NORTH BAY-MATTAWA CONSERVATION AUTHORITY

INFORMATION SHEET
CLASS 2 SEWAGE SYSTEMS – GREYWATER PIT

A Class 2 sewage system can only be used for the treatment and disposal of greywater derived from plumbing fixtures such as kitchen sinks, bath tubs, washing machines, and laundry tubs (waste-water not containing human body waste). A Class 2 sewage system is satisfactory for disposal of greywater when the daily amount of such waste is small and site conditions are suitable.

Greywater pits are regulated under the Ontario Building Code (OBC). They are designed to treat and dispose of greywater when there is presence of a sanitary drainage system in a structure. Under the OBC, a greywater pit can only be used if the daily design sewage flow is less than 1,000 Litres per day.

The total daily design flow for a Class 2 sewage system shall be calculated based on the fixtures discharging to the system as follows:

- **200 Litres per fixture unit where there is a supply of pressurized water, and**
- **125 Litres per fixture unit where there is no supply of pressurized water.**

When considering the location for a greywater pit, caution must be taken to ensure that the minimum setbacks are strictly adhered to. These distances are stated as minimum requirements and may have to be increased if the soil conditions are not ideal. These setbacks can be found in the OBC as well as in the North Bay-Mattawa Conservation Authority's Sewage System Permit Application listed under Clearance Distances.

The greywater pit should be constructed in an area that is elevated and well drained. Low lying areas that are subject to excessive surface run-off, promoting saturated soils, may overload the greywater pit. This will result in very poor greywater treatment and increase the possibility of ground water contamination.

Article 8.4.2.1. of Division B of the OBC outlines Construction Requirements

1. The bottom of the pit shall be at least 900mm above the high ground water table.
2. The pit shall be constructed in such a manner as to prevent the collapse of its sidewalls.
3. Any material used to support or form the sidewalls of the pit shall be an open jointed material of a type that will permit leaching from the pit.
4. The pit shall be provided with a tight, strong cover that shall remain over the pit except when it is necessary to remove it for purposes of adding greywater to or removing greywater from the pit or for purposes of maintenance of the pit.
5. The earth around the perimeter of the pit shall be raised or mounded to a height of at least 150mm above ground level.
6. The surface of the ground in the area of the pit shall be so graded that surface drainage in the area will be diverted away from the pit.
7. The pit shall be surrounded on all sides and on its bottom by at least 600mm of soil having a percolation time of less than 50minutes.

A Class 2 greywater pit shall be designed and constructed so that the loading rate to the side walls shall be not more than the value calculated using:

- **$L_R = 400 \div T$** **L_R = Loading Rate of the Side Walls in Litres/Day/m^2**
  T = Percolation Time of Soil

CLASS 2 GREYWATER PIT SIZING CALCULATIONS

EXAMPLE: Dwelling with a tub/shower and two sinks, supplied with a pressurized water supply, and native sandy soils with a 10min/cm percolation rate.

PRESSURIZED WATER SYSTEM:

Daily Design Sewage Flow (Litres/Day) = # of Fixture Units * 200

Daily Design Sewage Flow = 4.5 * 200
= **900 L/Day**

L_R (Side Wall Loading Rate) = $\frac{400}{T}$ where, T = Percolation Rate of the native soil (min/cm)
= $\frac{400}{10}$
= **40 L/Day/m^2**

Side Wall Area (1) = $\frac{\text{Daily Sewage Flow (L/Day)}}{\text{Loading Rate (L/Day/m}^2\text{)}}$
= $\frac{900}{40}$
= **22.5m^2**

Minimum Required Side Wall Area of Greywater Pit = 22.5m^2

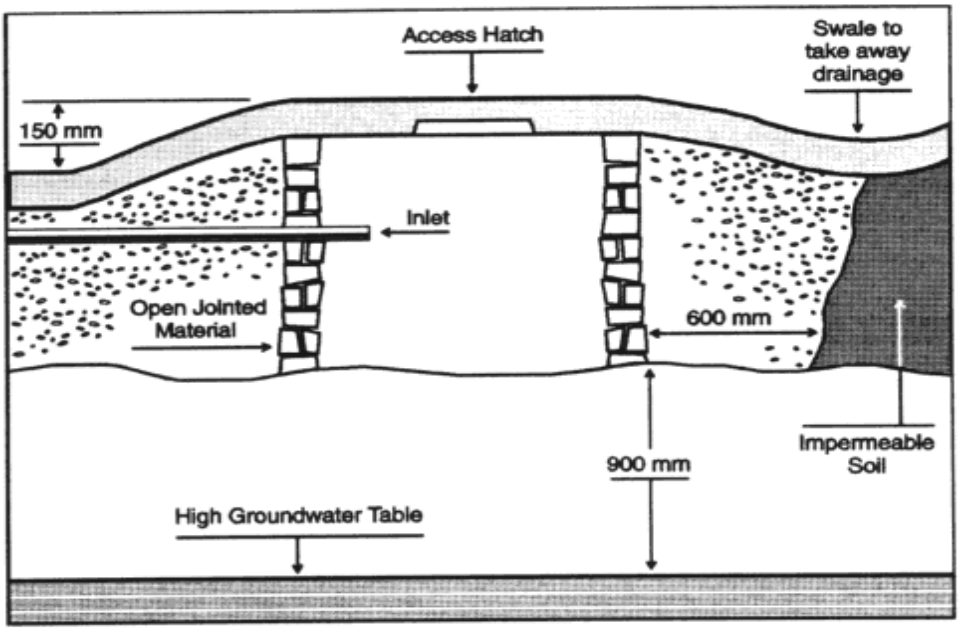
DIMENSIONS OF GREYWATER PIT:

Height = 1.0m Length = 5.50m Width = 6.0m

Side Wall Area = H * **L** * 2 (# of sides)
= 1m * **5.5m** * 2
= 11m^2

Side Wall Area = H * **W** * 2 (# of sides)
= 1m * **6.0m** * 2
= 12m^2

Total Calculated Side Wall Area (2) = [H*__L__*2] + [H*__W__*2]
= 11m^2 + 12m^2
= 23.0m^2



CALCULATION FORMULA:

(Must be completed & submitted with your Sewage System Permit Application)

1. Complete the fixture unit section in the Sewage System Permit Application.
2. Determine the percolation rate of the existing soil (T-time expressed in min/cm).
3. Determine if your water supply is pressurized or non-pressurized.

PRESSURIZED WATER SYSTEM:

Daily Design Sewage Flow (L/Day) = # of fixture units * 200

Daily Design Sewage Flow (L/Day) = _____ * 200

= _____ L/Day

OR

NON-PRESSURIZED WATER SYSTEM:

Daily Design Sewage Flow (L/Day) = # of fixture units * 125

Daily Design Sewage Flow (L/Day) = _____ * 125

= _____ L/Day

SIDEWALL LOADING RATE CALCULATION FOR THE GREY-WATER PIT SIZE

L_R = Loading Rate of the sidewalls in L/Day/m^2
T = Percolation Rate of the native soil in min/cm

$$L_R = \frac{400}{T} = \frac{400}{\quad}$$

= _____L/Day/m^2

Side Wall Area (1) = $\frac{\text{Daily Sewage Flow (L/Day)}}{\text{Loading Rate (L/Day/m}^2\text{)}}$ = $\frac{\text{L/Day}}{\text{L/Day/m}^2}$

= _____m^2 **(Min. Pit Size Required)**

CALCULATING THE DIMENSIONS OF THE GREY-WATER PIT ACCORDING TO SIDEWALL AREA REQUIRED

Height = Length = Width =

Side Wall Area = (H * **L** * 2)

= _____m^2

Side Wall Area = (H * **W** * 2)

= _____m^2

Total Calculated Side Wall Area (2) = [H***L***2] + [H***W***2]

= _____m^2 + _____m^2

= _____ m^2

Calculated Side Wall Area (2) must be equal to, or greater than the Side Wall Area (1) as determined in previous formula.