Caution Urged with Composite Floors

Several Cases of Firefighters Falling Through Floors Have Been Reported

Fairfax, Va., Dec. 4, 2006... The Safety, Health and Survival Section recently became aware of a potential hazard to firefighter safety. They asked the IAFC to share the following notification with all members.

There have been several cases of firefighters falling through floors made of composite structural components and an even greater number of near-miss situations. This type of construction is being investigated as a contributing factor in a line-of-duty death.

There is a proliferation of engineered floor systems in residential occupancies across the United States. Many newer residential occupancies incorporate lightweight, engineered wood or composite structural components, including trusses, wooden I-beams and lightweight flooring systems. In most cases, these systems are structurally sound and designed to support the appropriate loads under normal conditions; however, they are likely to fail very quickly under fire conditions.

These components and systems are most often found in situations where applicable codes do not require any rated fire resistance between floor levels. They have much less inherent fire resistance than conventional wood joist floor systems and conventional wood decking. Remember – many codes do not require any fire resistance in residential floors!

In the several cases of firefighters falling through floors, those floors had been exposed to fire from below for relatively short periods. Sometimes the weakened area is relatively small and the damage is concentrated to the area immediately above the seat of the fire. Firefighters should pay special attention when entering above a basement fire, where the floor could have been weakened to the point that the weight of a firefighter could cause a localized failure, dropping the firefighter into a burning

basement. *This can occur with no indication of imminent failure from above.*

Extreme caution should be exercised in any situation where entry is made above a basement fire. Conventional methods such as sounding ahead with a tool and checking for sponginess may not provide sufficient warning of a weakened floor. Using a thermal image camera is recommended to sweep the floor for hot areas before entering and to help avoid areas that appear to be hotter than the surrounding flooring. Be aware that thick carpets or tile floors may compound the risk by making it even more difficult to detect hot spots.

In summary, members should consider the following regarding lightweight floor systems in residential occupancies:

Know the local codes that require fire resistive construction and/or limit combustible storage in unprotected basements.
Conduct pre-incident surveys of new housing developments to check the types of floor system being used.
Use extreme caution when fighting basement fires in all occupancies, including newer residential occupancies.

Work is being done by a number of our fire service partners to investigate this phenomenon and more information will be provided in the future. In the meantime, go to the following websites for more information:

http://www.ksdk.com/news/news_article.aspx?storyid=107868
http://firefighterclosecalls.com/weeklydrills.php
http://www.rapidintervention.com/media/monthly_training_topic/february2005/
http://www.firenuggets.com/dunn2.htm
http://www.cdc.gov/niosh/99-146.html