

Continuing Education For the Fire Fighter



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Building Construction

Module 3

Chapter 4

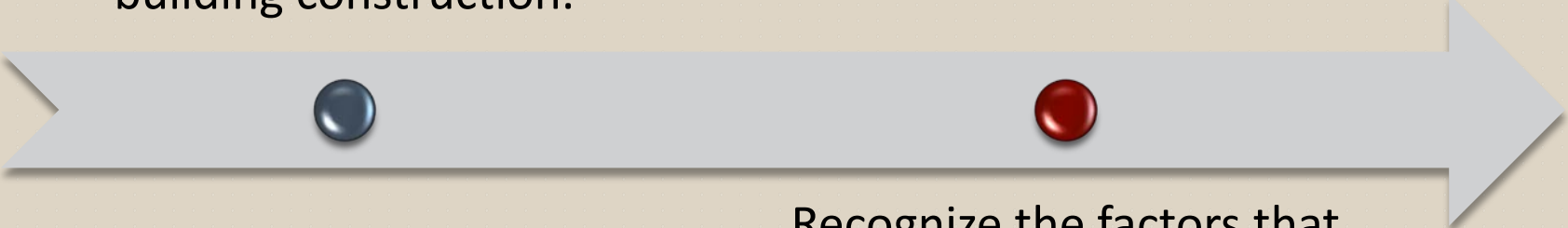


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LEARNING OBJECTIVES

Explain the hazards related to building construction.



Recognize the factors that influence structural collapse.



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UNDERSTANDING CONSTRUCTION TYPES CAN HELP FIREFIGHTERS IN SEVERAL WAYS.

Predict
aspects of
fire
development

Make aware
of structural
instability

Select
correct tools



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UNDERSTANDING CONSTRUCTION TYPES CAN HELP FIREFIGHTERS IN SEVERAL WAYS.

Judge
safety

Select right
type of
vertical
ventilation

Apply
emergency
escape
techniques

Adds to
situational
awareness



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CONSTRUCTION SIZE UP IS BASED ON THE CONSIDERATION OF SEVERAL FACTORS.



- Age of building
- Construction materials
- Roof type
- Renovations, modifications
- Dead loads
- Number of stories
- Windows
- Other



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YOU MUST BE AWARE OF CONDITIONS CREATED
BOTH BY THE FIRE AND BY TRYING TO EXTINGUISH
THE FIRE.



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DANGEROUS BUILDING CONDITIONS ARE CREATED BY A VARIETY OF FACTORS.



Fuel loading



Furnishings/
finishes

Courtesy of Eddie Avila



Roof
coverings



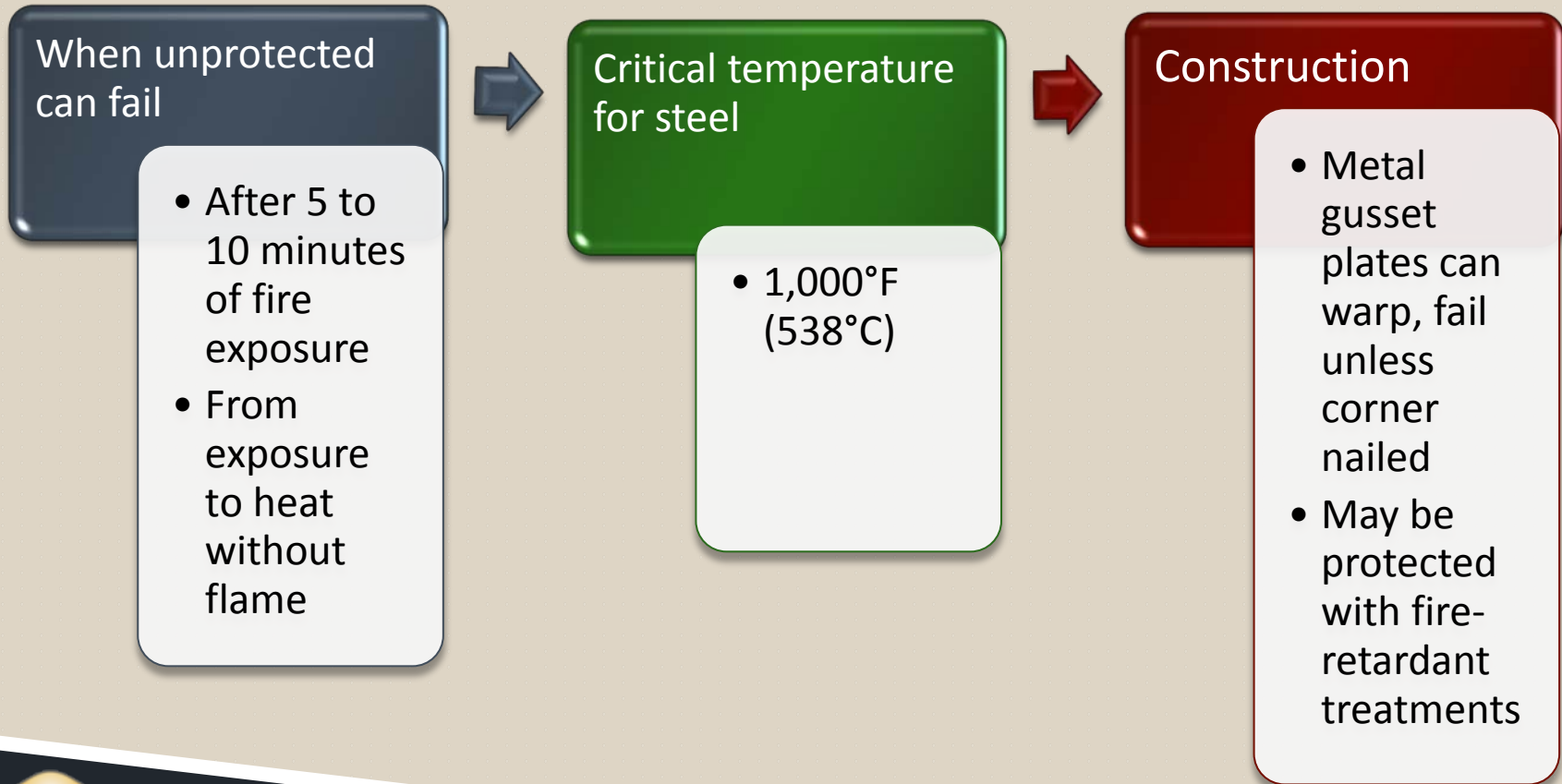
Large, open
spaces



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ENGINEERED AND TRUSS CONSTRUCTION PRESENTS UNIQUE HAZARDS.



BOWSTRING TRUSS ROOFS, COMMON IN LARGE OPEN FLOOR SPACES, PRESENT UNIQUE PROBLEMS.



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CONSTRUCTION, RENOVATION, AND DEMOLITION CAN CREATE HAZARDS.



Courtesy of Ron Moore and McKinney (TX) FD



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STRUCTURAL COLLAPSE IS THE FAILURE OF A BUILDING OR ANY PORTION OF A BUILDING.

Results from

- Natural cause
- Explosion
- Damage from other forces

May occur

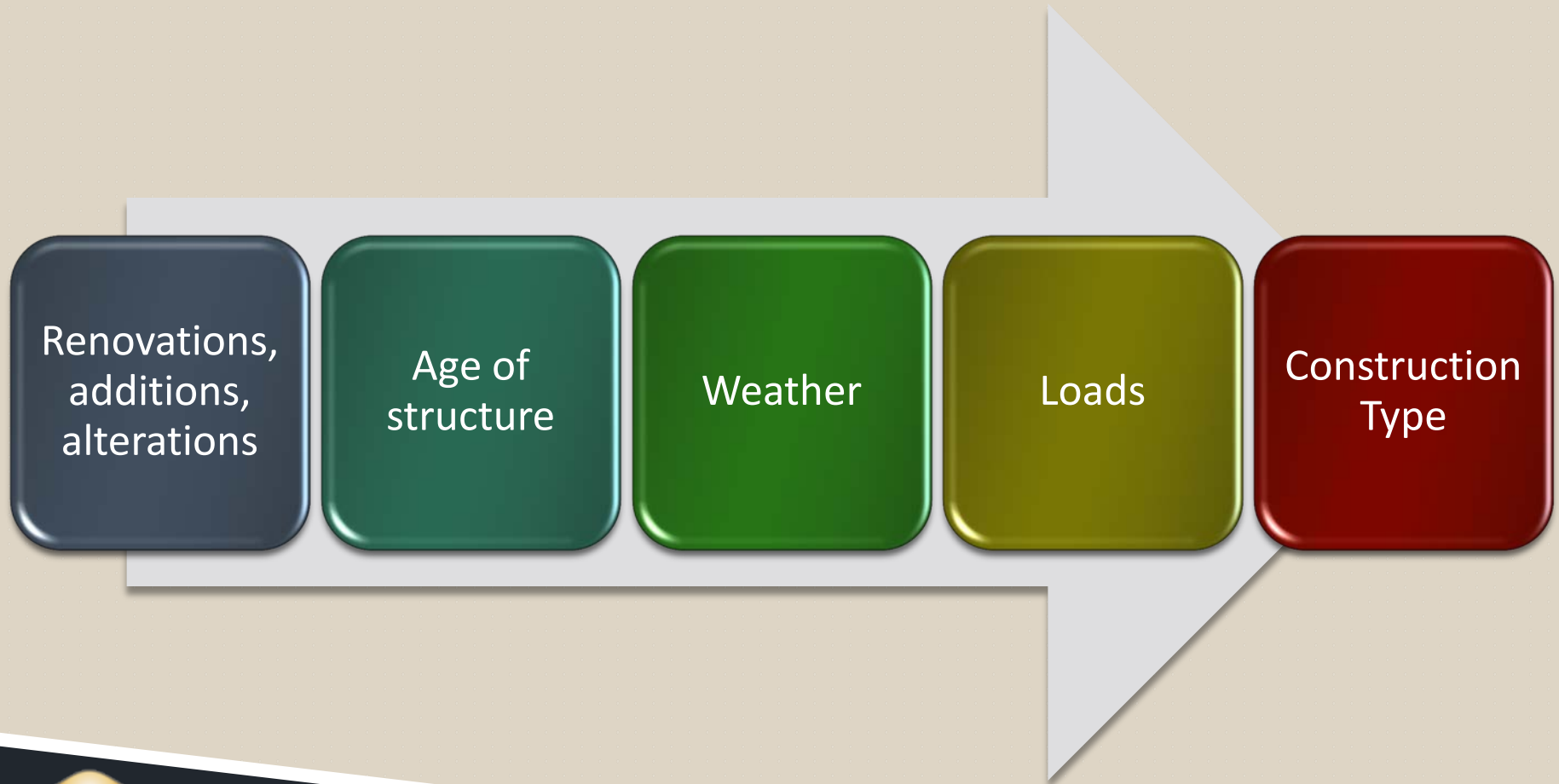
- With or without warning

Should be considered

- During preincident surveys
- Throughout size-up



MANY FACTORS ARE CONSIDERED WHEN DETERMINING COLLAPSE POTENTIAL.



MANY FACTORS ARE CONSIDERED WHEN DETERMINING COLLAPSE POTENTIAL.

Length of
time fire
burns

Stage of fire

Contents

Amount of
water used
to extinguish
fire

Other
indicators



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WARNING

Structural collapse can occur with little warning. If indicators start to appear, collapse is imminent and personnel must withdraw from the structure and the collapse zone.



WHEN COLLAPSE IS IMMINENT YOU SHOULD FOLLOW THE FOLLOWING STEPS.

FIRST

Inform
Command, all
others in
building

SECOND

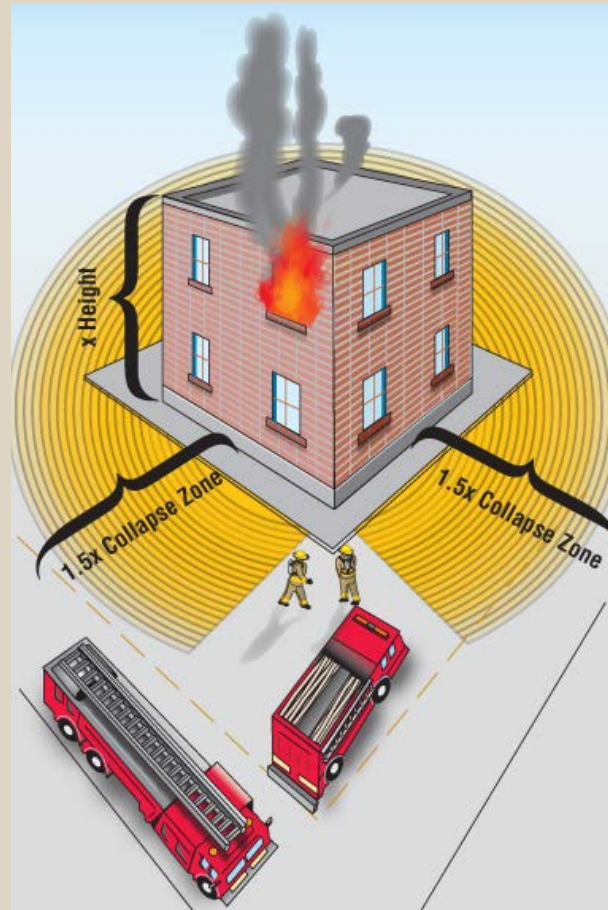
Establish clear
collapse zone

THIRD

Roll call or
personnel
accountability
report



DETERMINING A COLLAPSE ZONE IS DONE WITH SEVERAL FACTORS IN MIND.



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GUIDELINES TO CONSIDER WHEN DETERMINING THE COLLAPSE ZONE VARY BY CONSTRUCTION TYPE.

Type I

Not as likely to
collapse

Type II

Consider
unprotected steel or
noncombustible
supports

Type III

Should have
collapse zone $1\frac{1}{2}$
times structure
height



GUIDELINES TO CONSIDER WHEN DETERMINING THE COLLAPSE ZONE VARY BY CONSTRUCTION TYPE.

Type IV

Least likely to collapse

Type V

Collapse influenced by style of construction



COLLAPSE ZONES ARE ESTABLISHED IN THREE SITUATIONS.

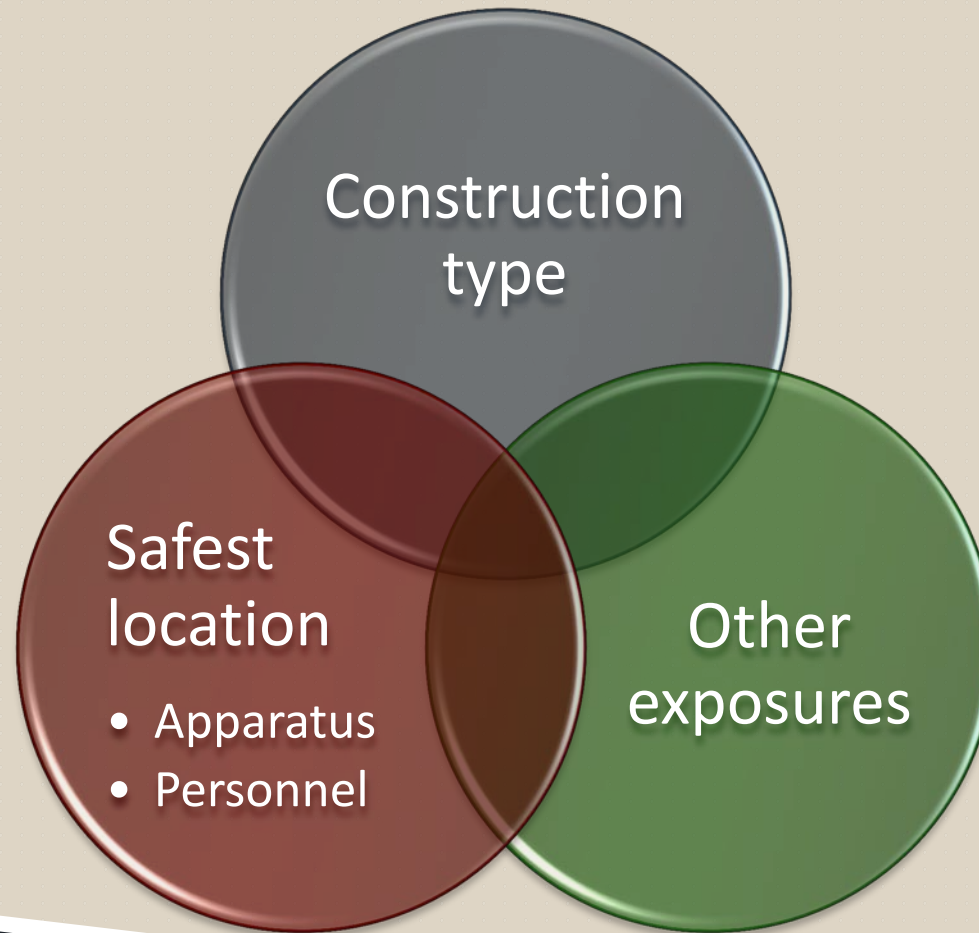
There is indication
the structure has
been weakened by
prolonged
exposure to fire or
heat

A defensive
strategy has been
adopted

Interior operations
cannot be justified

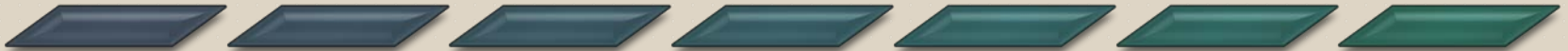


THE SIZE OF A COLLAPSE ZONE MUST ACCOUNT FOR SEVERAL ISSUES, INCLUDING SAFETY.

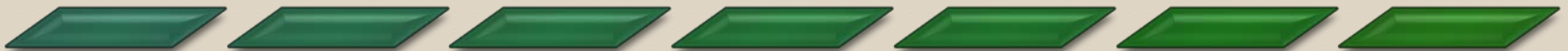


SUMMARY

Your safety when fighting fire depends on your ability to know how the building will contribute to and even control the spread of fire.



You must also understand the effect fire and heat have on structural components and materials to be able to anticipate results.



Knowing and understanding building construction is as vital as your knowledge and understanding of fire behavior.



You must be familiar with the types of construction in your community or response area, be aware of changes to existing structures, and follow trends in building construction.

