Skylight Workplace Safety

Executive Summary

Skylights can be a serious workplace hazard for laborers in the roofing, construction, maintenance, and emergency services industries. For example, falls through skylights constitute roughly 1-in-10 falls in the construction industry. The Occupational Safety and Health Administration (OSHA) establishes workplace safety guidelines that treat skylights as holes in the roof. Missouri does not currently have skylight workplace safety guidelines in addition to federal OSHA standards.

Highlights

- OSHA requires at least one of the following workplace safety measures for workers on roofs with skylights: screens or nets, guardrails, and/or personal fall protection systems.
- The most common OSHA citation against employers is failure to protect workers with workplace protections or training.
- Seventy-five workers in the U.S. have died from falls through skylights and 130 more have been injured between the years 2015-2021.

Limitations

- Fall data from OSHA often omit the cause of the fall. Additionally, twenty-two states have OSHA-approved state plans and do not report citations and incidents to OSHA.
- There is consistent evidence that citations and penalties from OSHA strongly reduce the frequency of injuries. However, there is less evidence on if the threat of inspections, inspections without citations, and the introduction of new regulations reduce injury frequency and severity.

Research Background

Skylights & Rooftop Safety Hazards

Workers often access rooftops for repairs and HVAC system maintenance. While the roofs of large buildings are commonly flat, roofs can still create a hazardous working environment due to falls or unprotected holes. The Occupational Safety and Health Administration (OSHA) considers skylights to be holes because most can not stop a worker from falling through.

Skylights are a fall hazard because they are often translucent and easy to accidentally step or trip into (Figure 1). Falls commonly occur when workers are backing up into an unprotected skylight while performing another task. The industries most affected by skylight falls include...
construction, service and maintenance personnel, and firefighters. Falls through skylights can often cause traumatic injuries that lead to permanent disability and job loss.\textsuperscript{2,3}

![Figure 1. Examples of skylights. (A) is a skylight protected with a skylight screen, (B) is an unprotected skylight that a worker had fallen through. Images from simplifiedsafety.com & CA Public Health.](image)

**Statistics and Studies from Falling at the Workplace**

Falls from an upper level are the number one cause of death in the construction industry. In 2019, there were 401 deaths in the construction industry from unspecified falls to a lower level and 13,770 injuries from a fall to a lower level.\textsuperscript{4} Failure to establish protections from worker falls was the most cited violation of federal standards between October 2020 and September 2021.\textsuperscript{5}

Rooftop falls also have economic consequences. In 2013, falls from roofs resulted in an average of 26–31 lost work days per worker injury.\textsuperscript{8} According to the Centers for Disease Control and Prevention (CDC), training at the workplace saves employers in the U.S. over $100 billion annually.\textsuperscript{9} In a study of 800 businesses, employers who receive random inspections have a 9.4% decrease in injury rates with no detectable loss in sales or employment.\textsuperscript{10}

**Skylight-Related Injury and Fatality Reports to OSHA**

OSHA maintains data sets from all federally-regulated states on workplace death and injury statistics, including the type of injury, the general classification or workplace environment the injury occurred, location, and possible cause of the injury. However, death and injury causes are often omitted from these data. Further, this data does not include information from the 22 states with OSHA-approved state plans.

Limited available data suggests that skylight falls account for \textasciitilde 1 in 10 falls in the construction industry.\textsuperscript{3} 75 reports of worker fatalities occurred due to falls through skylights from the period of 2017 to 2021.\textsuperscript{6} No skylight-related fatalities were reported in Missouri during this time period.

Between 2015–2021, 130 reported severe injuries resulting from falls through skylights.\textsuperscript{7} The most common injuries included bone fractures, intracranial injuries, internal injuries, and other
unspecified bodily traumas and severe pain. During this time period, one skylight-related injury of severe brain damage was reported in Missouri in 2020.

A study by the National Institute for Occupational Safety and Health used case reports of skylight falls to suggest that precautions from skylight manufacturers, architects, building owners, contractors, and workers all play a part in ensuring workplace safety around skylights.

Federal Regulations & Standards

Missouri workplaces are federally regulated by OSHA, with field offices in Kansas City and St. Louis. Fall protection measures must be used for heights over 6 feet to a lower level in construction, and heights over 4 feet in other industries. Individuals younger than 18 (or younger than 16 in agricultural work) are not permitted to do roofing work, be on ladders or scaffolds near roofs, or access equipment on roofs.

OSHA requires at least one of the following fall protection measures for workers on roofs with skylights:

- **Screens or Nets** - Typically installed above (though sometimes below a skylight), OSHA requires that screens be able to withstand twice the maximum load they may face.
- **Guardrails** - Typically most effective around larger skylights where a screen is not practical.
- **Personal Fall Protection Systems** - Full body harness with a lanyard attached to a secure anchor point/system.

The Centers for Disease Control and Prevention (CDC) also recommends internal worksite inspections, worker training, warning labels, and maps of worksite hazards to inform workers.

The maximum fine for an OSHA violation is $14,502 and repeated violations can result in fines up to $145,207 dollars. Workplace inspections by OSHA are relatively rare. Nationwide, OSHA has approximately 1,850 inspectors; which is about one inspector for every 70,000 workers.

There is consistent research evidence that citations and penalties from OSHA strongly reduce the frequency of injuries. However, there is less evidence on whether the threat of inspections, inspections without citations, and the introduction of new regulations actually reduces injury frequency and severity.

State Regulations

The Missouri Department of Labor provides [On-Site Safety & Health Consultation](#) inspections following OSHA guidelines for small employers in high-hazard industries, but does not issue fines for workplace hazards.

Twenty-two states (including IA, IL, KY, and TN) have [OSHA State Plans](#), which are agreements with OSHA that allow the state to regulate workplace safety as long as state standards meet or
exceed that of federal OSHA standards. Senate Bill 1016 in 2016 attempted to establish an OSHA state plan in Missouri, but it did not pass.

In general, states without OSHA State Plans typically do not have workplace safety regulations in state statute. California has skylight-screen-specific standards such as warning labels and screens being able to hold 400 pounds (or approximately twice the weight of a worker and equipment). Screens are optional if other safety measures are used.

References
18. MO-DOLIR. On-Site Safety & Health Consultation, https://labor.mo.gov/dls/onsite