Action meetings: Fire brigade reports and investigations

FIRE ACCIDENT AT THE SHOPPING CENTRE IN ZADAR, CROATIA

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BASIC BUILDING DOCUMENTATION

- Technical documentation – Structural analysis design
- Layout schematics
- Section schematics
- Building type – commercial shopping centre for home furniture and technical goods
- Estimated fire load: 500 MJ/m²
- Total fire duration: 2.5 hours
- Buildings A-B were equipped with sprinkler installations in accordance with fire elaborate
- Building C was added afterwards without any sprinkler installations
- Buildings B-C were not designed as separate fire compartments
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- Layout of the shopping centre

- Building A
- Building B
- Building C
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- Section schematics

Steel frame structure

≈20.0 m  ≈20.0 m  ≈26.0 m

Building A
Building B
Building C
FIRE SCENARIO

- Date: February 22., 2010.
- 23:43 h – Fire distress call
- 23:51 h – Arrival of 15 fire trucks with 28 firemen
- Fire origin: Building C
FIRE SCENARIO

- 00:20 h – fire spread to building B (there were no fire walls)
- Sprinkler system was activated in building B but with no effect on the fire spread (no water present in the system at that time)
FIRE SCENARIO

- Building B had additional furniture storage space on the first floor
Despite the firemen effort - building B was lost
Building C collapsed 60 minutes after the beginning of fire event
Building B collapsed 95 minutes after the beginning of fire event
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FIRE SCENARIO

- Fire continued spreading to building A
- Sprinkler system was incapacitated (no water present in the system)
Firemen were able to contain the fire in building A where it was stopped.
Partial collapse of the building A occurred.
Administrative offices were saved from the effects of fire.
Comments on the fire scenario

- Buildings B-C were constructed as a single fire compartment, despite the fire elaborate requirements which demanded compartmentation.
- Building C collapsed after one hour of fire spread (≈00:40 h).
- Building B collapsed at 01:15 h.
- Building A was partially saved.
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Aftermath
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Aftermath C
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Aftermath C
Action meetings: Fire brigade reports and investigations

Aftermath – structure details
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Aftermath – structure details
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Aftermath A
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STRUCTURE DEFORMATIONS

- Building C
CONCLUSIONS

By analysing the fire event at the shopping centre following conclusions were made:

- Building C was constructed without the proper technical documentation
- Building C was not constructed as a separate fire compartment, thus creating a combined compartment with building B (A ≈ 2400 m²)
- Active fire protection measures in the form of sprinklers were not effective during fire event
- Although the response time of the fire brigades was low, firemen intervention was limited because of the stated conclusions
- Fire brigade intervention was able to save only a part of building A