RAMA UNIVERSITY

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FACULTY OF RNGINEERING AND TECHNOLOGY (DEPARTMENT OF CIVIL ENGINEERING)

BUILDING CONSTRUCTION

DIPLOMA (IInd YEAR/ IIIrd SEM)

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LECTURE-02
CLASSIFICATION OF BUILDING

- **Based on the type of construction, buildings are classified into 5 categories.**

I. Fire resistive Buildings (Type 1A , 1B)

II. Non–Combustible Buildings (Type 2A, 2B)

III. Ordinary Buildings (Type 3A, 3B)

IV. Heavy timber Buildings (Type 4)

V. Wood framed Buildings (Type 5A, 5B)

- **FIRE RESISTIVE BUILDINGS: (TYPE 1A, 1B)**
- These type of buildings are generally high raised, and the stoutest of all, which are usually of more than 75 feet tall.
- They are constructed of concrete and protected steel, (coated with fire resistant material) which are designed to hold fire.
- This type of buildings are generally residential and industrial buildings.
- The fire resistance is valid only for a specific time, depending up on the type of construction.
- Let us have a look at the resistive time for Industrial and Residential buildings.

CLASSIFICATION OF BUILDING

INDUSTRIAL BUILDINGS:

- 3 Hr- Exterior Walls.
- 3 Hr- Structural Frame.
- 2 Hr-Floor/Ceiling assembly.
- 1 ½ Hr-Roof Protection.

• RESIDENTIAL BUILDINGS:

- 2 Hr- Exterior Walls.
- 2 Hr-Structural frame.
- 2 Hr-Ceiling/Floor Separation.
- 1 Hr-Ceiling/Roof assembly.
- It means that according to the time given above, the building is resistant towards fire, and after the specified time it must be super viewed by the fire control authorities.

CLASSIFICATION OF BUILDING

NON- COMBUSTIBLE BUILDINGS:(TYPE 2A,2B)

- These buildings are generally the new buildings and remodels of commercial structures.
- The walls and roofs are constructed of non- combustible materials.(i.e. walls are rein forced masonry and the roofs have metal structural members) .
- The top of the roofs are covered with light weight concrete etc.

Protected Non-combustible.(common in school buildings)

- 1 Hr-Exterior Walls
- 1 Hr-Structural Frame
- 1 Hr-Floor/Ceiling/Roof Protection

Unprotected Non-combustible.(common in commercial buildings):

- These Buildings are constructed of non- combustible materials but these materials have no fire resistance.

CLASSIFICATION OF BUILDING

ORDINARY BUILDINGS:(TYPE 3A,3B)

- These buildings may be of old or newer constructions. They have non-combustible walls and wooden roof.
- Older constructions may have un rein-forced masonry and have conventionally framed roof, while newer houses have light weight roof systems, supported by R.C.C masonry or tilt slab.
- The walls and the roofs are 1 hour fire protected.
- Ordinary buildings are of the other type also, which is unprotected combustible. walls are of a wooden roof and the floor assembly is not protected against fire.
- These buildings are frequently found in "warehouse“, districts of older cities.

Specifications:

- 2 Hr. Exterior Walls
- No fire resistance for structural frame, floors, ceilings, or roofs.

CLASSIFICATION OF BUILDING

HEAVY TIMBER:(TYPE 4)

- These buildings were most commonly built before 1960, when bolts and metal plates were used as connectors.
- It utilizes large dimensional lumber for structural members and interior elements. These buildings hold up well under fire conditions.
- It is critical that, as these buildings are often poorly maintained, or have termites, the weathering issues contributes an earlier-than-expected collapse.
- To qualify the structure, all wooden members must have a minimum nominal dimension of 8 inches.

Specifications:

- 2 Hr. Exterior Walls
- 1 Hr. Structural Frame or Heavy Timber (Heavy Timber Floor/Ceiling/Roof Assemblies)

WOOD FRAMED BUILDINGS: (TYPE 5A,5B)

- This type of construction is found in many modern homes. The walls and roofs are made of combustible materials—most commonly wood.

It has a few negative characteristics:

- It is not highly fireproof, as it is made of wood.
- It is not strong enough to resist major wind events such as tornadoes and hurricanes.
- Every timber frame home structure is made of a few basic components:
- Studs are vertical wooden members within the walls.
- Joists are the horizontal wooden beams that support the floors.
- Rafters are the sloping wooden beams that support the roof.
- It also has protected wooden frame and unprotected wooden frame.
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CLASSIFICATION OF BUILDING

PROTECTED WOOD FRAME:

- It is Commonly used in the construction of newer apartment buildings; there is no exposed wood visible.
- 1 Hr. Exterior Walls
- 1 Hr. Structural Frame
- 1 Hr. Floor/Ceiling/Roof

Unprotected Wood Frame:

- It is used commonly at single family homes and garages. They often have exposed wood so there is no fire resistance.
- Studs Joists Rafters
- Check the buildings if they are resistant to fire. Since STEEL does not feed on fire, steel structured buildings would be more safer.
- Hence, to construct any structure, first attain knowledge about the type you are going to construct, and also its safety measures.

BASIC COMPONENTS OF A BUILDING STRUCTURE

The basic components of a building structure are the as follows:

- Foundation,
- Floors,
- Walls,
- Beams,
- Columns,
- Roof,
- Stair,
- Parapet
- Lintels
- Damp proof course (DPC)
- Plinth Beam
- Plinth
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These elements serve the purpose of supporting, enclosing and protecting the building structure.

THANK YOU