Webinar on

Occupancy Classification and Types of Construction Classification
BNBC 2020

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OUTLINE

SEGMENT 01. 30 minutes (Approximately)
A general outline on Occupancy classification and types of construction classification (from BNBC Part III, Chapter 01)

RECESS. 05 minutes

SEGMENT 02. 60 minutes (Approximately)
Occupancy Classification: Detail Discussion

RECESS. 05 minutes

SEGMENT 03. 30 minutes (Approximately)
Types of Construction classification: Detail Discussion

Q/A SESSION. 15 minutes
BNBC 2020 PART III

Chapter 01. General Building Requirements (Partly)

Chapter 02. Classification of Buildings Based on Occupancy (Partly)

Chapter 03. Classification of Building Construction Types Based on Fire Resistance (Partly)
SEGMENT 01

General outline on

01. Occupancy classification and
02. Types of construction classification

(from BNBC Part III, Chapter 01, 02 & 03)

01. Occupancy Classification

- Classification of buildings based on occupancy or nature of use
- Deals with the general and specific requirements of each of the occupancy groups

- A brief description of such occupancy groups is presented in Part III, Chapter 01, Section 1.4 Occupancy and Construction Classification of Buildings, Table 3.1.1. of BNBC 2020
02. Types of Construction Classification

- The fire resistance ratings of various types of construction for structural and nonstructural members are the basis for Types of Construction Classification.

- A brief description of such construction groups is presented in Part III, Chapter 01, Section 1.4 Occupancy and Construction Classification of Buildings, Table 3.1.2 of BNBC 2020.
### Table 3.1.1: Summary of Occupancy Classification

<table>
<thead>
<tr>
<th>Occupancy Type</th>
<th>Subdivision</th>
<th>Nature of Use or Occupancy</th>
<th>Fire Index*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Residential</td>
<td>A1</td>
<td>Single family dwelling</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>A2</td>
<td>Two families dwelling</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>A3</td>
<td>Flats or apartments</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>A4</td>
<td>Mess, boarding houses, dormitories and hostels</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>A5</td>
<td>Hotels and lodging houses</td>
<td>1</td>
</tr>
<tr>
<td>B: Educational Facilities</td>
<td>B1</td>
<td>Educational facilities up to higher secondary levels</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>B2</td>
<td>Facilities for training and above higher secondary education</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>B3</td>
<td>Pre-school facilities</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 3.1.1 /Continued

<table>
<thead>
<tr>
<th>Occupancy Type</th>
<th>Subdivision</th>
<th>Nature of Use or Occupancy</th>
<th>Fire Index*</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: Institution for Care</td>
<td>C1</td>
<td>Institution for care of children</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>C2</td>
<td>Custodial institution for physically capable adults</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>C3</td>
<td>Custodial institution for the incapable adults</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>C4</td>
<td>Penal and mental institutions for children</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>C5</td>
<td>Penal and mental institutions for adults</td>
<td>1</td>
</tr>
<tr>
<td>D: Healthcare Facilities</td>
<td>D1</td>
<td>Normal medical facilities</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>D2</td>
<td>Emergency medical facilities</td>
<td>2</td>
</tr>
<tr>
<td>E: Business</td>
<td>E1</td>
<td>Offices</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>E2</td>
<td>Research and testing laboratories</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>E3</td>
<td>Essential services</td>
<td>2</td>
</tr>
<tr>
<td>F: Mercantile</td>
<td>F1</td>
<td>Small shops and market</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Large shops and market</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Refueling station</td>
<td>2</td>
</tr>
</tbody>
</table>
### Table 3.1.1 (Continued)

<table>
<thead>
<tr>
<th>G: Industrial Buildings</th>
<th>G1</th>
<th>Low hazard industries</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G2</td>
<td>Moderate hazard industries</td>
<td>3</td>
</tr>
<tr>
<td>H: Storage Buildings</td>
<td>H1</td>
<td>Low fire risk storage</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>H2</td>
<td>Moderate fire risk storage</td>
<td>3</td>
</tr>
<tr>
<td>I: Assembly</td>
<td>I1</td>
<td>Large assembly with fixed seats</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I2</td>
<td>Small assembly with fixed seats</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I3</td>
<td>Large assembly without fixed seats</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I4</td>
<td>Small assembly without fixed seats</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I5</td>
<td>Sports facilities</td>
<td>1</td>
</tr>
<tr>
<td>J: Hazardous Building</td>
<td>J1</td>
<td>Explosion hazard building</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>J2</td>
<td>Chemical hazard building</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>J3</td>
<td>Biological hazard building</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>J4</td>
<td>Radiation hazard building</td>
<td>4</td>
</tr>
</tbody>
</table>

### Table 3.1.1 (Continued)

<table>
<thead>
<tr>
<th>Occupancy Type</th>
<th>Subdivision</th>
<th>Nature of Use or Occupancy</th>
<th>Fire Index*</th>
</tr>
</thead>
<tbody>
<tr>
<td>K: Garage</td>
<td>K1</td>
<td>Parking garage</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>K2</td>
<td>Private garage</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>K3</td>
<td>Repair garage</td>
<td>3</td>
</tr>
<tr>
<td>L: Utility</td>
<td>L</td>
<td>Utility</td>
<td>2</td>
</tr>
<tr>
<td>M: Miscellaneous</td>
<td>M1</td>
<td>Special structures</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>M2</td>
<td>Fences, tanks and towers</td>
<td>1</td>
</tr>
</tbody>
</table>

*Fire Index: fire index is an absolute number. Occupancy group having same fire index may be permitted as mixed occupancy and different fire index shall be separated or detached as per provisions of this Code.
Mixed Occupancy
(Non-separated use)

- The following occupancies shall not be required to designate as a separated occupancy classification from uses to which they are accessory to any occupancy Group other than Occupancy Group J
  
  (a) Assembly rooms having a floor area not more than 75 m².
  
  (b) The administrative and clerical offices and similar offices not exceeding 25 Percent of the floor area of the major occupancy and not related to Hazardous Buildings as defined in Occupancy J.
  
  (c) Administrative offices, gift shops and other similar uses in Occupancy A provided the uses do not exceed 10 Percent of the floor area of the major occupancy.
  
  (d) Kitchens associated with a dining area.
  
  (e) Carports having at least two sides entirely open associated with Occupancy A.

Separated Occupancy and Construction

- When two or more occupancies are accommodated in a building, each such occupancy shall be separated according to the provisions specified in Sec 2.3 Chapter 2 Part 3 and Table 3.2.1.

- When two or more types of construction used within a building, the entire building shall be subject to the most restrictive construction type and shall comply with FAR restrictions as per provisions of this Code.

- However if the Occupancies within the different Types of Construction are completely separated by construction that meets the fire-resistance rating requirements for fire separation listed in Table 3.2.1 of Chapter 1 Part 3 then each Occupancy so separated may, for the purpose of this Code, be considered as separate building section.

- Restriction for mixed construction: In buildings of mixed construction, no structural element shall be supported by construction having a lower fire-resistance rating than that required for the element being supported.
Detached Occupancy

- A building **separated by distance** in a same plot to accommodate different type of occupancies shall be termed as Detached Occupancy.
Figure 3.1.1 Detached Occupancy *Separation Distance*
Table 3.1.2: Summary of Classification of Buildings Based on Types of Construction

<table>
<thead>
<tr>
<th>Construction Group</th>
<th>Construction Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I: Non-combustible</td>
<td>Type I-A</td>
<td>4 hour protected</td>
</tr>
<tr>
<td></td>
<td>Type I-B</td>
<td>3 hour protected</td>
</tr>
<tr>
<td></td>
<td>Type I-C</td>
<td>2 hour protected</td>
</tr>
<tr>
<td></td>
<td>Type I-D</td>
<td>1 hour protected</td>
</tr>
<tr>
<td></td>
<td>Type I-E</td>
<td>Unprotected</td>
</tr>
<tr>
<td>Group II: Combustible</td>
<td>Type II-A</td>
<td>Heavy timber</td>
</tr>
<tr>
<td></td>
<td>Type II-B</td>
<td>Protected wood joist</td>
</tr>
<tr>
<td></td>
<td>Type II-C</td>
<td>Unprotected wood joist</td>
</tr>
<tr>
<td></td>
<td>Type II-D</td>
<td>Protected wood frame</td>
</tr>
<tr>
<td></td>
<td>Type II-E</td>
<td>Unprotected wood frame</td>
</tr>
</tbody>
</table>

Applicability

- Any development permit for a site or a location **shall clearly mention** the permitted occupancy and construction type in accordance to Tables 3.1.1 and 3.1.2 for the existing or proposed building.
Change of Use

- **Without prior permission** from the Authorities no change shall be made in the

- **type of occupancy or use** of any building that would place it in a different occupancy group or

- in a **different subdivision** of the same occupancy group

Terminologies

- **Barrier:** A wall or a partition or a floor slab or a ceiling within a building which confines and protects flow of smoke and fire from the exposed side of the barrier. The fire rating of barriers shall be complied with the provisions of this Code.

- **Control Area:** A space or a room within a building enclosed by barriers with fire rated walls, floor and ceiling, where the quantity of hazardous material shall not exceed the maximum allowable quantity per control area for storing, displaying, handling, dispensing or using as per provisions of this Code.

- **Fire Separation Distance:** A minimum distance which to be maintained between potential sources and/or between structures for fire safety. In case of differences between building setback and the required minimum fire separation distance measurement; the higher value shall be implied.

- **Mixed Occupancy:** When two or more occupancies are amalgamated in a building shall be termed as Mixed Occupancy.

- **Non Separated Space Condition:** Walls or partitions between compartments, rooms, spaces or areas within a building or part of a building which are not separated by an approved fire rated barrier walls or partitions shall be designated as non-separates space condition or effective undivided single space.

- **Separated Occupancy:** A building or a portion thereof separated by barriers with wall or ceiling slab that into two or more parts to accommodate different type of occupancies in different parts.
Terminologies

- **Separate Rooms**: Spaces or areas within a building when separated by approved barrier wall.
- **Separation Wall**: This is a peripheral wall of a building or a building which shall be divided into two or more or a common wall between two buildings to control spreading of fire as per provisions of this Code.
- **Structural Frame**: All members or elements such as columns, girders, beams, trusses and spandrels which forms a frame and have direct connections with bearing and transferring as an integral and essential elements for the stability of a building or a structure as a whole.
- **Unprotected**: The element that shall have no prerequisites of fire protection rating.
- **Combustible Material**: Any material which burns and enhances the magnitude of fire.
- **Party wall**: A fire resistance rated wall where openings are protected, which is constructed from the ground level and continued up to at least 1m above the roof of a building to restrict the spread of a fire.

Tables & Figures

- Table 3.1.1 Summary of **Occupancy Classification**
- Table 3.1.2 Summary of **Classification of Buildings** Based on **Types of Construction**
- Table 3.2.1 Fire Resistance Rating Requirements for **Barrier Walls and Floor/Ceiling Assemblies** between Separated Occupancies (hours)
- Table 3.2.2 Fire Resistance Ratings in Hours of **Exterior Walls** for Various Occupancy Groups
- Table 3.2.3 Requirements for **Opening Protection Assembly** Based on Fire Resistance Rating of **Exterior Walls**
- Table 3.2.4 **Permitted Types of Construction and Fire Zones** for Various Occupancy Groups
- Table 3.2.5 (a) **Exempted Amount of Hazardous Materials** in Terms of **Physical Hazard in a Control Area**
- Table 3.2.5 (b) **Exempted Amounts of Hazardous Materials** in Terms of **Health Hazard in a Control Area**
- Table 3.2.6 **A-Z List of Occupancy Classification**
End of Segment 01
Thank you

RECESS
SEGMENT 02

Occupancy classification

(from BNBC Part III, Chapter 01 & 02)

Introduction
Introduction contd/

2.1.2 Utilities under Occupancy I is incidental to operation in all other type of occupancy except Occupancy I shall be considered as non-separated use of the main occupancy but shall be taken special safety measure as per provision of this Code.

2.1.3 Any occupancy or use type not mentioned specifically in Table 3.2.6 (A-Z list) or elsewhere in this Code shall be classified by the Board of Appeals under the occupancy group to which its use most closely resembles, considering the life safety and fire hazard.

2.1.4 Each occupancy group shall be subdivided as detailed in the following sections. The detail classification including mixed occupancy provided in the Table 3.2.6 (A-Z list) is non-exhaustive. If there is any use or character of occupancy in a building which is not mentioned here, it shall be classified as per provision of Sec 2.1.3 of this Chapter.

Occupancy definitions

2.1.5 Occupancy A: Residential Buildings
This occupancy type shall include any building or portion thereof providing sleeping and living accommodations to related or unrelated groups of people, with or without independent bathroom, cooking or dining facilities, except any building classified under Occupancy C or D. This Occupancy shall be subdivided as follows:

2.1.5.1 Single Family Dwelling (A1)
These shall include any building, row type or semi-detached or detached from neighboring buildings by distances required by this Code and having independent access to the plot, which is used as private dwelling by members of a single family.

2.1.5.2 Two Family Dwelling (A2)
These shall include any building, row type or semi-detached or detached from neighboring buildings by distances required by this Code and having shared or independent access for two families and having facilities for living, cooking and bathroom facilities independent of each other.

2.1.5.3 Flats or Apartments (A3)
These shall include any building or portion thereof which is provided for more than two families, having facilities for living, cooking and bathroom facilities independent of each other.

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Occupancy definitions /Continued

2.1.5.4 Mess, Boarding Houses, Dormitories and Hostels (A4)
These shall include any building or portion thereof in which sleeping, living accommodations and bathrooms are provided for groups of related or unrelated persons, with or without common dining and facilities, and with common cooking under single management control or with individual or group cooking facilities.

2.1.5.5 Hotels and Lodging Houses (A5)
These shall include any building, a portion thereof or group of buildings under single management, in which sleeping, living accommodation and bathroom facilities are provided with or without dining facilities but without cooking facilities for adult individuals, is provided for hire on transient or permanent basis.

2.1.6 Occupancy B: Educational Facilities
This occupancy type shall include any building or portion thereof in which education, training and care are provided to children or adults. This Occupancy shall be subdivided as follows:

Occupancy definitions /Continued

2.1.6.1 Educational Facilities up to Higher Secondary Level (B1)
These shall include any building or portion thereof used for purposes involving assembly for instruction, education and recreation of more than six persons on regular basis to fulfill the requirement of an academic curriculum approved by the Government up to Higher Secondary (12th Grade), and which is not covered by occupancy I.

2.1.6.2 Facilities for Training and for Above-Secondary Level (B2)
These shall include any building or portion thereof used for purposes involving assembly for instruction, education, training and recreation of more than six persons, and which is not covered by occupancy I and B1.

2.1.6.3 Pre-School Facilities (B3)
These shall include any building or portion thereof used for purposes involving care, recreation and education of children more than six in number, who have not yet reached the age to attend the school.

2.1.7 Occupancy C: Institution for Care
Buildings classified under this occupancy shall include those used for purposes of institutional care of the occupants, such as detention for correctional or penal purposes, medical or nursing care of persons suffering from illness or infirmity due to mental condition, or accommodation of children or minor, where the personal liberty of the inmate is restricted. These buildings shall ordinarily provide accommodation for sleeping, dining and other provisions approved by the authority for the occupants. This occupancy shall be subdivided as follows:
Occupancy definitions /Continued

2.1.7.1 Institution for Care of Children (C1)
These shall include any building or portion thereof or group of buildings under single management used as an institution for the full time care of children or minor, each providing accommodation for sleeping, dining and other provisions approved by the authority for more than six children.

2.1.7.2 Custodial Institution for Physically Capable Adults (C2)
These shall include any building or portion thereof or group of buildings under single management used for purposes of full time care and custody of adult or mentally disabled persons but physically capable of responding to emergency.

2.1.7.3 Custodial Institution for the Incapable Adults (C3)
These shall include any building or portion thereof or group of buildings under single management used for purposes of full time care and custody of persons physically or mentally incapable of responding to emergency.

2.1.8 Occuancy D: Health Care Facilities
Buildings under this Occupancy group shall include those used for purposes of providing medical care, diagnostic facilities and treatment to persons suffering from physical discomfort, in which sleeping accommodation may or may not be provided. This Occupancy shall be subdivided as follows:

2.1.8.1 Normal Medical Facilities (D1)
These shall include any building or portion thereof or group of buildings under single management in which essential medical facilities having surgery, emergency and casualty treatment facilities, general or specialized medical and other treatment are provided to persons suffering from physical discomfort.
Occupancy definitions /Continued

2.1.8.2 Emergency Medical Facilities (D2)

These shall include any building or portion thereof used for purposes of providing essential medical facilities having surgery, emergency, casualty treatment facilities. General or specialized medical and other treatment is provided to persons suffering from physical discomfort. This Type shall be equipped and designated to handle post disaster emergency. By construction it is required to remain operational during and after disasters, built as a part of disaster preparedness program.

2.1.9 Occupancy E: Business

These shall include any building or portion thereof which is used for any business transactions other than amusement. This Occupancy shall be subdivided as follows:

2.1.9.1 Office (E1)

These shall include any building or part thereof which is used for paper works, documentation, only display of samples of products but not for direct sale, maintaining accounts and records for administrative or consulting services, banking or activities for business purposes and professional training.

2.1.9.2 Research and Testing Laboratories (E2)

These shall include any building or portion thereof which is used as research establishment and or test laboratory involving hazardous materials within the limit of exempted quantity permitted in this Code.

2.1.9.3 Essential Services (E3)

These shall include any building or portion thereof used for purposes of providing emergency services and utilities which are required to remain operational during and after a disaster or other emergency situations.

2.1.10 Occupancy F: Mercantile

This occupancy type shall include any building or portion thereof or group of buildings which is used for display and sale of merchandise. This Occupancy shall be subdivided as follows:

2.1.10.1 Small Shops and Market (F1)

These shall include any building or portion thereof with an area divided or undivided not exceeding 300 m² used for purposes of display and sale of merchandise, either wholesale or retail, with or without incidental storage and service facilities.

2.1.10.2 Large Shops and Market (F2)

These shall include any building or portion thereof with an area divided or undivided more than 300 m² used for purposes of display and sale of merchandise, either wholesale or retail, with or without incidental storage and service facilities.
Occupancy definitions /Continued

2.1.10.3 Refueling Station (F3)
These shall include any building or portion thereof used for providing refueling and maintenance without repair services for automobiles which is moderately hazardous in nature.

2.1.11 Occupancy G: Industrial Buildings
Buildings under this Occupancy shall be subdivided on the basis of hazard potential of the contents and the processes of the industry. The hazard shall generally mean the relative danger of the start of fire and the rapidity of its spread, the danger of smoke and gases generated that pose a potential threat to the safety of the occupants of the building. Unless areas with different degrees of hazard are effectively segregated and separated in accordance with the provisions of this Code, the most hazardous area in a building shall govern its classification. This occupancy shall also include facilities for public utility services at the producer or distributor’s end that deals with generation and distribution of utility facilities. Any such building or portion thereof which is not using hazardous material quantified and categorized in occupancy group J, shall be subdivided as follows:

Occupancy definitions /Continued

2.1.11.1 Low Hazard Industry (G1)
These shall include any industrial building in which the contents are of such low combustibility and the processes conducted therein are of such low hazardous nature that danger of self-ignition and self-propagation of fire is nonexistent; the only danger being an onset of fire from external sources with the resulting danger to life and property.

2.1.11.2 Moderate Hazard Industry (G2)
These shall include any industrial building in which the contents are moderately combustible and the industrial processes conducted therein are liable to give rise to a fire which will spread with moderate rapidity, giving off considerable smoke.

2.1.12 Occupancy H: Storage Buildings
Buildings under this Occupancy group shall include any building or portion thereof used primarily for storage or sheltering of goods, wares, merchandises, vehicles or animals. Any such building or portion thereof which is not used for storing hazardous material quantified and categorized in occupancy group J, shall be subdivided as follows:
### Occupancy definitions /Continued

#### 2.1.12.1 Low Fire-risk Storage (H1)

These shall include any building or portion thereof which is used for storage of materials or other contents which do not constitute the danger of self-ignition, and in the event of fire the rate of burning shall be less than moderate rapidity.

#### 2.1.12.2 Moderate Fire-risk Storage (H2)

These shall include any building or portion thereof which is used for storage of materials which do not constitute the danger of self-ignition but which in the event of fire will burn with moderate rapidity.

Items which shall be deemed to render a building hazardous are specified in Sec. 2.14.3 along with the exempted amount for each item.

### Exempted amount of Hazardous Material

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Material</th>
<th>Class/State</th>
<th>Maximum Quantities in Storage Limit</th>
<th>Use Closed Systems</th>
<th>Use Open Systems</th>
<th>Maximum Quantities in Use Closed Systems</th>
<th>Use Open Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flammable solids</td>
<td>Class I-A</td>
<td>115 liters * 454 liters</td>
<td>115 liters 454 liters</td>
<td>115 liters 454 liters</td>
<td>28 liters 115 liters 454 liters</td>
<td>28 liters 115 liters 454 liters</td>
</tr>
<tr>
<td>2</td>
<td>Flammable gases</td>
<td>Class I-B</td>
<td>454 liters 1240 liters</td>
<td>454 liters 1240 liters</td>
<td>114 liters 320 liters</td>
<td>320 liters 114 liters</td>
<td>320 liters 114 liters</td>
</tr>
<tr>
<td>3</td>
<td>Combustible solids</td>
<td>Class I-C</td>
<td>454 liters 1240 liters</td>
<td>454 liters 1240 liters</td>
<td>114 liters 320 liters</td>
<td>320 liters 114 liters</td>
<td>320 liters 114 liters</td>
</tr>
<tr>
<td>4</td>
<td>Combustible gases</td>
<td>Class II-A</td>
<td>454 liters 1240 liters</td>
<td>454 liters 1240 liters</td>
<td>114 liters 320 liters</td>
<td>320 liters 114 liters</td>
<td>320 liters 114 liters</td>
</tr>
<tr>
<td>5</td>
<td>Combustible liquids</td>
<td>Class I-B</td>
<td>115 liters 454 liters</td>
<td>115 liters 454 liters</td>
<td>115 liters 454 liters</td>
<td>28 liters 115 liters 454 liters</td>
<td>28 liters 115 liters 454 liters</td>
</tr>
<tr>
<td>6</td>
<td>Combustible liquids</td>
<td>Class I-C</td>
<td>2.852 m³ 28.32 m³</td>
<td>2.852 m³ 28.32 m³</td>
<td>9.97 m³ 8.7 m³</td>
<td>9.97 m³ 8.7 m³</td>
<td>9.97 m³ 8.7 m³</td>
</tr>
</tbody>
</table>

Note: * denotes exempted amount.
## Exempted amount of Hazardous Material

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Material</th>
<th>Class/State</th>
<th>Maximum Quantities in Storage Limit</th>
<th>Use Closed Systems</th>
<th>Use Open Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Oxidizing Gas</td>
<td>Gaseous</td>
<td>42.48 m³ (NTP)</td>
<td>42.48 m³ (NTP)</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Liquid</td>
<td>56.78 liters</td>
<td>56.78 liters</td>
<td>Not applicable</td>
</tr>
<tr>
<td>14</td>
<td>Pyrophoric</td>
<td>Not applicable</td>
<td>0.454 kg or 0.056 m³ (NTP)</td>
<td>0.056 m³ (NTP)</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Pyrophoric</td>
<td>Not applicable</td>
<td>1.8 kg or 1.4 m³ (NTP)</td>
<td>0.28 m³ (NTP)</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Explosives**</td>
<td>Division 1.1</td>
<td>0.454 kg</td>
<td>0.1135 kg</td>
<td>0.1135 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Division 1.2</td>
<td>0.454 kg</td>
<td>0.1135 kg</td>
<td>0.1135 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Division 1.3</td>
<td>2.27 kg</td>
<td>0.454 kg</td>
<td>0.454 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Division 1.4</td>
<td>22.7 kg</td>
<td>22.7 kg</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Division 1.40</td>
<td>56.75 kg</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Division 1.5</td>
<td>0.454 kg</td>
<td>0.1135 kg</td>
<td>0.1135 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Division 1.6</td>
<td>0.454 kg</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

* The maximum quantities may be increased by 100 percent in areas not accessible to the public in buildings provided with automatic sprinkler system.

** see: Explosive control act.

## Table 3.2.5(b): Exempted Amounts of Hazardous Materials in Terms Health Hazard in a Control Area

<table>
<thead>
<tr>
<th>Material</th>
<th>Class/State</th>
<th>Maximum Quantities in Single Storage</th>
<th>Closed Systems</th>
<th>Open Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosive</td>
<td>Not applicable</td>
<td>2270 kg or 1892 liters or 23 m³ NTP</td>
<td>227 kg or 1892 liters or 23 m³ NTP</td>
<td>454 kg or 379 liters</td>
</tr>
<tr>
<td>Highly toxic</td>
<td>Not applicable</td>
<td>4.54 kg or 0.57 m³ NTP</td>
<td>4.54 kg or 0.57 m³ NTP</td>
<td>1.362 kg</td>
</tr>
<tr>
<td>Toxic</td>
<td>Not applicable</td>
<td>227 kg or 23 m³ NTP</td>
<td>227 kg</td>
<td>56.75 kg</td>
</tr>
</tbody>
</table>
Occupancy definitions /Continued

2.1.13 Occupancy I: Assembly

Buildings under this Occupancy group shall include any building or portion thereof in which groups of people congregate or assemble for recreation, amusement, social, religious, political, cultural, travel and similar purposes. This Occupancy shall be subdivided as follows:

Occupancy definitions /Continued

2.1.13.1 Large Assembly with Fixed Seats (I1)

This occupancy shall include a building or a portion thereof for assembly in a space provided with fixed seats for 1000 or more persons. Assembly buildings under this subdivision may be for theatrical, operatic performances or cinema projection having or not a raised stage, proscenium curtains, scenery loft or projection screen, lighting equipment, projection booth and necessary theatrical and mechanical equipment.

2.1.13.2 Small Assembly with Fixed Seats (I2)

This occupancy type shall include any building or portion thereof primarily meant for use as described for buildings under Occupancy I1, but with fixed seats for less than 1000 persons in a space. These assembly buildings may or may not be provided with a legitimate theatrical stage or related accessories or equipment.

2.1.13.3 Large Assembly without Fixed Seats (I3)

This occupancy type shall include any building or portion thereof for assembly in a space, in which there are no fixed seats, which may or may not be provided with a legitimate stage or theatrical accessories, and which has accommodation for 300 or more persons.
Occupancy definitions /Continued

### 2.1.13.4 Small Assembly without Fixed Seats (J4)
This occupancy type shall include any building or portion thereof primarily intended for use as described in Occupancy 13, but with accommodation for less than 300 persons in a space.

### 2.1.13.5 Sports Facilities (J5)
This occupancy type shall include any building or portion thereof meant for assembly of spectators for recreational and amusement purpose mainly related to sports.

### 2.1.14 Occupancy J: Hazardous Buildings

Any Building or portion thereof used as storage, industrial, research and other facilities dealing with hazardous material in excess of exempted quantity defined in the Table 3.2.5 or any micro-biological facilities shall be categorized in this Occupancy group.

Definition of hazard and the amount of such materials which shall be deemed to render a building hazardous are set forth in Sec 2.14.3. This Occupancy shall be subdivided as follows:

#### 2.1.14.1 Explosion Hazard Buildings (J1)
These shall include any building or portion thereof which is used for storage, handling, processing or manufacture of explosive materials and products that have explosion hazard.

### 2.1.14.2 Chemical Hazard Buildings (J2)
These shall include any building or portion thereof which is used for storage, handling, processing or manufacture of materials and products that are highly corrosive, toxic, poisonous and physically harmful including corrosive and toxic alkalis, acid or other liquids or chemicals, producing flame, fumes, radiation, and explosive, poisonous, irritant and corrosive gases.

#### 2.1.14.3 Biological Hazard Buildings (J3)
These shall include any building or portion thereof which is used for storage, handling, processing or manufacture of materials and products that use biological processes and in which the risk of harmful biological threat to the occupants exist.

#### 2.1.14.4 Radiation Hazard Buildings (J4)
These shall include any building or portion thereof which is used for storage, handling, processing or manufacture of materials and products that use nuclear and radioactive processes and in which the risk of radioactive contamination exists.
Occupancy definitions /Continued

2.1.15 Occupancy K: Garage

These occupancy types shall include any building or portion thereof used one or more vehicles having containers of flammable liquid or compressed gas or carrying power or combination of any of these as a supply source for self-propelling are kept for use, sale, rental purpose, storage, repair, exhibition and all those floors of a building or portion thereof in which such vehicles are not separated by suitable cutoff to prevent fire spreading.

2.1.15.1 Parking Garage (K1)

This occupancy type shall include any building or portion thereof used solely for parking Motor Vehicles for a limited period of time.

2.1.15.2 Private Garage (K2)

This occupancy type shall include any building or portion thereof used as store of owner's or tenant's Motor Vehicles for private use for unlimited period of time.

2.1.15.3 Repair Garage and Showrooms (K3)

This occupancy type shall include any building or portion thereof wherein repair of electrical or mechanical system or denting or painting works of body is performed on any type of vehicles and includes associated floor spaces used as office, showrooms, incidental store and parking.

Occupancy definitions /Continued

2.1.16 Occupancy L: Utility

This occupancy type shall include any building or portion thereof used to install any type of equipment to provide support service to any building or portion thereof or group of buildings of all occupancy groups and with special provisions for occupancy J.

This shall also include all public and private utility facilities of the consumer’s end that are located within the consumer’s site and all installations are required special care to ensure life and property safety as per provisions of this Code.
Occupancy definitions /Continued

2.1.17 Occupancy M: Miscellaneous
Buildings under this Occupancy group shall include special buildings not covered in other Occupancy groups. These Occupancies shall be subdivided as follows:

2.1.17.1 Special Structure (M1)
Any building or structure which is neither listed in the A-Z list nor covered in any occupancy group provided in this Code but unique in character may be categorized in this occupancy by the Board of Appeals. Each and every individual M1 Structure shall be complied with NFPA or equivalent standards for the life and fire safety.

2.1.17.2 Fences, Tanks and Towers (M2)
These shall include fences and boundary walls over 1.5 m high, standalone structures for gravity water tank and towers for telecommunication, power distribution, air-traffic control terminal or observation towers.

For general reference one can go through the non-exhaustive listing of Occupancy Classification of

Table 3.2.6: A-Z List of Occupancy Classification
End of Segment 02

Thank you

RECESS
SEGMENT 03

Classification of Building Construction Types Based on Fire Resistance

(from BNBC Part III, Chapter 03)

<table>
<thead>
<tr>
<th>Construction Group</th>
<th>Construction Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I: Non-combustible</td>
<td>Type I-A</td>
<td>4 hour protected</td>
</tr>
<tr>
<td>Group I: Non-combustible</td>
<td>Type I-B</td>
<td>3 hour protected</td>
</tr>
<tr>
<td>Group I: Non-combustible</td>
<td>Type I-C</td>
<td>2 hour protected</td>
</tr>
<tr>
<td>Group I: Non-combustible</td>
<td>Type I-D</td>
<td>1 hour protected</td>
</tr>
<tr>
<td>Group I: Non-combustible</td>
<td>Type I-E</td>
<td>Unprotected</td>
</tr>
<tr>
<td>Group II: Combustible</td>
<td>Type II-A</td>
<td>Heavy timber</td>
</tr>
<tr>
<td>Group II: Combustible</td>
<td>Type II-B</td>
<td>Protected wood joist</td>
</tr>
<tr>
<td>Group II: Combustible</td>
<td>Type II-C</td>
<td>Unprotected wood joist</td>
</tr>
<tr>
<td>Group II: Combustible</td>
<td>Type II-D</td>
<td>Protected wood frame</td>
</tr>
<tr>
<td>Group II: Combustible</td>
<td>Type II-E</td>
<td>Unprotected wood frame</td>
</tr>
</tbody>
</table>
No building or portion thereof shall be designated a given construction type unless it fully conforms to the minimum requirements for that Construction type.

When a type of construction is utilized which is superior than the type of construction required by this Code, there shall be no requirement to upgrade the rest of the construction to comply to that higher type of construction and the designated construction type shall be that of the lesser classification, unless all of the requirements for the higher classification are met.

The fire resistance ratings of various types of construction for structural and nonstructural members are specified in Tables 3.3.1 (a) and (b).

For hazardous Occupancies involving an exceptionally high degree of fire risk or an exceptionally high concentration of combustible or flammable content, the Authority may increase the requirement of Table 3.3.1 (a).

Buildings having a height of more than 33 m shall be constructed with non-combustible materials.

The fire resistance ratings of various building components shall conform to ASTM standards.
### 3.1.2 (Part III, Chapter 3) Group I: Non-Combustible Construction

**Buildings or portion thereof** in Non-combustible Construction Group I are those in which the *walls, exit-ways, shafts, structural members, floors, and roofs* are **constructed of non-combustible materials** and **assemblies having fire-resistance ratings** specified in Table 3.3.1 (a).

The Non-combustible group consists of Construction Type I-A, I-B, I-C, I-D and I-E.

<table>
<thead>
<tr>
<th>Construction Type</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.2.1 Construction Type I-A</td>
<td>This construction type includes buildings in which the <em>bearing walls and other major structural elements</em> are generally of <strong>four-hour-fire-resistance rating</strong>.</td>
</tr>
<tr>
<td>3.1.2.2 Construction Type I-B</td>
<td>This construction type includes buildings in which the <em>bearing walls and other major structural elements</em> are generally of <strong>three-hour-fire-resistance rating</strong>.</td>
</tr>
<tr>
<td>3.1.2.3 Construction Type I-C</td>
<td>This construction type includes buildings in which the <em>bearing walls and other major structural elements</em> are generally of <strong>two-hour-fire-resistance rating</strong>.</td>
</tr>
<tr>
<td>3.1.2.4 Construction Type I-D</td>
<td>This construction type includes buildings in which the <em>bearing walls and other major structural elements</em> are generally of <strong>one-hour-fire-resistance rating</strong>.</td>
</tr>
<tr>
<td>3.1.2.5 Construction Type I-E</td>
<td>This construction type includes buildings in which the <em>bearing walls and other major structural elements</em> generally have <strong>no fire-resistance rating</strong>.</td>
</tr>
</tbody>
</table>
### 3.1.3 (Part III, Chapter 3) Group II: Combustible Construction

**Buildings or portion thereof** in Combustible Construction Group II are those in which the walls, exit-ways, shafts, structural members, floors, and roofs are constructed wholly or partly of combustible materials having fire-resistance ratings specified in Table 3.3.1 (b).

The Non-combustible group consists of Construction Type II-A, II-B, II-C, II-D and II-E.

### 3.1.3.1 Construction Type II-A

This Construction type includes heavy timber construction in which fire-resistance is attained by

(a) Limiting the minimum sizes of wood structural members and the minimum thickness and composition of wood floors and roofs;

(b) Avoiding concealed spaces under floors and roofs or by providing fire-stopping protection for these spaces; and

(c) Using fastening, construction details, and adhesives for structural members as required by this Chapter and Part 4.

(d) The minimum dimensions for framing members shall be prescribed in this Chapter and Part 4, except that members are protected to provide a fire resistance rating of at least one hour need not comply with this requirement.
### Construction type Definitions

#### 3.1.3.2 Construction Type II-B

This Construction type includes *buildings and portion thereof* in which

(a) *Exterior walls, fire walls, exit-ways, and shaft enclosures* are of *non-combustible materials* having the required fire-resistance ratings; and

(b) The floors, roofs and interior framing are *wholly or partly of wood of smaller dimensions than required for type II-A construction*, or *are of other combustible or non-combustible materials*, having the required fire-resistance rating.

#### 3.1.3.3 Construction Type II-C

This Construction type includes *buildings and portion thereof* in which

(a) *Exterior walls, fire walls, exit ways, and shaft enclosures* are of *noncombustible materials* having the required fire-resistance ratings; and

(b) The floors, roofs and interior framing are *wholly or partly of wood of smaller dimensions than required for type II-A construction*, or *are of other combustible or non-combustible materials*, having no required fire-resistance rating.
### 3.1.3.4 Construction Type II-D

This Construction type includes *buildings and portion thereof* in which exterior walls, bearing walls, floors, roofs, and interior framings are generally of *wood or other combustible materials* having the required fire-resistance ratings.

### 3.1.3.5 Construction Type II-E

This Construction type includes *buildings and portion thereof* in which

(a) The exterior walls are generally of *wood or other combustible materials* having the required fire-resistance ratings, and

(b) In which the bearing walls, floors, roofs, and interior framing are of *wood or other combustible materials*, generally having no fire-resistance ratings.
3.1.4 Separated Occupancy and Construction

When two or more occupancies accommodated in a building, each such occupancy shall be separated according to the provisions specified in Sec 2.3 Chapter 2 Part 3 and Table 3.2.1.

When two or more types of construction used within a building, the entire building shall be subject to the most restrictive construction type and shall comply with FAR restrictions as per provisions of this Code.

However if the Occupancies within the different Types of Construction are completely separated by construction that meets the fire-resistance rating requirements for fire separation listed in Table 3.2.1 of Chapter 1 Part 3 then each Occupancy so separated may, for the purpose of this Code, be considered as separate building section.
### Construction
Separation, Construction elements & fire rating

#### Exterior wall with Fire Separation Distance of

<table>
<thead>
<tr>
<th>Construction Element</th>
<th>TYPE I-A</th>
<th>TYPE I-B</th>
<th>TYPE I-C</th>
<th>TYPE I-D</th>
<th>TYPE I-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating in Hours</td>
<td>Exterior Opening</td>
<td>Rating in Hours</td>
<td>Exterior Opening</td>
<td>Rating in Hours</td>
<td>Exterior Opening</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Structural members supporting walls</td>
<td>Structural members shall have the same fire resistance rating of wall to be supported, but not less than rating required by the construction classification.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor construction including beams</td>
<td>3</td>
<td>2</td>
<td>1½</td>
<td>1</td>
<td>0½</td>
</tr>
<tr>
<td>Roof construction, including beams, trusses and framing including arches, domes, sheds, cable supported roofs and roof decks</td>
<td>4.5m or less in height above floor to lowest member of ceiling</td>
<td>3</td>
<td>1½</td>
<td>1</td>
<td>0½</td>
</tr>
<tr>
<td></td>
<td>4.5m to 6m in height above floor to lowest member of ceiling</td>
<td>2 or 3</td>
<td>1½ or 1½</td>
<td>1½ or 1½</td>
<td>1½ or 1½</td>
</tr>
<tr>
<td></td>
<td>6m or more in height above floor to lowest member of ceiling</td>
<td>2 or 3</td>
<td>1½ or 1½</td>
<td>1½ or 1½</td>
<td>1½ or 1½</td>
</tr>
</tbody>
</table>
## Construction
Separation, Construction elements & fire rating

### Table 3.3.1 (b): Fire Rating for Construction Group II: Combustible

<table>
<thead>
<tr>
<th>Exterior wall with Fire Separation Distance of</th>
<th>TYPE I-A</th>
<th>TYPE I-B</th>
<th>TYPE I-C</th>
<th>TYPE I-D</th>
<th>TYPE I-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior Element Interior Wall</td>
<td>Exterior Opening in Hours</td>
<td>Exterior Opening in Hours</td>
<td>Exterior Opening in Hours</td>
<td>Exterior Opening in Hours</td>
<td>Exterior Opening in Hours</td>
</tr>
<tr>
<td>Shaft (other than exits) and elevator hoistways</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Fire separation wall and party wall</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Access corridor leading to exits</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Non-combustible Material: N, P, Not Permitted: N, L, No Limit

---

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Notes:

1. Requirements of protected exterior openings shall not apply to religious assembly. [Protected openings within an exterior separation of 0.9 m or less are permitted for buildings classified in Occupancy Groups A provided, however said openings do not exceed in total area of 2 1/4% of the facade of the story in which they are located. The openings however, may not be credited towards meeting any of the mandatory natural light and ventilation as per provisions of this Code. Protection of openings with an exterior separation of 0.9 m to 9 m shall not be required for A-1, A-2 and A-3 Occupancy groups] or to buildings classified in Occupancy groups J, G and H additional requirements for exterior walls and exterior wall openings as per provisions of this Code.

2. Upon special application, the area development authorities may permit exterior wall openings to be constructed in excess of the permitted area established by this Table 1 if such openings at the time of their construction are located at least 9 m in a direct line from any neighboring building except as otherwise permitted in footnote f. Such additional openings may not however be credited toward meeting any of the mandatory natural light and ventilation requirements of Sec 1.19 Part 3 of this Code. If any neighboring building is later altered or constructed to come within the above distance limitation, the affected exterior openings shall immediately be closed with construction meeting the fire-resistance rating requirements for exterior wall construction of the building in which they are located.
Construction
Separation, Construction elements & fire rating

Applies to occupancy groups J, G and H

See Provisions of this Code for additional impact resistance requirements applicable to certain stair enclosures and for certain exceptions to stair enclosure requirements.

When two or more buildings are constructed on the Plot and the combined floor area of the buildings does not exceed the limits established by this Code for any of the buildings, not fire-resistance rating shall be required for non-bearing portions of the exterior walls of those buildings facing each other, and there shall be no limitation on the permitted amount of exterior openings.

Fire retardant treated wood complying with the requirements of this Code may be used.

Tabulated ratings apply to buildings over one storey in height. In one storey building, roof construction may be of material having zero hour fire-resistance rating.

Materials which are not non-combustible as defined in this Code may be used in non-bearing construction elements as per provisions for this Code.

Applies to the construction of the street floor and all construction below the level of the street floor in building or spaces classified in occupancy group A-3 except where the space below the street floor does not exceed five feet in height.

Columns supporting the roof of a one-story building shall have the same fire-resistance rating as required for a column supporting one floor in a building of the same construction class.

Members supporting loads of not more than two floors or one floor and a roof need not have a fire-resistance rating greater than the floor construction fire-resistance requirement in buildings classified in occupancy groups B, C and A-3, not including unsprinklered spaces of other occupancy, and in fully sprinklered buildings in occupancy groups E and A-5.
End of Segment 03

Thank you
Any Questions?

Thank you