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UNIVERSITY

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FACULTY OF ENGINEERING AND  
TECHNOLOGY (DEPARTMENT OF  
CIVIL ENGINEERING)

**BUILDING CONSTRUCTION  
DIPLOMA (IIInd YEAR/ IIIrd SEM)**



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- **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)

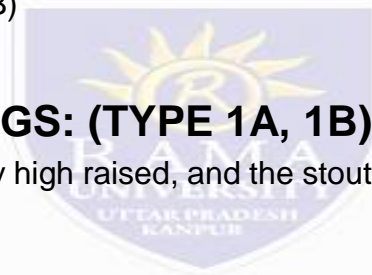
III. Ordinary Buildings (Type 3A, 3B)

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.



## 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.

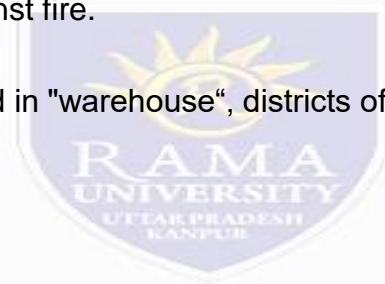
# CLASSIFICATION OF BUILDING

## 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 reinforced 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.



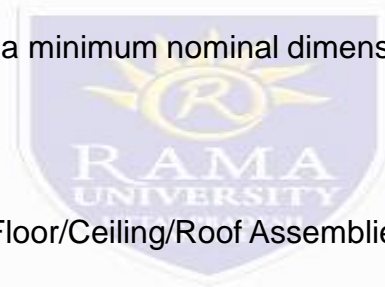
# CLASSIFICATION OF BUILDING

## 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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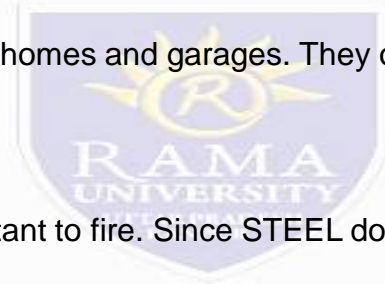
# CLASSIFICATION OF BUILDING

## **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
- 



These elements serve the purpose of supporting, enclosing and protecting the building structure.

***THANK YOU***

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