Primary Treated Effluent Treatment Field

Trench Bottom Surface Area & Length Sizing

This design worksheet was developed by
Saskatchewan Onsite Wastewater Management Association.
The complete system is to comply with the Saskatchewan Onsite Wastewater Disposal Guide 2018
This worksheet does NOT consider all of the requirements of the mandatory Guide
****Use only Imperial units of measurement throughout (feet, inches, Imperial gallons, etc…)**

Step 1) Determine the expected volume of sewage per day:

Assess the initial sewage strength against the requirements of the SOWDG
Effluent quality must meet the requirements for residential strength

Expected Peak Volume of Sewage per Day

_____ **Imp.gal/day** **F1**

Step 2) Determine the design soil effluent loading rate:

Soil Effluent Loading Rate [From <30 mg/L $cBOD_5$ column]

_____ (Soil Texture) **&** _____ (Structure) **&** _____ (Grade) **=** _____ **Imp. gal/ ft².day** **F2**

If result is less than 0.2 Imp. Gal/ft²/day a treatment field cannot be installed.

Note: Effluent loading rate MUST be determined from soil texture, structure, and grade classification according to Imperial Tables 13-2 and 13-3
Note: Ensure infiltration loading rate chosen does not exceed loading rates as set out in the SOWDG

Step 3) Determine Hydraulic Linear Loading Rate:

Use Table 13-5

_____ (Soil Texture) & _____ (Structure) _____ (& Grade) _____ (& Slope) _____ (& Infiltration Depth) **–** _____ **Imp. gal/ lineal ft./day** **F3**

Note: System Geometry and Linear Loading Rate Design Tables 13-4 and 13-5

Step 4) Type and width of trench bottom used:

Actual Pipe & Rock Trench Width in inches.

_____ **inches** **÷** 12 **=** _____ **feet** **F4**

Actual Chamber Width in inches

_____ **inches** **÷** 12 **=** _____ **feet** **F4A**

Note: Chamber width for trench fields is calculated using the exterior width at the base of the chamber.

Step 5) Calculate optional credits for effluent loading rate:

Primary treated effluent requires a minimum 5 feet Vertical Separation below infiltration surface area.
Article 13.3.4

Effluent loading rate factors cannot be taken for soils with textures Coarse Sand (COS), Medium Sand (MS), Loamy Coarse Sand (LCOS), Loamy Medium Sand (LMS) and;
Coarse Sandy Loam (COSL) or Medium Sandy Loam (MSL) having Prismatic, Blocky or Granular structure of Grade 2 or 3.

	Effluent Loading Rate		Factor		Effluent Loading Rate with Factor Applied	
Pipe & Rock Trench - Gravity Distribution	From F2	X	1	=	ELR	F5
OR						
Pipe & Rock - Pressure Distribution	From F2	X	1.2	=	ELR	F5A
OR						
Chambers - Gravity Distribution[1]	From F2	X	1.1	=	ELR	F5B
OR						
Chambers - Pressure Distribution[1]	From F2	X	1.3	=	ELR	F5C

*****See Article 13.4.2 regarding loading rates on various types of soils. Sentences 3 through 8 provide additional requirements for sandy soils and other challenging textures and/or structures.**
Note: Ensure adjusted infiltration loading rate chosen does not exceed loading rates for secondary treated systems.
* **If result is less then 0.2 gal/ft²/day a treatment field cannot be installed.**

Step 6) Determine minimum soil infiltration required:

Expected Peak Volume of Sewage per Day		Effluent Loading Rate with Factor Applied		Minimum Soil Infiltration Area Required	
Imp.gal/day (From F1)	÷	Imp.gal/ft² feet (From F5 or , F5A, B, or C)	=	ft²	F6

Step 7) Calculate Treatment Field Minimum Length required:

Expected Peak Volume of Sewage per Day		Hydraulic Linear Loading Rate		Minimum Treatment Field System Length Required	
Imp.gal/day (From F1)	÷	Imp.gal/ft/day (From F3)	=	Lineal Feet	F7

***Note System May be longer than calculated as this actually reduces the Hydraulic Linear Loading**

Step 8) Determine the total Trench Bottom length required:

Minimum Soil Infiltration Area Required		Actual Trench Width		Total Length of Trench Bottom Required	
	ft^2 ÷	feet	=	lineal feet	F8
From F6		F4			

Step 9) Determine the number of lateral trenches required:

Total Length of Trench Bottom Required		Length Determined by Linear Loading		Number of Trenches Required	
lineal feet	÷	lineal feet	=		F9
From F8		F7		*Round down to whole number of trenches required	

Step 10) Determine the number of lateral trenches required:

Total Length of Trench Bottom Required		Number of Trenches		Length of Each Lateral Trench	
lineal feet	÷		=	feet	F10
From F8		F9		Equal to or greater than F7	

*System may be larger than required to accommodate linear loading rates and number of trenches required

Step 11) Summary:

F1	Imp. gal/day	Peak Daily Flow, including allowance for any additional flow volumes
F2	Imp. gal/ft²/day	Soil Effluent Loading Rate.
F3	Imp. gal/ft/day	Hydraulic Linear Loading Rate
F4	feet	Trench Bottom Width
F5 or F5A	Imp. gal/ft²/day	Effluent Loading Rate with Factor Applied
F6	ft²	Minimum Soil Infiltration Area Required
F7	feet	Minimum Treatment Field System Length
F8	feet	Total Trench Bottom Length Required
F9		Number of Lateral Trenches
F10	feet	Length of Each Lateral Trench