

Commercial Roofer Falls 30 Feet Through a Skylight While Installing Roof Insulation

CASE SUMMARY

On Friday, December 11, 2015 a 25-year-old male roofer (the victim) was working with a roofing crew to install insulation and corrugated metal roofing panels on a warehouse roof. The victim was stretching roofing insulation near the peak of the roof when the insulation tore, causing the roofer to lose his balance. He stepped forward onto a clear fiberglass skylight in an attempt to gain his balance, causing the skylight to break. He fell approximately 30 feet to the concrete below, fatally striking his head. He was pronounced dead at the scene by the coroner.



Figure 1. Location on roof where roofer fell.

Recommendations for prevention:

- A job hazard analysis should be performed by a trained, competent person, before beginning a job.
- Workers should always use personal fall protection when exposed to a vertical drop of 6 feet or more.
- All employees expected to work from heights of 6 feet or more should receive training on fall protection use prior to beginning such work.
- Employers and forepersons should enforce worker safety policies and procedures that, at a minimum, adhere to federal OSHA regulations.

EMPLOYER

The employer was an out-of-state roofing contractor who had been in business since January 1, 2009, with 18 employees.

SAFETY AND TRAINING PROGRAMS

The employees interviewed said they had not received any type of fall protection safety training when they were hired and while fall protection was available, it was not used by any of the employees and the employees were not trained on how to properly wear the fall protection. The employees had been trained to operate the aerial lift earlier in the year.

VICTIM

The victim was a 25-year-old male high school graduate. He was a father of one son. He had been with the company for four months and on this particular jobsite for three weeks.

EQUIPMENT

The equipment used was a Genie model S-45 boom lift to access the rooftop and to deliver materials as needed. Also, rolled fiberglass insulation was being installed.



Figure 2. Genie model S-45 boom lift used to transfer roofers and materials to roof.

INCIDENT SCENE

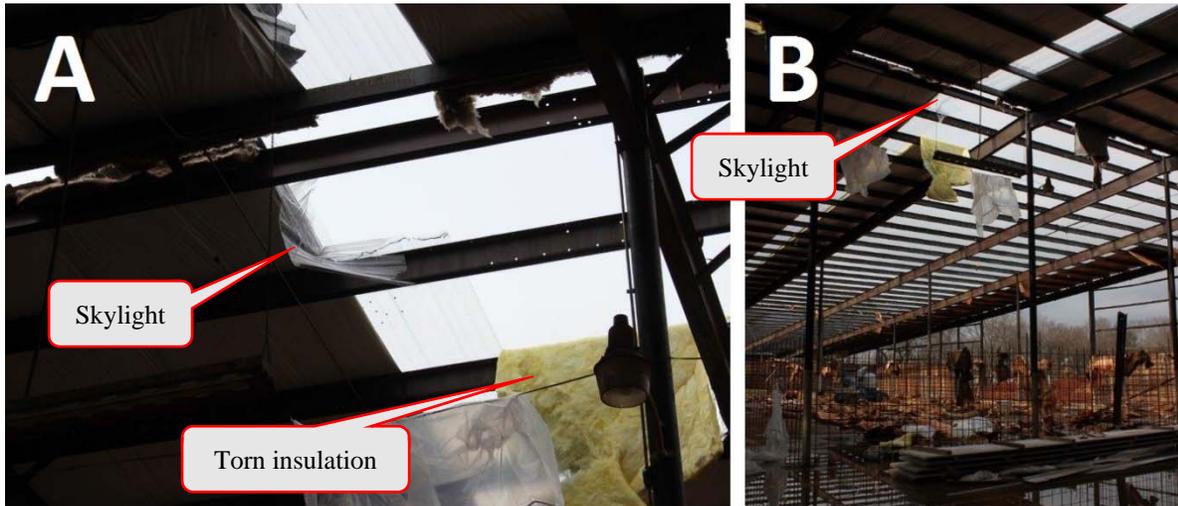


Figure 3. Skylight through which the victim fell with torn insulation (A); interior of the building (B).

The incident took place inside a former tobacco warehouse. The floor was littered with old insulation that had been removed and new rolls of fiberglass insulation were to be installed. The 1:12 pitch roof was being constructed of corrugated sheets of metal and had corrugated fiberglass skylights running through. There was a tractor and van stored inside the building. The victim was 30 feet above on the roof installing insulation when the incident occurred. When he fell, he landed on the concrete surface below in a large puddle of water. The foreman witnessed the victim falling and called for emergency medical services.

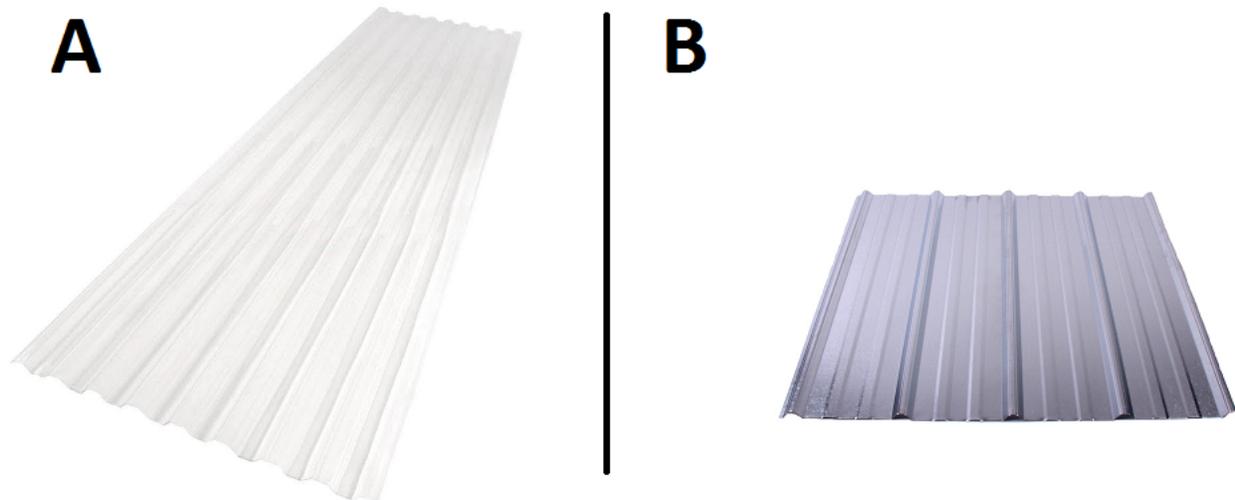


Figure 4. Fiberglass corrugated skylight panels, similar to those on the roof (A); corrugated metal roofing panels, similar to those on the roof (B).

WEATHER

December 11, 2015, had temperatures ranging from 53 to 71 degrees Fahrenheit. The temperature was approximately 64°F at the time of the incident. The humidity was 88%, and the wind was blowing from the south at 5.8 mph with overcast conditions.¹ Weather was not considered a factor in this incident.

INVESTIGATION

On Friday, December 11, 2015, the Kentucky Fatality Assessment and Control Evaluation Program was made aware by Kentucky Occupational Safety and Health (KY OSH) of a fatality involving a fall from a roof. An immediate site visit and investigation was subsequently conducted.

An out-of-state roofing contractor had been hired to remove and replace roofing and insulation as a part of a tobacco warehouse renovation project. The original skylights were being utilized and not replaced. A work crew of three roofers and one foreman had been on the job site for approximately three weeks and were in the process of installing the new rolled fiberglass insulation and corrugated metal roofing materials. They arrived at the worksite at 9:00 am. The three roofers and the foreman had been using a Genie S-45 boom lift to access the roof and transfer roofing materials. Approximately three hours after arriving, the three roofers were positioned on the roof—the victim was positioned

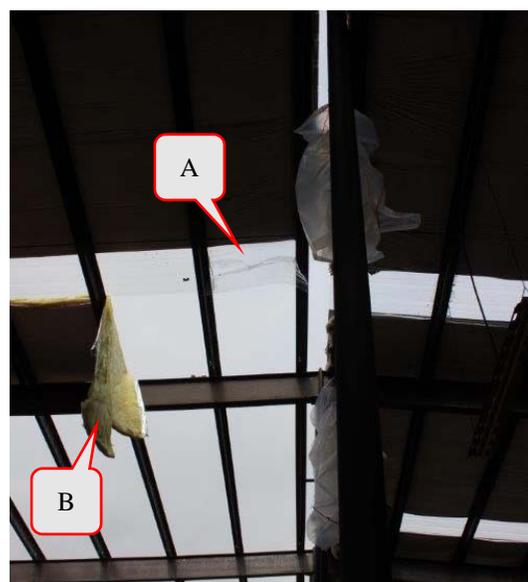


Figure 5. Skylight that collapsed under the roofer (A); insulation that tore (B).

near the roof's peak, while the other two were positioned elsewhere on the roof. The foreman was located at the ground level. None of the roofers were wearing fall protection, and the nearby skylights were not guarded. The victim pulled the insulation tight in an attempt to fully stretch it out. As he was doing this, the insulation tore (Figure 5B), causing him to lose his balance. Trying to recover his balance, he staggered forward and stepped onto an unguarded skylight panel (Figure 5A) that was attached to the purlins. The skylight broke from the weight of the victim, causing the victim to fall thirty feet to the ground below, striking his head on the water covered concrete. The victim was pronounced dead at the scene at 12:23 pm by the coroner.

Lack of Training, Personal Protective Equipment Use

The other roofers on the scene, including the foreman, stated that despite fall protection being available, they did not use it on the day of the incident and had no training on how to wear it properly. The foreman was working on the roof with the roofers off and on that day, and the lack

of personal fall arrest systems being worn was readily visible to onlookers. The roofers also stated that they had never received any type of worker safety training except lift operation training since being hired by the employer, as required by federal and state OSHA regulations. The use of the boom lift also required personal fall arrest systems, which were not used during boom operation.

CAUSE OF DEATH

The cause of death was an open head injury.

CONTRIBUTING FACTORS

This investigation identified the following factors that may have contributed to the fatality:

- A job hazard analysis was not performed.
- Personal fall protection was not worn.
- There was no safety violation enforcement by the foreman.
- No competent person onsite.
- No guarding was used for the skylights.
- No safety training was provided.
- Company procedures and policies were not followed.

RECOMMENDATIONS AND DISCUSSIONS

Recommendation No. 1: A job hazard analysis should be performed by a trained, competent person, before beginning a job.

29 CFR 1910.132(d)(2) requires that a job hazard analysis (JHA) be performed prior to beginning a worksite project:

“The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment.”

The purpose of a JHA is to identify potentially hazardous job tasks before they occur. This analysis should be performed by a competent person, as defined by the Occupational Safety and Health Administration (OSHA). OSHA defines a competent person as one who is capable of identifying hazards present in the workplace, and has the authority to eliminate them and enforce safety measures.² The JHA should focus on the worker, the task at hand, any tools or equipment to be used, and the working environment.³ Feasible and effective control solutions should be implemented to reduce or eliminate the risk of any hazards identified by the JHA.

The Occupational Safety and Health Administration's JHA manual suggests the following activities in performing a JHA:

1. **Involve your employees**, as they will likely have a unique understanding of the hazards present, and will be invaluable when constructing your JHA;
2. **Review your accident history**, as this can be a reliable indicator of whether your existing safety measures need improvement;
3. **Conduct a preliminary job review** by discussing with your employees what hazards they personally know exist, and ways in which they can be eliminated or controlled. If any risks are identified which pose an immediate threat, take immediate action to protect the worker(s);
4. **List, rank, and set priorities for hazardous jobs**. List the jobs with the hazards that are most likely to be encountered and have the most severe consequences at the top. These should be the first priority for analysis.
5. **Outline the steps of tasks** to be performed so that you can review them with your employees to discuss hazards on a step-by-step basis.

The goal of the JHA is to identify the following:

1. What can go wrong?
2. What are the consequences?
3. How could problems arise?
4. What are other contributing factors?
5. How likely is it that the hazard will occur?

The foreman in this case stated that he and his roofing crew were aware that personal fall arrest systems were available on site, but that they did not wear the fall protection systems while working on the roof nor when positioned on the boom lift. Because the fall hazard was readily visible, a properly performed JHA would have identified the need for a personal fall arrest system for each roofer.

To view more information on performing a JHA, refer to the JHA Manual, OSHA:

<https://www.osha.gov/Publications/osha3071.pdf>

Recommendation No. 2: Workers should always use personal fall protection when exposed to a vertical drop of 6 feet or more.

OSHA requires in 29 CFR 1926.501(a)(2) that employers assess a workplace to ensure that the structures on which workers will be working have the structural strength and integrity to support workers. This analysis of the walking surface at the jobsite should be carried out during the JHA (see recommendation 1). Employees must be restricted from working in this area until the employer has deemed it safe.⁴ Once it has been determined that the surface can safely support the roofing workers, appropriate personal fall protection systems must be put in place.

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 which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.”⁵

Personal fall arrest systems (PFAS) were available, but neither the victim nor the other roofers were using personal fall protection of any kind. The use of a drop-tested safety net (Figure 6A) or a PSAF may have prevented the outcome of this fatal incident. A competent person should always be on the worksite who is capable of identifying hazards and has the authority to eliminate or reduce them. In this case, the foreman should have been trained in the role of a competent person and should have enforced the use of fall protection by all roofers exposed to the fall hazard, both on the roof and in the boom lift.



Figure 6. Safety net on building construction site.

For more detailed information on choosing the correct type of personal fall protection for your construction site, please refer to the OSHA “[Fall Protection in Construction](https://www.osha.gov/Publications/OSHA3146.pdf)” handbook, accessible at <https://www.osha.gov/Publications/OSHA3146.pdf>.

Recommendation No. 3: All employees expected to work from heights of 6 feet or more should receive training on personal fall protection use prior to beginning such work.

29 CFR 1926.503 (a) (1) states that:

“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.”⁶

Fall protection is of vital importance when working from heights. Equally important is ensuring that roofers are trained to choose the appropriate fall protection type for the job. The victim and the other roofers were not trained on recognition of fall hazards or personal protective equipment selection. Appropriate worker safety training is needed to identify work hazards and the necessary PPE for the job. Employers should strongly consider competent person training for each person expected to work from heights so that they are capable of assessing fall hazards and choosing the appropriate fall protection system.

Recommendation No 4: Employers and forepersons should enforce worker safety policies and procedures that, at a minimum, adhere to federal OSHA regulations.

The foreman in this incident was aware that the victim and other roofers were working from the rooftop, and exposed to a fall of greater than 6 feet without the use of fall protection. He was also aware that the employees did not use personal fall arrest systems when operating the boom lift to access the roof. Employers should use federal OSHA safety regulations as a basis for constructing effective worker safety policies, and foremen and other site management personnel should ensure enforcement of these policies on the job site. If site management personnel witness a hazard that places a roofer in immediate danger, control measures should immediately be implemented.

ACKNOWLEDGEMENT

Kentucky FACE maintains objectivity in order to produce a technically accurate and useful report. However, we cannot ignore the tragic nature of our investigations, and our staff would like to extend our deepest sympathy to the families and colleagues of each and every worker we investigate.

SURVEY

Please take the time to [complete our brief survey](https://uky.az1.qualtrics.com/jfe/form/SV_01HMFnq071QeyeV) regarding this report:
(https://uky.az1.qualtrics.com/jfe/form/SV_01HMFnq071QeyeV)

Electronic access to this full report can be found [here](http://www.mc.uky.edu/kiprc/face/reports/pdf/15KY078.pdf):
(<http://www.mc.uky.edu/kiprc/face/reports/pdf/15KY078.pdf>)

KEYWORDS

Fall Protection
Fall prevention
Safety Training
Roofing

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- ⁶“Training Requirements, 29 CFR 1926.503(a)(1)”. Occupational Safety and Health Administration. [<https://www.osha.gov/SLTC/fallprotection/construction.html>]

PHOTO CREDIT

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DISCLAIMER

This case report was developed to draw the attention of employers and employees to serious worker safety hazards 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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