Secondary Treated Effluent Treatment Field

Trench Bottom Surface Area & Length Sizing

This design worksheet was developed by Alberta Municipal Affairs and Alberta Onsite Wastewater Management Association.
The complete system is to comply with Alberta Private Sewage Standard of Practice 2021
This worksheet does NOT consider all of the requirements of the mandatory Standard
****Use only Imperial units of measurement throughout (feet, inches, Imperial gallons, etc…)**

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

Note: Use Table 2.2.2.2.A. (p.26) & 2.2.2.2.B. (p.28) to determine expected volume of sewage per day. Provide allowance for additional flow factors as detailed in Table 2.2.2.3. (p.29)

Expected Peak Volume of Sewage per Day

IG/day **F1**

Assess the initial sewage strength against the requirements of 2.2.2.1.(2) (p 25)
Effluent quality must meet the requirement of Article 8.1.1.6(1)(b) [p. 85].

Step 2) Determine the design soil effluent loading rate:

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

Soil Texture & Structure & Grade = IG/ ft².day **F2**

If result is less than 0.2 Imp. Gal/ft²/day a treatment field cannot be installed. Article 8.2.1.13. (1) (p 85)

Note: Effluent loading rate MUST be determined from soil texture, structure, and grade classification according to Imperial Table A.1.E.1. (p.141).
Note: Ensure infiltration loading rate chosen does not exceed loading rates as set out in 8.1.2.2. (p. 89).

Step 3) Determine Hydraulic Linear Loading Rate:

Use Table A.1.E.1. (p. 141)

Soil Texture & Structure & Grade & Slope & Infiltration Depth = IG/ lineal ft./day **F3**

Note: System Geometry and Linear Loading Rate Design Article 8.1.1.7. (p.85)

Step 4) Chamber Width Selected:

Actual Chamber Width in inches

inches ÷ 12 inches/foot = feet **F4**

Articles 8.3.1.3. & 8.3.1.4. (p.98)

Step 5) Calculate optional loading rate factor for effluent soil loading rate:

Effluent Loading Rate with Factor Applied

Chambers - Pressure Distribution Article 8.3.1.5. 1)c Page 98 — Effluent Loading Rate (From F2) X Loading Rate Factor **1.1*** = ELR **F5**

Chambers - Pressure Distribution & Timed Dosing Article 8.3.1.5. 1)d Page 98 — Effluent Loading Rate (From F2) X Loading Rate Factor **1.2*** = ELR **F5A**

* **If result is less than 0.2 gal/ft²/day a treatment field cannot be installed. Article 8.2.1.13. (1) Page 93**

Step 6) Determine minimum soil infiltration required:

Expected Peak Volume of Sewage per Day (From F1) IG/day ÷ **Effluent Loading Rate with Factor Applied** (From F5 or 5A) IG/ft²/day feet = **Minimum Soil Infiltration Area Required** ft² **F6**

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Step 7) Calculate Treatment Field Minimum Length required:

Expected Peak Volume of Sewage per		Hydraulic Linear Loading Rate		Minimum Treatment Field System Length Required	
	IG/day		IG/ft/day		Lineal Feet F7
From F1	÷	From F3	=		

*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 Chamber Width		Total Trench Bottom length 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	=		

Article 8.2.1.12. (p.93)

*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	IG/day	Peak Daily Flow, including allowance for any additional flow volumes additional
F2	$IG/ft^2/day$	Soil Effluent Loading Rate.
F3	IG/ft/day	Hydraulic Linear Loading Rate
F4	feet	Chamber Width
F5 or F5A	$IG/ft^2/day$	Effluent Loading Rate with Factor Applied
F6	ft^2	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