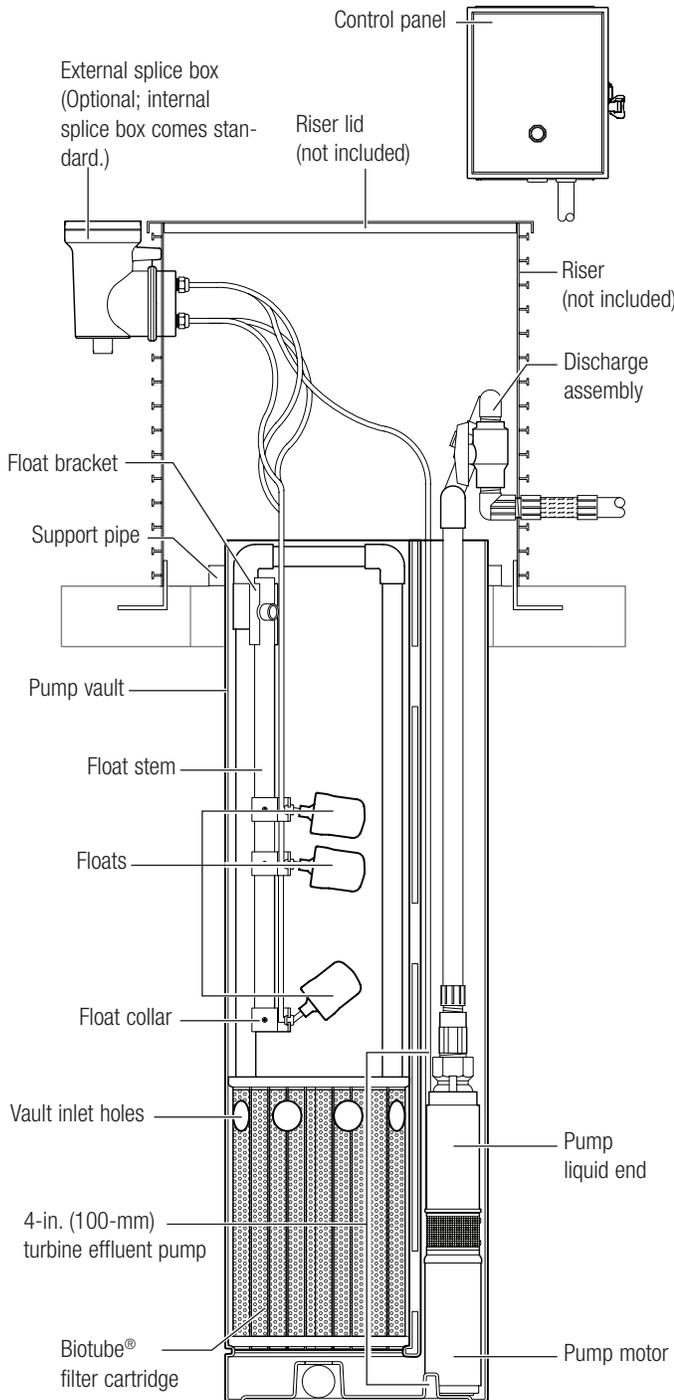
Legend

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



Biotube® ProPak™ Pump Package

60-Hz Series Pump Packages



Biotube® ProPak™ pump package components.

Applications

The Biotube ProPak is designed to filter and pump effluent to either gravity or pressurized discharge points. It is intended for use in a septic tank (one- or two-compartment) and can also be used in a pump tank.

The Biotube ProPak is designed to allow the effluent filter to be removed for cleaning without the need to remove the pump vault or pump, simplifying servicing.

Complete packages are available for on-demand or timed dosing systems with flow rates of 10, 20, 30, and 50-gpm* (0.6, 1.3, 1.9, and 3.2 L/sec), as well as with 50 Hz and 60 Hz power supplies.

General

Orenco's Biotube® ProPak™ is a complete, integrated pump package for filtering and pumping effluent from septic tanks. And its patented pump vault technology eliminates the need for separate dosing tanks.

This document provides detailed information on the ProPak pump vault and filter, 4-in. (100-mm) 60-Hz turbine effluent pump, and control panel. For more information on other ProPak components, see the following Orenco technical documents:

- Float Switch Assemblies (NTD-MF-MF-1)
- Discharge Assemblies (NTD-HV-HV-1)
- Splice Boxes (NTD-SB-SB-1)
- External Splice Box (NTD-SB-SB-1)

Standard Models

BPP10DD, BPP20DD, BPP20DD-SX, BPP30TDA, BPP30TDD-SX, BBPP50TDA, BPP50TDD-SX

Product Code Diagram

BPP -

Standard options:

- Blank = 57-in. (1448-mm) vault height, internal splice box, standard discharge assembly
- 68 = 68-in. (1727-mm) vault height
- SX = external splice box
- CW = cold weather discharge assembly
- DB = drainback discharge assembly

Panel Application:

- DD = demand dosing
- TDA = timed dosing, analog timer
- TDD = timed dosing, digital timer, elapsed time meter & counters

Pump flow rate (nominal):

- 10 = 10 gpm (0.6 L/sec)
- 20 = 20 gpm (1.3 L/sec)
- 30 = 30 gpm (1.9 L/sec)
- 50 = 50 gpm (3.2 L/sec)

Biotube® ProPak™ pump vault

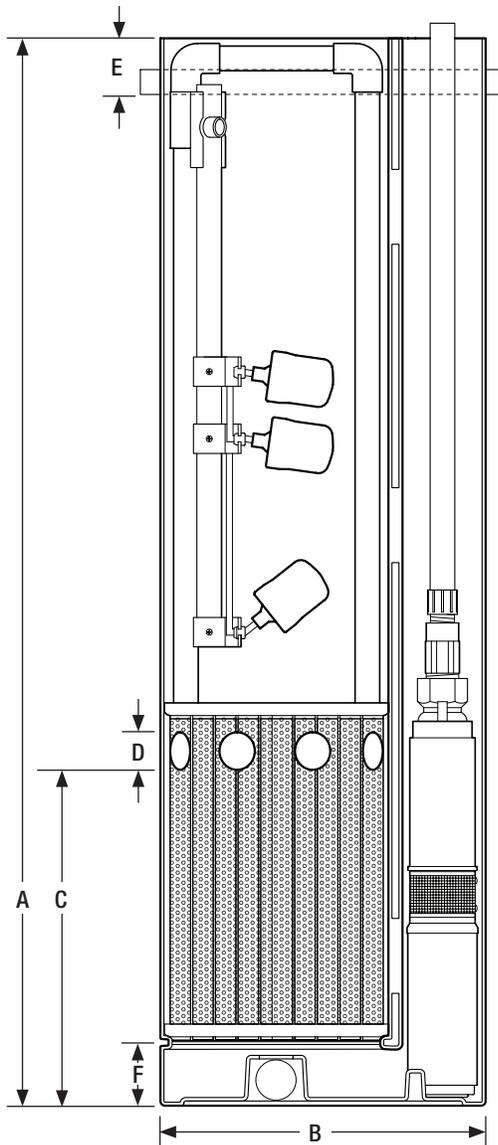
ProPak™ Pump Vault

Materials of Construction

Vault body	Polyethylene
Support pipes	PVC

Dimensions, in. (mm)

A - Overall vault height	57 (1448) or 68 (1727)
B - Vault diameter	17.3 (439)
C - Inlet hole height	19 (475)
D - Inlet hole diameter (eight holes total)	2 (50)
E - Vault top to support pipe bracket base	3 (76)
F - Vault bottom to filter cartridge base	4 (102)



ProPak™ pump vault (shown with Biotube filter and effluent pump)

Biotube® Filter Cartridge

Materials of Construction

Filter tubes	Polyethylene
Cartridge end plates	Polyurethane
Handle assembly	PVC

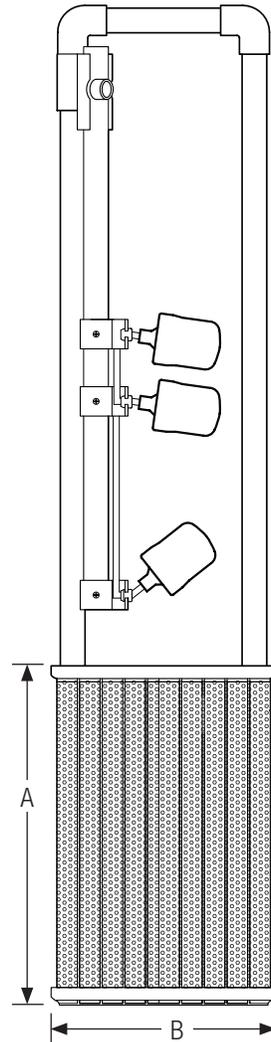
Dimensions, in. (mm)

A - Cartridge height	18 (457)
B - Cartridge width	12 (305)

Performance

Biotube® mesh opening	0.125 in. (3 mm)*
Total filter flow area	4.4 ft² (0.4 m²)
Total filter surface area	14.5 ft² (1.35 m²)
Maximum flow rate	140 gpm (8.8 L/sec)

*0.062-in. (1.6-mm) filter mesh available



Biotube® filter cartridge (shown with float switch assembly)

4-in. (100-mm) Turbine Effluent Pumps*

Orenco's 4-in. (100 mm) Turbine Effluent Pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics; all are field-serviceable and repairable with common tools. All 60-Hz PF Series models are CSA certified to the U.S. and Canadian safety standards for effluent pumps, and meet UL requirements.

Power cords for Orenco's 4-in. (100-mm) turbine effluent pumps are Type SOOW 600-V motor cable (suitable for Class 1, Division 1 and 2 applications).

Materials of Construction

Discharge:	Stainless steel or glass-filled polypropylene
Discharge bearing:	Engineered thermoplastic (PEEK)
Diffusers:	Glass-filled PPO
Impellers:	Acetal (20-, 30-gpm), Noryl (50-gpm)
Intake screens:	Polypropylene
Suction connection:	Stainless steel
Drive shaft:	300 series stainless steel
Coupling:	Sintered 300 series stainless steel
Shell:	300 series stainless steel
Lubricant:	Deionized water and propylene glycol

Specifications

Nom. flow, gpm (L/sec)	Length in. (mm)	Weight lb (kg)	Discharge in., nominal ¹	Impellers
10 (0.6)	23.0 (660)	26 (11)	1.25	6
20 (1.3)	22.5 (572)	26 (11)	1.25	4
30 (1.9)	21.3 (541)	25 (11)	1.25	3
50 (3.2)	20.3 (516)	27 (12)	2.00	2

Performance

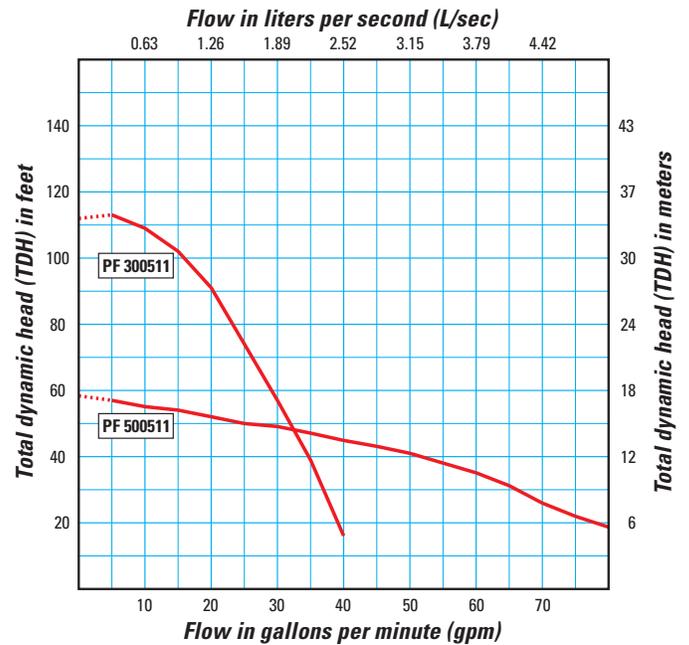
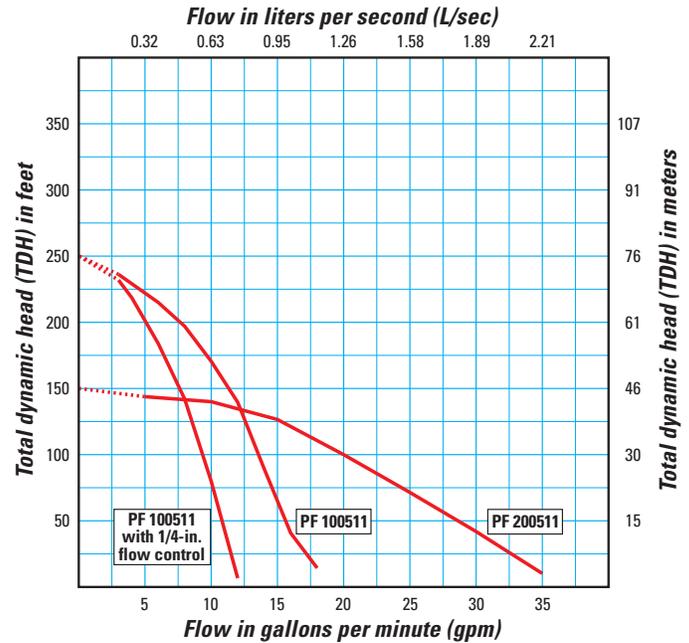
Nom. flow, gpm (L/sec)	hp (kW)	Design flow amps	Rated cycles/day	Min liquid level, in. (mm) ²
10 (0.6)	0.5 (0.37)	12.7	300	16 (406)
20 (1.3)	0.5 (0.37)	12.3	300	18 (457)
30 (1.9)	0.5 (0.37)	11.8	300	20 (508)
50 (3.2)	0.5 (0.37)	12.1	300	24 (610)

¹ Discharge is female NPT threaded, U.S. nominal size, to accommodate Orenco® discharge hose and valve assemblies. Consult your Orenco Distributor about fittings to connect discharge assemblies to metric-sized piping.

² Minimum liquid level is for single pumps when installed in an Orenco Biotube® ProPak™ Pump Vault.

Pump Curves

Pump curves, such as those shown here, can help you determine the best pump for your system. Pump curves show the relationship between flow (gpm or L/sec) and pressure (TDH), providing a graphical representation of a pump's performance range. Pumps perform best at their nominal flow rate, measured in gpm or L/sec.



Control Panel (Demand Dose)

Orenco's ProPak™ demand dose control panels are specifically engineered for the ProPak pump package and are ideal for applications such as demand dosing from a septic tank into a conventional gravity drainfield.

Materials of Construction

Enclosure	UV-resistant fiberglass, UL Type 4X
Hinges	Stainless steel

Dimensions, in. (mm)

A - Height	11.5 (290)
B - Width	9.5 (240)
C - Depth	5.4 (135)

Specifications

Panel ratings	120 V, 3/4 hp (0.56 kW), 14 A, single phase, 60 Hz
1. Motor-start contactor	16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA)
2. Circuit breakers	120 V, 10 A, OFF/ON switch, Single pole
3. Toggle switch	Single-pole, double-throw HOA switch, 20 A
4. Audio alarm	95 dB at 24 in. (600 mm), warble-tone sound, UL Type 4X
5. Audio alarm silence relay	120 V, automatic reset, DIN rail mount
6. Visual alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence," 120 V LED, UL Type 4X

Control Panel (Timed Dose)

Orenco's ProPak timed dose control panels are specifically engineered for the ProPak pump package and are ideal for applications such as timed dosing from a septic tank into a pressurized drainfield or mound. Analog or digital timers are available.

Materials of Construction

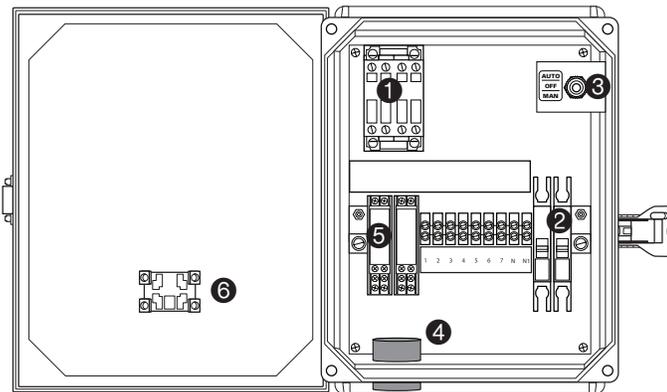
Enclosure	UV-resistant fiberglass, UL Type 4X
Hinges	Stainless steel

Dimensions, in. (mm)

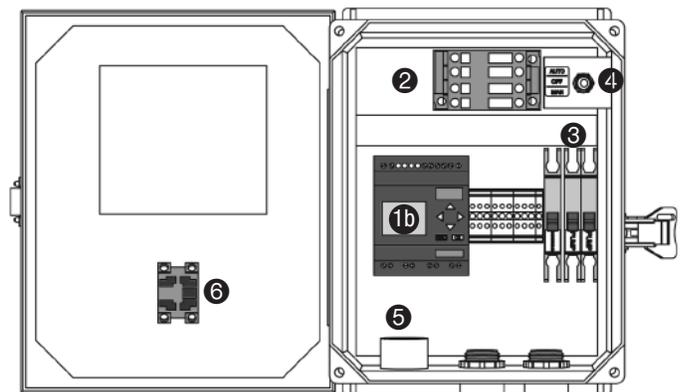
A - Height	11.5 (290)
B - Width	9.5 (240)
C - Depth	5.4 (135)

Specifications

Panel ratings	120 V, 3/4 hp (0.56 kW), 14 A, single phase, 60 Hz
Dual-mode	Programmable for timed- or demand-dosing (digital timed-dosing panels only)
1a. Analog timer	120 V, repeat cycle from 0.05 seconds to 30 hours. Separate variable controls for OFF and ON time periods
1b. Digital timer	120-V programmable logic unit with built-in LCD screen and programming keys. Provides control functions and timing for panel operation
2. Motor-start contactor	16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA)
3. Circuit breakers	120 V, 10 A, OFF/ON switch. Single pole 120 V
4. Toggle Switch	Single-pole, double-throw HOA switch, 20 A
5. Audio alarm	95 dB at 24 in. (600 mm), warble-tone sound, UL Type 4X
6. Visual alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence", 120 V LED, UL Type 4X



Control panel, demand-dose



Control panel, timed-dose (digital timer model shown)

Biotube® ProPak™ Design Criteria

System Description and Effluent Quality

Orenco's Biotube® ProPak™ pumping systems are fully integrated pumping packages, designed to transport filtered effluent from single- and dual-compartment septic tanks (septic/dosing tanks), as well as from pump tanks, to dispersal systems or secondary treatment. Because all of its components are designed to work together, ProPak reduces installation time and errors.

The ProPak pump vault includes a Biotube filter cartridge for filtering solids from the effluent pumped out of the tank's clear zone. Filtering solids from the effluent reduces loading and clogging of downstream components. In turn, this extends the life of drainfields, secondary treatment systems, and other downstream components. When an Orenco Biotube ProPak pumping system is used in a properly sized, structurally sound, water-tight septic/dosing tank, it can be reliably expected to reduce Total Suspended Solids (TSS) by an average of more than 60%.

This document provides Orenco's design recommendations for using the ProPak pumping system to pump out of a single septic/dosing tank. Before using these design recommendations, please verify that they will meet or exceed applicable regulatory requirements in your area. Specific areas for consideration when designing with the ProPak are tank reserve volume, tank minimum liquid level, and minimum dose volume.

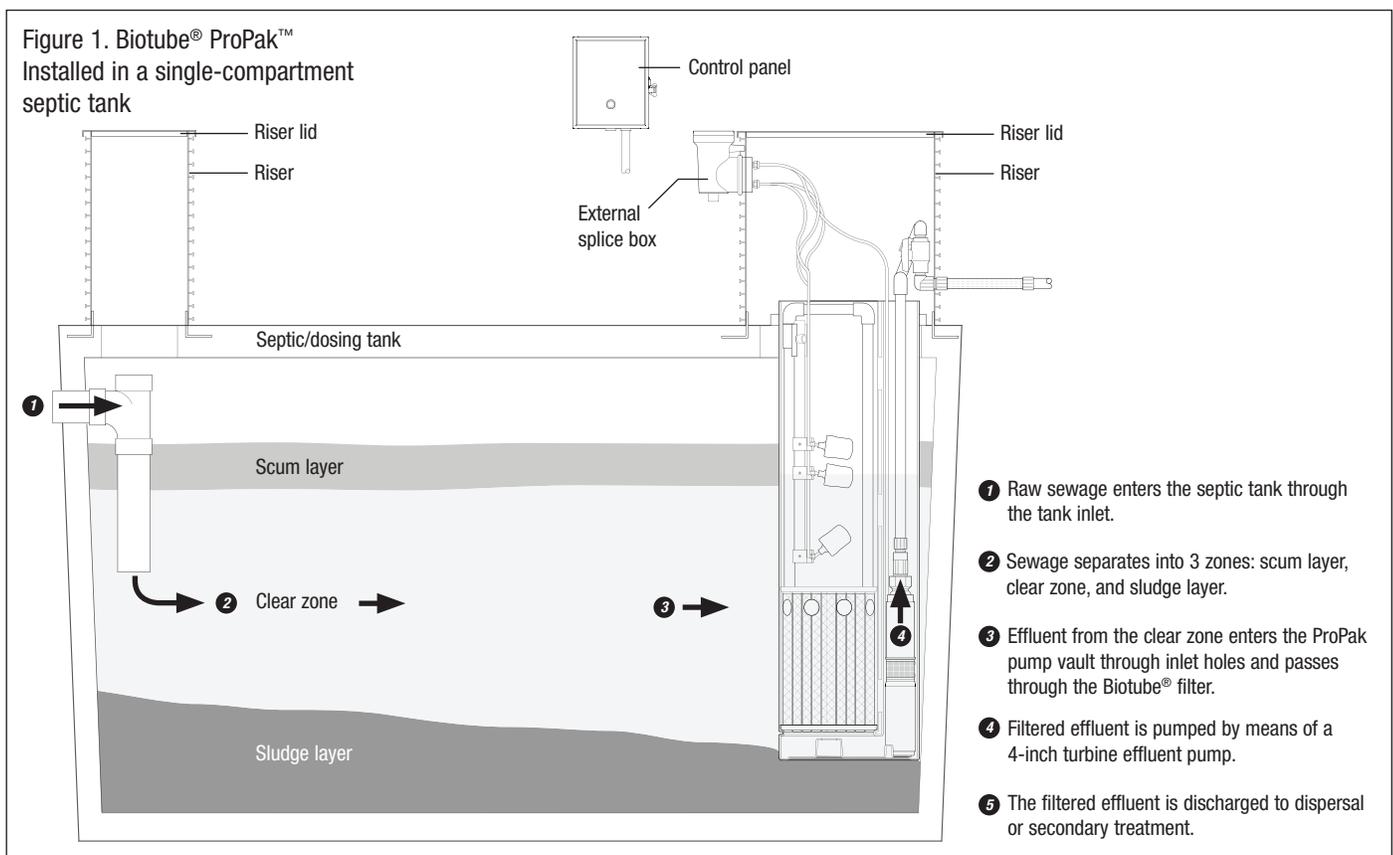


Figure 1 shows a typical single-family system with a ProPak in a single-compartment septic/dosing tank. Raw sewage enters the septic/dosing tank and separates into three distinct zones: a scum layer, a sludge layer, and a clear zone. The ProPak pump package draws effluent from the clear zone and filters it before pumping it to a drainfield, secondary treatment system, or other downstream termination point. In effect, the ProPak effectively acts as a separate dosing tank inside of the septic tank; eliminating the need for additional dosing tankage outside of the septic tank.

An Orenco ProPak ensures high quality effluent by baffling and screening large solids that could otherwise escape the septic/dosing tank. The Biotube Pump Vault's closed bottom and vertical inlet holes help to retain sludge, scum, and other gross solids in the tank — even when biological agitation (bulking) of the tank's contents occurs. Thus, Orenco's Biotube Pump Vault Technology provides sludge, scum and gas baffling.

Pumping System

Figure 2 shows the components of a ProPak pumping system:

1. **Control panel** – The control panel governs pump operation and should be mounted within sight of the pump system. (See Appendix 2.)
2. **External splice box** – In the electrical splice box, wires from the control panel are spliced with the cords from the pump and float switches.
3. **Riser, lid, and adapter** – The riser and lid (ordered separately from the ProPak package) provide a structurally sound, watertight method for accessing the pumping system.
4. **Biotube Pump Vault** – Orenco's patented Biotube pump vault houses the float switch assembly, Biotube filter, turbine effluent pump, and discharge plumbing assembly.
5. **Float switch assembly** – Float switches affixed via float collars to a quick disconnect float stem are mounted onto the Biotube filter to monitor and control the liquid level inside the tank.
6. **Biotube filter** – Effluent filter with 1/8-in. (3.2-mm) mesh that removes approximately two-thirds of suspended solids. Filters with 1/16-in. (1.6-mm) mesh are also available. The Biotube filter can be removed for cleaning without the need to remove the pump or pump vault.
7. **Orenco 4-in. (100-mm) turbine effluent pump** – The turbine pump moves the filtered effluent to the distribution point. (See Appendix 1.)
8. **Discharge plumbing assembly** — A discharge plumbing assembly connects the pump to the transport line.

Accessory Equipment

The following products may be required to complete the system:

- Access risers with fiberglass lids
- Riser tank adapters with bolt-down kits
- Adhesive
- Grommets

See *Orenco's General Onsite Products Catalog (ACT-GOP-1)* to order these products.

Pumping System Requirements: Septic Tank

Because septic tanks provide the initial treatment for any septic system, it is critical that the septic/dosing tanks used with ProPak pumping systems are properly designed, structurally sound, and watertight. The ProPak can pump effluent from a single- or dual-compartment septic/dosing tank.

ProPak Pumping Systems are designed to take in effluent from the clear zone of the septic/dosing tank. Care must be taken that the ProPak vault's inlet holes are positioned at 70% (\pm 10%) of the minimum liquid level in the tank — approximately at the center of the clear zone — to assure that effluent from the clear zone is being filtered.

For pump flows less than 40 gallons per minute (< 2.52 liters per second):

Single-compartment septic/dosing tanks can be used. The drawdown in a septic/dosing tank with a single compartment should also be minimized to ensure that sufficient retention and settling time are provided in the tank; this equates to sustaining a liquid volume of about 90% of tank capacity.

Figure 2.
Biotube® ProPak™ Components

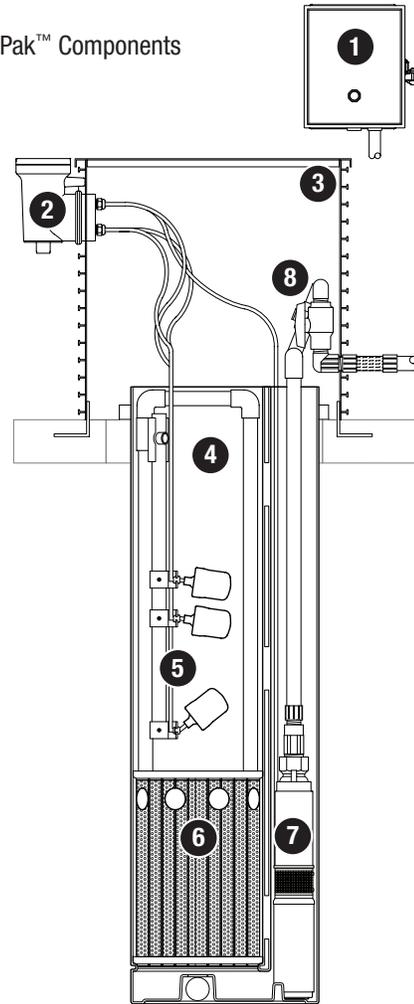
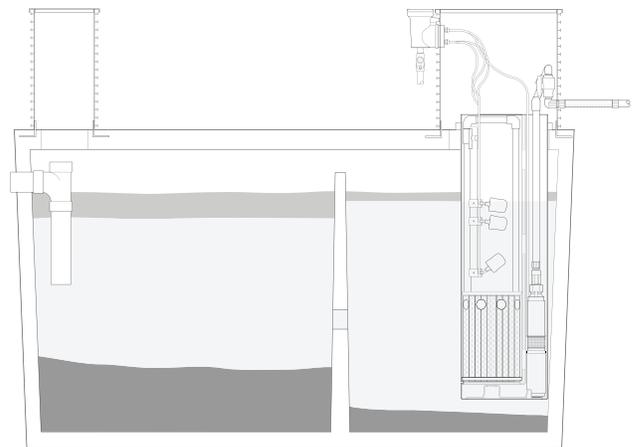


Figure 3.
Dual-Compartment Septic/Dosing Tank
With Shared Liquid Level



For pump flows greater than 40 gallons per minute (> 2.52 liters per second):

Because pump flows exceeding 40 gpm may pull the floating scum layer into the inlet holes of the pump vault in a single-compartment tank, a septic/dosing tank with dual compartments is recommended. Additionally, the liquid level in dual-compartment septic tanks should be kept as high as possible to maintain effluent quality. Scum and sludge layers develop in the secondary compartment — though less rapidly than in the primary compartment — so it is best to maintain surge and reserve volumes by using a dual-compartment tank with a shared liquid level. (See Figure 3.)

Pumping System Settings: Pump Vault Placement

The inlet holes in the Biotube Pump Vault should be located at about 70% (\pm 10%) of the distance up from the the bottom of the tank to the lowest operating liquid level (“Off” float or “Timer off” float). (See Figures 4 and 5.) This location allows the ProPak to draw effluent from the middle of the clear zone in the tank. As the accumulation of scum and sludge occurs in the tank, the location of the inlet holes ensures that the highest quality effluent is being filtered and transported out of the septic/dosing tank.

Pumping System Settings: Float Switch Settings

Several factors affect the operation of the system and the location of the float switches. These factors may include, but aren’t limited to, dose method; downstream components; and local, municipal, county, or state regulations. Information provided in this section is intended to be used as a guideline.

The portion of the septic/dosing tank between the level of the “Off” float and the level of the “On” float (for demand-dose systems) or the “High level alarm” float (for timed-dose systems) is called the operating zone.

Demand-dose systems are typically used to pump effluent to a gravity drainfield or downstream treatment system. For demand-dose systems, the operating zone should be as small as possible. The small operating zone allows more scum and sludge to be stored in the tank. It also minimizes the disturbance of the scum layer during pumping cycles. The minimum achievable operating zone for a ProPak system is 2 inches (50 mm). This is the closest that the “On” and an “Off” floats can be physically placed to one another.

Timed-dose systems are typically used to pump effluent to soil, sand, and media filters for additional treatment. For timed-dose systems, the operating zone should be sized as small as possible while allowing for 24 hours’ worth of estimated daily flow storage. To balance the need for a small operating zone with the need for flow storage capacity, we recommend using single-compartment tanks or tanks with shared liquid levels for timed-dose applications.

Float settings for both types of dosing systems also need to account for reserve volume in the septic/dosing tank. The reserve volume is the portion of the tank from the soffit of the tank to the invert of the tank inlet (“High level alarm” float setting). Reserve volumes should be capable of storing 24-48 hours’ of estimated daily flows.

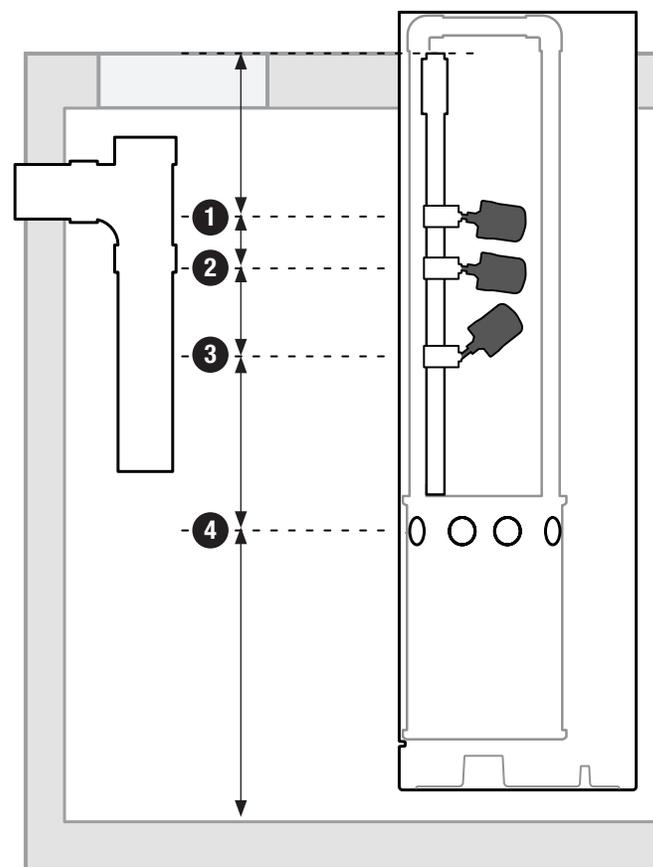
Demand-dose float settings :

Float settings for demand-dose ProPak applications are typically set to maximize the volume in the septic/dosing tank by utilizing a small operating zone. Figure 4 shows general guidelines for float placement. Standard settings for demand-dose are as follows ...

- “High level alarm” float: At the invert of the inlet of septic/dosing tank, as measured from the outside top of the tank.
- “On” float: 2 inches (50 mm) below the high level alarm float
- “Off” float: 2-4 inches (50-100 mm) below the “On” float. The amount of space between the “On” and “Off” float will determine dose volume.

NOTE: The on/off function may be controlled by one float. In this case, dose volume will be constrained by the drawdown of the “On/Off” float.

Figure 4.
Standard Settings: Three-Float, Demand-Dose System (not to scale)



- 1 “High level alarm” float location
(Invert of the tank inlet as measured from the outside top of the tank)
- 2 “On” float location, 2 inches (50 mm) below “High level alarm”
- 3 “Off” float location, about 3 inches (75 mm) below “On” float
- 4 Pump vault inlet hole location, about 70% of the distance between the tank bottom and the lowest operating liquid level (“Off” float)

Timed-dose float settings:

For a single-family dwelling, wastewater flows typically range from 40 to 60 gallons per capita per day (gpcd) or 150 to 227 liters per capita per day (Lpcd). A design parameter of 50 gpcd (190 Lpcd) is commonly used in determining estimated flows from a dwelling. Estimated flows are determined by multiplying the number of occupants in the dwelling by 50 gpcd (190 Lpcd). Figure 5 shows general guidelines for float placement.

- **“High level alarm/override” float:** At the invert of the inlet in the septic/dosing tank, as measured from the outside top of the tank. The “High level alarm” function is combined with the “Override” function. (Some jurisdictions require separate floats for high level alarm and override functions. When a single-function float switch is used for the “Override” function, it is typically set at 2 inches or 50 mm below the “High level alarm” float.)
- **“Timer off” float:** This float is set at a distance below the “High level alarm” float or the “Override” float, equal to the estimated flows for the system. (Example: a home with 4-person occupancy would be set for estimated flows of 200 gallons per day (757 liters per day) or $50 \text{ gpcd} \times 4$ ($190 \text{ Lpcd} \times 4$).

“Redundant off” float settings:

A “Redundant off” float may be used with both demand-dose and timed-dose systems. The “Redundant off” float is placed 2-3 inches below the “Off” float in demand-dose systems, or the “Timer off” float in timed-dose systems.

Drainfield Considerations

When designing the pump system for any type of low-pressure dispersal system (sand filters, pressure drainfields, mounds, etc.), it is important to note that the best design practices address not only the issue of supplying frequent, small doses for dispersal, but also equal distribution. Equal distribution of frequent, small doses maintains the oxygen supply to microbes and promotes the best possible aerobic treatment. Using small-diameter laterals (typically 1-inch) and orifices (typically 1/8-inch) helps to ensure equal distribution of effluent in a dispersal system.

Package Selection

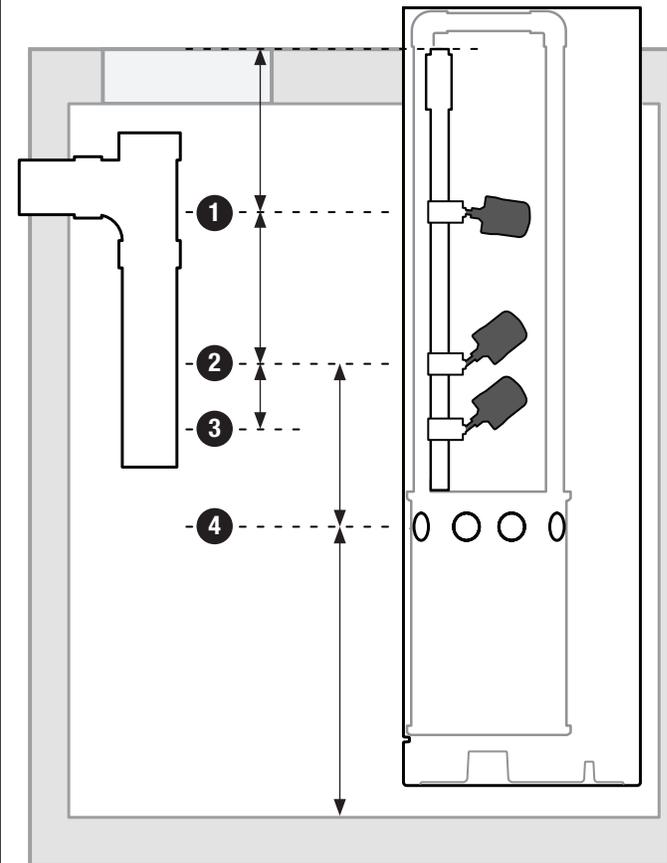
All ProPak pump packages are available for both demand-dose and timed-dose applications, with 15, 20, 30, and 50 gpm (0.95-, 1.6-, 2.5-, and 4.1 L/sec) flow options. There are two basic packages:

1. **Demand-dose** – The BPP15DD accommodates flows up to 20 gpm (1.3 L/sec) and is used to pump to gravity drainfields (distribution boxes, hydro-splitters, etc.). BPP20DD, BPP30DD and BPP50DD systems are available for demand-dose applications that require flow rates greater than 20 gpm.
2. **Timed-dose** – The BPP30TDD accommodates flows up to 40 gpm (2.5 L/sec) and can be used for pumping to a pressurized final dispersal system (drainfield, secondary treatment system, etc.). BPP30TDD systems are available for timed-dose applications for small pressurized dispersal systems (e.g. sand filters, mounds). BPP50TDD systems are available for timed-dose applications that require flows between 40-65 gpm (2.5-4.1 L/sec), such as large pressurized drainfields or mounds.

Design Tools

The ProPak Design Aid CD-ROM includes a ProPak Select™ software program that allows system designers and specifiers to select the correct ProPak package for their application. When project-specific parameters are entered into the appropriate fields in ProPak Select, minimum pump requirements are automatically calculated (e.g. total dynamic head and flow rate) and the appropriate ProPak model is selected for your application.

Figure 5. Standard Settings: Three-Float, Timed-Dose System (not to scale)



- 1 “High level alarm/override” float location (Invert of the tank inlet as measured from the outside top of the tank)
- 2 “Timer off” float location, distance below “High level alarm/override” float equal to “estimated daily flow”
- 3 “Redundant off” float, 3 in. (75 mm) below “Timer off” float
- 4 Pump vault inlet hole location, about 70% of the distance between the tank bottom and the lowest operating point (“Timer off” float)

ProPak Pump Packages and Applications

Tables 1a and 1b below provide recommendations for selecting the correct ProPak pumping systems based on application. Other ProPak models are available. Contact your Distributor or Orenco for more information.

Table 1a. Pumping to Hydrosplitters, Distribution Boxes, and Gravity Drainfields

Pump System Type	Model Code*	Maximum Flow Rate, gpm (L/sec)
Demand-dose	BPP15DD	20 gpm (1.3 L/sec)
Demand-dose	BPP20DD	25 gpm (1.6 L/sec)

Table 1b. Pumping to Pressure Distribution Systems (Soil, Sand, and Media Filters, Mounds, Low-Pressure Pipe Systems, etc.)

Pump System Type	Model Code*	Maximum Flow Rate, gpm (L/sec)
Demand-dose	BPP30DD	40 gpm (2.5 L/sec)
Demand-dose	BPP50DD	65 gpm (4.1 L/sec)
Timed-dose	BPP30TDA	40 gpm (2.5 L/sec)
Timed-dose	BPP30TDD	40 gpm (2.5 L/sec)
Timed-dose	BPP50TDA	65 gpm (4.1 L/sec)
Timed-dose	BPP50TDD	65 gpm (4.1 L/sec)

* ProPak systems come standard with 57-inch pump vault units (PVU). For 68-inch pump vault units, add "-68" to the end of the product code

Appendix 1:

Orenco-Designed 4-in. (100-mm) Turbine Effluent Pumps

In onsite wastewater and pressure distribution systems, Orenco's 4-in. (100-mm) turbine effluent pumps are commonly used because of several advantages they offer compared with other pumps on the market:

1. **High cycle life** – Orenco's 4-in. (100-mm) turbine pumps regularly reach lifetime cycle counts of more than one million.
2. **Scouring velocity** – Orenco's 4-in. (100-mm) turbine effluent pumps provide more than sufficient energy to flush laterals and help keep orifices clear.
3. **Pump run-dry** – Orenco's 4-in. (100-mm) turbine effluent pumps have 24-hr run-dry capability with no deterioration in pump life or performance.
4. **Ease of maintenance** – Orenco's ½-hp (0.37 kW) turbine pumps weigh approximately 25 lbs (11.4 kg) and can be removed by one person for maintenance or repairs without the need for a lifting mechanism. Additionally, because the pump is in a separate chamber from the Biotube filter, there is no need to remove the pump or the pump vault when filter cleaning is required.
5. **Excellent abrasion- and corrosion-resistance** – Orenco's 4-in. turbine effluent pumps are constructed of 300-series stainless steel and thermoplastics.
6. **Warranty period** – Orenco provides a 5-year warranty on its 4-in. (100-mm) turbine effluent pumps.

Appendix 2:

Orenco Simplex Control Panels

Orenco's Biotube ProPak Simplex Control Panels provide pump control based on dose method. Demand-dose panels are specifically engineered for pumping to non-secondary treatment systems (e.g. lift stations, drainfields, manholes, etc.). Timed-dose panels are specifically engineered for applications that require programmable timers, such as pressurized drainfields and secondary treatment systems.

Both panels include the following shared features:

- Motor-start contactor for increased system life.
- 20A Auto/Off/Manual toggle switch for easy troubleshooting and maintenance.
- Resettable control circuit breaker that negates the need for easily lost or forgotten fuses.
- Discrete, touch-safe terminal locations for simple, intuitive pump and float wiring.
- Fiberglass enclosure, for increased durability over plastic.
- Easily accessed external "Push to Silence" button, for homeowner control over audible alarms.

Demand-dose panels include the following features:

- Audible and visual alarms to signal high-level conditions.
- Audible alarm silence relay keeps the audible alarm off until the next alarm condition (or the power is removed and then restored). The visual alarm light remains on until the alarm condition is alleviated.

Timed-dose panels include the following features:

- Choice of digital or analog timers.
- Digital timing is accurate to within 1%.
- Digital timer panels can accommodate multiple timer settings for normal and peak flow conditions.
- Timer settings are field-adjustable without the need of a portable computer.
- Digital timer panels include built-in elapsed time meters and counters (optional on analog timer panels).
- Digital timer panels differentiate between high- and low-level alarm conditions, thereby facilitating troubleshooting.
- Silenced alarms automatically reactivate after 12-hours if condition is not corrected (specific to digital timer panels).
- Timed delays on float inputs to prevent rapid cycling (specific to digital timer panels).
- Visual indicators of float position.

City of Shasta Lake

Margret Polk Park - Septic System

February 24, 2026

Distribution Valve

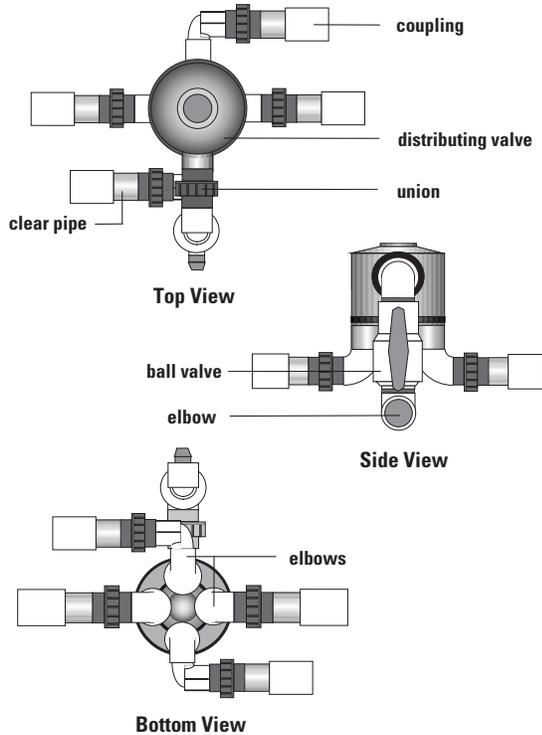
Distributing Valves

Submittal
Data Sheet



Applications

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



General

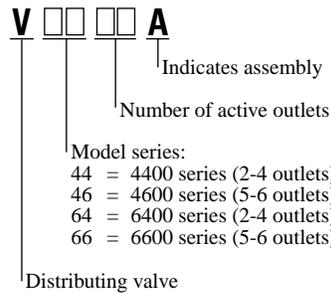
Oreco's Automatic Distributing Valve Assemblies are mechanically operated and sequentially redirect the pump's flow to multiple zones or cells in a distribution field. Valve actuation is accomplished by a combination of pressure and flow. Automatic Distributing Valve Assemblies allow the use of smaller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

Oreco 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 and a section of clear pipe and 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.

Nomenclature

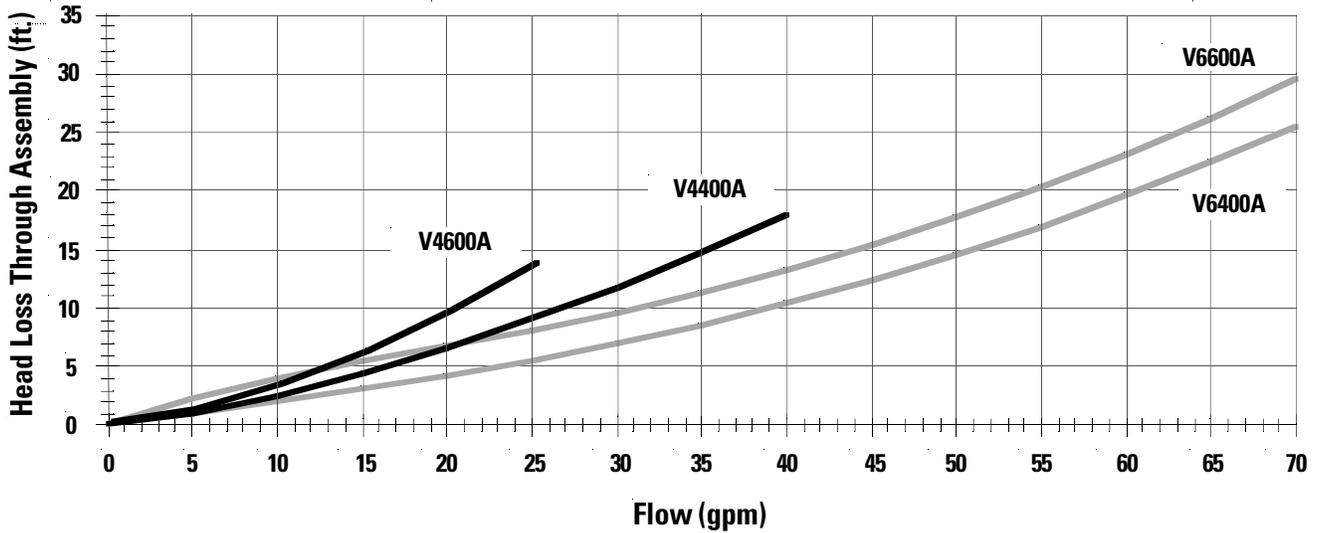


Specifications

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
V4XXX Distributing Valves:	High-strength noncorrosive ABS polymer and stainless steel
V6XXX Distributing Valves:	High-strength noncorrosive ABS polymer, stainless steel, and die cast metal

Distributing Valves (continued)



Model	Inlet Size (in.)	Outlets Size (in.)	Flow range (gpm)	Max Head (ft.)	Min. Enclosure
V4402A	1.25	1.25	10 - 40	170	VB1217
V4403A	1.25	1.25	10 - 40	170	VB1217
V4404A	1.25	1.25	10 - 40	170	VB1217
V4605A	1.25	1.25	10 - 25	170	RR2418
V4606A	1.25	1.25	10 - 25	170	RR2418
V6402A	1.5	1.5	15 - 100	345	RR2418
V6403A	1.5	1.5	15 - 100	345	RR2418
V6404A	1.5	1.5	15 - 100	345	RR2418
V6605A	1.5	1.5	15 - 100	345	RR2418
V6606A	1.5	1.5	15 - 100	345	RR2418

Orenco Automatic Distributing Valve Assemblies



Orenco Systems[®]
Incorporated

1-800-348-9843

For Wastewater Effluent Systems

Introduction

Orenco's automatic distributing valve assemblies, pressurized with small high-head effluent pumps, are useful for distributing effluent to multiple zones. These zones can be segments of sand filter manifolds, drainfields, or other effluent distribution systems. Distributing valve assemblies can substantially simplify the design and installation of a distribution system and reduce installation costs. This is particularly true where a distributing valve assembly is used instead of multiple pumps and/or electrically operated valves. Additionally, a reduction in long term operation and maintenance costs is realized due to a reduced size and/or number of pumps. More even distribution can be achieved on sloping sites by zoning laterals at equal elevations. This eliminates drainback to lower lines and the unequal distribution of effluent that occurs at the beginning of a cycle.

Valve Operation

The valve itself has only a few moving parts, requires no electricity, and alternates automatically each cycle. Refer to Figure 1 for the following valve operation description. The flow of the incoming effluent forces the rubber flap disk ① to seat against the valve bottom ②. The opening ③ in the rubber flap disk aligns with an opening in the valve bottom to allow flow to only one valve outlet. The stem ④ houses a stainless steel spring which pushes the rubber flap disk away from the valve bottom after the flow of effluent stops. The stem acts as a cam follower and rotates the rubber flap disk as the stem is raised and lowered through the cam ⑤. The force from the flow of effluent pushes the stem down through the cam and the stainless steel spring pushes the stem back up through the cam when the flow of effluent stops. Each linear motion of the stem allows the rubber flap disk to rotate half the distance necessary to reach the next outlet. When there is no flow, the rubber flap disk is in the "up" position and is not seated against the valve bottom.

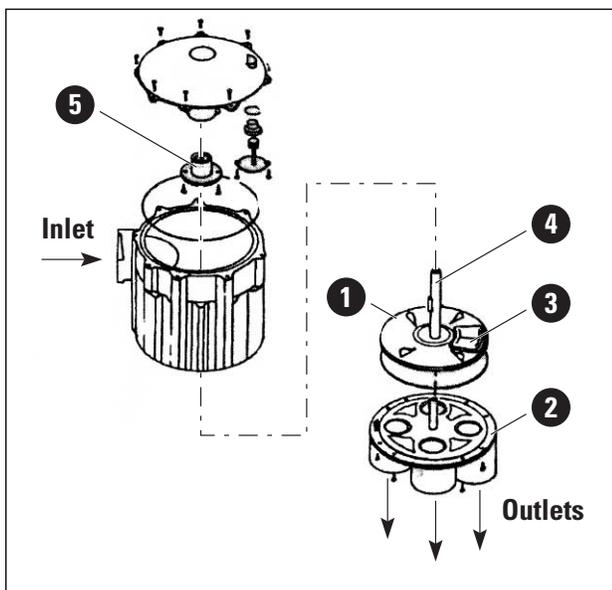


Figure 1:
6000 Series Valve

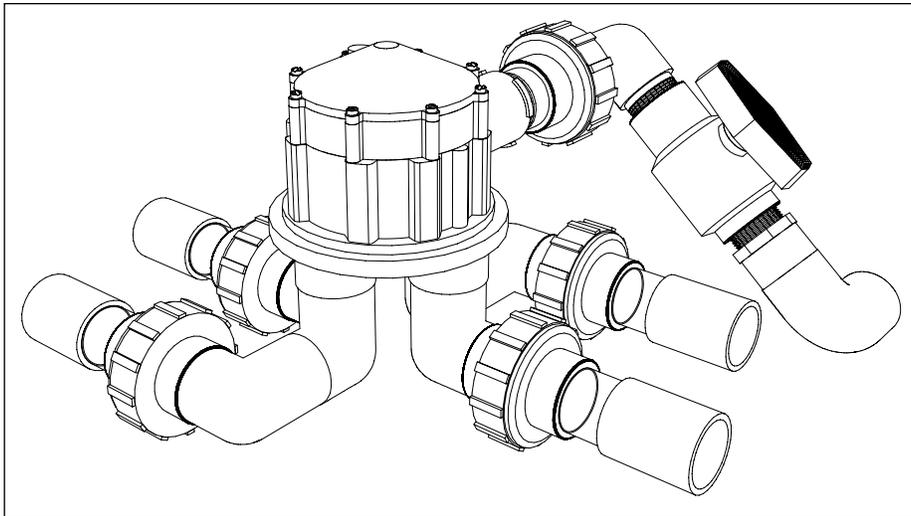


Figure 2:
Orenco Distributing Valve Assembly (6000 Series Valve)

The Distributing Valve Assembly

The Orenco Automatic Distributing Valve Assembly combines the distributing valve itself and several other components to give a complete preassembled unit that is easy to install, monitor, and maintain. Figure 2 shows a complete assembly. Because distributing valves with several outlets can be difficult to line up and glue together in the field, the discharge lines in the assemblies are glued in place at Orenco. The unions (1) allow removal and maintenance of the valve. The clear PVC pipe sections (2) give a visual check of which discharge line is being pressurized. The inlet ball valve (3) allows a quick, simple method to test for proper valve cycling. The ball valve also stops the flow of effluent in case the pump is activated unexpectedly during maintenance or inspection. Check valves may be necessary on the discharge lines. Use of check valves is discussed in the valve positioning section.

Valve Assembly Hydraulics

Liquid flowing through the valve assembly must pass through fairly small openings and make several changes in direction. Because of this, headlosses through the valve assembly are fairly high. Table 1 gives the headloss equations for several different assemblies and Figure 3 shows the graphical representations of these equations. Orenco recommends that high-head turbine pumps be used to pressurize the valve assemblies to ensure enough head is available for proper system operation. High-head turbine pumps are also recommended because the use of a distributing valve usually requires more frequent pump cycling. The high-head turbine pumps are designed for high cycling systems and will outlast conventional effluent pumps by a factor of 10 or more in a high cycling mode. Furthermore, the high-head turbine pump intake is 12 inches or more above the bottom of the pump and tends to prevent any settled solids from being pumped into the distribution valve and obstructing its operation. A minimum flow rate through the distributing valve is required to ensure proper seating of the rubber flap disk. Minimum flow rates for the various models are given in Table 1.

Table 1. Automatic Distributing Valve Assembly Headloss Equations

<u>Model Series</u>	<u>Equation</u>	<u>Operating Range (gpm)</u>
V4400A	$H_L = 0.085 \times Q^{1.45}$	10 - 40
V4600A	$H_L = 0.085 \times Q^{1.58}$	10 - 25
V6400A	$H_L = 0.0045 \times Q^2 + 3.5 \times (1 - e^{-0.06Q})$	15 - 70
V6600A	$H_L = 0.0049 \times Q^2 + 5.5 \times (1 - e^{-0.1Q})$	15 - 70

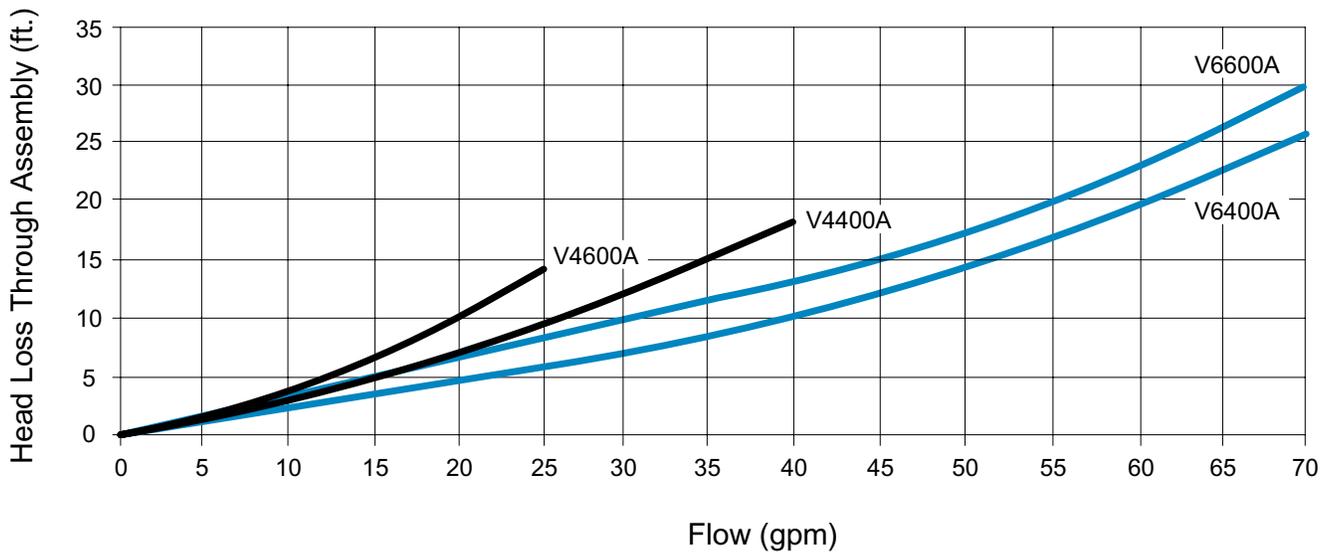


Figure 3:
Automatic distributing valve assembly headloss curves

The Pumping System

Although the distributing valve was designed for the irrigation industry, it has started to gain fairly wide acceptance in the effluent pumping industry. However, because of the mechanical movements of the valve, it is necessary to take steps to prevent solids from reaching the distributing valve that may impede the operation of the valve. Orenco Biotube® Pump Vaults — when properly sized and installed — provide the necessary protection to prevent valve malfunction. The Biotube® pump vault accepts effluent only from the clear zone between a tank’s scum and sludge layers and then filters this effluent through a very large surface area screen cartridge. Without this protection in effluent systems, the valve has very little chance of reliable long-term operation.

Valve Positioning

The physical position of the valve in relation to the pump and the discharge point is very important for proper valve operation. The most reliable operation occurs when the valve is placed at the high point in the system and as close to the pump as possible. The transport line between the pump and valve should be kept full if possible. If the line is empty at the beginning of each cycle, pockets of air during filling can cause random rotation of the valve. The valve is particularly vulnerable to this erratic rotation with empty lines that are long and not laid at a constant grade. An ideal valve location is shown in Figure 4.

If the final discharge point is more than about 2 feet above the valve and the system does not drain back into the dosing tank, check valves should be installed on the lines immediately following the valve and a pressure release hole or line should be installed just prior to the valve. This pressure release hole or line can go into a return line to the dosing tank or to a “minidrainfield” near the valve. In order for the valve to rotate reliably, no more than about 2 feet of head should remain against the valve to allow the rubber flap disk to return to its up position. In many cases, it may take from one minute to several minutes for the pressure in the valve to be lowered enough for proper rotation to occur. Special care should be taken when installing systems controlled by programmable timers to ensure cycling does not occur too rapidly. Figure 5 illustrates a valve assembly using check valves. Pumping downhill to the valve should be avoided unless the transport line is very short and the elevation between the discharge line out of the tank and the valve is less than about 2 feet. If the valve is located many feet below the dosing tank, random cycling may occur while the transport line drains through the valve at the end of the cycle. A pressure sustaining valve located just before the distributing valve may overcome this problem in some instances.

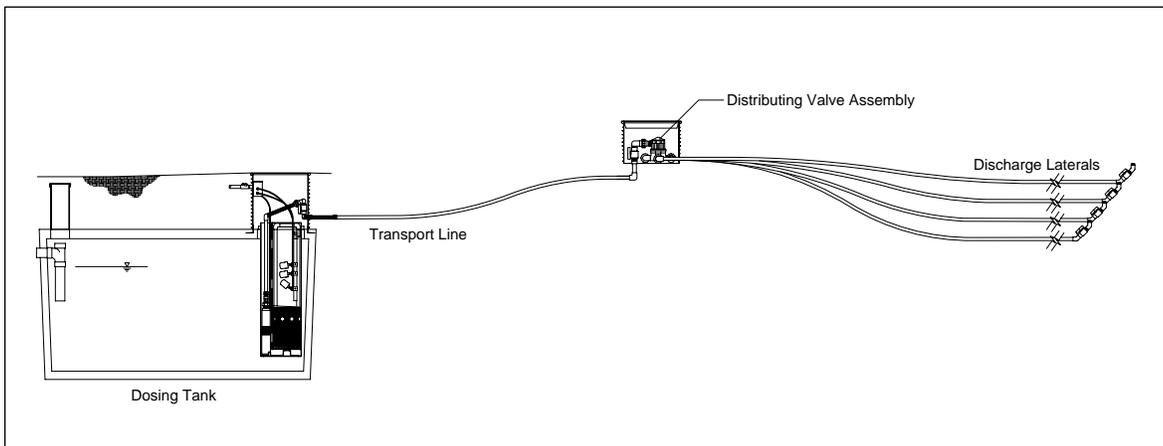


Figure 4:
Ideal valve location

System Startup

Refer to the Hydrotek Valve booklet that is provided with the distributing valve assembly for the sequencing of the valve outlets. The transport line should always be flushed with clean water before installing the valve. Any sand, gravel, or other foreign objects that may have been in the pipe during installation can easily become lodged in the distributing valve, causing malfunction.

With the pump running, alternately close and open the ball valve on the distributing valve assembly to check proper rotation of the valve. (Note: If check valves are used on the lines after the distributing valve, the pump may need to be turned on and off to allow the pressure to be released from the valve.) If visual operation of which zone is operating is not possible, watch the clear pipe on each line for indication of which zone is operating.

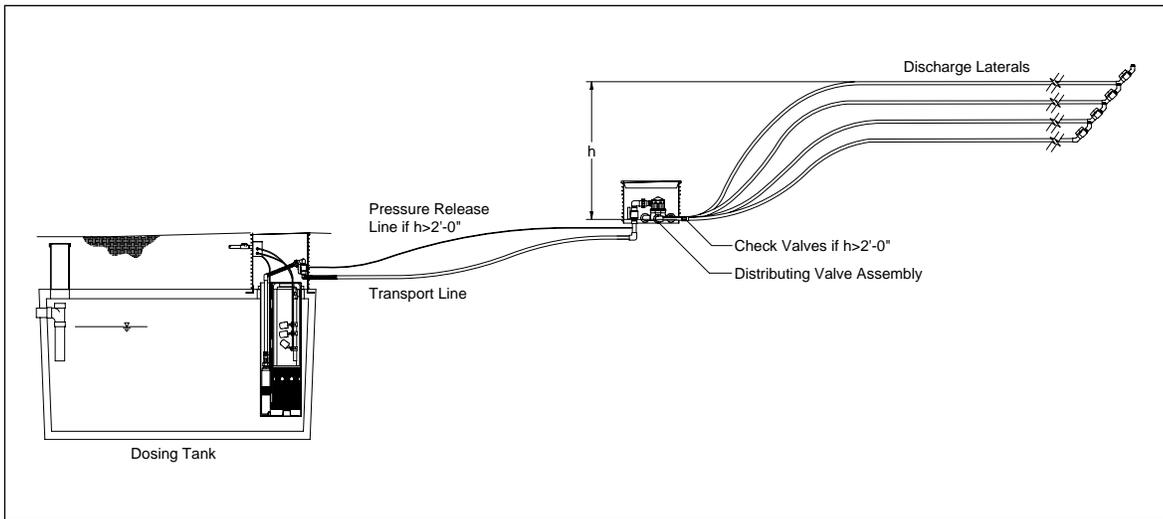


Figure 5:
Valve assembly below final discharge point

Maintenance

Annually check for proper operation by following procedures listed in the Hydrotek Valve booklet and system startup procedures listed above.

Troubleshooting

1. **PROBLEM:** Valve does not change or cycle to next zone or outlet

CAUSE: The stem and disk assembly is not rotating when water flow is turned off and then back on.

SOLUTION 1: Ensure that there is no debris inside the cam. Clean and carefully reinstall the cam.

SOLUTION 2: If fewer than the maximum number of outlets are being used, check the installation of the cam. Ensure that the stem and disk assembly is not being held down by an improperly installed cam. Refer to the cam replacement instructions.

- SOLUTION 3: Remove the valve top and check for proper movement of stem and disk assembly. Check for and remove any debris or foreign objects that may jam or retard the movement of the disk.
- SOLUTION 4: Check for freedom of movement of stem and disk assembly up and down over the center pin in bottom of valve. Scale deposits may build up on the pin and hold stem and disk assembly down. Clean pin and again check for freedom of movement.
- SOLUTION 5: Be sure that all operating outlets are not capped and that the flow to operating zones is not restricted in any manner. This would cause pressure to build up in the valve and lock the stem and disk assembly in the down position.
- SOLUTION 6: The backflow of water from uphill lines may be preventing the valve from cycling properly. This can happen when the valve is placed too far below an elevated line. If the valve cannot be placed close to the high point of the system, a check valve should be installed near the valve in the outlet line that runs uphill from the valve and a drain line installed just prior to the valve to relieve the pressure.

2. PROBLEM: Water comes out of all the valve outlets

CAUSE: Stem and disk assembly not seating properly on valve outlet.

SOLUTION 1: Check for sufficient water flow. A minimum flow rate is required to properly seat the disk as shown in Table 1.

SOLUTION 2: Remove the valve top and check the inside walls to ensure that nothing is interfering with the up and down movement of the stem and disk assembly inside the valve.

SOLUTION 3: Make sure that the operating outlets are not capped and that the flow to the operating zones are not restricted in any manner.

3. PROBLEM: Valve skips outlets or zones

CAUSE: Pumping into an empty transport line — especially downhill — may cause the valve to skip outlets from pockets of air allowing the rubber flap disk to raise during a cycle.

SOLUTION 1: Keep the transport line full.

SOLUTION 2: If the line must remain empty between cycles, use a larger diameter transport line laid at a constant grade to prevent air pockets from forming.

CAUSE: The stem and disk assembly is being advanced past the desired outlet.

SOLUTION 1: Ensure that the correct cam for the desired number of zones is installed and that the outlet lines are installed to the correct outlet ports of the valve as indicated by the zone numbers on the top of the cam.