Ontario Building Code (OBC)

1. Project Description
2. Major Occupancies & Multiple Occupancies
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1. Project Description

An Aside......

Some Definitions (reference 1.4.1.2.)

- Building area
- Building height
- Fire alarm system (alarm signal, fire detector, heat detector, smoke detector)
- Gross (floor) area (GFA)
- Storey
- Sprinklers
- Standpipe
1. Project Description

i) New Building
   • from the ground up.
   • 1.1.2. – a reminder which sections of Division B relate to new builds.

ii) Addition
    • adding to an existing building.
    • implications regarding increased area or height – will change certain code requirements and require Owner to upgrade to current standards.

iii) Alteration
     • building shell does not change, interior renovations typically.
     • implications towards exiting requirements; distances, occupant load calculations.
     • additional requirements in Part 11.

iv) Change of Use
    • occupancy change.
    • can be as complicated as a new build.
    • Other Authorities Having Jurisdiction may take precedence; ie. Ministry of Environment (converting industrial buildings to residential/mercantile/office).
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2. Major Occupancies & Multiple Occupancies

i) Major Occupancies
   • Table 3.1.2.1. – classifies spaces into these categories.

### 3.1.2.1. Classification of Buildings

(1) Except as permitted by Articles 3.1.2.3. to 3.1.2.6., every building or part of it shall be classified according to its major occupancy as belonging to one of the Groups or Divisions described in Table 3.1.2.1.

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Division</td>
<td>Description of Major Occupancies</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>Assembly occupancies intended for the production and viewing of the performing arts</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>Assembly occupancies not elsewhere classified in Group A</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>Assembly occupancies of the arena type</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>Assembly occupancies in which occupants are gathered in the open air</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>Detention occupancies</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>Care and treatment occupancies</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>Care occupancies</td>
</tr>
<tr>
<td>C</td>
<td>---</td>
<td>Residential occupancies</td>
</tr>
<tr>
<td>D</td>
<td>---</td>
<td>Business and personal services occupancies</td>
</tr>
<tr>
<td>E</td>
<td>---</td>
<td>Mercantile occupancies</td>
</tr>
<tr>
<td>F</td>
<td>1</td>
<td>High hazard industrial occupancies</td>
</tr>
<tr>
<td>F</td>
<td>2</td>
<td>Medium hazard industrial occupancies</td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>Low hazard industrial occupancies</td>
</tr>
</tbody>
</table>
2. Major Occupancies & Multiple Occupancies

ii) Multiple Occupancies

• Sentence 2 of 3.1.2.1 clarifies multiple occupancies.

(2) A building intended for use by more than one major occupancy shall be classified according to all major occupancies for which it is used or intended to be used.

• 3.1.3 deals with how multiple occupancies are dealt with in a building.
• differing occupancies must be separated by fire separations.
• must conform to Table 3.1.3.1.
• be mindful of the notes below the Table. Additional requirements will apply depending on these, as well as when we deal with mixing occupancies with the Hazardous occupancies (F1, F2 and F3).
## 2. Major Occupancies & Multiple Occupancies

<table>
<thead>
<tr>
<th>Major Occupancy</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
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<th>Column 6</th>
<th>Column 7</th>
<th>Column 8</th>
<th>Column 9</th>
<th>Column 10</th>
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</tbody>
</table>
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3. Building Area & Gross Floor Area
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7. Occupant Load
3. Building Area & Gross Floor Area

i) Building Area
   • measurement of the amount of land the building encompasses.
   • taken from the outside face of the exterior walls.
   • do a P-line in Defpoints layer, or create an “Area” non-printing layer.
   • takeoff your area in metres squared (m²).

ii) Gross Area (Gross Floor Area, or GFA)
   • the sum of the areas of every floor above grade
   • taken from the outside face of the exterior walls.
   • do a P-line in Defpoints layer, or create an “Area” non-printing layer.
   • takeoff your area in meters squared (m²).

iii) Why is this information necessary?

3.2.2.4. Buildings with Multiple Major Occupancies

(1) The requirements restricting fire spread and collapse for a building of a single major occupancy classification are provided in this Subsection according to its building height and building area.

(2) If a building contains more than one major occupancy, classified in more than one Group or Division, the requirements of this Subsection concerning building size and construction relative to major occupancy shall apply according to Articles 3.2.2.5. to 3.2.2.8.
3. Building Area & Gross Floor Area

3.2.2.5. Applicable Building Height and Area

(1) In determining the fire safety requirements of a building in relation to each of the major occupancies contained in it, the building height and building area of the entire building shall be used.

3.2.2.6. Multiple Major Occupancies

(1) Except as permitted by Articles 3.2.2.7. and 3.2.2.8., in a building containing more than one major occupancy, the requirements of this Subsection for the most restricted major occupancy contained shall apply to the whole building.
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7. Occupant Load
4. Building Storeys & Height

i) Building Height
   • measured from the ground floor surface, to the highest given point on the roof surface.
   • keep in mind: roof slopes drain to roof drains, therefore the highest point is typically at parapet edge.
   • measure in metres (m).

i) Building Stories
   • count every occupied floor above grade.
   • note this special code requirement:

3.2.1.1. Exceptions in Determining Building Height

   (1) A roof-top enclosure provided for elevator machinery, a stairway or a service room used for no purpose other than for service to the building, shall not be considered as a storey in calculating the building height.

   • does a penthouse count?
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6. Building Classification
7. Occupant Load
5. Number of Streets Faced

i) Streets the Building Faces and/or is Adjacent To
   • relatively straightforward.
   • most cases a building will be on one street minimum
   • exception: rural areas. Therefore, access routes become the “street”.
   • review the definition of a “street” in 1.4.1.2.

ii) Rules for Multiple Streets: Article 3.2.2.10.

3.2.2.10. Streets

(1) Every building shall face a street located in conformance with the requirements of Articles 3.2.5.4 and 3.2.5.5 for access routes.

(2) For the purposes of Subsections 3.2.2. and 3.2.5. an access route conforming to Subsection 3.2.5. is permitted to be considered as a street.

(3) A building is considered to face 2 streets provided not less than 50% of the building perimeter is located within 15 m of the street or streets.

(4) A building is considered to face 3 streets provided not less than 75% of the building perimeter is located within 15 m of the street or streets.

(5) Enclosed spaces, tunnels, bridges and similar structures, even though used for vehicular or pedestrian traffic, are not considered as streets for the purpose of this Part.
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7. Occupant Load
6. Building Classification

i) Classification of a Given Building
   • all of the above information (area, height, streets etc.) culminates into determining the classification.
   • this portion of the code analysis determines what you are allowed to do with your building relative to the previous data.

ii) Implications
   • maximum building area allowed (sometimes per floor).
   • type of construction allowed (combustible or non-combustible).
   • floor and roof assembly ratings.
   • sprinklered or non-sprinklered.
   • load-bearing structure and their applicable fire resistance ratings.
   • cost.

iii) Choices
   • more than one classification may apply to your design.
   • the idea is to use the least stringent set of rules you can get away with.
   • less work, complies with code, client is happy.

iv) What Part of the Code Do We Use?
   • Articles 3.2.2.20. through to 3.2.2.83.
   • each Article will have defined rules based on your design data.
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7. Occupant Load

Occupant Load can be calculated depending on:

- Design of the room
- Calculated based on area per person in metres squared (m²)
- Fixed seating
- Specified by use (ie. dwelling unit)

3.1.17.1. Occupant Load Determination

(1) The occupant load of a floor area or part of a floor area, or of a building or part of a building not having a floor area, shall be based on,

   (a) the number of seats in an assembly occupancy having fixed seats,

   (b) 2 persons per sleeping room or sleeping area in a dwelling unit or suite, or

   (c) the number of persons,
      (i) for which the area is designed, or
      (ii) determined from Table 3.1.17.1. for occupancies other than those described in Clauses (a) and (b).
## 7. Occupant Load

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Use of Building or Floor Area or Part of Floor Area</strong></td>
<td><strong>Area per Person, m²</strong></td>
</tr>
<tr>
<td><strong>Assembly uses</strong></td>
<td></td>
</tr>
<tr>
<td>space with fixed seats</td>
<td>See Clause (1)(a)</td>
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<tr>
<td>space with nonfixed seats</td>
<td>0.75</td>
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<tr>
<td>stages for theatrical performances</td>
<td>0.75</td>
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<tr>
<td>space with nonfixed seats and tables</td>
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<tr>
<td>standing space</td>
<td>0.40</td>
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<td>stadia and grandstands</td>
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<tr>
<td>bowling alleys, pool and billiard rooms</td>
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<tr>
<td>classrooms</td>
<td>1.85</td>
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<td>school shops and vocational rooms</td>
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<tr>
<td>reading or writing rooms or lounges</td>
<td>1.85</td>
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<tr>
<td>dining, alcoholic beverage and cafeteria space</td>
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<tr>
<td>laboratories in schools</td>
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<td>exhibition halls other than those classified in Group E</td>
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<td>B-1 : detention quarters</td>
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<td>B-2 : treatment and sleeping room areas</td>
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<tr>
<td>B-3 : sleeping room areas</td>
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<td>(See also Article 3.7.1.3.)</td>
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<td><strong>Residential uses</strong></td>
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<td>dwelling units</td>
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<td><strong>Business and personal services uses</strong></td>
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<tr>
<td>offices</td>
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<td><strong>Mercantile uses</strong></td>
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<tr>
<td>basements and first storeys</td>
<td>3.70</td>
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<tr>
<td>second storeys having a principal entrance from a pedestrian</td>
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<tr>
<td>thoroughfare or a parking area</td>
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<tr>
<td>dining, alcoholic beverage and cafeteria space</td>
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<tr>
<td>other storeys</td>
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<tr>
<td><strong>Industrial uses</strong></td>
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<tr>
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<td>public corridors intended for occupancies in addition to pedestrian travel</td>
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</tr>
</tbody>
</table>
7. Occupant Load

i) Additional Definitions

- Floor area
- Suite
- Occupant load

ii) Implications

- Calculated area vs. design of room.
- Denser occupancies may require a rethinking of usable occupant load. Direct link to washroom counts.
- Exit capacity: 3.4.3.2 (4) and (6) deal with multi-floor buildings. Question: are all occupants expected to be only on one floor? What is the worst case scenario?

3.4.3.2. Exit Width

(4) Except as required by Sentence (5), the required exit width need not be cumulative in an exit serving two or more floor areas located one above the other.

(6) If more than one exit is required, every exit shall be considered as contributing not more than one-half of the required exit width.

iii) Example – Seniors Residence
7. Occupant Load

Total Design Occupant Load = 32 + 20 + 9 = 61