Impact of Elevated Walkways in Storage on Sprinkler Protection

25 June 2019

**Background:** Solid and open metal grate walkways are often installed in aisles as part of rack storage. Further, open metal grates are also used as mezzanine levels above storage. There is little information on how these walkway and mezzanine installations impact current storage protection requirements. When is this type of installation considered a problem from a sprinkler protection standpoint? At what point do walkways interfere with pre-wetting of adjacent arrays? There is a need to compile available information and develop a research plan on this topic.

**Research Goal:** Develop guidance on protection of storage when solid or open metal grate walkways are present. The objective of this Phase 1 project is to document knowledge gaps related to this topic and to develop a research plan.

**Project Tasks:**
Task 1: Perform a literature review on sprinkler protection related to walkways in aisles and mezzanines above storage and develop an interim report summarizing the findings. Consider the following questions:
- What are the variables?
  - Aisle width
  - Types of walkways (solid/grated/grated with floor coverings and percent open)
  - Walkways up to rack, through rack, or short of rack
  - Automatic sprinklers or no sprinkler underneath
  - Vertical spacing of racks
  - Other
- What is the impact of the opening percentage for metal grate walkways?
- When should sprinklers be installed under walkways/mezzanines and how do they perform with fire in the rack? What is effective in terms of spacing, etc.?
- How do the walkways/mezzanine impact water from ceiling sprinklers reaching storage?
- What are the impacts of floor coverings on top of open grate walkways?

Task 2: Analyze the literature from Task 1, identify the knowledge gaps, and develop a research plan to fill the gaps.

Task 3: Develop a final report that summarizes the work on Task 1 and Task 2.

**Implementation:** This research project is led by the Fire Protection Research Foundation and will be conducted in accordance with the "Research Foundation Policies for the Conduct of Research Projects". The project will be guided by a Project Technical Panel who will provide input to the project, recommend
contractor selection, review periodic reports of progress and research results, and review the final project report.

**Deliverables:** The project contractor is responsible for the following deliverables:

- An interim report documenting the literature review.
- Draft final report and final report that includes findings from the literature review and the research plan.
- The results of the study should be presented to the NFPA 13 Technical Committees on Sprinkler System Discharge Criteria and Installation Criteria or at another appropriate venue.

**Intellectual Property:** The Research Foundation will retain rights to all project deliverables including the project report, which will be published on the Foundation website.

**Schedule and Costs:**

- Proposals due: July 22, 2019
- Contractor selected: August 2, 2019
- Task 1 Interim report: September 27, 2019
- Draft final report: October 31, 2019
- Final report: November 27, 2019

This is a fixed price project in the amount of $25,000. All indirect and travel costs incurred are intended to be included within this fixed price. The Foundation does not have a limit on indirect costs, but the total proposal cannot exceed this fixed price.

**How To Respond:** Letter proposals (not to exceed six pages) shall be submitted electronically to Amanda Kimball, Research Director of the Foundation, at akimball@nfpa.org no later than 5:00 pm Eastern time 22 July 2019. For additional details see the “Research Foundation Policies for the Conduct of Research Projects”, the Foundation Operating Principles, and “Research Project Guidelines for Contractors” on the Foundation website at: https://www.nfpa.org/foundation. Each proposal shall include a description of the following which will be used as the basis for proposal evaluation: scope and approach, problem understanding, technical merit, and prior relevant experience and personnel expertise. This is a fixed price project in the amount of $25,000, which includes any indirect costs and travel to in-person meetings and presentations.

**Note:** This project will proceed only on the basis of receipt of a proposal deemed acceptable to the Foundation and the project sponsor(s). Information on the Foundation’s policies for the conduct of research can be found on our website.