

## 4.20 STRUCTURE COLLAPSE

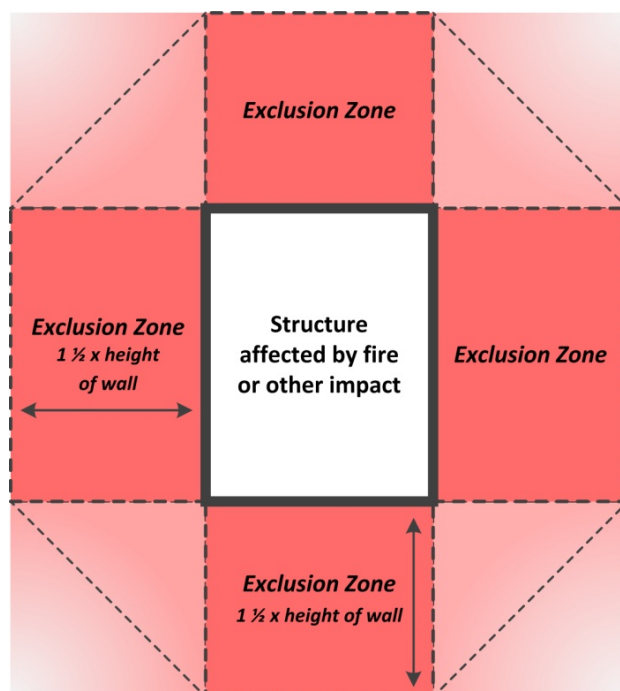
### Hazard

A structure with physical damage **may collapse with little or no warning.**

You could be killed or injured if a structure collapses on you. No level of PPE can protect you.

### Principles

- ☐ Consider structure collapse a critical factor until ruled out.
- ☐ Minimise work in or near a structure affected by fire or other damage.
- ☐ If there is a risk of structure collapse, adopt a defensive strategy.
- ☐ Establish an exclusion zone of at least  $1\frac{1}{2}$  times the height of the structure – to identify areas where collapse may occur
- ☐ If entry is required because there is life at risk, minimise time in the structure.
- ☐ Communicate the strategy and any exclusion zones to everyone at the incident.



**Everyone at the incident *must* observe the exclusion zone.**

### Operations

- ☐ Request specialist equipment and advice to assess structural integrity.
- ☐ Ensure everyone is aware of the strategy and exclusion zone. Advise FireCOM.
- ☐ Continually monitor for changes to the structure.
- ☐ List any identified collapse risks and exclusion zones in place on the *Site handover form*.

## Factors to consider

- ⇒ *Any change* to the structural integrity of a structure weakens it and affects its stability.
- ⇒ Structures may collapse *hours or days* after the incident. Collapse can occur *away* from the damaged area. Collapse can be *inwards, outwards*, or both.
- ⇒ Structure collapse may cause *additional hazards* – eg downed power lines or ruptured gas pipes.
- ⇒ *Predicting* a structure collapse is difficult – it requires an understanding of:
  - Construction type
  - Magnitude of damage
  - Location of damage
  - Effect of our operations.

## Signs

- ⇒ There *may be* signs of impending collapse, or there may be *no signs*.
- ⇒ If there are signs, they may be in areas of the structure that are not visible or easily accessed.

Signs of impending collapse could include:

- ⇒ Cracks in walls or other supports
- ⇒ Displaced columns, joists or beams
- ⇒ Concrete spalling or falling debris
- ⇒ Leaning or bulging walls
- ⇒ Cracked or dropped supports over doors and windows
- ⇒ Gaps between floors and walls
- ⇒ Cracking sounds or other noises.

## Likelihood

Fire increases the likelihood of structure collapse.

A structure may be more likely to collapse if there is:

- ⇒ Pre-existing structural damage or deterioration.
- ⇒ Construction or demolition underway.
- ⇒ A building feature such as a parapet, chimney, balcony or awning, or internal mezzanine level.
- ⇒ An added load on the structure such as solar panels, water heaters, signs, air-conditioning units, or heavy plant.