D25 The Role of Standards and Case Law Relating to Forensic Analysis in Walkway-Safety Incidents: Part One

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Learning Overview: The goal of this presentation is to discuss the respective roles of codes, standards, professional practice, and judicial precedent with respect to the question of what constitutes an actionable defect.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by making attendees aware of the relationship between engineering and safety-professional standards and upon case law and, based upon that, whether an incident is actionable or not.

When an ambulation-related accident occurs, it is important to determine whether the accident was caused by a failure of or defect in the premises' design, construction, or maintenance. If yes, the question then becomes whether or not that failure or defect is actionable. The rubric is that if an element is related to design or construction, for that element to be a failure or defect, it must have been recognized as such at the time the element was designed or constructed. If the element is related to maintenance, an ongoing process, the element under study had to have been recognized as problematic at the time of the accident.

A building, unless it had been erected in pre-code times (the late 19th century in some large cities, as late as the mid-20th century—or not at all—in some rural areas), would have to conform to the building code in effect at the start of construction. (The examples in this paper refer to the New York City Building Codes.) For example, a building erected in New York City in the 1950s had to be in conformance with the 1938 New York City Building Code (the "Code"). That building also has to conform to any property maintenance codes in effect at the time of an accident. (Property maintenance codes generally mimic common law [i.e., property owners must keep premises in "safe condition"]. Thus, they add little of substance (and much to the imagination) of forensic practitioners.) Beyond the building and property-maintenance codes, there exists a host of other standards, typically non-mandatory, either promulgated by companies having an interest in a specific topic or voluntary-consensus standards, promulgated by interested parties through a Standards Development Organization. Beyond that, there is the question of what constitutes Acceptable Practice at the times of design, construction, and ongoing maintenance. All of this is filtered through the lens of litigation, in which courts receive into evidence engineering and safety practice in the form of "expert opinion" that serves as a guide, but not a mandate.

The need to look beyond specific standards is aptly illustrated by two simple—but not simple—examples relating to stair handrails: the height of a handrail above a flight of stairs, immediately below, and the requirement for handrails at building entrances, in Part Two.

Example 1: Handrail height. Handrails were not mentioned at all when the Code was first enacted in 1899; they are mentioned only in passing in the State of New York Tenement–House Act, which came into effect in the first decade of the 20th century, to wit: in every tenement house all stairways shall be provided with proper banisters and railings and kept in good repair. The 1916 Code provides that stairs "shall have hand-rail on both sides." The 1938 Code further specified that handrails must be placed 30–34 inches above the tread nosing. The 2008 Code revised the height requirement to 34–38 inches above the tread nosing. These changes over time generate interesting questions: (1) If a building had been erected in 1955 and the handrail height was measured to be 36 inches above the stair nosing, can it be considered defective? It surely violates the code in effect when the building was erected, but it meets the current handrail requirement; and (2) The inverse situation is also problematic. Consider a building built in 2015 having handrail heights of 32 inches above the step nosing. Is that handrail defective? Consider that thousands of buildings built before 2008 were required to have handrails between 30–34 inches.

Ultimately, the analysis should focus upon the relationship between handrail height and stair-user safety, starting with the basis for the Code revision. However, research relating to the higher handrail height is incomplete. Maki discussed a partial answer in researching handrail grasping from a static position, but the kinematics of grasping for and holding onto a handrail was not researched.[1,2]

Short of the existence of definitive evidence that the 2008 Code change either eliminated or (heaven forbid) substantially increased staircase accidents in structures; a forensic practitioner should have an uphill battle arguing that any handrail height between 30–38 inches could be unsafe or accident causal based solely upon reliance of one of the two editions of the Code.

This is a simple example: a single measurement and a single requirement. Yet it can stir a hornet's nest of disagreement.

Reference(s):

1. Maki, B.E., Bartlett, S.A., Fernie, G.R. Influence of stairway handrail height on the ability to generate stabilizing forces and moments. *Human Factors*, 1984
2. Maki, B.E., Bartlett, S.A., Fernie, G.R. Effect of Stairway Pitch on Optimal Handrail Height." *Human Factors*, 1985.

Standards, Codes, Case Law

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