

Safety Challenges of “Green” Buildings

Problem Statement

To enhance their market value, and improve the sustainability of operations, many new commercial and industrial facilities are being designed and constructed with the goal of achieving a “green” certification, the most common of which in the U.S. is the LEED certification by the U.S. Green Building Council. The International Code Council and other groups are promulgating “green” building codes. These changes to building design and materials are an opportunity for safety improvements but may also include building performance, fire and safety challenges that have unintended consequences for sustainability from property damage as well as life safety. An assessment of fire performance (among other considerations) of green buildings, and focused research on the primary changes affecting building performance, fire and safety, are required. Furthermore, a systematic method needs to be developed for implementation in the certification process that integrates the consideration of fire as well as other hazard risk factors as part of design performance metrics.

Project Objectives:

- a) Systematically document a set of green building design elements that increase safety hazards
- b) Share best practices for hazard risk mitigation

Tasks:

1. A global literature search to:
 - i. Identify documented fire incidents in the built inventory of certified (e.g. LEEDS, BREAM) green buildings;
 - ii. Define a specific set of elements in green building design, including configuration and materials, that, without mitigating strategies, increase fire risk, decrease safety or decrease building performance in comparison with conventional construction;
 - iii. Identify and summarize existing best practice case studies in which the risk introduced by specific green building design elements has been explicitly addressed;
 - iv. Compile research studies related to incorporating building safety, life safety and fire safety as an explicit element in green building indices, indentifying gaps and specific needed research areas