

History of Building Codes

- ❖ Since at least the Code of Hammurabi in the 18th Century BC, there have been codes governing the design and construction of buildings.
- ❖ Some codes, such as the Code of Napoleon, 18th Century AD, provided for loss replacement as a sort of insurance policy.
- ❖ Still other codes established rules for materials or systems: the Lord Mayor of London in 1189 required party walls between buildings, and the Charlestown General Assembly in 1740 required brick and stone for exterior walls.

Purpose

- ❖ Building codes are an expression of acceptable means and technology to meet prescribed needs at a point in time
- ❖ Normally, model building codes have a 3-5 year update cycle.

Code Evolution

- ❖ New editions of the building code come out every 3 to 5 years.
- ❖ Approval is through political process.
- ❖ Due to length of review in political processes, the adapted code is often not the most recent edition of the model building code on which the adopted code is based.

Legacy codes

- ❖ ***BOCA National Building Code (BOCA/NBC)*** by the Building Officials Code Administrators International (BOCA)
- ❖ ***Uniform Building Code (UBC)*** by the International Conference of Building Officials (ICBO)
- ❖ ***Standard Building Code (SBC)*** by the Southern Building Code Conference International (SBCCI)

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Nationally Recognized Codes and Standards

- ❖ **Americans with Disabilities Act Guidelines (ADAAG)**
- ❖ **National Fire Protection Association codes (NFPA)**
 - **Life Safety Code**
 - **National Electric Code**
 - **Building Construction and Safety Code**
- ❖ **Occupational Health and Safety Act – Means of Egress**

International Code Series:

- ❖ **International Building Code (IBC)**
- ❖ **International Energy Conservation Code (IECC)**
- ❖ **International Fire Code (IFC)**
- ❖ **International Fuel Gas Code (IFGC)**
- ❖ **International Mechanical Code (IMC)**
- ❖ **International Plumbing Code (IPC)**
- ❖ **International Property Maintenance Code (IPMC)**
- ❖ **International Residential Code (IRC)**

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ICC Codes Adapted by NYS

International Building Code	Building Code of NYS Existing Building Code of NYS
International Residential Code	Residential Code of NYS
International Fire Code	Fire Code of NYS
International Energy Conservation Code	Energy Conservation Code of NYS
International Mechanical Code	Mechanical Code of NYS
International Plumbing Code	Plumbing Code of NYS
International Fuel Gas Code	Fuel Gas Code of NYS
International Property Maintenance Code	Property Maintenance Code of NYS

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Objectives of the Codes

- ❖ A large portion of the International Building Code deals with fire prevention. The building code also deals with access for the disabled and structural stability (including earthquakes).
- ❖ It differs from the related International Fire Code in that the IBC handles fire prevention in regards to *construction and design* and the fire code handles fire prevention in an *on-going basis*.
 - **For example, the building code would deal with location of exits with the fire code keeping exits unblocked.**

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Code Focuses

- ❖ **Building occupancy classifications**
- ❖ **Building heights and areas**
- ❖ **Interior finishes**
- ❖ **Foundation, wall, and roof construction**
- ❖ **Fire protection systems (sprinkler system requirements and design)**
- ❖ **Materials and engineering used in construction**
- ❖ **Elevators and escalators**
- ❖ **Already existing structures**
- ❖ **Means of egress**

Building Occupancy

Building occupancy classifications refer to categorizing structures based on their usage and are primarily used for building and fire code enforcement.

- ❖ **Assembly (Group A)**
- ❖ **Business (Group B)**
- ❖ **Educational (Group E)**
- ❖ **Factory (Group F)**
- ❖ **High-Hazard (Group H)**
- ❖ **Institutional (Group I)**
- ❖ **Mercantile (Group M)**
- ❖ **Residential (Group R)**
- ❖ **Storage (Group S)**
- ❖ **Utility (Group U)**

Building Occupancy

Assembly (Group A) - places used for people gathering for entertainment, worship, and eating or drinking. Examples: churches, restaurants (with 50 or more possible occupants), theaters, and stadiums.



Building Occupancy

Business (Group B) - places where *services* are provided (not to be confused with mercantile,). Examples: banks, insurance agencies, government buildings (including police and fire stations), and doctor's offices.

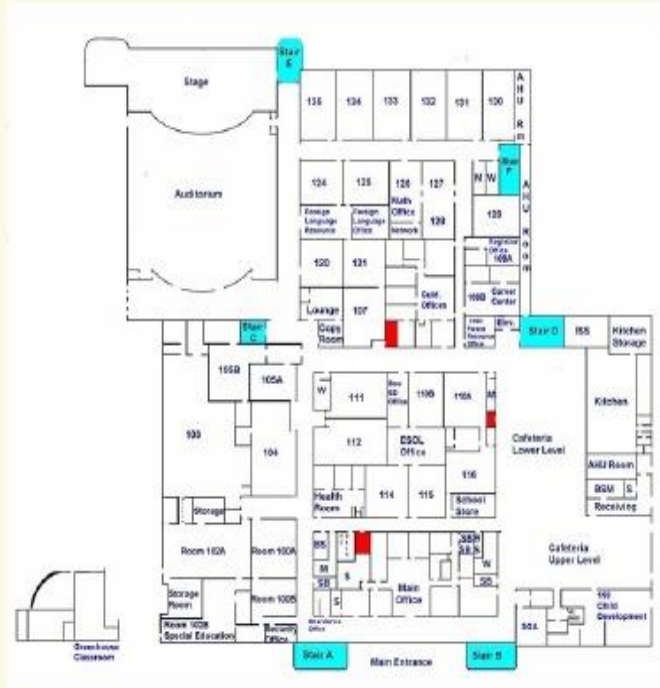
Higher education is part of Group B



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Building Occupancy

Educational
(Group E) -
schools and day
care centers up
to the 12th
grade.



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Building Occupancy

Mercantile (Group M) -
places where goods are
displayed and sold.
Examples: grocery
stores, department
stores, and gas stations.



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Building Occupancy

- ❖ **Factory (Group F)** - places where goods are manufactured or repaired (unless considered "High-Hazard" (below)). Examples: factories and dry cleaners.
- ❖ **High-Hazard (Group H)** - places involving production or storage of very flammable or toxic materials. Includes places handling explosives and/or highly toxic materials (such as fireworks, hydrogen peroxide, and cyanide).
- ❖ **Storage (Group S)** - places where items are stored (unless considered High-Hazard). Examples: warehouses and parking garages.
- ❖ **Utility and Miscellaneous (Group U)** - others. Examples: water towers, barns, towers.

Building Occupancy



- ❖ Institutional (Group I) - places where people are physically unable to leave without assistance. Examples: hospitals, nursing homes, and prisons.
- ❖ Residential (Group R) - places providing accommodations for overnight stay (excluding Institutional). Examples: houses, apartment buildings, hotels, and motels.

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PROGRAM	TPOLOGY	OCCUPANCY CLASSIFICATION
Institutional		Assembly (Group A) Business (Group B) Educational (Group E)
Commercial		Business (Group B) Mercantile (Group M)
Industrial		Factory (Group F) High-Hazard (Group H)
Residential		Residential (Group R) Institutional (Group I)
Religious		Assembly (Group A) Educational (Group E)
Monuments		Assembly (Group A)
Funerary		Assembly (Group A) Storage (Group S)
Storage		Storage (Group S)
Agricultural		Business (Group B) Factory (Group F) High-Hazard (Group H)
Public Works		Utility (Group U)

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Mixed Occupancies

- ❖ Many buildings may have multiple occupancies. These are referred to as "mixed occupancies" and the different parts will be required to meet the codes for those specific areas.
- ❖ In places where more than one occupancy may apply the stricter code is usually enforced.
- ❖ Code enforcement officials will usually enforce the strictest side of the code

Using The Codes In The Design Process

- ❖ Determine applicable building occupancies present;
- ❖ If multiple occupancies are found in the building, document how each is separated or not separated
- ❖ If any hazardous materials are to be used/stored in the building, clearly indicate the locations
- ❖ Determine the allowable building area/height and class of construction
- ❖ Design building components based on class of construction requirements

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Code and Safety Planning

Life Safety

- ❖ Occupancy Separations
- ❖ Exiting
- ❖ Fire resistance ratings and penetrations
- ❖ Fire Protection Systems
- ❖ Windows and Fire Dept. Access
- ❖ Hazardous Materials
- ❖ Special Construction

Means of Egress

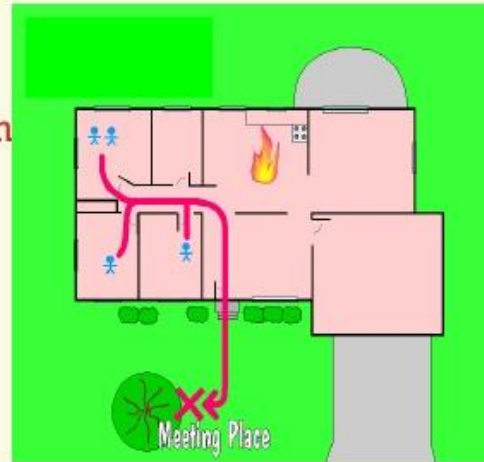
The code also address the number of exits required for a structure based on its intended occupancy use and the number of people who could be in the place at one time as well as their relative locations.

Means of Egress

The ability to exit the structure, primarily in the event of an emergency, such as a fire.

A means of egress consists of three parts:

- Exit access
- Exit
- Exit discharge



Code and Safety Planning

Assemblies

- Interior finishes
- Interior Environment
- Exterior Walls
- Roof and Penthouses
- Structural: Chapters
- Glass and Glazing
- Gypsum Board and Plaster
- Plastics (foam and light-transmitting)

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Using The Codes In The Design Process

Prescriptive design

- Specified by licensed design professional, usually architect
- Based on prescribed requirements in regulations and referenced standards
- Examples include framing, nailing schedules, thermal performance

Using The Codes In The Design Process

Performance design

- Design by architect or engineer practicing within their specialty
- Based on agreed performance objectives and engineering analysis
- Verified by peer review
- Examples include exit systems, fire rated separations, engineered assemblies

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Code and Safety Planning

Usage

- Sanitary Facilities
- Accessibility

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