

WSE MASSEY ENGINEERING & SURVEYING, LTD
320 WEST BROADWAY PLAINVIEW, MN 55964

MAILING ADDRESS: PO BOX 100 KASSON, MN 55944

507.634.4505 ■ WSE.ENGINEERING



Subsurface Sewage Treatment Design

For

River Ridge 5th

Section 26 T108N R14W

Parcel # 057824 & 057846

01/08/26

Prepared By:

WSE MASSEY

1765 Restoration Road SW

Rochester MN 55902

507-535-9573

320 West Broadway, Ste. 3
Plainview, MN 55964
507-634-4505

1712 Restoration Road SW
Rochester, MN 55902
507-634-4505

33 B Veterans Memorial Highway E, PO 100
Kasson, MN 55944
507-634-4505



1-08-26

Re: Drainfield Design WSE

Project # 012

PARID 057824 &057846

Dear: Dan

In accordance with your authorization, we have designed an Onsite Sewage Treatment System for your site.

We are sending you a copy of our report. If you have any questions on this report or if we can help you in any way, please contact me on my cell phone at 507-535-9573.

Sincerely,

WSE

A handwritten signature in blue ink that reads "Daniel J. Zemke".

Daniel J. Zemke

PE MPCA Advanced

Designer License # 4208

320 West Broadway, Ste. 3
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I Introduction

In accordance with the authorization of Dan Fitzpatrick WSE has completed a subsurface soil treatment design for the purpose of constructing a new on-site sewage treatment system located on the site. The parcel is Located at 5** Frederichs Dr NW . The area of our exploration is in the Southern end of the parcel, located in section 26 Township 108 North Range 14 West. The parcel is located in Oronoco Township in Olmsted County Minnesota. The Scope of work is limited to the following:

1. Explore the existing soil conditions on the site.
2. Make design recommendation for the structure and soil conditions

II Soil Conditions on the site

Soil Survey indicates the following soils are located on the site.

	Olmsted County	Soil Survey	Information	
Map Unit	Soil Texture	% Slope	Permeability	Drainage Class
322C2	Silt Loam	6-12	0.6-2.00 in/hr	B
322D2	Silt Loam	12-20	0.6 -2.000.14in/hr	B

Soil Boring/ Test Pits results

5 test Probes were placed on the site and found silt loam and redox was found at 60” of surface . The system will be designed with a restrictive layer at 60”

Water Level determination

No water level was found on the site.

III Project Information

We have been given (by the owner) the following design parameters:

5 bedroom

Design flow 750 gpd per day

Septic Tank requirements: 2250 Min Required

The design has been based on these assumptions and if any of this information is changed, the design must be further reviewed to make sure that it is still valid.

This design indicates that a drop box trench system will be allowed. The design details are located within this report.

IV Design Summary

The soils that we found on the site will allow gravity trench system. This system has been designed with a 0.5 gpd/sf soil sizing factor loading rate. The detailed University of Minnesota design sheets are attached in Appendix B.

The installation and design shall meet any and all requirements of the county and state codes. Well setbacks for this site are very critical and must be measured prior to the installation of the system. Installation must be performed at the time when the moisture in the soil is below the plastic limit. Construction traffic within the drainfield area must be limited to tracked equipment only. Maintenance is required to keep a system operating properly. The Operation and Maintenance Manual is attached in appendix C. The septic tank is required to be pumped or checked every three years at a minimum.

V Field sampling results

Soil Borings/ Probes

320 West Broadway, Ste. 3
Plainview, MN 55964
507-634-4505

1712 Restoration Road SW
Rochester, MN 55902
507-634-4505

33 B Veterans Memorial Highway E, PO 100
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Soil test probes have been performed on the drainfield site. The locations of the test are shown on the attached map in on the last page of this design. This map must be submitted with the design. The soil test holes have been filled with on-site material and some settlement may occur. The owner is responsible for the final closure of the test holes.

Soil Sampling

The soils samples were visually classified by WSE personnel based on the USDA classification system. The soil logs are attached in appendix A.

VI Standard of Care

The design in this report is based on our professional judgement and is based on our experience and training. The design is in line with current engineering practices being used at this time and location. Other than this no warranty is implied or intended. The longevity of the system depends on the installation, usage and maintenance of the system.

Prepared By



Daniel J Zemke PE

Advanced designer,

Inspector and service

Provider # 4208



Preliminary Evaluation Worksheet

v 04.02.2024

1. Contact Information

Property Owner/Client: Date Completed:

Site Address: Project ID:

Email: Phone:

Mailing Address: Alt Phone:

Legal Description:

Parcel ID: SEC: TWP: RNG:

2. Flow and General System Information

A. Client-Provided Information

Project Type: New Construction Replacement Expansion Repair

Project Use: Residential Other Establishment:

Residential use: # Bedrooms: Dwelling sq.ft.: Unfinished sq.ft.:

Adults: # Children: # Teenagers:

In-home business (Y/N): If yes, describe:

Water-using devices: *(check all that apply)*

Garbage Disposal/Grinder Dishwasher Hot Tub*
 Sewage pump in basement Water Softener* Sump Pump*
 Large Bathtub >40 gallons Iron Filter* Self-Cleaning Humidifier*
 Clothes Washing Machine High Eff. Furnace* Other:

* Clear water source - should not go into system

Additional current or future uses:

Anticipated non-domestic waste:

The above is complete & accurate:

Client signature & date

B. Designer-determined Flow and Anticipated Waste Strength Information

Attach additional information as necessary.

Design Flow: GPD Anticipated Waste Type:

Maximum Concentration BOD: mg/L TSS mg/L Oil & Grease mg/L

3. Preliminary Site Information

A. Water Supply Wells

#	Description	Mn. ID#	Well Depth (ft.)	Casing Depth (ft.)	Confining Layer	STA Setback	Source
1	New well to be drilled						
2							
3							
4							

Additional Well Information:



Preliminary Evaluation Worksheet



Site within 200' of noncommunity transient well (Y/N) Yes, source:

Site within a drinking water supply management area (Y/N) Yes, source:

Site in Well Head Protection inner wellhead management zone (Y/N) Yes, source:

Buried water supply pipes within 50 ft of proposed system (Y/N)

B. Site located in a shoreland district/area? Yes, name:

Elevation of ordinary high water level: ft Source:

Classification: Tank Setback: ft. STA Setback: ft.

C. Site located in a floodplain? Yes, Type(s):

Floodplain designation/elevation (10 Year): ft Source:

Floodplain designation/elevation (100 Year): ft Source:

D. Property Line Id / Source: Owner Survey County GIS Plat Map Other

E. ID distance of relevant setbacks on map: Water Easements Well(s)
 Building(s) Property Lines OHWL Other:

4. Preliminary Soil Profile Information From Web Soil Survey (attach map & description)

Map Units: Slope Range: %

List landforms:

Landform position(s):

Parent materials:

Depth to Bedrock/Restrictive Feature: in Depth to Watertable: in

Map Unit Ratings

Septic Tank Absorption Field- At-grade:

Septic Tank Absorption Field- Mound:

Septic Tank Absorption Field- Trench:

5. Local Government Unit Information

Name of LGU:

LGU Contact:

LGU-specific setbacks:

LGU-specific design requirements:

LGU-specific installation requirements:

Notes:



Field Evaluation Worksheet

v 04.02.2024

1. Project Information

Property Owner/Client: Project ID:

Site Address: Date Completed:

2. Utility and Structure Information

Utility Locations Identified Gopher State One Call # Any Private Utilities:

Locate and Verify (see Site Evaluation map) Existing Buildings Improvements Easements Setbacks

3. Site Information

Vegetation type(s): Landscape position:

Percent slope: % Slope shape: Slope direction:

Describe the flooding or run-on potential of site:

Describe the need for Type III or Type IV system:

Note:

Proposed soil treatment area protected? (Y/N): If yes, describe:

4. General Soils Information

Filled, Compacted, Disturbed areas (Y/N):

If yes, describe:

Soil observations were conducted in the proposed system location (Y/N):

A soil observation in the most limiting area of the proposed system (Y/N):

Number of soil observations: Soil observation logs attached (Y/N):

Percolation tests performed & attached (Y/N):

5. Phase I. Reporting Information

	Depth	Elevation	
Limiting Condition*:	<input type="text" value="60"/> in	<input type="text" value="1055.00"/> ft	*Most Restrictive Depth Identified from List Below
Periodically saturated soil:	<input type="text" value="60"/> in	<input type="text" value="1055.00"/> ft	Soil Texture: <input type="text" value="Silt Loam"/>
Standing water:	<input type="text" value="N/A"/> in	<input type="text"/>	Percolation Rate: <input type="text"/> min/inch
Bedrock:	<input type="text" value="N/A"/> in	<input type="text"/>	Soil Hyd Loading Rate: <input type="text" value="0.50"/> gpd/sq.ft
Benchmark Elevation:	<input type="text" value="1,060.0"/> ft	Elevations and Benchmark on map? (Y/N): <input type="text" value="Yes"/>	

Benchmark Elevation Location:

Differences between soil survey and field evaluation:

Site evaluation issues / comments:

Anticipated construction issues:



Soil Observation Log

Project ID: v 04.02.2024

River Ridge Fifth											
Client: 5** Fredrichs Dr NW						Location / Address: 5** Fredrichs Dr NW					
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input checked="" type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter <input type="checkbox"/> Disturbed/Fill											
Landscape Position: Back/Side Slope			Slope %: 12.0			Slope shape: Linear, Linear			Flooding/Run-On potential: No		
Vegetation: Grass			Soil survey map units: 322C2			Surface Elevation-Relative to benchmark: 1060.00			Limiting Layer Elevation: 60"		
Date/Time of Day/Weather Conditions: 9/8/2025 1:00 PM			Observation Type: Sunny 60								
Observation #/Location: SB1											
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure-----I		Consistence	Probe	
							Shape	Grade		Shape	Grade
0-10	Silt Loam	0	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate		Blocky	Friable
10-60	Silt Loam	0	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate		Blocky	Friable
60-65	Silt Loam	0	10YR 6/4	10YR 6/2	Concentrations	S1	Blocky	Weak		Blocky	Friable
Comments:											
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.											
Daniel Zemke						<i>Daniel Zemke</i>					
(Designer/Inspector)						(License #) 4208					
Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.											
(LGU/Designer/Inspector)						(Signature)					
(Date)						(Cert #)					
(Date)						(Date)					



Soil Observation Log

Project ID: **v 04.02.2024**

Client: **River Ridge Fifth**

Location / Address: **5** Fredrichs Dr NW**

Soil parent material(s): (Check all that apply) Outwash Lacustrine Loess Till Alluvium Bedrock Organic Matter Disturbed/Fill

Landscape Position: **Back/Side Slope** Slope %: **12.0** Slope shape: **Linear, Linear** Flooding/Run-On potential: **No**

Vegetation: **Grass** Soil survey map units: **322C2** Surface Elevation-Relative to benchmark: **1054.00**

Date/Time of Day/Weather Conditions: **9/8/2025** **1:00PM** Sunny **60** Limiting Layer Elevation: **60.00**

Observation #/Location: **SB2** Observation Type: **Probe**

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure-----I		
							Shape	Grade	Consistence
0-10	Silt Loam	0	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
10-60	Silt Loam	0	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
60-65	Silt Loam	0	10YR 6/4	10YR 6/2	Concentrations	51	Blocky	Weak	Friable

Comments:

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Daniel Zemke (Designer/Inspector) **4208** (License #) **10/2/2025** (Date)

Daniel Zemke (Signature)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU/Designer/Inspector) (Signature) (Cert #) (Date)



Soil Observation Log

Project ID: v 04.02.2024

Client: River Ridge Fifth

Location / Address: 5** Friedrichs Dr NW

Soil parent material(s): (Check all that apply) Outwash Lacustrine Loess Till Alluvium Bedrock Organic Matter Disturbed/Fill

Landscape Position: Back/Side Slope Slope %: 12.0 Slope shape: Linear, Linear Flooding/Run-On potential: No

Vegetation: Grass Soil survey map units: 322C2 Surface Elevation-Relative to benchmark: 1055.00

Date/Time of Day/Weather Conditions: 9/8/2025 1:00 PM Sunny 60 Limiting Layer Elevation: 60.00

Observation #/Location: SB3 Observation Type: Probe

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure		Consistence
							Shape	Grade	
0-10	Silt Loam	0	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
10-60	Silt Loam	0	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
60-65	Silt Loam	0	10YR 6/4	10YR 6/2	Concentrations	51	Blocky	Weak	Friable

Comments:

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Daniel Zemke *Daniel Zemke* (Signature) 4208 (License #) 9/8/2025 (Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU/Designer/Inspector) (Signature) (Cert #) (Date)



Soil Observation Log

Project ID: v 04.02.2024

Client: River Ridge Fifth

Location / Address: 5** Fredrichs Dr NW

Soil parent material(s): (Check all that apply) Outwash Lacustrine Loess Till Alluvium Bedrock Organic Matter Disturbed/Fill

Landscape Position: Back/Side Slope Slope %: 12.0 Slope shape: Linear, Linear Flooding/Run-On potential: No

Vegetation: Grass Soil survey map units: 322C2 Surface Elevation-Relative to benchmark: 1060.00

Date/Time of Day/Weather Conditions: 9/8/2025 1:00 PM Sunny 60 Limiting Layer Elevation: 65.00

Observation #/Location: SB4 Observation Type: Probe

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure-----I		
							Shape	Grade	Consistence
0-10	Silt Loam	0	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
10-65	Silt Loam	0	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
65-70	Silt Loam	0	10YR 6/4	10YR 6/2	Concentrations	S1	Blocky	Weak	Friable

Comments:

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Daniel Zemke (Designer/Inspector) Signature: *Daniel Zemke* License #: 4208 Date: 9/8/2025

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU/Designer/Inspector) Signature: _____ (Cert #) _____ (Date) _____



Soil Observation Log

Project ID: v 04.02.2024

Client: River Ridge Fifth

Location / Address: 5** Fredrichs Dr NW

Soil parent material(s): (Check all that apply) Outwash Lacustrine Loess Till Alluvium Bedrock Organic Matter Disturbed/Fill

Landscape Position: Back/Side Slope Slope %: 12.0 Slope shape: Linear, Linear Flooding/Run-On potential: No

Vegetation: Grass Soil survey map units: 322C2 Surface Elevation-Relative to benchmark: 1057.00

Date/Time of Day/Weather Conditions: 9/8/2025 1:00 PM Sunny 60 Limiting Layer Elevation: 65.00

Observation #/Location: SB5 Observation Type: Probe

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I		
							Shape	Grade	Consistence
0-10	Silt Loam	0	10YR 3/2	N/A	N/A	N/A	Blocky	Moderate	Friable
10-65	Silt Loam	0	10YR 4/4	N/A	N/A	N/A	Blocky	Moderate	Friable
65-70	Silt Loam	0	10YR 6/4	10YR 6/2	Concentrations	S1	Blocky	Weak	Friable

Comments:

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Daniel Zemke
 (Designer/Inspector) 4208 (License #) 9/8/2025 (Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

Daniel Zemke (Signature) _____ (Cert #) _____ (Date)



1. PROJECT INFORMATION		v 04.02.2024
Property Owner/Client:	<input type="text" value="River Ridge Fifth"/>	Project ID: <input type="text"/>
Site Address:	<input type="text" value="5** Fredrichs Dr NW"/>	Date: <input type="text" value="01/08/26"/>
Email Address:	<input type="text" value="dan@premierartisan.com"/>	Phone: <input type="text" value="507-269-8844"/>
2. DESIGN FLOW & WASTE STRENGTH		
Design Flow:	<input type="text" value="750"/> GPD	Anticipated Waste Type: <input type="text"/>
BOD:	<input type="text"/> mg/L	TSS: <input type="text"/> mg/L
		Oil & Grease: <input type="text"/> mg/L
Treatment Level:	<input type="text" value="C"/> <i>Select Treatment Level C for residential septic tank effluent</i>	
3. HOLDING TANK SIZING <i>Holding Tank Sizing: see 7080.2290</i>		
Code Minimum Holding Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
Recommended Holding Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
The holding tank(s) will be:	<input type="text"/> <i>Existing tank reuse requires a tank integrity assessment</i>	
Type of High Level Alarm:	<input type="text"/>	
	(Alarm Set @ 75% tank capacity measured from inlet to bottom)	
Comments:	<input type="text"/>	
4. SEPTIC TANK SIZING <i>Sizing: See 7080.1930</i>		
A. Residential dwellings:		
Number of Bedrooms (Residential):	<input type="text" value="5"/>	
Code Minimum Septic Tank Capacity:	<input type="text" value="2250"/> Gallons	with <input type="text" value="2"/> Tanks or Compartments
Recommended Septic Tank Capacity:	<input type="text" value="2250"/> Gallons	with <input type="text" value="2"/> Tanks or Compartments
The septic tank(s) will be:	<input type="text" value="All New"/> <i>Existing tank reuse requires a tank integrity assessment</i>	
Comments:	<input type="text"/>	
Effluent Screen & Alarm (Y/N):	<input type="text" value="Yes"/>	Model/Type: <input type="text" value="PL 122"/>
B. Other Establishments:		
Waste received by:	<input type="text"/>	<input type="text"/> GPD x <input type="text"/> Days Hyd. Retention Time
7080 Minimum Septic Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
Designed Septic Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
The septic tank(s) will be:	<input type="text"/> <i>Existing tank reuse requires a tank integrity assessment</i>	
Comments:	<input type="text"/>	
Effluent Screen & Alarm (Y/N):	<input type="text"/>	Model/Type: <input type="text"/>
<small>* Other Establishments Require Department of Labor and Industry Approval and Inspection for Building Sewer *</small>		

5. PUMP TANK SIZING *Sizing: see 7080.2100*

Soil Treatment Dosing Tank		Other Component Dosing Tank:	
Pump Tank Capacity (7080 Minimum):	600 Gal	Pump Tank Capacity (7080 Minimum):	Gal
Pump Tank Capacity (Designed):	781 Gal	Pump Tank Capacity (Designed):	Gal
Pump Req:	41.0 GPM Total Head 21.3 ft	Pump Req:	GPM Total Head ft
Supply Pipe Dia.	2.00 in Dose Vol: 150.0 gal	Supply Pipe Dia.	in Dose Vol: Gal

* Flow measurement device must be incorporated for any system with a pump *

6. SYSTEM AND DISTRIBUTION TYPE Project ID:

Soil Treatment Type:	Trench	Distribution Type:	Gravity Distribution
Elevation Benchmark:	1060.00 ft	Benchmark Location:	SB1
MPCA System Type:	Type I	Distribution Media:	
Type III/IV/V Details:			

7. SITE EVALUATION SUMMARY:

Describe Limiting Condition: Redoximorphic Features/Saturated Soils

Layers with >35% Rock Fragments? (yes/no) No If yes, describe below: % rock and layer thickness, amount of soil credit and any additional information for addressing the rock fragments in this design.

Note: Maximum depth 12"

Limiting Condition:	60.0 inches	Depth	5.00 ft	Elevation	1055.00 ft	<i>Elevations are critical for system compliance.</i>
Minimum Req'd Separation:	48 inches	Depth	4.00 ft	Elevation		
Distribution Media Bottom*:	12 inches	Depth	1.00 ft	Elevation	1059.00 ft	Media Bottom Elevation OK

*This is the maximum depth to the bottom of the distribution media for required separation. Negative Depth (ft) requires a mound.

Designed Distribution Bottom Elevation: 1059.00 ft Mound Minimum Sand Depth: N/A inches

A. Soil Texture: Silt Loam

B. Soil Hyd. Loading Rate: 0.50 GPD/ft² C: Percolation Rate: MPI

D. Contour Loading Rate: 12.0 Note:

E. Measured Land Slope: 12.0 % Note:

Comments:

8. SOIL TREATMENT AREA DESIGN SUMMARY

Trench:

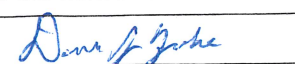
Dispersal Area	1500 sq.ft	Sidewall Depth	6 in	Trench Width	3.0 ft
Total Lineal Feet	500.0 ft	No. of Trenches	4	Code Max. Trench Depth	12 in
Contour Loading Rate	12.0 ft	Minimum Length	62.5 ft	Designed Trench Depth	12 in

Bed:

Dispersal Area	sq.ft	Sidewall Depth	in	Maximum Bed Depth	in
Bed Width	ft	Bed Length	ft	Designed Bed Depth	in



Design Summary Page

Project ID: _____								
Mound:								
Dispersal Area	sq.ft	Bed Length	ft					
	<input type="text"/>		<input type="text"/>					
		Bed Width	ft					
		<input type="text"/>	<input type="text"/>					
Absorption Width	ft	Clean Sand Lift	ft					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		Berm Width (0-1%)	ft					
		<input type="text"/>	<input type="text"/>					
Upslope Berm Width	ft	Downslope Berm	ft					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		Endslope Berm Width	ft					
		<input type="text"/>	<input type="text"/>					
Total System Length	ft	System Width	ft					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		Contour Loading Rate	gal/ft					
		<input type="text"/>	<input type="text"/>					
At-Grade:								
Dispersal Area	sq.ft	Bed Length	ft					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		Bed Width	ft					
		<input type="text"/>	<input type="text"/>					
Upslope Berm	ft	Downslope Berm	ft					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		Finished Height	ft					
		<input type="text"/>	<input type="text"/>					
System Length	ft	Endslope Berm	ft					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		System Width	ft					
		<input type="text"/>	<input type="text"/>					
Level & Equal Pressure Distribution Soil Treatment Area								
No. of Laterals	<input type="text"/>	Lateral Diameter	in					
		<input type="text"/>	<input type="text"/>					
		Lateral Spacing	ft					
		<input type="text"/>	<input type="text"/>					
Perforation Spacing	ft	Perforation Diameter	in					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		Drainback Volume	gal					
		<input type="text"/>	<input type="text"/>					
Min Dose Volume	gal	Max Dose Volume	gal					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>					
		Total Dosing Volume	gal					
		<input type="text"/>	<input type="text"/>					
Non-Level and Unequal Pressure Distribution Soil Treatment Area								
	Elevation (ft)	Pipe Size (in)	Pipe Volume (gal/ft)	Pipe Length (ft)	Perf Size (in)	Spacing (ft)	Spacing (in)	Minimum Dose Volume
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> gal
Lateral 1								
Lateral 2								Maximum Dose Volume
Lateral 3								<input type="text"/> gal
Lateral 4								
Lateral 5								Total Dosing Volume
Lateral 6								<input type="text"/> gal
9. Organic Loading and Additional Info for HSW or Type IV/V Design - See Organic Loading tab								
Organic Loading to Soil Treatment (Based on Waste Strength Data and Organic Loading Design)								
A. Organic Loading Based on:		<input type="text"/>	B. Minimum required area		<input type="text"/>	sq.ft		
Technology Strength Reduction (Treatment Level or HSW)								
A. Starting Waste Strength		<input type="text"/>	Treatment designed to meet:		<input type="text"/>			
Pretreatment Technology:		<input type="text"/>				*Must Meet or Exceed Target Level		
Model:		<input type="text"/>	Units:		<input type="text"/>			
Disinfection Technology:		<input type="text"/>				*Required for Levels A & B		
Model:		<input type="text"/>	Units:		<input type="text"/>			
10. Comments/Special Design Considerations:								
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.								
Daniel Zemke (Designer)		 (Signature)		4208 (License #)		10/2/2025 (Date)		

1. SYSTEM SIZING: Project ID: _____ v 04.02.2024

- A. Design Flow: GPD
- B. Code Maximum Depth: inches Designers Maximum Depth: inches
- C. Soil Loading Rate: GPD/sq.ft Contour Loading Rate: gal/ft
- D. Required Bottom Area: Design Flow(1A) ÷ Soil Loading Rate(1C)
- GPD ÷ GPD/sq.ft = sq.ft

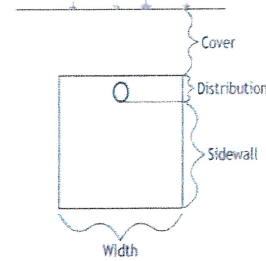
Optional Upsizing of Dispersal Media Area

- E. Larger Bed Area Size or Organic Sizing of Bed Area sq.ft
(see organic loading sheet - 2G)

- F. Designed Bottom Area: sq.ft
- G. Select Dispersal Media:
If Registered Media
- H. Select Distribution Method: Notes:
- I. Is distribution media installed in contact with sand or loamy sand or with a percolation rate of 0.1 to 5 mpi?
If yes, Indicate distribution or treatment method:

2. TRENCH CONFIGURATION

A.	Initial required trench bottom area (ft ²): (from 1.D)	Sidewall Absorption (inches)	Bottom Area Reduction	Bottom Area Multiplier	Design trench bottom area
	1500	6 to 11	0%	1	1500
		12 to 17	20%	0.8	1200
		18 to 23	34%	0.66	990
		24	40%	0.6	900



Check registered product information for specific application details and design

- B. Select Sidewall Height: inches = ft
- C. Design Bottom Area: sqft
- D. Select Trench/Registered Width: ft
- E. Total Designed Trench Length: Bottom Area (2C) ÷ Trench Width(2D)
- sq.ft ÷ ft = ft
- F. Calculate Minimum length of each trench based on Contour Loading Rate: Design Flow(1A) ÷ CLR (1C₂) =
- gpd ÷ gal/ft = ft
- G. Rapidly Permeable Soil Design Considerations:

15% Trench Distribution = Required Bottom Area (2C) x 15%.

sq.ft X 15% = sq.ft

Length Trenches at 15%: Trench area (2G) ÷ Trench Width(2D)

sq.ft ÷ ft = ft

- H. Number of Trenches: Based on CLR minimum length (2E)/(2F).

Based on 15% sections (2E)/(2G)

Designed Number of Trenches:

I. Equal Length per Trench = Actual Trench Length(2E) ÷ Number of Trenches(2H)

$$\boxed{500.0} \text{ ft} \div \boxed{4} = \boxed{125.0} \text{ ft}$$

J. Select Trench Spacing : $\boxed{6.0}$ ft (typically 5 - 12 ft from center to center)

K. Calculate Lawn Area: Total Trench Length(2E) X Trench Spacing(2J)

$$\boxed{500.0} \text{ ft} \times \boxed{6.0} \text{ ft} = \boxed{3000.0} \text{ sq.ft lawn area}$$

3. ESTIMATED ROCK MATERIALS

Project ID:

A. Select Depth Required to Cover Distribution Pipe: $\boxed{0.50}$ ft (0.33 ft for pressure, 0.5 ft for gravity)

B. Calculate Rock Volume:

(Sidewall Height(2B) + Depth to Cover Pipe(3A)) X Bottom Area(2C) = cubic feet ÷ 27 = cubic yards

$$(\boxed{} \text{ ft} + \boxed{} \text{ ft}) \times \boxed{} \text{ sq.ft} = \boxed{} \text{ cu.ft} \div 27 \boxed{} \text{ cu.yd}$$

Trench to be constructed to dimensions in design. This is an estimate of materials needed. Individual construction practices may vary quantities.

4. ESTIMATED REGISTERED PRODUCTS MATERIALS

A. Registered Product: Model:

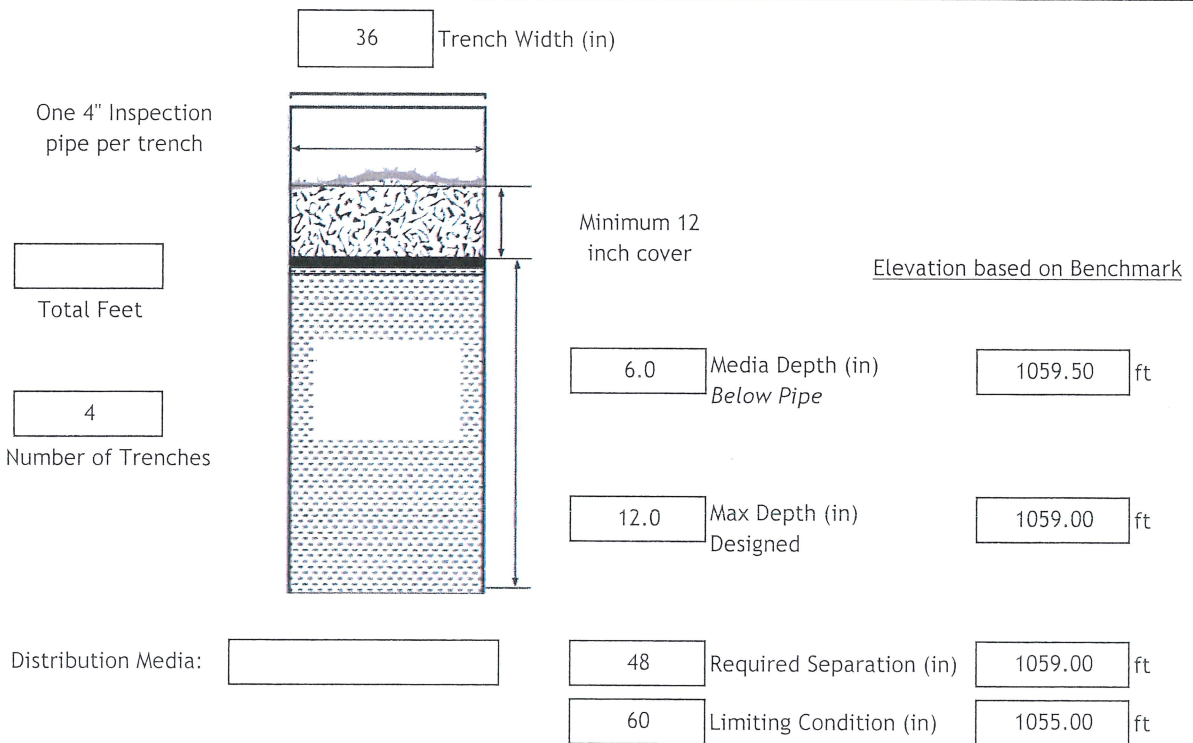
B. Total Length to be Installed: $\boxed{257}$ ft

C. Total Designed for Install (4B) - Total Trench Required(2E) (must be a positive number)

$$\boxed{257.0} \text{ Total ft} - \boxed{500.0} \text{ ft required} = \boxed{} \text{ ft}$$

Check registered product information for specific application details and design

5. Dimension Summary



Comments: