



The National Institute for Occupational Safety and Health (NIOSH)

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Electrician's Helper Falls to His Death Through a Skylight

FACE 8930

Introduction

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology (FACE) investigations when a participating state reports an occupational fatality and requests technical assistance. The goal of these evaluations is to prevent fatal work injuries in the future by studying the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

On April 18, 1989, a 39-year-old male electrician's helper died after falling 16 feet through a skylight to a concrete floor.

Contacts/Activities

State Officials notified DSR of this fatality and requested technical assistance. On April 27, 1989, a research safety specialist met and discussed the incident with the company's vice-president and the Occupational Safety and Health Administration (OSHA) compliance officer assigned to the case. Photographs and a police report of the incident were also obtained.

Overview of Employer's Safety Program

The victim had been employed for 9 months as an electrician's helper by an electrical contracting company that has been in operation for 21 years. The company employs 40 workers, including 10 electrician's helpers. The employer has a written safety policy and uses written safety rules and procedures. On-the-job training is provided to employees and weekly safety meetings are also conducted.

Synopsis of Events

The company had been contracted to install lighting and outside receptacles, as well as remove an existing company sign at an industrial building. The building is 50 feet wide by 200 feet long and is divided into two sections. One section is 20 feet high and the other is 16 feet high.

On the day of the incident the victim was working with an electrician/foreman assigned to finish work on the building. All work had been completed except for removing the sign attached to the side of the 20-foot-high section. The foreman, working from a bucket truck, attached a hemp rope to the sign. The victim, who was on the roof, secured the rope to a fixed metal ladder which provided access between the roof of the lower section to the roof of the higher section. The rope was approximately 1 1/4 inches in diameter by 120 feet long. The foreman disconnected the electric power to the sign and unfastened the bolts which secured the sign to the side of the building. He raised the bucket to a position level with the roof of the building to help the victim lower the sign to the ground. After they lowered the sign, the foreman lowered the bucket to ground level so he could disconnect the rope and load the sign on a truck. The foreman told the victim, still on the rooftop, to coil up the rope and return it to the storage area.

The victim, apparently untied the rope from the ladder, and either tripped, stepped, or possibly sat on a 4-foot-square smoke dome type skylight located near the work area. The skylight broke and the victim fell 16 feet to a concrete floor (see Figures 1, 2, 3). A 1-foot length of rope was found hanging through the broken skylight following the incident.

The foreman, after loading the sign on the truck, drove around the building and went inside the warehouse section where he found the victim lying facedown on the floor. The foreman checked the victim for vital signs (i.e., pulse and breathing) and found none. He then summoned personnel outside the building to call for help.

Emergency medical service (EMS) personnel arrived at the scene approximately 17 minutes after being called. At this time no vital signs were present and the county medical examiner pronounced the victim dead at the scene.

Cause of Death

The medical examiner's report for this incident has not been completed at this time, but severe head injuries incurred as a result of the fall are presumed to have caused death.

Recommendations/Discussion

Recommendation #1: The employer should review, revise where applicable, and enforce a comprehensive safety program that is task specific.

Discussion: The majority of work performed by the employer is electrical-related and the employer's existing written safety rules and procedures applied primarily to electrical safety. Other safety aspects need to be taken into consideration (e.g., recognition and elimination of fall hazards), incorporated into the safety program, and enforced by the employer. A comprehensive safety program should address all aspects of safety, especially those related to specific tasks and work environments. These rules and procedures should include, but not be limited to, fall hazards. The employer should comply with OSHA standard 1926.21(B)(2), which requires the employer to instruct each employee in the recognition and avoidance of unsafe conditions and regulations applicable to the work environment to control or eliminate any hazards or other exposure to illness or injury.

Recommendation #2: Worker safety should be considered and addressed in the planning phase of all work projects.

Discussion: Safety concerns should be discussed and incorporated into all work projects during planning and throughout the entire project. In this instance, the planning of safety procedures was incomplete for the work being performed by allowing employees to work in an area where the potential for a fall existed without providing adequate written and verbal instructions to recognize and avoid fall hazards. In addition, employers should inform workers of the potential hazards associated with stepping, standing or sitting on skylights.

Recommendation #3: Skylight manufacturers and owners of buildings where skylights have been installed should voluntarily affix accident prevention signs on the skylights, and at or near points of access (e.g., roof hatches, fixed ladders, stairways, doors, etc.) to areas containing these skylights.

Discussion: Although skylights are required to withstand specified amounts of weight (e.g., OSHA standard 1910.23(e)(8) – at least 200 pounds applied perpendicular at any one area), deaths still occur as a result of workers falling through these skylights. Skylight manufacturers should voluntarily affix accident prevention signs (Figure 4) at conspicuous places on the skylights. Also, owners of building where skylights have been installed should voluntarily affix similar signs (Figure 5) at or near points of access to areas containing these skylights. These signs would visually warn individuals of the potential fall hazard posed by stepping, standing, or sitting on a skylight. Characteristics of accident prevention signs and tags (i.e., classification, design, color, layout, finish, lettering, placement, illumination, and symbols), should comply with the American National Standards Institute (ANSI) standards Z35.1-1972, and OSHA standards (general industry and construction industry) 29 CFR 1910.145 and 1926.200.

Signs should be easily visible to anyone approaching the area, should contain specific information on procedures, should be inspected on a regular basis, and should be printed both in English and in the predominant language of non-English-reading workers. Also, workers unable to read posted signs should receive instructions regarding hazardous area.

Recommendation #4: Designers/manufacturers of skylights should evaluate current designs with a view toward increasing load capacities and/or incorporating safeguards.

Discussion: Skylight materials may weaken due to age and/or environmental conditions. As a result, the probability that a person could exert sufficient pressure to break through skylights may increase. Designers/manufacturers should consider design modifications to skylights which would strengthen these units sufficiently to enable them to support a person should that person step, sit or fall onto a skylight. If the smoke venting effectiveness of the skylight would be adversely affected by such changes, consideration should be given to development and utilization of other alternatives for increasing the strength of skylights, e.g., a dome-shaped wire cover to fit over the skylight.

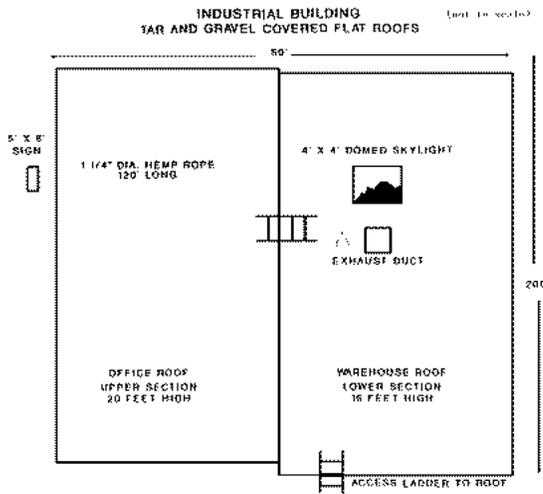


Figure 1.

Figure 2.



Figure 3.



Figure 5. Recommended accident prevention sign to be applied to skylights.

Figure 4.

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Yes

Partly

No