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Thesis

Performance of Gypsum Board Exposed to Fire

Abstract

Gypsum board provides significant protection to timber and steel frame floor assemblies exposed to fire. Typically, the behaviour of those boards is assessed based on the standard fire exposure which is conservative for long fire exposures. However, the severity of a non-standard fire might exceed the standard exposure, especially in the early stages.

Full-scale tests in which floor assemblies were subjected to standard and non-standard time-temperature exposures conducted as part of this study revealed that the performance of gypsum board is highly dependent on the severity of the fire. In addition, intermediate-scale tests exposed to standard and non-standard fire on floor assemblies conducted as a part of this research showed that intermediate-scale tests can be used in the evolution stages to reduce costs.

The time of gypsum board fall-off has been investigated by analyzing fall-off times observed in 80 full-scale standard fire resistance tests conducted on floor assemblies. This investigation resulted in correlations that can be used to predict the fall-off time of the first piece of the gypsum board from the assembly.

Degree

M.A.Sc.

Completion

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Supervisor

Hadjisophocleous