

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

INCIDENT HIGHLIGHTS

**DATE:**

November 11, 2022

**TIME:**

9:45 a.m.

**VICTIM:**

37-year old non-Hispanic roofing contractor

**INDUSTRY/NAICS CODE:**

Roofing Contractors/
238160

**EMPLOYER:**

Commercial building roof contractor

**SAFETY & TRAINING:**

No formal program

**SCENE:**

Commercial building

**LOCATION:**

Kentucky

EVENT TYPE:

Fall from elevation



REPORT#: 22KY096

REPORT DATE: 02/02/2023

Roofing Contractor Dies after Falling through Skylight

SUMMARY

On November 11, 2022, a 37-year-old roofing contractor (victim) was assisting the job foreman with the installation of a commercial grade rubberized roof coating. In the process, the victim stepped on a fiberglass skylight and fell to the surface below. Post-incident, a non-employee family member of the foreman was attempting to retrieve tools left on the roof. While doing so, the family member fell through a fiberglass skylight adjacent to the skylight involved with the original incident. The non-employee family member suffered non-life-threatening injuries. [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,
- No worker safety training program.

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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,
- Train employees on 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 November 11, 2022, a 37-year-old roofing contractor (victim) was assisting the job foreman with the installation of a commercial grade rubberized roof coating. The victim stepped on a fiberglass skylight while navigating the roof and fell 30 feet to the surface below. The victim succumbed to his injuries on scene. Post-incident, a non-employee family member of the foreman was attempting to retrieve tools left on the roof. While doing so, he too also fell through a fiberglass skylight that was situated adjacent to the skylight involved in the fatal incident. The non-employee family member suffered non-life-threatening injuries. On November 18, 2022, the Kentucky Labor Cabinet informed the Kentucky Fatality Assessment and Control Evaluation (FACE) program of the incident.

EMPLOYERS

The employer is a roofing contractor that specializes in the installation of rubberized coating on low-slope commercial building roofs. The company was founded in 2019 and consists of one full-time employee (the owner/foreman) and multiple part-time employees that are utilized on an as-needed basis depending on the specifics of the particular job.

WRITTEN SAFETY PROGRAMS and TRAINING

According to the owner, the company has no written safety program in place. The owner stated that he typically provides verbal safety guidance to his part-time employees.

WORKER INFORMATION

The victim was a 37-year-old non-Hispanic single male. The decedent was a high school graduate and had worked as a part-time employee for the company since 2020. In addition to his part-time employment with the involved company, the victim held a full-time position at a food manufacturing facility.

INCIDENT SCENE

The incident occurred on the roof of a 19,000-square-foot multi-use commercial building that sits on a fenced gravel lot. The building has been leased to multiple tenants over the years. According to the owner of the property, the building was vacant for approximately 1.5 years prior to June 2022 when the current tenant, a commercial electrical company, leased the building. The roof is constructed of corrugated metal and measures 27.5 feet on either side and 30 feet at its peak and has a pitch of 1:12; meaning the roof rises one inch for every 12 inches it moves toward the peak. A total of 30 fiberglass skylights are present within the roof, all original to the construction of the building. The floor inside the building is constructed of concrete.

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Photo 1. Google Earth image of building where the incident occurred.



Photo 2. Photo showing 1 of 30 fiberglass skylights present on top of the building where the incident occurred (photo taken prior to incident).

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Photo 3. Photo showing fiberglass skylight arrangement and roof of the building where the incident occurred (photo taken prior to incident).

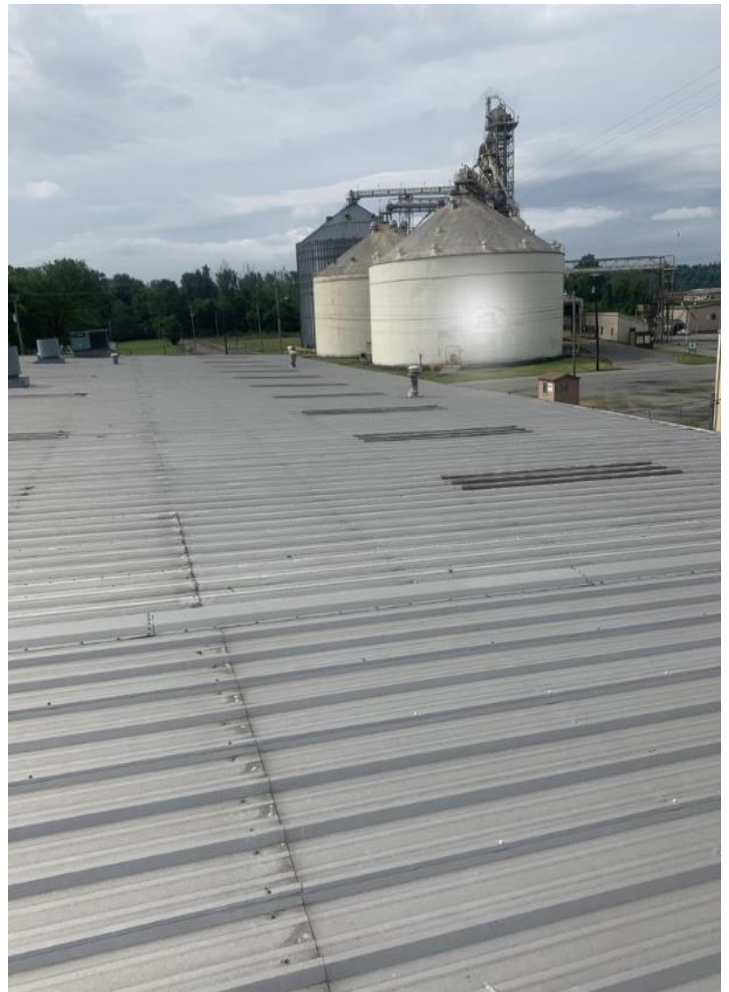


Photo 4. Photo showing fiberglass skylight arrangement and roof of the building where the incident occurred (photo taken prior to incident).

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WEATHER

The weather on the day of the incident was approximately 54 degrees Fahrenheit, 80% humidity, 13 mph average northerly wind speed. The weather is not believed to have been a factor in this incident.¹

INVESTIGATION

On November 11, 2022, the job foreman arrived on site at approximately 8:45 a.m. The foreman began set up and preparation for what was expected to be the last day of a 4-day commercial roof coating job. The coating was being applied to all surfaces of the roof except the fiberglass skylights; the skylights were left uncoated. At approximately 9:00 a.m., the part-time employee (victim) arrived at the job site to assist with the completion of the job. The rubberized coating is applied to the roof via a pneumatic sprayer. According to the foreman, the victim's primary job function was to manage the hose that fed the product to the sprayer, as the hose should not contact freshly applied product until it has had adequate time to properly cure. At approximately 9:15 a.m., the job foreman advanced to the roof with his hose and sprayer via a 28-foot aluminum extension ladder that was situated on top of a 3-foot concrete slab. The victim remained on the ground during the beginning stages of the application to verify the coating was properly flowing through the hose. The job foreman stated that he had expected the victim on the roof shortly after spraying began. At approximately 9:45 a.m., the foreman realized that the part-time employee (victim) was not present on the roof. The foreman stopped the application process to further investigate. As the foreman proceeded toward the ladder, he observed a breach in one of the roof's 30 fiberglass skylights. After closer examination, the foreman realized the victim had fallen 30 feet through the fiberglass skylight and landed face down on the concrete surface below. The foreman rushed to the victim's aid and placed a call to emergency services at 9:48 a.m. Local police and two ambulances were on scene at 9:55 a.m. EMS rendered aid, but attempts were unsuccessful; the victim was pronounced deceased at the scene by the local coroner.

Family members of the victim were notified and arrived on scene at approximately 11:45 a.m. The coroner afforded the family the opportunity to visit with the victim prior to the body being removed from the scene. At approximately 12:30 p.m., while family members of the victim, EMS, and the coroner were still present at the scene, a relative of the foreman arrived and voluntarily proceeded to the roof to gather the equipment and tools. While doing so, the non-employee family member stepped on and fell through a fiberglass skylight located adjacent to the skylight of the original incident. The non-employee family member fell 30 feet to the concrete surface below and came to rest 10 feet from the deceased victim. EMS, already on scene and witnessing the incident, rendered aid. The non-employee family member was life-flighted to an out-of-state trauma center for treatment of nonfatal injuries. The non-employee family member suffered multiple broken bones, including a broken hip, ribs, and jaw. After a 14-day hospital stay, the non-employee family member of the foreman was released and expected to make a full recovery.

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Photo 5. Photo depicting the fiberglass skylights involved in each of the two incidents.

- **Red Circle** – The skylight involved in the victim’s incident.
- **Purple circle** – The skylight involved in the non-employee family member’s incident.

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CAUSE OF DEATH

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

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,
- No worker safety training program.

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 beginning work, the employer would have likely observed the hazards associated with the job site, specifically the exposure to the fiberglass skylights and the need for adequate fall protection.

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 30 fiberglass skylights. Originally, the plan was to cover the skylights with corrugated metal panels. However, matching panels could not be located due to the age of the roof. The decision was made to keep the fiberglass skylights in place and apply the rubberized coating around the skylights, keeping them exposed. Skylights present risk to workers, as they can often be difficult to differentiate from roof panels. 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.⁶

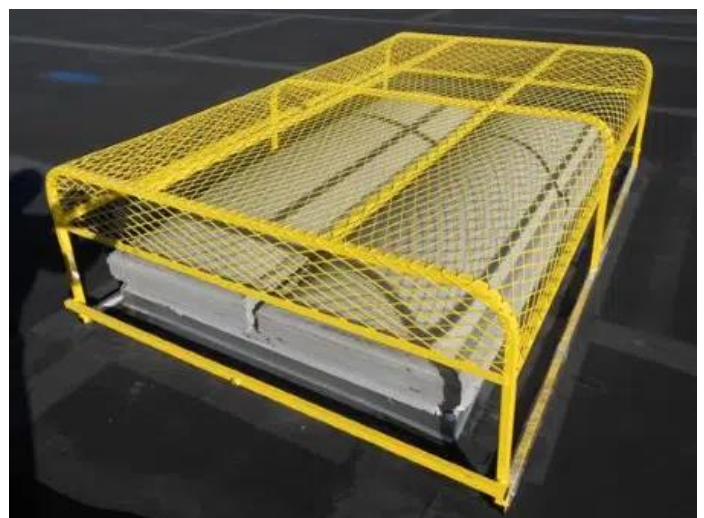


Photo 7. Photo depicting a skylight screen.⁷

Recommendation #3: Train employees on 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 industry.³ Failure to protect employees while working at heights and failure to properly train and document completion of fall protection training directly violates 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 systems.⁴ The victim was working at heights above six feet when the incident occurred. The owner of the company did not provide fall protection, direct the victim to wear fall protection, or provide safety training on how to inspect or adjust a personal fall arrest system had one been provided. The victim was not utilizing fall protection when the incident occurred.

According to 29 CFR 1926.502(b)(1): The employer shall verify compliance with paragraph (a) of this section by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training.⁴

OSHA standard 1926.503(a)(1) states the employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.³ OSHA Standard 1926.503(a)(2) states the employer shall assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:

- The nature of fall hazards in the work area;
- The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
- The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;
- The role of each employee in the safety monitoring system when this system is used;
- The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;
- The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection; and
- The role of employees in fall protection plans.⁵

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

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Recommendation #4: Employers should consider prevention through design (PtD) 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. Also, 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.⁸

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.⁹

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.¹⁰

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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