

BUILDING CONSTRUCTION FOR THE FIRE SERVICE

STUDENT HANDOUT MANUAL



EMERGENCY TRAINING ASSOCIATES, LLC

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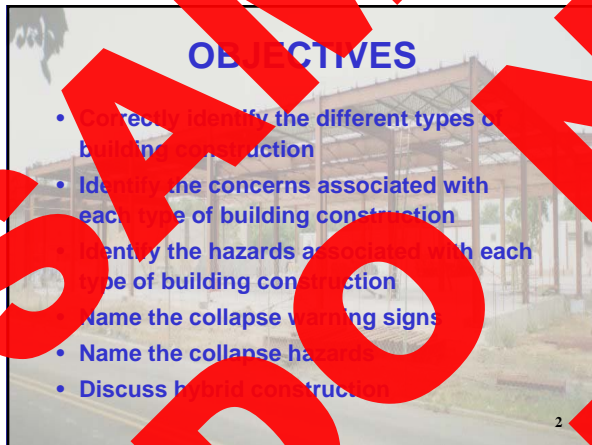
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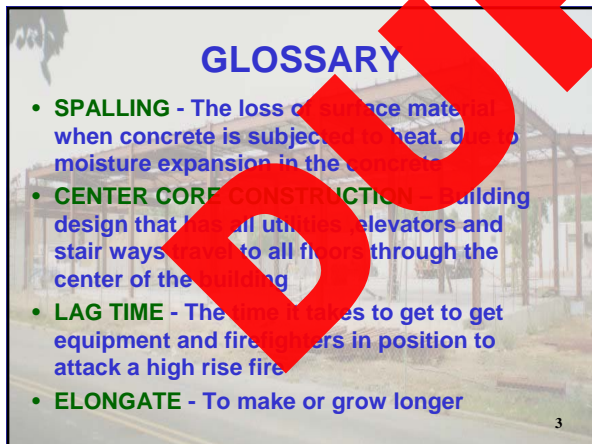
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GLOSSARY

- **COCKLOFT** - Void space between the top floor ceiling and the roof
- **HYBRID BUILDINGS** - Incorporate materials of more than one type of building construction
- **PARAPET WALL** - The continuation of a party wall, exterior wall, or fire wall above the roof line
- **DECORATIVE CORNICE** - A structure of wood, metal or masonry that tops a wall and projects from it

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GLOSSARY

- **STONE CORBELLING** - A bracket of stone projecting from the face of the wall and generally used to support a cornice
- **COMPOSITE MATERIAL** - Built up of different parts, pieces and materials intended to act as one
- **ENGINEERED LUMBER** - Wood modified from its natural state

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INTRODUCTION

WHY STUDY BUILDING CONSTRUCTION?

- To ensure safe and effective incident Action Plan
- Enables us to recognize potential construction hazards
- Gives us the knowledge to understand the effects of fire and fire suppression on selected building materials


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SAMPLE DO NOT DUPLICATE

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INTRODUCTION

All firefighters must have a general knowledge of building construction and how fire reacts in various types of buildings



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INTRODUCTION

This knowledge gives us an edge in planning for a safe and effective fire ground operation



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INTRODUCTION

History has shown that failure to recognize potential dangers presented by a particular type of construction can lead to deadly results.



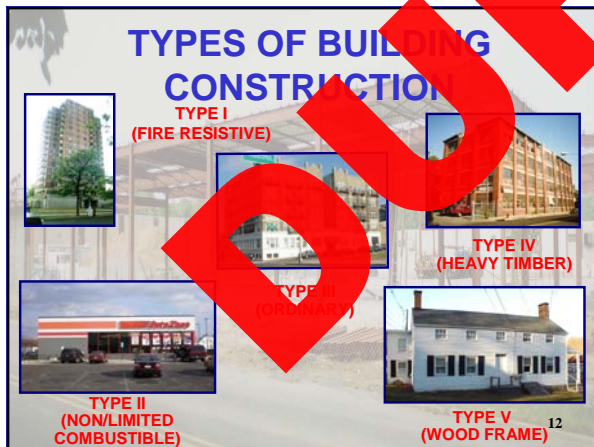
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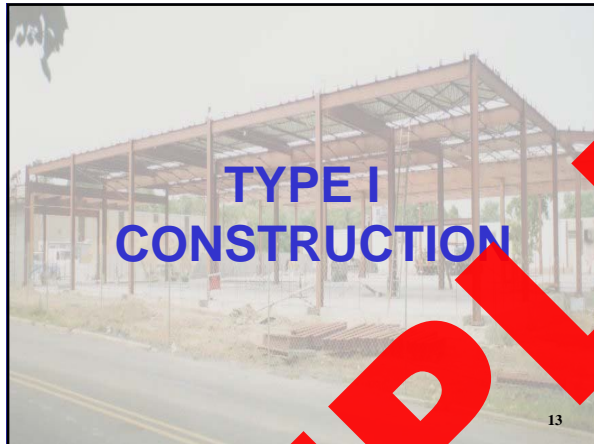
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CHARACTERISTICS OF TYPE I CONSTRUCTION

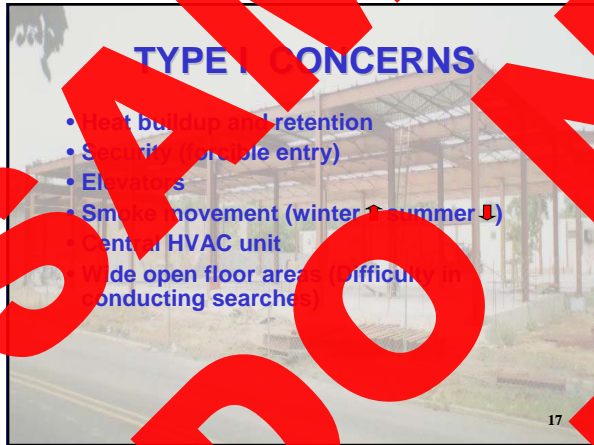
- Most resistant to collapse
- Most resistant to fire spread
- Structural components have sprayed on fire protection or encased in concrete or tile
- Structural components do not add to the fire spread in the building



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TYPE I CONCERNS

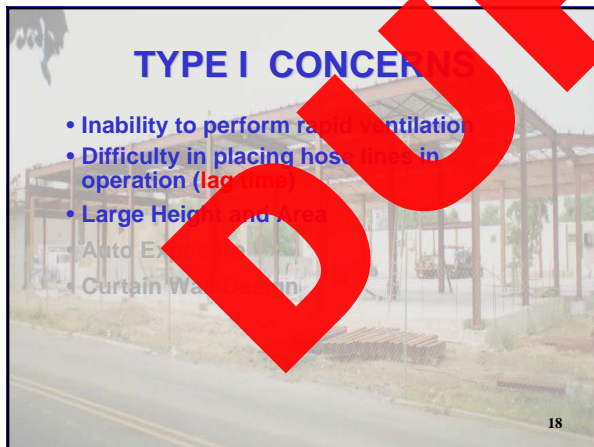
- Heat buildup and retention
- Security (multiple entry)
- Elevators
- Smoke movement (winter & summer)
- Central HVAC unit
- Wide open floor areas (difficulty in conducting searches)



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TYPE I CONCERNS

- Inability to perform rapid ventilation
- Difficulty in placing hose lines in operation (lag time)
- Large Height and Area
- Auto Ex
- Curtain Wall



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TYPE I CONCERNS

- Inability to perform rack installation
- Difficulty in placing hose (max. 4 ft. min.)
- Large Height and Area
- Auto Exposure
- Curtain Wall Design



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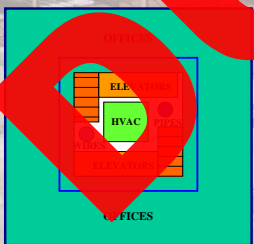
TYPE I HAZARDS

- Concrete Spalling
- Heated concrete ceilings collapse
- Heated concrete floors explode upward
- Suspended Ceilings



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TYPE I CENTER CORE




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TYPE IV CONCERNS

- Large open wooden interior frame work
- Oil soaked floors
- Renovations



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TYPE IV HAZARDS

- Radiant heat
- Falling masonry walls
- Chunks of steel and concrete bouncing outside of the collapse zone



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TYPE V CONSTRUCTION



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TYPE V CONSTRUCTION
WOOD FRAME



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**CHARACTERISTICS OF
TYPE V CONSTRUCTION**

- Load bearing structural members are partly or entirely combustible
- Exterior walls are partly or entirely combustible



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TYPE V CONCERNS

- Exterior wall fire spread
- Unlimited potential for fire extension within structure
- Balloon construction
- Early collapse of the light weight wood trusses




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TYPE V HAZARDS

- Combustible nature of a wood frame building
- Use of smaller structural members to support larger members
- Structural collapse



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TYPE V CONSTRUCTION WOOD FRAME

FOUR METHODS OF CONSTRUCTING WOOD FRAME BUILDINGS:

1. Brace frame
2. Balloon frame
3. Platform
4. Engineered lumber

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TYPE V CONSTRUCTION WOOD FRAME

PLATFORM CONSTRUCTION - FIRE STOPS

BALLON FRAME - FIRE SPREAD

LIGHTWEIGHT WOOD FRAME - TRUSS



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CHARACTERISTICS OF BRACED FRAME

- Vertical timbers called posts reinforce the four corners of the structure
- Horizontal timbers called girts reinforce each floor
- Posts and girts are connected by fastenings called mortise and tenon joints

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BRACE FRAME MORTISE AND TENON JOINTS



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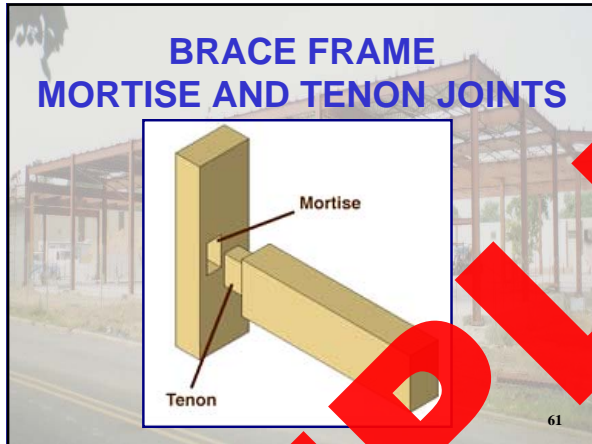
BRACE FRAME COLLAPSE HAZARD

- Weak point is the mortise and tenon joint
- Weakened by age
- Weather
- Previous fire damage
- Current fire involvement
- Failure of these joints can cause complete collapse of the structure

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SAMPLE NOT DUPLICATE


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What type of construction is this?
What are the firefighter's concerns?
What are the hazards of this type of construction?

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What type of construction is this?
What are the firefighter's concerns?
What are the hazards of this type of construction?

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