



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Carpenter Dies After 13-foot Fall Through Roof Opening Onto Concrete Floor

FACE 8941

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 June 8, 1989, a 27-year-old male carpenter fell through a duct opening on a roof, to a concrete floor 13 feet, 4 inches below, sustaining massive head injuries. He died 6 days later from the injuries.

CONTACTS/ACTIVITIES

State officials notified DSR of this fatality and requested technical assistance. On June 27, 1989, a DSR research team consisting of a safety engineer and a safety specialist conducted a site visit, interviewed a company representative, photographed the site of the incident, and discussed the incident with local emergency personnel and state medical examiner personnel.

OVERVIEW OF EMPLOYER'S SAFETY PROGRAM

The victim had been employed for 2 months by a construction company that was building a shopping mall. He was hired as an experienced carpenter from the local union hall. The company has about 70 employees total, had 3 carpenters at the shopping mall site. The company has no designated safety officer. The job superintendent has conducted safety meetings in the past, but indicated that the last safety meeting he conducted was over a year prior to the incident. The company has written safety rules that were not made available to the investigators. The company provides no safety training, relying upon the union and previous employers to provide safety training.

SYNOPSIS OF EVENTS

The company had been contracted to construct a small shopping mall. The victim had been made the lead carpenter of a 3-man carpenter crew about a week before the incident. On the day of the incident, the victim and the job superintendent discussed what work was to be performed. The victim intended to work on the roof with electric power tools. He told co-workers that he was going onto the roof to drop an electrical cord down for someone at floor level to plug into an outlet.

A short while later, co-workers heard the sound of a piece of wood falling. Upon investigation, they found the victim lying on the concrete floor of the structure bleeding from injuries to the right side of his forehead. The victim was conscious and one co-worker provided first aid while another notified the superintendent, who immediately called for emergency services. Local fire department personnel responded within 6 minutes of notification and, upon evaluating the situation, called for a trauma transport unit. Emergency medical service (EMS) personnel stabilized the victim's head, took vital readings, did a spinal immobilization, provided oxygen, and prepared for transportation by helicopter. A medical helicopter transported the victim to the trauma unit of an area hospital. The victim died in the hospital 6 days after the incident.

There were no eyewitnesses to the incident. Investigation of the scene after the incident revealed that the nails had been removed from one side of a 4-foot by 8-foot sheet of 5/8-inch plywood that was placed over a 37-inch by 67-inch roof opening for a heating, ventilation, and air conditioning unit. The victim apparently removed the nails from one side of the plywood cover so that he could drop an electric cord down to the floor where power outlets were available. He apparently knelt down and leaned into the opening with the plywood resting on his back in order to look for somebody to plug the cord into an electrical outlet. While kneeling, the victim either lost his balance or the weight of the plywood caused him to fall headfirst onto the concrete floor below.

CAUSE OF DEATH

The medical examiner's report has not yet been received; presumably, multiple traumatic injuries resulting from the fall caused his death.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: During planning for any job, consideration should be given to providing temporary power to locations where powered tools will be needed.

Discussion: The job planning should have identified that electrically-powered tools would be needed to work on the roof. Provisions should have been made to provide temporary electrical outlets on the roof at several locations. This would have eliminated the need to drop a cord down through an opening and could have prevented this incident.

Also, the installation of temporary power on the roof would allow management to establish specific tool use areas. Minimizing the number and length of electrical cords at worksite locations minimizes the creation of tripping hazards, and the potential that insulation on the electrical cords might be damaged, possibly leading to electrical shock hazards.

Recommendation #2: Warning signs should be present on all roof covers.

Discussion: The cover should have been affixed with a warning sign indicating that the plywood sheet was covering an opening and should not be removed without the job superintendent's permission. The victim obviously knew there was an opening below the plywood since he was attempting to provide electric power to the roof by dropping a cord through the opening. A warning sign might have made him stop to evaluate if there was a safer place to drop the electric cord down to the ground floor.

Recommendation #3: The company should develop and implement an active safety program.

Discussion: The company has no active safety program. The job superintendent indicated that he had not had a safety meeting in over a year. The company should implement a safety training program in compliance with CFR 1926.21(b)(2), which requires employers to instruct all employees in the recognition and avoidance of unsafe conditions that could lead to injury.

Areas that the safety program should cover include:

- Housekeeping (The housekeeping in the building was poor.)
- Hazard recognition. (An employee without a hard hat was cleaning up trash immediately below workers on the roof.)
- Fall protection (A carpenter was working 15 feet above the ground without any fall protection equipment.)
- Ladder safety (A ladder that was used to access the roof did not extend 3 feet above the roof and was tied off with a piece of scrap binder twine.)

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Last Reviewed: November 18, 2015

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