# Ontario Building Code Explained



**How to interpret the code!**

The building code can be quite intimidating and confusing. Here is a quick guide to help you with how to design a new system.

All septic systems that are within a single lot and rated to accept a total daily flow rate of <10,000 L must comply with the Ontario Building Code (OBC). The average 3-4 bedroom house is rated at 2000L.

All systems must be built according to the OBC regardless of how the residence will be used such as seasonal cottage use or low occupancy numbers. The system must be built to meet the maximum use possibility of the residence in case the property is sold to new owners or changed from seasonal use to a year round residence.

It is the homeowners responsibility to contact local governing authorities and acquire the necessary permits associated with the septic system installation or repair.

The following guide has been put together to assist you with meeting *minimum* OBC regulations for residential septic systems. Local governing authorities may have additional by-laws in place requiring additional design requirements.

**The two main factors that dictate the size and design of a septic system are the maximum daily flow and soil/site conditions.**

**Step 1:** Calculate the maximum daily flow, as per the OBC calculation.

All daily flow calculations start with the number of bedrooms. Most people assume it is based on the number of bathrooms or current occupants, but that is not the case.

The OBC assumes that for every bedroom, 2 people could be living in the residence. Average daily use per person is approximately 275 L, and therefore, the maximum daily flow could be around 500-600 L / bedroom.

OBC Bedroom Rate:

1 Bedroom – 750 L

2 Bedrooms – 1100 L

3 Bedrooms – 1600 L

4 Bedrooms – 2000 L

5 Bedrooms – 2500 L *(If you are building a home with more then 5 bedrooms, consult a professional)*

The OBC refers to the Maximum Daily Flow as “Q” for all calculations.

Figure out if the number of fixtures (bathrooms, sinks, etc) OR total living space will also need to be calculated to ADD additional L/day to the base bedroom rate. The greater of these calculations will need to be added, as opposed to both being added.

**Fixtures:**

If the total fixture count exceeds 20, then 50 L per additional fixture will need to be added to the bedroom base rate.

Use the chart below to figure out the number of fixtures:

| Column 1 | Column 2 | Column 3 | Column 4 |
|---|---|---|---|
| *Fixture* or Device | Number within residence | Hydraulic Load, *fixture units* | Totals (Column 2 x Column 3) |
| *Bathroom group (toilet, sink, tub)* | | | |
| (a) with flush tank | | 6 | |
| (b) with direct flush valve | | 8 | |
| ½ Bathroom | | 5 | |
| Kitchen sink | | 1.5 | |
| Garburator | | 3 | |
| Clothes washer | | 1.5 | |
| Dishwasher | | 1 | |
| Laundry tub | | 1.5 | |
| Additional tub | | 2 | |
| Additional shower (stand alone) | | 2 | |
| Additional sink | | 1.5 | |
| Additional toilet | | 4 | |
| Floor Drain | | 2 | |

| | | | |
|---|---|---|---|
| Total of Column 4 | | | |

*If you are building a residence with fixtures not listed in the chart above, consult a professional.*

If your total is greater then 20, calculate the additional flow of 50 L for each additional fixture over 20 (round up for each half)

For example, if your total is 23, then you may have to add 150 L to the bedroom base rate.

**Living area (m2) (all living space, excluding basement)**

Next you will need to figure out if the house living space is going to be exceeding the included limit of 200 m2, and need to add additional flow to the base rate according to the following calculation:

For each 10m2 of living space over 200 m2 to a max of 400 m2, calculate 100 L per 10m2. (rounded up)

*(if your house is greater then 400 m2, consult a professional)*

Then once you have calculated the living space and fixture count flow rates, whichever is greater must be added to the base bedroom rate.

So for example, let's figure out the maximum daily flow rate for a 4 bedroom house with 3 full bathrooms, kitchen sink, clothes washer, laundry tub, dishwasher and total living space of 224 m2.

The base rate will be 2000 L (4 bedrooms). We just have to figure out if we have to add anything to that.

Lets do the math. The total fixture units for the house will be 23.5 (3 full bathrooms = 18 + kitchen sink = 19.5 + clothes washer = 21 + laundry tub = 22.5 + dishwasher = 23.5)
So for each fixture unit over 20 we have to add 50 L which will be 200 L.

The additional flow due to living space over 200 m2 is 300 Litres. (24 m2 over 200 m2 = 300 L)

So the largest of the living space / fixture count is 300 L which has to be added to the 2000 L, so the Maximum Daily Flow (Q) will be 2300 L.

**Step 2: Soil/Site Conditions**

The other factor we have to figure out is the rate at which the treated wastewater will be absorbed into the soil.

This is called a "T" time.

"T" time is equal to the number of minutes it takes for the water level to drop per cm in a water filled hole in the receiving soil.

So in sandy soil a common T time is <10 (meaning it took less then 10 minutes for the water level to drop 1 cm in the water filled hole)
In sandy loam soil the T time could be 20 or more because the smaller soil particles are slowing the rate of absorption.

The worst soil though is clay where the T time is generally over 50 because clay particles are so fine and tightly packed.

The most common method of identifying the percolation rate is to send a soil sample to a lab for analysis. The cost associated with a soil analysis ranges from $200-$300 for the test, plus the time and labour to dig the hole and deliver the sample.

Another method is to have a professional perform a percolation test on-site. The cost will be comparable to the lab analysis, but results will be known sooner and be much more accurate.

Once the Daily Flow number and the “T” time are identified, you can then figure out how large the system has to be.

**Septic Tank Sizing**

The septic tank must be twice* the daily flow (Q), but no less then 3600 L. The tank must also be dual chamber with 2/3 of the volume in the first compartment. The reason for this size is to provide 24hr retention time of sewage to allow for proper separation of solids.
*If a garburator is installed, the volume must be three times the daily flow.

Each type of system then has a different equation to be used to figure out the size. For example;

Conventional trench: Total Trench Length = (Q X T time) / 200
Above house example would be 2300 X 10 (sandy soil) = 23000 / 200 = 115 Meters of total trench length

If the T time is 50 or greater, conventional trenches can not be installed. A raised bed or “tertiary” unit will need to be installed instead.