COMMON QUESTIONS – CONCRETE BLOCK

1. What is the difference between a metric and an imperial block?

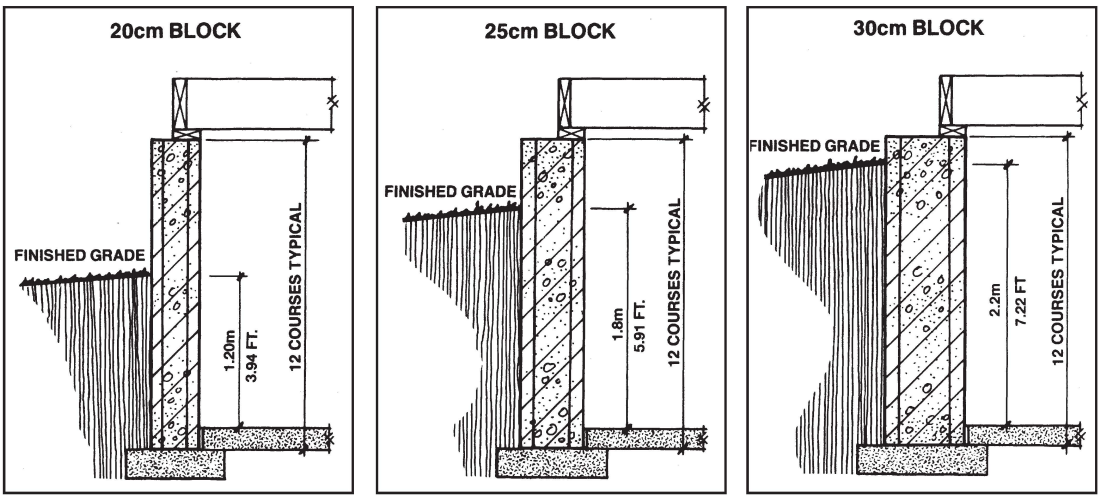
Prior to 1979, all concrete blocks manufactured in Canada were based on the following imperial dimensions - height of 8", length of 16", widths ranged from 4" to 12". However, the actual dimensions of the blocks were 7-5/8" by 15-5/8" by between 3-5/8" and 11-5/8" to allow for the 3/8" mortar.

In 1979, the industry switched to metric sized blocks based on the following dimensions - height of 200 mm, length of 400 mm, width ranging from 100 to 300 mm. After accounting for 10 mm of mortar, the actual dimensions of the blocks are 190 mm by 390 mm by between 90 and 390 mm.

When the two blocks are compared, the metric unit is actually smaller than the equivalent imperial unit by 6.9 mm or 1/8" in all directions. This means that a metric block could be used to replace an imperial block (because of its smaller size) by thickening the mortar, but an imperial block cannot be used to replace a metric block because it would be too big.

2. How do I know what size block I need for my basement?

The main deciding factor in determining what size of block to use for a residential basement is the depth of the fill outside the house. See the following figures for details:



NOTES:
1.0 Requirements from 9.15, Ontario Building Code
2.0 Below grade depth measured from top of floor slab

3.0 Footing must be below frost line
4.0 Ontario Building Code 9.15.4 gives lateral support requirements

Source: CCMPA Metric Technical Manual

Please note that this assumes that the wall is laterally supported at the top. If there is no support at the top, the maximum fill heights reduce to 1.4 m, 1.2 m and 0.9 m for 290, 240 and 190 mm blocks respectively.

For any industrial or commercial application, especially where there will be increased loadings on the foundations, it is best to have a Professional Engineer specify the basement details.

3. What are the benefits of using concrete blocks over poured concrete for foundation walls?

The benefits are as follows:

- Masonry block walls traditionally take less time to complete, especially when the time taken for curing poured concrete is factored in.
- The top surface of a block basement is smooth, while poured concrete walls tend to settle within their forms causing an uneven top surface finish. It is important to have a smooth top as this is what the frame, brick, stone or other veneers that form the exterior cladding are built on.
- Block basements add flexibility and ease because they can be fitted around any shape of door and window without having to create elaborate forms, and can come in any colour or with any texture desired.
- With concrete masonry units, you are not limited to the size of forms, as in poured concrete walls.
- With block walls, the quality of concrete masonry units is controlled by the manufacturer. With poured walls, quality can be influenced by the contractor increasing the amount of water (thus decreasing the concrete strength) and by a number of other environmental factors.
- A basement made with concrete masonry units is less likely to crack than a poured concrete basement. When concrete is poured in forms, the concrete will shrink as it dries in natural environmental conditions. The warmer it is during drying, the worse the cracking will be. According to the CMHC and Ontario New Home Warranty Program, over 90% of complaints for foundation walls were related to these types of cracks and the associated water leaks.
- Concrete blocks are much better at providing sound protection because blocks include two of the best sound dampening features - mass and dead air space.

4. What are the advantages of using concrete products over other materials for above grade wall construction?

The benefits are as follows:

- Concrete blocks are recognized for their superior fire resistance. In fact, the National Fire Code of Canada prescribes the use of concrete and masonry where fire resistance cannot be compromised.

- Concrete blocks are much better at providing sound protection because blocks include two of the best sound dampening features - mass and dead air space. For example, a 140 mm thick 75% solid concrete block has an STC (Sound Transmission Class) rating of 50, meeting the Building Code requirements for a privacy wall with no additional coatings or absorption layers of material.
- Concrete products are more resistant to damage from the environment, human traffic / accidental contact, vandalism and projectiles than most other building materials.
- Concrete masonry is one of the few building materials that is not susceptible to deterioration due to mold, and does not provide a food source for mold. Concrete masonry can also be more easily cleaned in the event that mold is identified.

5. How do I estimate how many blocks I need for a basement or wall?

The following steps can be followed to estimate the number of blocks required:

- Multiply the length of all walls in feet by ¾ (in metres by 2.5) to get the number of blocks per row (this provides for the block and 10 mm of mortar on all sides).
- Multiply the height of the wall in feet by 1.5 (in metres by 5) to get the number of courses of standard blocks (again, this provides for the block and 10 mm of mortar on all sides). If the number of courses is not an even number, it is recommended that you round the number of courses off to the next highest number to avoid being short blocks. Using ashlar (half height) blocks is also an option.
- Multiply the number of blocks per row by the number of courses to get the total number of standard blocks.
- If the walls are 90 mm, 140 mm, 240 mm or 290 mm in width, multiply the number of corners by the number of courses to get the number of L-corner blocks. Subtract the number of L-corner blocks from the plain blocks to get the correct number of plain blocks.
- Subtract the number of blocks required for windows, doors, etc.

Example: Let's say the drawings show a 6 metre by 4 metre basement with a wall height of 2.4 metres using 240 mm block.

1. Total wall length = 6 + 4 + 6 + 4 = 20 metres (4 sides)
2. Number of blocks per row = 20 * 2.5 = 50
3. Number of courses = 2.4 * 5 = 12
4. Number of blocks = 50 * 12 = 600
5. 4 corners - require (4*12 courses) 48 L-corner blocks.
6. Number of standard blocks = 600 - 48 = 552.

Final total - 552 standard 240 mm blocks, 48 L-corner blocks