

Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

REPORT#: 23KY00901

REPORT DATE: 04/18/2023

INCIDENT HIGHLIGHTS



DATE:

January 30, 2023



TIME:

10:00 a.m.



VICTIM:

59-year-old non-Hispanic roofing contractor



INDUSTRY/NAICS CODE:

Roofing Contractors/
238160



EMPLOYER:

Roof contractor

SAFETY & TRAINING:

Formal program



SCENE:

Commercial building



LOCATION:

Kentucky



EVENT TYPE:

Fall from elevation



Project Manager Dies after Falling through Skylight

SUMMARY

On January 30, 2023, a 59-year-old roofing project manager (victim) was performing a post-purchase roof inspection for the buyer of a commercial warehouse. In the process, the victim stepped on a polycarbonate skylight and fell to the surface below.

[READ THE FULL REPORT>](#) (p.3)

CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Failure to recognize job hazards,
- Failure to guard skylights with railings or skylight screen,
- Failure to utilize fall protection when working at heights,
- Failure to enforce the use of fall protection.

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RECOMMENDATIONS

Kentucky investigators concluded that, to help prevent similar occurrences, employers should:

- Implement a job hazard analysis process;
- Guard skylights with railings or a skylight screen;
- Require and enforce the use of fall protection when working at heights above 6 feet;
- Consider prevention through design (PtD) to “design out” or minimize hazards and risk.

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KENTUCKY

State **FACE** Program

Fatality Assessment & Control Evaluation

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Fatality Assessment and Control Evaluation (FACE) Program

This case report was developed to draw the attention of employers and employees to a serious safety hazard and is based on preliminary data only. This publication does not represent final determinations regarding the nature of the incident, cause of the injury, or fault of employer, employee, or any party involved.

This case report was developed by the Kentucky Fatality Assessment and Control Evaluation (FACE) program. Kentucky FACE is a NIOSH-funded occupational fatality surveillance program with the goal of preventing fatal work injuries by studying the worker, the work environment, and the role of management, engineering, and behavioral changes in preventing future injuries. The FACE program is located in the Kentucky Injury Prevention and Research Center (KIPRC). KIPRC is a bona fide agent for the Kentucky Department for Public Health.

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INTRODUCTION

On January 30, 2023, a 59-year-old, non-Hispanic roofing project manager (victim) was tasked with performing a post-purchase roof inspection for the buyer of a commercial warehouse (photo 3). The victim stepped on a polycarbonate skylight while walking on the roof and fell 25 feet to the surface below. The victim was transported via ambulance from the scene of the incident but succumbed to his injuries prior to arriving at a local university hospital. On February 2, 2023, the Kentucky Labor Cabinet informed the Kentucky Fatality Assessment and Control Evaluation (FACE) program of the incident. On February 6, 2023, the Kentucky FACE investigator conducted a site visit, at which time photographs of the scene were taken.

EMPLOYERS

The employer is a roofing contractor that specializes in both commercial and residential roofing projects. Services provided include asphalt shingle replacement and repair, metal roof replacement and repair, roof inspections, and commercial roof coating systems. The company was founded in 2012 and consists of seven employees; however, they often work with subcontractors to complete larger jobs.

WRITTEN SAFETY PROGRAMS and TRAINING

According to a company representative, the company has a formal safety training program. The program consists of four primary elements:

- Written safety policy and procedure manual,
- Orientation training, conducted at time of hire,
- Practical field training, which is on-the-job training where new employees shadow senior experienced employees, and
- Weekly safety meetings.

Although a copy of the program was not provided to FACE investigators, the company stated that fall protection training, OSHA-required training, drug- and alcohol-free workplace training, and bloodborne pathogens training were some examples of the training provided to employees. The company representative stated that all employees are issued a National Roofing Contractors Association (NRCA) [Pocket Guide to Safety](#). The pocket guide covers topics such as fall protection, electrical hazards safety, heat illness guidelines, personal protection equipment guidance, and fire prevention methods.

WORKER INFORMATION

The victim was a 59-year-old non-Hispanic single male. The decedent was a high school graduate; he had worked for the involved company since 2021. Prior to his work as a roofing project manager, the victim worked as a carpenter in the construction industry, focusing primarily on framing.

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INCIDENT SCENE

The incident occurred on the roof of a 19,024-square-foot commercial warehouse building that sits on a paved and fenced lot. The building is vacant and had recently been purchased by private investors. The roof is constructed of corrugated metal (photo 1). It measures 20 feet on either side, 31 feet at its peak, and has a pitch of 4:12, meaning the roof rises four inches for every 12 inches it moves toward the peak. A total of 16 polycarbonate skylights are present within the roof, all original to the construction of the building. The floor inside the building is constructed of concrete (photo 2).



Photo 1. Google Earth image of building where the incident occurred. The red circle indicates the skylight involved in the incident.

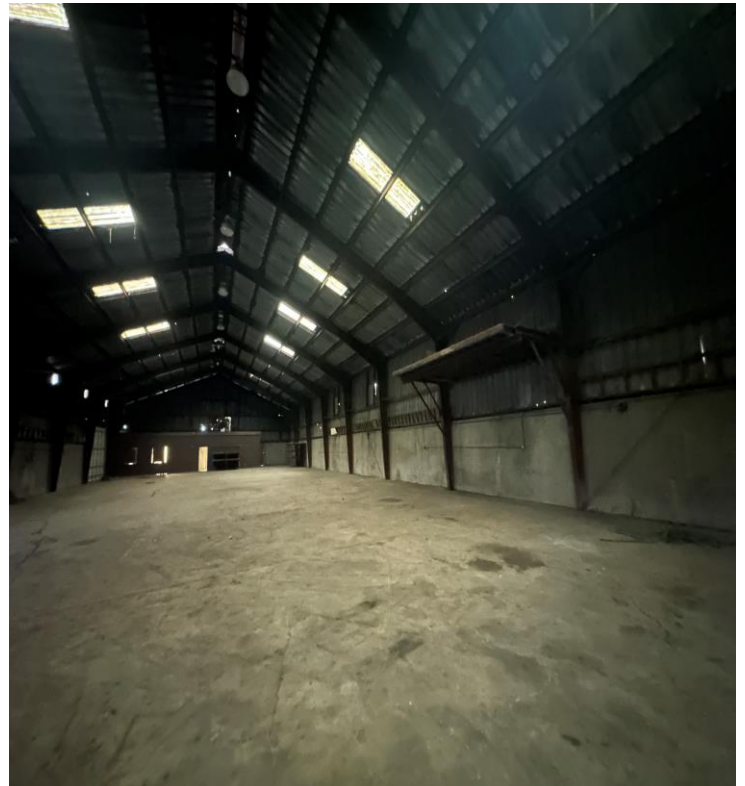


Photo 2. Photo showing interior and surface of the building where the incident occurred.

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Photo 3. Exterior photo of the building where the incident occurred.



Photo 4. Red circle identifying the polycarbonate skylight the victim fell through.



Photo 5. The red arrow indicating the now breached polycarbonate skylight.



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WEATHER

The weather on the day of the incident was approximately 36 degrees Fahrenheit, 97% humidity, 10 mph average northerly wind speed. The weather is not believed to have been a factor in this incident.¹

INVESTIGATION

On January 30, 2023, the victim, a project manager for the involved roofing company, arrived at the company's corporate office at 8:00 a.m. After clocking in for the day, the victim and his supervisor departed the corporate office en route to a commercial warehouse to conduct a roof inspection. The warehouse had recently been purchased; the new owner requested an evaluation of the condition of the metal roof and asked that temporary repairs be made on any holes that were found upon the inspection.

After arriving on scene at approximately 9:00 a.m., the project manager (victim) and his supervisor entered the vacant building to conduct an initial walk-through assessment of the roof from the interior of the building. Fifteen minutes later, at approximately 9:15 a.m., the employees finished the initial assessment. They retrieved a 2-gallon container of roof patching sealant and advanced to the roof via a 40-foot fiberglass extension ladder.

Although policies requiring fall protection were in place, neither of the employees utilized fall protection on the day the event occurred. Once on the roof, the supervisor placed the bucket of patching silicone on the peak of the roof in the center of the building so that it would be centrally located and accessible to both employees. The supervisor and project manager (victim) split up to address both sides of the roof at once. When a hole was located, the employees would walk to the peak, dip their brush applicator into the bucket of silicon, walk back to the hole and apply it accordingly. At approximately 9:30 a.m., the victim verbally reminded his supervisor to be careful around the skylights, stating that he had nearly stepped on one. Thirty minutes later, at approximately 10:00 a.m., the project manager (victim) stepped directly onto one of the roof's 16 polycarbonate skylights (photo 4). The supervisor stated that he heard a loud crack; he looked up and observed the victim falling through the skylight (photo 5). The supervisor immediately started walking toward the ladder to render aid to the victim. While doing so, he observed a city sanitation worker on the street. The supervisor yelled from the roof to the sanitation worker that there had been an accident and asked him to call 911. After descending to the ground, the supervisor observed the victim laying on his back, just below the breached skylight. The victim was conscious and was able to communicate with the supervisor. The victim expressed that he was having difficulty breathing and experiencing pain in his back and hip. The supervisor contacted his company to make them aware of the incident. A company representative arrived on scene 10 minutes later, at 10:10 a.m.

Shortly after, at 10:12 a.m., the fire department arrived on scene and began evaluating the victim's injuries. Paramedics arrived at 10:18 a.m. to render aid. The victim was placed in the ambulance approximately 10 minutes later, at 10:28 a.m. The ambulance departed the scene of the incident at 10:30 a.m., en route to a local university hospital. The company representative left shortly after but arrived at the hospital before the ambulance. At approximately 11:00 a.m., the hospital chaplain notified the company representative that the victim had just arrived but had succumbed to his injuries while en route to the hospital.

CAUSE OF DEATH

According to the death certificate, the cause of death was blunt force trauma.

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CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. Kentucky investigators identified the following unrecognized hazards as key contributing factors in this incident:

- Failure to recognize job hazards,
- Failure to guard skylights with railings or skylight screen,
- Failure to utilize fall protection when working at heights,
- Failure to enforce the use of fall protection.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should implement a job hazard analysis process.

Discussion: The Occupational Safety and Health Administration (OSHA) defines a job hazard analysis (JHA) as a technique that focuses on job tasks to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. OSHA states that ideally, after you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level.² OSHA suggests a job hazard analysis be performed when completing the following types of jobs:

- Jobs with the highest injury or illness rates;
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents;
- Jobs in which one simple human error could lead to a severe accident or injury;
- Jobs that are new to your operation or have undergone changes in processes and procedures;
- Jobs complex enough to require written instructions.

Companies should implement a job hazard analysis process to assess risk prior to performing work.²

OSHA provides guidance on how to identify workplace hazards when conducting a JHA. OSHA states that the goal is to discover the following:

- What can go wrong?
- What are the consequences?
- How could it arise?
- What are other contributing factors?
- How likely is it that the hazard will occur?²

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A JHA can be used to identify the existing or potential hazards involved in each step of a work task. The following are the basic elements of a JHA:

- Task description,
- Hazard description,
- Hazard control(s).

Had a JHA been performed prior to the incident at the warehouse, the employer could have likely observed the hazards associated with the job site, specifically the exposure to the polycarbonate skylights and the need for adequate fall protection and skylight guarding.

Recommendation #2: Employers should guard skylights with railings or a skylight screen.

Discussion: The roof where the incident occurred was constructed of corrugated metal and contained a total of 16 polycarbonate skylights. Skylights present risk to workers, as they can often be difficult to differentiate from roof panels. Even in instances where skylights are clearly visible, workers may be task focused and lose sight of skylight placement. The victim in this case was aware that skylights pose risk to employees. Thirty minutes prior to the incident, the victim verbally reminded his co-worker to be careful around the skylights, stating he had nearly stepped on one. OSHA standard 29 CFR 1926.501(b)(4)(ii) states that walking surfaces shall be protected from tripping on or stepping into or through holes, including skylights. Employers should guard skylights with railings (photo 6) or a skylight screen (photo 7) prior to performing work on roofs equipped with skylights. Skylight guarding provides employees with a physical barrier of protection from falling through skylights and serves as a visual aid by clearly identifying the location of the skylights.



Photo 6. Photo depicting a skylight rail guarding system.⁵

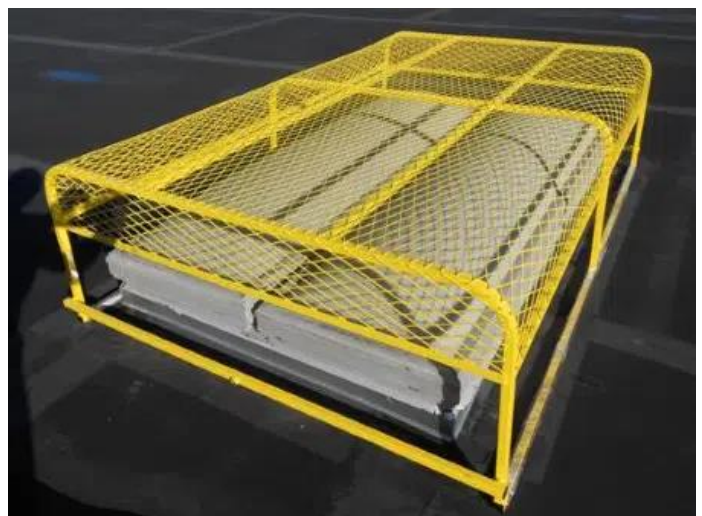


Photo 7. Photo depicting a skylight screen.⁶

Recommendation #3: Require and enforce the use of fall protection when working at heights above 6 feet.

Discussion: According to OSHA, falls are the leading cause of fatalities in construction, accounting for one-third of all fatalities in the industry³. Failure to protect employees while working at heights and failure to properly train and document completion of fall protection training directly violate two separate OSHA standards. According to 29 CFR 1926.501 (b)(1): Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge that is 6 feet (1.8m) or more above a lower level shall be protected from falling using guardrail systems, safety net systems, or personal fall arrest systems⁴. The victim and his supervisor were working at heights above six feet when the incident occurred. According to a company representative, the company does provide fall protection training and fall protection equipment. However, neither the victim nor his supervisor was utilizing fall protection when the incident occurred. In an interview with the supervisor who witnessed the fall, he confirmed that he had received fall protection training and both he and the victim had proper fall protection equipment in their company-provided vehicle.

Achieving compliance with fall protection safety policy and procedures can be challenging, but employers must enforce its use. Although methods of enforcing the use of fall protection could be different for each company, some strategies that may help are listed below:

- When designing policy, set clear zero tolerance expectations as they relate to the utilization of fall protection. Wording should be clear and easy for employees to comprehend. Require employees to verify their knowledge of policy expectations by conducting written and practical examinations.
- Implement a clearly defined and uncompromising disciplinary policy. The policy should clearly define the consequences for failing to utilize fall protection.
- Conduct work-site compliance audits. The audits should be unannounced and occur frequently to verify compliance with fall protection policies and procedures.
- Evaluate fall protection equipment. A common excuse for not utilizing fall protection equipment is its suitability to the employee, that it is uncomfortable or hard to use. Work with employees to find equipment that fits their individual needs best, which will increase their likelihood of utilizing the equipment.
- Implement employee focus groups. Often, employees have the best suggestions for solving on-the-job problems, like failing to utilize fall protection. Employee focus groups can be a great way to instill peer-to-peer accountability on the job site.
- Create a transparent culture where on-the-job incident investigations are shared with employees. Sharing real-world incident facts and collectively discussing root causes can often be an eye-opening experience for employees and lead to higher levels of compliance with policies.

Companies that require employees to work at heights above 6 feet should require and enforce the use of fall protection in accordance with the associated OSHA standards.

Recommendation #4: Employers should consider prevention through design to “design out” or minimize hazards and risk.

Discussion: Most skylights in the US are not designed to withstand the weight of an individual leaning or falling. Use of railings, grids, internal and external screens, or specifically designed products meeting fall protection standards can be used to prevent falls through skylights. Some skylights are designed to withstand human impact or point loads. However, the National Institute for Occupational Safety and Health (NIOSH) suggests that one of the best ways to prevent and control occupational injuries, illnesses, and fatalities is to “design out” or minimize hazards and risk. NIOSH leads a national initiative called [Prevention through Design](#) (PtD). The mission of the Prevention through Design national initiative is to prevent or reduce occupational injuries, illnesses, and fatalities through the inclusion of prevention considerations in all designs that impact workers. The mission can be achieved by:

- Eliminating hazards and controlling risks to workers to an acceptable level “at the source” or as early as possible in the life cycle of items or workplaces;
- Including design, redesign, and retrofit of new and existing work premises, structures, tools, facilities, equipment, machinery, products, substances, work processes, and the organization of work;
- Enhancing the work environment through the inclusion of prevention methods in all designs that impact workers and others on the premises.⁷

PtD encompasses all the efforts to anticipate and “design out” hazards to workers. Such efforts can include changes to construction design, work methods and operations, equipment, and the organization of work along with use of new technologies.⁸

Falls are deadly: The [Bureau of Labor Statistics](#) reports that from 2011 to 2018, 2,652 workers in private construction died as a result of a fall. Of these, 2,576 (97.1%) involved a fall to a lower level. Of falls to a lower level, 16.5% (n=426) resulted from falling through a surface or existing opening. Examining common sources associated with falling through a surface or existing opening, it was found that 119 deaths involved skylights and 65 deaths involved existing roof openings other than skylights.⁹

By utilizing the Prevention through Design initiative, employers can eliminate fall hazards associated with skylights by excluding them from building designs. Facilities with existing skylights can phase out and remove the skylights in lieu of repairing them, thus eliminating the hazard and future exposure.



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INVESTIGATOR INFORMATION

This investigation was conducted by Beau Mosley, Fatality Investigator, Fatality Assessment and Control Evaluation, Kentucky Injury Prevention and Research Center, University of Kentucky College of Public Health.

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