

U.S. Fire Administration / National Fire Academy

Coffee Break Training

Topic: Maintaining Fire-Resistive Construction Elements

Learning objective: The student shall be able to identify at least one damaged element in a fire-resistive assembly.

The photograph illustrates steel beams in an parking garage that are supporting a floor deck where heavy motor vehicles are stored.

Due to the building's size, the structural elements must be protected to a minimum one-hour fire resistance rating. In this particular example, the steel's fire resistance rating is achieved through concrete encasement.



The physical damage that has caused the concrete to separate from the steel has compromised the structure's fire-resistive integrity. Exposed steel is susceptible to failure when its average temperature reaches approximately 1,000 °F. In this case, weakening steel could cause sagging that might result in catastrophic structural failure.

Fire inspectors should be familiar with the many elements that make up fire-resistive construction, and if they observe damaged components, they should order corrective action.

The model fire codes authorize the fire inspector to require repairs to damaged fire-resistive assemblies. For additional information, refer to NFPA 1, *Uniform Fire Code*[™], Chapter 12, and the *International Fire Code*[®], Chapter 7.