Fire Engineering®

Construction Concerns: Architects and OSHA

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By Gregory Havel

For www.fireengineering.com *Photos by author*.

Over the last century, the fire service has been instrumental in promoting the development and revision of building and fire codes directed toward the safety of the people who occupy buildings.

Over the past 40 years, the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has promoted safe working conditions for people in locations and performing activities that are not covered by the building and fire codes. Specifically, OSHA sets standards and develops regulations to enforce them and to provide for the safety of employees in their workplaces. Some of the OSHA standards are incorporated by reference from the National Fire Protection Association (NFPA) library of codes and standards, while others directly quote the older editions of NFPA and other standards.

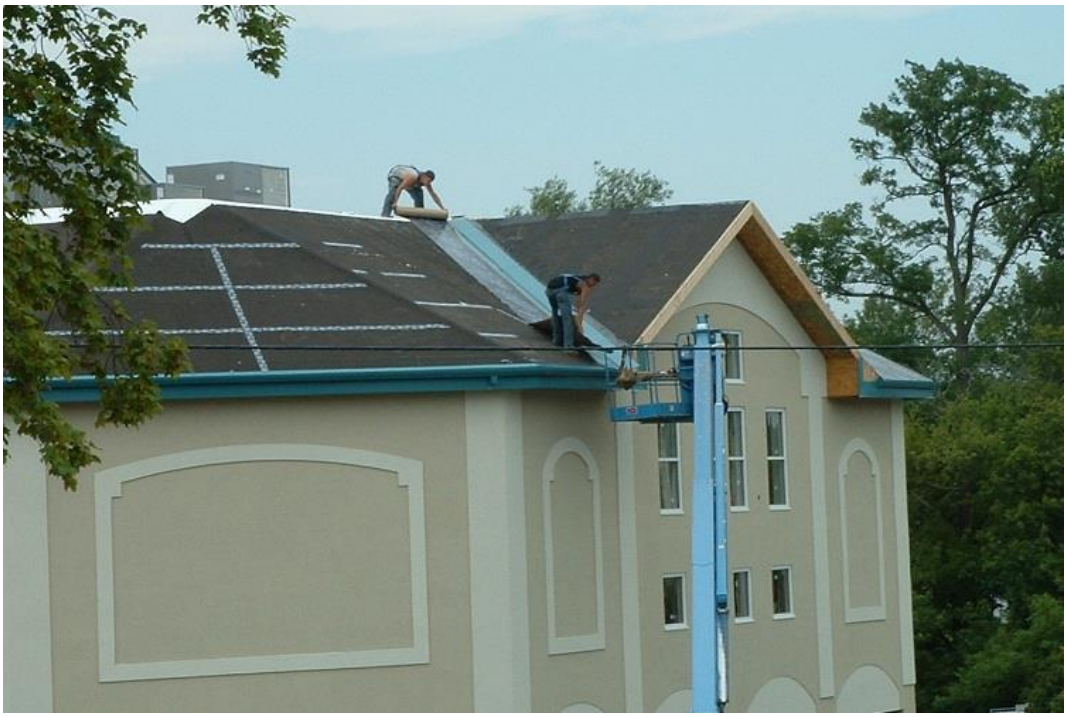
One section of the OSHA standards [29 CFR 1926 Subpart M (1926.500 through 1926.503 and Appendices] addresses fall protection hazards to which construction workers may be exposed while buildings are under construction. Another section of the OSHA standards [29 CFR 1910 Subpart D (1910.21 through 1910.30)] addresses fall protection hazards to the people who work in buildings that are not under construction. Many of the requirements of these and other sections of the OSHA standards are not included in building or fire codes, but they exist to protect employees rather than the public.

During the construction of a building, fall protection is fairly simple: No worker (except for structural steel erectors and connectors) may be exposed to a fall of more than six feet without protection or 10 feet if working from a scaffold. One common method of fall protection is the “personal fall arrest system” (PFAS), consisting of a fall protection harness; a shock-absorbing lanyard, a retractable lifeline, or any other deceleration device; and an anchor point attached to the structure that is capable of supporting at least 5,000 pounds of dynamic load (22.2 kN). The PFAS is most commonly used for fall protection on exposed structural steel and in locations where guardrails or scaffolding

cannot be used, in locations that are not accessible by aerial work platforms, and on open-sided platforms and roofs which allow no other means of fall protection.

During early phases of construction, you can attach anchor points to the structure and move as needed to maintain safe working conditions. At some point during construction, the finished surfaces will be applied to the building, after which it is difficult or impossible to attach a temporary fall protection anchor to the building without permanently damaging its appearance or weather-tight integrity.

Photo 1 shows two roofing contractor employees applying a waterproof flashing membrane to the valley on a sloped roof deck on a multistory building without fall protection. They reached their work area using a telescoping-boom aerial work platform; disconnected their fall protection harnesses from the lift, and climbed out onto the roof. They are unable to attach a temporary fall protection anchor to this roof since the top deck has already been finished with a white rubber membrane and the slope has a waterproof underlayment on it that does not permit the size or number of screws necessary to attach an anchor. As a result, they opted to work without fall protection. This is a high-risk activity, which also leaves the employer open to citations and fines by OSHA.



(1)

A solution to this situation would have been for the architect or structural engineer to have designed permanent fall protection anchor points near the center of the top roof deck and along the ridges for use during the construction of the building. When the building was completed, they would have been left in place for use by the building owner’s employees and maintenance subcontractors who perform such tasks as roof inspection and repairs, removal of ice dams, installing and removing seasonal

decorations, painting, window washing, and other routine periodic activities. Photo 2 shows permanent fall protection anchor points on a flat roof of another building.

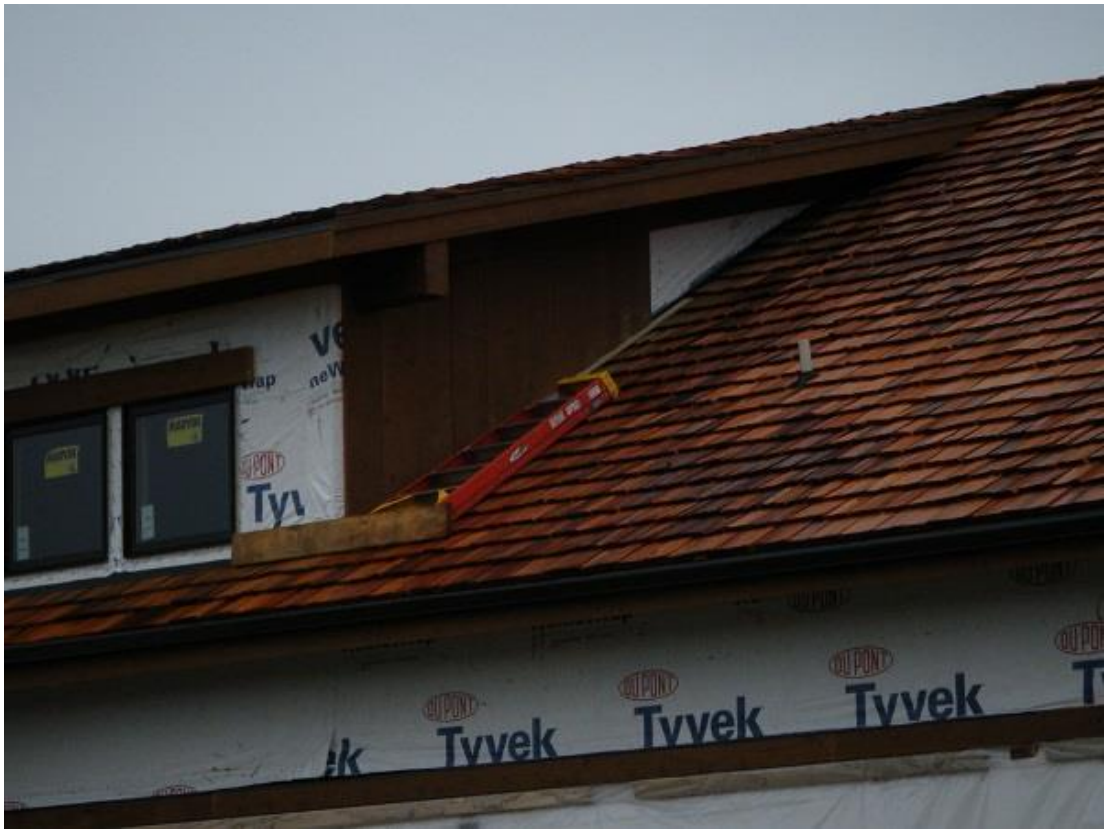
(2)

Architects and engineers do not usually design permanent fall protection anchor points on buildings, unless the project owner requires it, as government agencies and managers of large facilities sometimes do. The fall protection system and its anchor points during construction are usually considered part of the construction “means and methods” for which the contractors are responsible, and which are expected to be removed by the time that the building is complete. After the building is complete, the architects and engineers are usually not concerned with the owner’s need to supply fall protection anchor points for employees working more than six feet above a lower level.

Design and installation of permanent fall protection anchor points during the early stages of building construction can provide for safe working conditions for construction workers until the building is complete. They provide the same safe working conditions for the building owner’s maintenance employees and contractors during the life of the building, without resorting to less-safe improvised methods.

Photo 3 shows the installation of siding on a wood-frame dormer on a wood shingle roof. Since there is nowhere to attach a temporary fall protection anchor at this phase of construction, the worker opted to screw a piece of 2 x 6 to the studs in the wall of the dormer and the rest on the bottom of a folded stepladder. This is a high-risk activity since the worker’s fall protection depends on the integrity of the cantilevered 2 x 6

lumber against which the bottom of the ladder rests, the integrity of the studs to which the 2 x 6 is screwed, the strength of the screws, and the strength of the ladder which is being used in a way for which it was not designed. Once the installation of the siding is complete, even this less-than-optimal method will not be available to maintenance workers, window cleaners, and painters.



(3)

In addition to their use in fall protection systems, permanently installed fall protection anchors may also provide the anchor points that you could need if emergency services must perform a technical rescue.

It is time that these fall protection requirements and other employee safety requirements from the OSHA be made part of the building codes in the interest of protecting the building owner's employees and subcontractors (who are also building occupants). Fire service involvement in the code development processes resulted in today's common—and code-required—exit stairway dimensions, illumination in means of egress, panic hardware on exit doors, automatic fire sprinkler systems, and fire alarms systems with smoke detectors. Fire service involvement in code revision can make buildings safer places to work for the owners' employees.

In the meantime, we must begin to educate architects and engineers on the need for installing permanent fall protection anchor points as part of each new building's design.

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