Renfrew
INC • 1858
Bridging Charm and Convenience

INDIVIDUAL SEWAGE TREATMENT WORKSHEET

(For Sanitary sewage system of less than 10,000 Litres/day)
On Completion the Diagram is to be provided to the Building Department

STEP 1- DETERMINING NUMBER OF FIXTURE UNITS

A fixture unit is a unit of measure used to determine the hydraulic (water) loading of any water-generating fixture.
Determine the number of fixture units in your home by using the below table.
You MUST include all fixtures in the house even if they will be installed in the future (i.e. roughed-in plumbing, sauna, etc.)

	No. in house	X Fixture unit	=	Total No. of Fixtures
Any full bathroom groups with a toilet, basin, bath/shower		X 6	=	
Any Additional:				
Washbasins		X 1 ½	=	
Shower or tubs		X 1 ½	=	
Toilets		X 4	=	
Bidet		X 1	=	
Urinal				
Pedestal		X 4	=	
Stall		X 2	=	
Wall		X 1 ½	=	
Sink or laundry tub		X 1 ½	=	
Dishwasher		X 1 ½	=	
Washing Machine		X 1 ½	=	
Kitchen sink		X 1 ½	=	
Sauna		X 1 ½	=	
Floor drain (if going into septic system)		X 3	=	

GRAND TOTAL= _____

STEP 2- DETERMINING DAILY DESIGN SANITARY SEWAGE FLOWS (Q)

A) Total Amount of Finished Floor Area: _____
(Square footage or square metres of house)
To calculate square metres from square feet multiply by 0.093

B) Number of Bedrooms:_____
(Also includes dens, libraries, study, sewing room, hobby room as these rooms could be converted to bedrooms in the future, bedrooms located in the basement and/or attic must also be included)

C) Number of Fixture Units:_____
(Determined in Step 1)

Based on the above calculations, use the chart below to determine Total Daily Design Sewage Flow.

Residential Occupancy	Volume (Litres)
Dwellings:	
a) 1 bedroom dwelling	750
b) 2 bedroom dwelling	1100
c) 3 bedroom dwelling	1600
d) 4 bedroom dwelling	2000
e) 5 bedroom dwelling	2500
f) Additional flow for:	
i) Each bedroom over 5	500
ii) Each $10m^2$ (*or part thereof*) over $200m^2$	100
OR	
iii) Each fixture unit over 20 fixture units	50

Total Daily Design Sanitary Sewage Flow (Q)_____ litres.

STEP 3- DETERMINING SEPTIC TANK SIZE

A septic tank must be big enough to hold several days' worth of sewage and shaped so that the flow through the tank is slow. When sewage enters the tank, solid material will settle to the bottom as sludge, while fats and grease rise to the top to form a scum. If the system is working well, the liquid portion that flows out of the tank will be relatively clear, although it still will have an odour and carry disease. This liquid should not go anywhere except to either a tertiary treatment or to the leaching bed, depending on the type of septic system on your property. Be sure to have your septic tank emptied every 1 to 5 years by a certified sewage hauler.

Never allow sewage to flow into a ditch or watercourse. (Penalties under the definition of the Ontario Building Code Act, Section 36 (3), any person who is convicted of an offence is liable to a fine of no more than $25,000 for the first offence and to a fine of no more than $50,000 for a subsequent offence.)

The minimum working size (capacity) of a septic tank should equal or be greater than twice the daily design sanitary sewage flow (Q). In no case shall a septic tank be less than 3600 litres.

Determine the greater of:

a) Total Daily Design Sanitary Sewage Flow _____ multiplied by 2=_____litres.
b) 3600 litres

Septic Tank Size = _____ litres.

STEP 4- SOIL TYPES AND PRECOLATION RATES (T= TIME)

The suitability of the soil for absorbing, transporting and treating liquid waste depends on characteristics of the soil such as its grain size, density, moisture content, plastic properties and chemical composition. These characteristics must be assessed and a judgement must be made on the percolative capacity of the soil for handling septic tank effluent. This must be done by an individual qualified to specify soil type according to the United Soil Classification System.

From the soil investigation: (Qualified Soils Person should see last page of this package)

Soil Type: _____

T-Time: _____

STEP 5- DETERMINING DRAINFIELD LENGTH

Now that the daily design sanitary sewage flow (Q from Step 2) and the percolation rate (T-Time from Step 4) have been selected, the drain field length can be calculated. As a minimum, the total length of distribution piping must be 40 metres or greater unless it is a shallow buried trench, in which case the total length of the distribution pipe must be 30 metres or greater. The following equations provide the method for calculating the total length of the distribution pipe for the different types of leaching beds. The length of distribution piping varies according to the daily design sanitary sewage flow and T-Time of the soil.

In these formulae, L= total length of distribution pipe in metres

Q= total daily design sanitary sewage flow in litres

T= the design percolation time

1. Every leaching bed from a septic tank treatment unit:

$$L = \frac{Q\ (\quad\quad) \times T\ (\quad\quad)}{200}$$

2. Leaching bed from a treatment unit that produces secondary or tertiary effluent:

$$L = \frac{Q\ (\quad\quad) \times T\ (\quad\quad)}{300}$$

Total Distribution Pipe Length (Septic Field) = _____ metres.

NOTE: Any Septic field over 150 metres in length requires a pump or siphon system.

STEP 6- DIAGRAM OF PROPOSED WORKS

1. Be neat. Use a ruler.

2. This diagram does not have to be to scale, however, if it is not to scale, all distances must be marked clearly. If the lot is very large, you need only indicate the area affected around the house.

3. Measure and record the distances to the nearest centimetre from the edge of septic field to:
   a) The house
   b) Your well and the neighbours wells
   c) The road or street, any ditches or drains, and any slopes or dramatic grade changes
   d) Any buildings or structures within 5 metres of the septic field, including patio, gazebo, deck, and swimming pool

4. The septic field should always be installed with the distribution lines running at right angles to the slope of the land. The distribution lines should be spaced 1.6 metres apart minimum.

5. A septic tank may not be located closer than 15 metres to a well, lake, pond, reservoir, river, spring or stream, and 1.5 metres from a structure. The septic tank should always be placed in a location that will permit easy access for routine maintenance (i.e. pumping trucks). A deck, gazebo, playground or above pool must not be located over the septic field or mantle areas.

6. Note the type of water source that will service the dwelling, i.e. dug well, drilled well, municipal. Also note the neighbouring properties location of wells.

SEWAGE TREATMENT SYSTEM WORKSHEET

Propose to _____ a Class _____septic/sewage system to serve _____.
(Install/Repair/Enlarge) (House/Cottage/Motel/Restaurant/etc.)

Total Number of Fixture Units _____ f.u.

Building Area _____ Sq.Ft.

Number of Bedrooms _____

Daily Design Sanitary Sewage Flow (Q) _____ litres

Septic Tank Size _____ litres

Soil Type _____

Percolation Rate (T time) _____

Total Distribution Pipe Length _____ metres

SITE PLAN

Show the following:

- Property lines
- All buildings
- Road, driveways, trees, water courses (lake, rivers, municipal drains)
- Location of existing or proposed wells
- Proposed location of septic tank, distribution tile, mantle area
- North arrow

SOIL INVESTIGATION REPORT

A. Company/ Individual undertaking soils investigation		
First Name	Last Name	
Address	City/ town	Postal Code
Telephone Number	Fax Number	

B. Location of Property	
Municipality	Municipal Address
Lot/Con	Plan #

C. Sample Information	
Number of Samples Taken	Sample Number
Soil Type	T-Time
Water table found: _____ mm below existing grade.	

_____ _____

Signature Date

SOIL TYPES AND PERCOLATION RATES

SOIL TYPE	DESCRIPTION	PERCOLATION TIME (T)
Sand	Loose. Single grains. Can see individual grains. When squeezed in the hand, the soils mass falls apart when touched.	5-10 minutes/cm
Sandy Loam	Faint velvety feeling but with continued rubbing the gritty feeling of sand soon dominates.	10-12 minutes/cm
Loam	Feels velvety that becomes slightly gritty with continued rubbing. Holds a cast easily.	12-15 minutes/cm
Silty Loam	Holds a cast easily. Slight tendency to ribbon between thumb and forefinger. Rubbed surface has a broken rippled look.	15-20 minutes/cm
Clay Loam	Holds cast easily. Pinched between thumb and forefinger, it forms a ribbon. Soil is sticky and puddles easily.	20-50 minutes/cm
Clay	Cast can bear considerable handling without breaking. Forms a flexible ribbon with thumb and forefinger. Rubbed surface has smooth, satin feeling. Sticky when wet. Shiny surface when cut with knife.	>50 minutes/cm (unacceptable, needs imported soil)

MOIST CAST TEST

Compress some moist soil by clenching it in your hand. If the soil holds together (i.e. forms a cast) then test the strength of the cast by tossing it from hand to hand. The most durable it is, the more clay is present.

RIBBON TEST

Moist soil is rolled into a cigarette shape and then squeezed out between the thumb and forefinger to form the longest and thinnest ribbon possible. Soils with a high silt content will form flakes or peel-like thumb imprints rather than a ribbon.

IMPORTED SOIL

If the original soils are clay or there is a high ground water table or bedrock (within 1.5 metres) in the area of the septic field, acceptable fill may be imported. Use the T-Time (percolation time) of the imported fill. This T-Time may vary dramatically especially if the imported fill is mixed material or potentially contaminated fill. If this imported material is not clean, sandy loam or finely graded sandy material then the fill is unacceptable for use in leaching bed construction. Prior to the decision being made to import fill on any site, careful consideration must be given to existing lot grades and draining patterns, as well as the neighbouring properties grades and drainage patterns.

CLEARANCE FOR SEPTIC TANKS AND DRAINFIELDS

	To septic tank	To septic field
Building (includes decks & shed)	1.5m (5 ft.)	5m (15 ft.)
Property Lines	3m (10 ft.)	3m (10 ft.)
Well- Dug well, lake, creek	15m (50 ft.)	30m (100 ft.)
Well- Drilled well (casing to 6 metres)	15m (50 ft.)	15m (50 ft.)
Lakes, rivers, ponds etc. (not portable)	15m (50 ft.)	15m (50 ft.)

SAMPLE DIAGRAM