

Manitoba Sizing Chart for 24" Wide Trench Fields to be used with Soil Texture Classification Triangle

		Number of Bedrooms (igpd shown below bedrooms) - Length of Trench (feet)														
		Stone Trench (24"W x 12"H)					Stone Trench (24"W x 18"H)					Stone Trench (24"W x 24"H)				
Soil Type	App. Rate (igpd/sf)	2 220	3 330	4 440	5 550	Each Add. BR	2 220	3 330	4 440	5 550	Each Add. BR	2 220	3 330	4 440	5 550	Each Add. BR
Sand - modified surface/subsurface systems	0.60	122	183	244	306	61	105	157	210	262	35	92	138	183	229	31
Loamy Sand	0.60	122	183	244	306	61	105	157	210	262	35	92	138	183	229	31
Sandy Loam	0.45	163	244	326	407	81	140	210	279	349	47	122	183	244	306	41
Loam	0.34	216	324	431	539	108	185	277	370	462	62	162	243	324	404	54
Silt Loam	0.28	262	393	524	655	131	224	337	449	561	75	196	295	393	491	65
Sandy Clay Loam	0.28	262	393	524	655	131	224	337	449	561	75	196	295	393	491	65
Silt	0.26	282	423	564	705	141	242	363	484	604	81	212	317	423	529	71
Clay Loam	0.22	333	500	667	833	167	286	429	571	714	95	250	375	500	625	83
Silty Clay Loam	0.18	407	611	815	1019	204	349	524	698	873	116	306	458	611	764	102
Sandy Clay	0.18	407	611	815	1019	204	349	524	698	873	116	306	458	611	764	102
Silty Clay	0.17	431	647	863	1078	216	370	555	739	924	123	324	485	647	809	108
Clay	0.17	431	647	863	1078	216	370	555	739	924	123	324	485	647	809	108
Sandy Clay	0.17	431	647	863	1078	216	370	555	739	924	123	324	485	647	809	108
Heavy Clay	Modified aboveground system. See soil texture classification matrix.															

Length of System (feet)

Notes:

- Length of trench is calculated based on loading rates defined in the EPA Design Manual: "Onsite Wastewater Treatment and Disposal".
(the application rate (gpd/sf) has been reduced from 1.2 to 0.8 in coarse to medium sands and from 1.0 to 0.7 in fine to loamy sands based on current research).

Stone Trench Rating (24"W x 12"H) = 3 sq. ft./ ft.

Stone Trench Rating (24"W x 18"H) = 3.5 sq. ft./ ft.

Stone Trench Rating (24"W x 24"H) = 4 sq. ft./ ft.

- The minimum size home for wastewater system design shall be a 2 bedroom house.
- Length of System Based upon the following: Length of Trench = (Daily Sewage Flow)/[(Application Rate) x (Application Area)]
 Length of Trench (ft) - lineal length of trench required for field
 Daily Sewage Flow (igpd) - volume produced on a daily basis, 110 igpd/bedroom
 Application Rate (igpd/sq. ft.) - application rate given, based upon US EPA
 Application Area (sq. ft.) - area of base of trench plus area of .5 of height of trench

Table 1: 24" Stone Trench - Imperial

Manitoba Sizing Chart for 36" Wide Trench Fields to be used with Soil Texture Classification Triangle

		Number of Bedrooms (igpd shown below bedrooms) - Length of Trench (feet)														
		Stone Trench (36"W x 12"H)					Stone Trench (36"W x 18"H)					Stone Trench (36"W x 24"H)				
Soil Type	App. Rate (igpd/sf)	2 220	3 330	4 440	5 550	Each Add. BR	2 220	3 330	4 440	5 550	Each Add. BR	2 220	3 330	4 440	5 550	Each Add. BR
Sand - modified surface/subsurface systems	0.60	92	138	183	229	31	81	122	163	204	27	73	110	147	183	24
Loamy Sand	0.60	92	138	183	229	31	81	122	163	204	27	73	110	147	183	24
Sandy Loam	0.45	122	183	244	306	41	109	163	217	272	36	98	147	196	244	33
Loam	0.34	162	243	324	404	54	144	216	288	359	48	129	194	259	324	43
Silt Loam	0.28	196	295	393	491	65	175	262	349	437	58	157	236	314	393	52
Sandy Clay Loam	0.28	196	295	393	491	65	175	262	349	437	58	157	236	314	393	52
Silt	0.26	212	317	423	529	71	188	282	376	470	63	169	254	338	423	56
Clay Loam	0.22	250	375	500	625	83	222	333	444	556	74	200	300	400	500	67
Silty Clay Loam	0.18	306	458	611	764	102	272	407	543	679	91	244	367	489	611	81
Sandy Clay Loam	0.18	306	458	611	764	102	272	407	543	679	91	244	367	489	611	81
Silty Clay	0.17	324	485	647	809	108	288	431	575	719	96	259	388	518	647	86
Clay	0.17	324	485	647	809	108	288	431	575	719	96	259	388	518	647	86
Sandy Clay	0.17	324	485	647	809	108	288	431	575	719	96	259	388	518	647	86
Heavy Clay	Modified aboveground system. See soil texture classification matrix.															

Notes:

1. Length of trench is calculated based on loading rates defined in the EPA Design Manual: "Onsite Wastewater Treatment and Disposal".
(the application rate (igpd/sf) has been reduced from 1.2 to 0.8 in coarse to medium sands and from 1.0 to 0.7 in fine to loamy sands based on current research).
 - Stone Trench Rating (36"W x 12"H) = 4 sq. ft./ft.
 - Stone Trench Rating (36"W x 18"H) = 4.5 sq. ft./ ft.
 - Stone Trench Rating (36"W x 24"H) = 5 sq. ft./ ft.
2. The minimum size home for wastewater system design shall be a 2 bedroom house.
3. Length of System Based upon the following: Length of Trench = (Daily Sewage Flow)/[(Application Rate) x (Application Area)]
 - Length of Trench (ft) - lineal length of trench required for field
 - Daily Sewage Flow (igpd) - volume produced on a daily basis, 110 igpd/bedroom
 - Application Rate (igpd/sq. ft.) - application rate given, based upon US EPA
 - Application Area (sq. ft.) - area of base of trench plus area of .5 of height of trench

Table 2: 36" Stone Trench - Imperial

Manitoba Infiltrator[®] Chamber Sizing Chart for Trench Fields to be used with Soil Texture Classification Triangle

		Number of Bedrooms (igpd shown below bedrooms) - Length of Trench (feet)														
		Quick4 Equalizer [®] 36					Quick 4 Standard					Quick 4 High Capacity				
Soil Type	App. Rate (igpd/sf)	2	3	4	5	Each Add. BR	2	3	4	5	Each Add. BR	2	3	4	5	Each Add. BR
Sand - modified surface/ subsurface systems	0.60	105	157	210	262	35	85	128	171	213	28	76	115	153	191	51
Loamy Sand	0.60	105	157	210	262	35	85	128	171	213	28	76	115	153	191	51
Sandy Loam	0.45	140	210	279	349	47	114	171	227	284	38	102	153	204	255	68
Loam	0.34	185	277	370	462	62	150	226	301	376	50	135	202	270	337	90
Silt Loam	0.28	224	337	449	561	75	183	274	365	457	61	164	246	327	409	109
Sandy Clay Loam	0.28	224	337	449	561	75	183	274	365	457	61	164	246	327	409	109
Silt	0.26	242	363	484	604	81	197	295	394	492	66	176	264	353	441	118
Clay Loam	0.22	286	429	571	714	95	233	349	465	581	78	208	313	417	521	139
Silty Clay Loam	0.18	349	524	698	873	116	284	426	568	711	95	255	382	509	637	170
Sandy Clay	0.18	349	524	698	873	116	284	426	568	711	95	255	382	509	637	170
Silty Clay	0.17	370	555	739	924	123	301	451	602	752	100	270	404	539	674	180
Clay	0.17	370	555	739	924	123	301	451	602	752	100	270	404	539	674	180
Sandy Clay	0.17	370	555	739	924	123	301	451	602	752	100	270	404	539	674	180
Heavy Clay	Modified aboveground system. See soil texture classification matrix.															

Notes:

1. Number of chambers is calculated based on loading rates defined in the EPA Design Manual: "Onsite Wastewater Treatment and Disposal" and the following chamber equivalencies: (the application rate (gpd/sf) has been reduced from 1.2 to 0.8 in coarse to medium sands and from 1.0 to 0.7 in fine to loamy sands based on current research).

- Q4 EQ36 Rating = 3.5 sf.kf
- Q4 Standard Rating = 4.3 sf/lf
- Q4 High Capacity = 4.8 sf/lf

2. The minimum size home for wastewater system design shall be a 2 bedroom house.

3. Length of System Based upon the following: Length of Trench = (Daily Sewage Flow)/[(Application Rate) x (Application Area)]

- Length of Trench (ft) - lineal length of trench required for field
- Daily Sewage Flow (igpd) - volume produced on a daily basis, 110 igpd/bedroom
- Application Rate (igpd/sq. ft.) - application rate given, based upon US EPA
- Application Area (sq. ft.) - area of base of trench plus area of .5 of height of trench

Table 3: Infiltrator[®] Chamber - Imperial

ARC 24 Chamber System Sizing for Trench Fields to be used with Soil Texture Classification Triangle

ARC 24 dimensions are 22.5"W x 2" H x 5' L Length of Trenches (Feet)											
Soil Type		Perc Rate	Application Rate		2 Bdrm 220 gpd	3 Bdrm 330 gpd	4 Bdrm 440 gpd	5 Bdrm 550 gpd	Each Add'l Bdrm		
			(min/inch)	(igpd/sq.ft.)						(lpd/sq.m)	
(n) Sand 85-100%	Modified Subsurface System ¹	1-8	0.60	29.35	105	157	210	262	35		
(m) Loamy Sand	Traditional Subsurface Chamber Systems	9-15	0.60	29.35	105	157	210	262	35		
		16-20	0.55	26.90	114	171	229	266	38		
(l) Sandy Loam		21-25	0.50	24.45	126	189	251	314	42		
		26-30	0.45	22.02	140	210	279	349	47		
		31-35	0.41	20.10	153	230	307	383	51		
		36-40	0.37	18.10	170	255	240	425	57		
(i) Loamy Sand		41-45	0.34	16.63	185	277	270	462	62		
		46-50	0.31	15.16	203	304	406	507	68		
(j) Silty Loam			51-55	0.28	13.70	224	337	449	561	75	
(h) Clay Loam			(g) Clay Loam	56-60	0.26	12.72	242	363	484	604	81
(k) Silt				61-65	0.24	11.75	262	393	524	655	87
				66-70	0.22	10.76	286	429	571	714	95
(f) Silty Clay Loam	71-75			0.20	9.78	314	471	629	786	105	
	76-80		0.18	8.80	349	524	698	873	116		
(e) Sandy Clay <35-40%	Modified System ¹		81-120	0.17	8.31	370	555	739	924	123	
(d) Sandy Clay 40-60%											
(c) Silty Clay 40-60% Clay											
(b) Clay 40-60% Clay	Modified Above Ground System ²	>120									
(a) Heavy Clay >60-100% Clay											

Notes:

1. Number of chambers is calculated based on loading rates defined in the EPA Design Manual: "Onsite Wastewater Treatment and Disposal" and the following chamber equivalencies: (the application rate (gpd/sf) has been reduced from 1.2 to 0.8 in coarse to medium sands and from 1.0 to 0.7 in fine to loamy sands based on current research).
ARC 24 Rating = 3.5 sf.kf
2. The minimum size home for wastewater system design shall be a 2 bedroom house.
3. Length of System Based upon the following: Length of Trench = (Daily Sewage Flow) / (Application Rate) x (Application Area)]
 Length of Trench (ft) - lineal length of trench required for field
 Daily Sewage Flow (igpd) - volume produced on a daily basis, 110 igpd/bedroom
 Application Rate (igpd/sq. ft.) - application rate given, based upon US EPA
 Application Area (sq. ft.) - area of base of trench plus area of .5 of height of trench

^{1 & 2} See soil texture classification matrix

Table 4: ARC 24

ARC 36 Chamber System Sizing for Trench Fields to be used with Soil Texture Classification Triangle

Soil Type		ARC 36 Length of Trenches (Feet)								
		Perc Rate	Application Rate		2 Bdrm 220 gpd	3 Bdrm 330 gpd	4 Bdrm 440 gpd	5 Bdrm 550 gpd	Each Add'l Bdrm	
			(min/inch)	(igpd/sq.ft.)						(lpd/sq.m)
(n) Sand 85-100%	Modified Subsurface System ¹	1-8	0.60	29.35	85	128	171	213	28	
(m) Loamy Sand	Traditional Subsurface Chamber Systems	9-15	0.60	29.35	85	128	171	213	28	
		16-20	0.55	26.90	93	140	186	233	31	
(l) Sandy Loam		21-25	0.50	24.45	102	153	205	256	34	
		26-30	0.45	22.02	114	171	227	284	38	
		31-35	0.41	20.10	125	187	250	312	42	
		36-40	0.37	18.10	138	207	277	346	46	
(i) Loamy Sand		41-45	0.34	16.63	150	226	301	376	50	
		46-50	0.31	15.16	203	248	330	413	55	
(j) Silty Loam		51-55	0.28	13.70	183	274	365	457	61	
(h) Clay Loam		56-60	0.26	12.72	197	295	394	492	66	
(k) Silt			61-65	0.24	11.75	213	320	426	533	71
			66-70	0.22	10.76	233	349	465	581	78
			71-75	0.20	9.78	256	384	512	640	85
(g) Clay Loam		76-80	0.18	8.80	284	426	568	711	95	
(f) Silty Clay Loam	Modified System ¹	81-120	0.17	8.31	301	451	602	752	100	
(e) Sandy Clay <35-40%										
(d) Sandy Clay 40-60%										
(c) Silty Clay 40-60% Clay										
(b) Clay 40-60% Clay	Modified Above Ground System ²	>120								
(a) Heavy Clay >60-100% Clay										

^{1 & 2} See soil texture classification matrix

ARC 36 dimensions are 34.5" W x 13" H x 5' L

Table 4(a): ARC 36

July 2010

ARC 36HC Chamber System Sizing for Trench Fields to be used with Soil Texture Classification Triangle

Soil Type		ARC 36HC Length of Trenches (Feet)								
		Perc Rate	Application Rate		2 Bdrm 220 gpd	3 Bdrm 330 gpd	4 Bdrm 440 gpd	5 Bdrm 550 gpd	Each Add'l Bdrm	
			(min/inch)	(igpd/sq.ft.)						(lpd/sq.m)
(n) Sand 85-100%	Modified Subsurface System ¹	1-8	0.60	29.35	76	115	153	191	51	
(m) Loamy Sand	Traditional Subsurface Chamber Systems	9-15	0.60	29.35	76	115	153	191	51	
		16-20	0.55	26.90	83	125	167	208	56	
(l) Sandy Loam		21-25	0.50	24.45	92	138	183	229	61	
		26-30	0.45	22.02	102	153	204	255	68	
		31-35	0.41	20.10	112	168	224	279	75	
		36-40	0.37	18.10	124	186	248	310	83	
(i) Loamy Sand		41-45	0.34	16.63	135	202	270	337	90	
		46-50	0.31	15.16	148	222	296	370	99	
(j) Silty Loam		51-55	0.28	13.70	164	246	327	409	109	
(h) Clay Loam		56-60	0.26	12.72	176	264	353	441	118	
(k) Silt			61-65	0.24	11.75	191	286	382	477	127
			66-70	0.22	10.76	208	313	417	521	139
			71-75	0.20	9.78	229	344	458	573	153
(g) Clay Loam		76-80	0.18	8.80	255	382	509	637	170	
(f) Silty Clay Loam	Modified System ¹	81-120	0.17	8.31	270	404	539	674	180	
(e) Sandy Clay <35-40%										
(d) Sandy Clay 40-60%										
(c) Silty Clay 40-60% Clay										
(b) Clay 40-60% Clay	Modified Above Ground System ²	>120								
(a) Heavy Clay >60-100% Clay										

^{1 & 2} See soil texture classification matrix

ARC 36HC dimensions are 34.5" W x 16" H x 5' L

Table 4(b): ARC 36HC

July 2010

ARC Chamber System Sizing for Total Area Fields to be used with Soil Texture Classification Triangle

			Chamber Total Area System (Area of Field in Square Feet)					
Soil Type		Perc Rate (min/inch)	App. Rate (igpd/sf)	2 200	3 330	4 440	5 550	Each Add'l BR
Coarse to Medium Sand	Modified Surface/ Subsurface Systems	1-5	0.60	550	825	1100	1375	275
		6-10	0.60	550	825	1100	1375	275
Fine Sand Sandy Loam		11-15	0.60	550	825	1100	1375	275
		16-20	0.55	600	900	1200	1500	300
		21-25	0.50	660	990	1320	1650	330
		26-30	0.45	733	1100	1467	1833	367
Silty Loam		31-35	0.41	805	1207	1610	2012	402
		36-40	0.37	892	1338	1784	2230	446
		41-45	0.34	971	1456	1941	2456	485
		46-50	0.31	1065	1597	2129	2661	532
		51-55	0.28	1179	1768	2357	2946	589
		56-60	0.26	1269	1904	2538	3173	635

ARC Chamber Ratings (sf/chamber):

ARC 24: 17.5 sf/chamber(3.5 sf/lin.ft.)

ARC 36: 21.5 sf/chamber(4.3 sf/lin.ft.)

ARC 36HC: 24.0 sf/chamber(4.8 sf/lin.ft.)

$$\text{Area of Field} = \frac{\text{Daily Sewage Flow} \times \text{Safety Factor}}{\text{Application Rate}}$$

Area of Field (sq.ft.) – total required disposal field surface area

Daily Effluent Flow (igpd) – volume produced on a daily basis, 110 igpd/bedroom

Application Rate (igpd/sq.ft.) – application rate of the soil, based upon US EPA

Safety factor – 2.0 for graded stone and pipe systems; 1.5 for chamber/aggregate-free systems

Glossary: min/inch – minutes per inch
 Igpd - imperial gallons per day
 igpd/sf – imperial gallons per day per square foot
 BR - bedroom

Table 4(c): ARC Total Area Fields

July 2010

Manitoba Sizing Chart for Total Area Fields to be used with Soil Texture Classification Triangle

		Number of Bedrooms (igpd)									
		Stone Total Area System					Chamber Total Area System				
		Area of Field (sq.ft.) + cubic yards of stone required					Area of Field (sq.ft.)				
Soil Type	App. Rate (igpd/sf)	2	3	4	5	Each Add. BR	2	3	4	5	Each Add. BR
Sand - modified surface/ subsurface systems	0.60	733 75	1100 110	1467 145	1833	367	550	825	1100	1375	275
Loamy Sand	0.60	733 75	1100 110	1467 145	1833	367	550	825	1100	1375	275
Sandy Loam	0.45	978 95	1467 145	1956 190	2444	489	733	1100	1467	1833	367
Loam	0.34	1294 130	1941 190	2588 256	3235	647	971	1456	1941	2426	485
Silt Loam	0.28	1571 155	2357 235	3143 310	3929	786	1179	1768	2357	2946	589
Sandy Clay Loam	0.28	1571 155	2357 235	3143 310	3929	786	1179	1768	2357	2946	589
Silt	0.26	1692 170	2538 250	3385 335	4231	846	1269	1904	2538	3173	635

Notes:

1. Total Area Field is calculated based on loading rates defined in the EPA Design Manual: "Onsite Wastewater Treatment and Disposal".
(the application rate (gpd/sf) has been reduced from 1.2 to 0.8 in coarse to medium sands and from 1.0 to 0.7 in fine to loamy sands based on current research).
2. The minimum size home for wastewater system design shall be a 2 bedroom house.
3. Area of Field Based upon the following: Area of Field = (Daily Effluent Flow) x (Safety Factor) / (Application Rate)
 Area of Field (sq.ft.) - total required disposal field surface area
 Daily Effluent Flow (igpd) - volume produced on a daily basis, 110 igpd/bedroom
 Application Rate (igpd/sq. ft.) - application rate given, based upon US EPA
 Safety Factor - is a factor of 2.0 for graded stone and pipe systems and 1.5 for chamber/aggregate-free systems

Table 5: Total Area - Imperial