

Primary 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 2015
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.23) & 2.2.2.2.B. (p.24) to determine expected volume of sewage per day. Provide allowance for additional flow factors as detailed in Table 2.2.2.3. (p.25)

Expected Peak Volume of Sewage
per Day

F1

Assess the initial sewage strength against the requirements of 2.2.2.1.(1) (p.21)
 Effluent quality must meet the requirement of Article 8.1.1.6(1)(a) (p. 76).

Step 2) Determine the design soil effluent loading rate:

Soil Effluent Loading Rate
[30 - 150 mg/L cBOD₅ column]

 & &
 Texture Structure Grade

 = Imp. gal/ft²/day

F2

If result is less than 0.2 gal/ft²/day a treatment field cannot be used. Article 8.2.1.13. (1) Page 85

Note: Effluent loading rate MUST be determined from soil texture, structure, and grade classification according to Imperial Table A.1.E.1. (p.129) (For metric measurement use Table 8.1.1.10 on Page 79)

Step 3) Calculate optional credits for effluent loading rate:

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

Refer to Article 8.1.1.4. (1)a) and 8.1.1.4. (1)d) p. 75 & 76.

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	<input type="text"/> From F2	X	<input type="text" value="1"/>	=	<input type="text"/> ELR	F3
OR						
Pipe & Rock - Pressure Distribution	<input type="text"/> From F2	X	<input type="text" value="1.2"/>	=	<input type="text"/> ELR	F3A
OR						
Chambers - Gravity Distribution ¹	<input type="text"/> From F2	X	<input type="text" value="1.1"/>	=	<input type="text"/> ELR	F3B
OR						
Chambers - Pressure Distribution ¹	<input type="text"/> From F2	X	<input type="text" value="1.3"/>	=	<input type="text"/> ELR	F3C

*****See Article 8.2.1.8.1) regarding calculation of trench bottom using gravel. Page 84 AB SOP 2015. See Article 8.3.1.5.(1) regarding calculation of trench bottom area using chambers. Page 90 AB SOP 2015*****

Note: Ensure infiltration loading rate chosen does not exceed loading rates as set out in 8.1.2.2. (p. 81).

Step 4) Calculate the minimum required infiltration surface area for the soil using adjusted effluent loading rates:

Expected Peak Volume of Sewage per day <input style="width: 100%; height: 20px;" type="text"/> Imp. gal/day From F1	÷	Effluent Loading Rate with Factor Applied <input style="width: 100%; height: 20px;" type="text"/> Imp. gal/ft ² /day From F3, F3A ,F3B or F3C	=	Minimum Soil Infiltration Area Required <input style="width: 100%; height: 20px;" type="text"/> ft ²	F4
--	---	---	---	---	-----------

Step 5) Type and width of trench bottom used:

Actual Pipe & Rock Trench Width in inches. <input style="width: 100%; height: 20px;" type="text"/> inches	÷	<input style="width: 100%; height: 20px; text-align: center; border: 1px solid black;" type="text" value="12"/>	=	<input style="width: 100%; height: 20px;" type="text"/> feet	F5
Actual Chamber Width in inches <input style="width: 100%; height: 20px;" type="text"/> inches	÷	<input style="width: 100%; height: 20px; text-align: center; border: 1px solid black;" type="text" value="12"/>	=	<input style="width: 100%; height: 20px;" type="text"/> feet	F5A

Note: Chamber width is calculated using the exterior width at the base of the chamber. (Article 8.3.1.4, p. 90)

Step 6) Determine total weeping lateral trench length required:

Infiltration Area Required <input style="width: 100%; height: 20px;" type="text"/> ft ² From F4	÷	Width of Trench <input style="width: 100%; height: 20px;" type="text"/> ft From F5 or F5A	=	Minimum Weeping Lateral Trench Length Required <input style="width: 100%; height: 20px;" type="text"/> feet	F6
--	---	---	---	--	-----------

Step 7) Select number of weeping lateral trenches and determine length of each of trench:

Minimum Weeping Lateral Trench Length Required <input style="width: 100%; height: 20px;" type="text"/> ft From F6	÷	Number of Weeping Lateral Trenches Required <input style="width: 100%; height: 20px;" type="text"/> F7 See Note Below ²	=	Minimum Length of Each Weeping Lateral Trench <input style="width: 100%; height: 20px;" type="text"/> feet	F8
---	---	--	---	---	-----------

² Refer to Article 8.2.1.12. (p.84) Treatment Field Layout with regards to Linear Loading and potential for groundwater mounding

Step 8) Summary:

F1	<input style="width: 100%; height: 20px;" type="text"/>	Imp gal/day - Peak Daily Flow, including any additional fixtures.
F2	<input style="width: 100%; height: 20px;" type="text"/>	Imp gal/ft ² /day - Soil Effluent Loading Rate.
F3 - F3C	<input style="width: 100%; height: 20px;" type="text"/>	Imp gal/ft ² /day - Effluent Loading Rate with Factor Applied
F4	<input style="width: 100%; height: 20px;" type="text"/>	Ft ² - Minimum Soil Infiltration Area Required
F5 or F5A	<input style="width: 100%; height: 20px;" type="text"/>	Ft - Actual Width of Gravel Trench or Chambers.
F6	<input style="width: 100%; height: 20px;" type="text"/>	Ft - MINIMUM Weeping Lateral Trench Length Required.
F7	<input style="width: 100%; height: 20px;" type="text"/>	Total Number of Weeping Lateral Trenches.
F8	<input style="width: 100%; height: 20px;" type="text"/>	Ft - Length of Each Weeping Lateral Trench.