

On December 1, 2015, the Safety Codes Council published the Alberta Private Sewage Systems Standard of Practice 2015 (2015 SOP). The 2015 SOP replaces the version previously published in 2009. Chamber-related amendments in the 2015 SOP include:

- Shifting from internal to external width to calculate the effective soil infiltration surface
- Removing the 3.0-ft (0.9-m) limitation on effective soil infiltration surface
- Removing the 2-in (50-mm) stone layer requirement beneath chambers in mounds
- Establishing effective infiltration surface multipliers as shown in the table below

Chamber Application	Effluent Loading Rate Factors (Article 8.3.1.5)
Primary Level 1 Gravity	1.1
Primary Level 1 Pressure	1.3
Secondary Pressure	1.1
Secondary + Timed Dosing	1.2

Article 8.3.2.1 of the 2015 SOP requires chamber systems to be installed in accordance with the manufacturer's instructions and 2015 SOP requirements. A new 2015 SOP requirement is an energy dissipation mechanism for systems that do not have a pipe running the length of the chambers, per Article 8.3.2.3. This mechanism may include:

- Geotextile fabric or a minimum of 2-in (50-mm) gravel layer covering the upstream 5 ft (1.5 m) of the trench or other area receiving effluent; or
- Other suitable means of hydraulic energy dissipation.

Example system sizing calculations are provided on the following page for Infiltrator's Quick4 Plus Equalizer 36 LP, Quick4 Equalizer 36, Quick4 Plus Standard LP, and Quick4 Standard chambers in four installation applications. The removal of the 3-ft (0.9-m) limitation on effective soil infiltration surface for a chamber expands the potential applications for which the 34-inch-wide (0.86-m-wide) Quick4 Plus Standard LP and Quick4 Standard chamber models can be used. Chamber exterior widths are provided in the table below.

Chamber Model	Exterior Width (ft [m])
Quick4 Standard Quick4 Plus Standard LP Arc 36 Arc 36 LP	2.83 (0.86)
Quick4 Equalizer 36 Quick4 Equalizer 36 LP Arc 24	1.83 (0.56)

# System Design

## Design Examples

Bedrooms.....4  
 Soil Texture.....Silty Loam  
 Soil Shape .....Blocky (BK)  
 Soil Grade.....Weak (1)

### Quick4 Plus Equalizer 36 LP and Quick4 Equalizer 36 (width = 1.83 ft [0.56 m])

Method of Distribution	Gravity	Pressure Dosed		Time Dosed
Pretreatment Level	Primary	Primary	Secondary	Secondary
Effluent Hydraulic Loading Rate (igpd/ft <sup>2</sup> [lpd/m <sup>2</sup> ])	0.30 [14.7]	0.30 [14.7]	0.45 [22.0]	0.45 [22.0]
Loading Rate Factor	1.1	1.3	1.1	1.2
Effective Hydraulic Loading Rate (igpd/ft <sup>2</sup> [lpd/m <sup>2</sup> ])	0.33 [16.2]	0.39 [19.1]	0.49 [24.2]	0.54 [26.4]
Area Required (ft <sup>2</sup> [m <sup>2</sup> ])	1,362 [126]	1,152 [107]	910 [84]	834 [77]
Minimum Trench Length (ft [m])	743 [226]	629 [191]	496 [151]	455 [138]
Number of Chambers Required	186	158	125	114

### Quick4 Plus Standard LP or Quick4 Standard (width = 2.83 ft [0.86 m])

Method of Distribution	Gravity	Pressure Dosed		Time Dosed
Pretreatment Level	Primary	Primary	Secondary	Secondary
Effluent Hydraulic Loading Rate (igpd/ft <sup>2</sup> [lpd/m <sup>2</sup> ])	0.30 [14.7]	0.30 [14.7]	0.45 [22.0]	0.45 [22.0]
Loading Rate Factor	1.1	1.3	1.1	1.2
Effective Hydraulic Loading Rate (igpd/ft <sup>2</sup> [lpd/m <sup>2</sup> ])	0.33 [16.2]	0.39 [19.1]	0.49 [24.2]	0.54 [26.4]
Area Required (ft <sup>2</sup> [m <sup>2</sup> ])	1,362 [126]	1,152 [107]	910 [84]	834 [77]
Minimum Trench Length (ft [m])	481 [146]	407 [124]	321 [98]	294 [89]
Number of Chambers Required	121	102	81	74

### Sample Calculation – Quick4 Standard, gravity distribution

Effluent Hydraulic Loading Rate = 0.30 igpd/ft<sup>2</sup> [14.7 lpd/m<sup>2</sup>] (SOP Table 8.1.1.10.)

Loading Rate Factor = 1.1

Product Width = 2.83 ft

Effective Product Length = 4 ft

$$\text{Flow Rate} = 4 \text{ bedrooms} \times 1.5 \frac{\text{pp}}{\text{bedroom}} \times 75 \frac{\text{igpd}}{\text{pp}} = 450 \text{ igpd}$$

$$\text{Effective Hydraulic Loading Rate} = 0.30 \text{ igpd/ft}^2 \times 1.1 = 0.33 \text{ igpd/ft}^2$$

$$\text{Effluent Soil Infiltration Surface Area} = \frac{450 \text{ igpd}}{0.33 \text{ igpd/ft}^2} = 1,362 \text{ ft}^2$$

$$\text{Minimum Trench Length} = \frac{1,362 \text{ ft}^2}{2.83 \text{ ft}} = 481 \text{ ft}$$

$$\text{Number of Chambers Required} = \frac{481 \text{ ft}}{4 \text{ ft/chamber}} = 121 \text{ chambers}$$