



**SCHEDULE C to By-Law 91-2021**

**Design Calculations For Class 2, 4, & 5 ON-SITE Sewage Systems.**

<b>Owner/Address:</b>	<b>Designer:</b>	<b>Installer:</b>
	<b>BCIN #:</b>	<b>BCIN #:</b>

**STEP 1 - DAILY SEWAGE FLOW** (Based on Hydraulic Loads for Fixtures, Floor Area, and Bedrooms)

Plumbing Fixture Description	Existing # of Fixtures	Proposed # of Fixtures	Hydraulic Load	Fixture Units	All calculations as per Part 8 of Ontario Building Code	
Bathroom group (toilet, sink, bathtub)			6			
Toilet			4		<b>Proposed(m<sup>2</sup>):</b>	
Washbasin			1.5		<b>Proposed(ft<sup>2</sup>):</b>	
Bathtub or Shower			1.5		<b>Existing(m<sup>2</sup>):</b>	
Kitchen Sink(s)			1.5		<b>Existing(ft<sup>2</sup>):</b>	
Bar Sink			1.5		<b>Total Finished Floor Area Excluding Area of Finished Basement:</b>	
Dishwasher			1.5			
Washing Machine			1.5			
Bidet			1		<b>m<sup>2</sup>:</b>	
Laundry Tub			1.5		<b>ft<sup>2</sup>:</b>	
Other:						
<b>TOTAL FIXTURE UNITS</b>						

**Residential Occupancy**

Number of bedrooms	1	2	3	4	5
<b>Q (L/day)</b>	750	1100	1600	2000	2500

If you have more than 5 bedrooms, put 5 in the existing number of bedrooms and add additional bedrooms under additional flow for each bedroom over 5

Existing Number of Bedrooms	Additional Bedrooms	Hydraulic Load, Q (L)	Calculation

Additional Flow For:	Existing	Proposed	Q (L/day)	Calculation
Each Bedroom over 5 <b>OR*</b>			500	
Floor space for each 10m <sup>2</sup> over 200m <sup>2</sup> up to 400m <sup>2</sup>			100	
Floor space for each 10m <sup>2</sup> over 400m <sup>2</sup> up to 600m <sup>2</sup>			75	
Floor Space for each 10m <sup>2</sup> over 600m <sup>2</sup> <b>OR*</b>			50	
Each fixture unit over 20 fixture units total			50	
<b>TOTAL (L) =</b>				

\*NOTE: where you need to do multiple calculations, signified by the "OR" in the table, do the calculation for daily sewage flow based on bedrooms and floor space first, then fixture units, and use the larger of the two calculations.

**Other Occupancy (Table 8.2.1.3 (B))**

Establishment: (office, store, etc.)	Volume/Unit :	Occupant Load :	Volume (L) :

**EXPECTED DAILY DESIGN SEWAGE FLOW(Q):**

**STEP 2 - PROPERTY SOIL PROFILE AND PERCOLATION RATE (T) DESCRIPTION**

Percolation rate (T) is measured as minutes/centimetre, and measures the rate at which water drains into the soil. Please indicate the T-time of your site below as calculated by a qualified person.

Soil Type	(1) Coarse Gravel, no fines	(2) Gravel, some small rocks	(3) Gravel, sand mix, some fines	(4) Sand, fairly uniform, some fines	(5) Sandy, Loam mix	(6) Silty, Loam, almost clay	(7) Clay, smears well, rolls into ribbon
T-time (min/cm)	0 to 1	1 to 5	5 to 10	10 to 15	15 to 25	25 to 50	> 50

**ON\_SITE PROFILE (SUBTRACT USEABLE DEPTH OF SOIL FROM 1.5m FOR DEPTH OF IMPORTED FILL)**

Select largest percolation rate (T) for appropriate soil type and insert below

Soil Depth (m)	Percolation Rate T	Soil Type
0.2		
0.4		
0.6		
0.8		
1.0		
1.2		
1.4		
1.6		

**Fill in the following:**

Depth of Soil / Impervious Soil / Groundwater Table(m):	
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Fill in the following information on your soil

	Depth (m)	Depth (ft)	Rate (min/cm)
<b>Topsoil to be removed:</b>			
<b>Usable Existing Soil:</b>			
<b>Imported Fill:</b>			
<b>Percolation Rate (T):</b>			
<b>Excavation of existing soil:</b>			

**CONTACT AREA CALCULATION**

If you do not have a minimum of 250mm of useable soil on the property, you will need to import the mantle or contact area. Choose T and, divide Q by Loading Rate for T

Percolation Time (T) of soil (min/cm)	Loading Rate (L/m <sup>2</sup> /day)
1 < T ≤ 20	10
20 < T ≤ 35	8
35 < T ≤ 50	6
T > 50	4

<b>DAILY SEWAGE FLOW (Q):</b>	÷	<b>Loading Rate (L/m<sup>2</sup>/day)</b>	=	<b>CONTACT AREA (m<sup>2</sup>)</b>
	÷		=	

**STEP 3 - A) SEPTIC TANK SIZE CALCULATION**

To calculate the minimum capacity of your septic tank, use the following formulas. Minimum tank size is 3600L.

<b>Residential:</b>	Q=	2XQ=	Tank Size:	
<b>Other Occupants:</b>	Q=	3XQ=	Tank Size:	

**B) LEACHING BED LENGTH CALCULATION (conventional)**

<b>Length (m)= (Q X T)/200</b>		<b>Length of Pipe (ft )=</b>	
<b>Number of Runs (m):</b>		<b>D-BOX (Y/N):</b>	<b>Header (Y/N):</b>

**C) FILTER BED** - Where you may not have sufficient area on your property to install a leaching bed, you may install a filter bed for your distribution system

**FILTER BED CALCULATION** - If your daily sewage flow is less than 3000L/day, perform calculation 1), or if your daily sewage flow exceeds 3000L/day, perform calculation 2).

**Calculation 1) - Filter Bed Surface Area**

Surface Area (m<sup>2</sup>) = Q ÷ 75

Q = \_\_\_\_\_  
 SA = \_\_\_\_\_

**FILTER BED SURFACE AREA (m<sup>2</sup>)**  
 =  
**FILTER BED SURFACE AREA (ft<sup>2</sup>)**  
 =

**Calculation 2) - Filter Bed Surface Area**

Surface Area (m<sup>2</sup>) = Q ÷ 50

Q = \_\_\_\_\_  
 SA = \_\_\_\_\_

**FILTER BED SURFACE AREA (m<sup>2</sup>)**  
 =  
**FILTER BED SURFACE AREA (ft<sup>2</sup>)**  
 =

Select a desired length for the filter bed

<b>Filter Bed Loading Area (m<sup>2</sup>):</b>		<b>Length (m):</b>		<b>Width (m):</b>	
<b>Filter Bed Loading Area (ft<sup>2</sup>):</b>		<b>Length (ft):</b>		<b>Width (ft):</b>	

**EXTENDED CONTACT AREA - T>11.5**

Contact Area = (QXT)/850

Q = \_\_\_\_\_  
 T = \_\_\_\_\_

**EXTENDED CONTACT AREA (m<sup>2</sup>)**  
 =  
**EXTENDED CONTACT AREA (ft<sup>2</sup>)**  
 =

**DESIGN CALCULATIONS FOR A CLASS 2 SEWAGE SYSTEM**

Refer to Sizing a Grey Water System located at the end of the description for a Class 2 - Leaching Pit system located on the APH website at [www.algomapublichealth.com](http://www.algomapublichealth.com)

**D) GREYWATER SYSTEM -CLASS 2**

**1) How much Grey Water Waste?**

Do you have pressurized(P) or non-pressurized(N) water? (P/N)			
Type of System	Number of Fixture Units	Volume/Unit (L)	Grey Water Waste, Q (L)

**IF Grey Water Waste(Q) is greater than 1000L, a grey water system cannot be used.**

**2) Loading Rate (LR)**

Loading Rate =  $400/T$

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T = \_\_\_\_\_

Loading Rate = \_\_\_\_\_

**LOADING RATE (L/m<sup>2</sup>/day)**  
=

**3) Size of System**

Size of System =  $Q / LR$

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Q = \_\_\_\_\_

LR = \_\_\_\_\_

**SIZE OF SYSTEM (m<sup>2</sup>)**  
=

**DESIGN CALCULATIONS FOR A CLASS 5 SEWAGE SYSTEM**

**E) Holding Tank - Class 5**

In order to calculate the capacity of your proposed holding tank, you must perform the following two calculations, and install a holding tank(s) with a capacity of the greater volume

<b>Minimum Holding Tank Capacity (L) =</b>	9000
<b>Seven(7) X Daily Sewage Flow, Q (L) =</b>	
<b>MINIMUM HOLDING TANK CAPACITY (L)=</b>	