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## Roofer Falls from Top of New Home in Wyoming

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### SUMMARY

A 53 year old teacher who was working as carpenter/leadman on a housing project died from injuries received when he fell nearly 30' from the roof of a two-story home he was helping to roof. The victim had been standing on a roof slope with an unusually steep pitch (45° angle), braced against a 2x4 that was securely nailed to the roof about four feet from the peak. A fork-lift supported platform had been raised to bring a 4x8 sheet of plywood within reach, which the victim would then take from the platform and hand up to other workers who would nail the plywood sheet in place. As he turned toward the platform he apparently lost his footing and began sliding feet first down the roof. As he slid down the slope of the roof he somehow got turned around and fell headfirst from the roof to the ground below, striking his head on an inch long  $\frac{3}{4}$  inch diameter bolt that protruded from wooden support block.

The victim's son, who was working with him on the construction project, had begun mouth-to-mouth resuscitation before ambulance personnel arrived. An off-duty EMT arrived at the scene and began CPR. Ambulance personnel then prepared the victim for transport to a local hospital where he expired.

Employers may be able to minimize the potential for occurrence of this type of incident through the following precautions:

- **Personal protective equipment, including tiedowns, should be provided to and used by all employees required to work over 10 feet from the ground on a roof**
- **Guard rails should be provided for employees who work on a platform six feet or more from the ground**
- **Specific training and education should be provided to all employees who work over 10 feet above the ground**

### INTRODUCTION

On a late Monday morning, March 8, 1993, a teacher who was working as a supervisory carpenter on a construction project was on the roof of a new two-story home that was being constructed in a housing development. His task was to take pieces of plywood that were raised up to him by a ground-based forklift, and hand them up to other workers who were nailing them to the sides of a roof monitor at the peak of the house. As the 4' by 8' sheets were raised, the victim would brace his feet against a secured 2" by 4" piece of wood (called a cleat) that was nailed to the roof, lean his lower back into the slope of the roof, and lift a plywood sheet from the platform and place it against the roof monitor near his head. The workers standing inside the roof monitor then nail the plywood sheets into place. Earlier that morning, a co-worker had seen the victim slip and had called out to him that he'd better be careful.

The temperature was cold (around 20°) and there was snow on the ground, but the roof was dry and was not slick. The victim was in good physical shape and was comfortable working on scaffolding or rooftops. The slope of the roof was unusually steep at a 12/12 ratio (45° angle), but the victim had been working on that rooftop for two days, had very strong legs, and was considered by other employees to be knowledgeable of the operations and safety minded.

As the victim turned toward the platform to retrieve a sheet of plywood, his feet apparently slipped from the cleat and he slid feet first down the roof. As he slid under the platform, he got turned around and left the roof head first. He slid approximately sixteen feet down the roof and then fell another twelve feet to the ground.

## **INVESTIGATION**

Through a reciprocal notification agreement with the Director of the Occupational Health and Safety Division of the Department of Employment, the WY- Wyoming FACE Project was notified of this incident on March 24, 1993. The Wyoming FACE investigator then requested and received reports from official sources, and talked with the employer of the company where the victim had worked. The victim had been employed by the company for a period of 1½ years, and was both an employee and personal friend of the company owner. He was considered by the company and its employees to be very knowledgeable about the task that was being conducted and very safety minded. He had worked at the specific job site for two weeks and had been working on the roof from which he fell for the previous two days.

The company does not have a safety officer or formal written safety procedures. They do institute "safety talks" over lunch and hand out copies of pertinent safety information that is available to company personnel. Employee training is primarily on-the-job supervised training, and the victim in this instance had been trained and promoted to a supervisory position.

The surface from which the victim fell was a dry plywood roof with an unusually steep pitch. There was good lighting available. The temperature was low (20°) and there was snow on the ground, but the roof was dry and was not slick. While no one saw the victim slip from the roof it is believed that, in reaching for a sheet of plywood that had been lifted to rooftop level, he lost his footing against a 2x4 that was nailed to the roof. He possibly reached for the platform to catch himself, resulting in his being turned 180° from a feet-first to a head-first direction down the slope of the roof.

The surface onto which the victim fell was snow-covered, rock strewn, frozen ground amidst building materials and equipment. As he fell, his head struck a bolt that was protruding from a stemwall through a 2x8 platform for a roof support.

The victim was a college graduate with a Masters Degree plus 15 years of teaching experience. He was in good physical condition and did not smoke or use alcohol or drugs. He was 5'7" tall with an estimated weight of 160 pounds.

The company had been in business in the town where the death occurred for 2½ years, employing 8 full time persons. The business is home construction, and was serving as a sub-contractor for a new housing development project.

Several witnesses saw the victim sliding down the roof and falling to the ground. The victim's son, who was working in the roof monitor, was among the first to reach him after the fall. He began mouth-to-mouth resuscitation and a co-worker checked for and found a pulse. The owner of the company, who had been off premises at the time of the fall, was returning as resuscitation attempts were being started, and used his cellular phone to call for help. An off-duty EMT who was nearby, arrived shortly and with a law enforcement officer who was responding to the call, began CPR, and readied the victim for transport to a nearby hospital, where he expired after resuscitative measures had proved unsuccessful.

## **CAUSE OF DEATH**

The Medical Examiner listed the cause of death as subarachnoid hemorrhage, extensive resulting from a depressed skull fracture of occiput.

## **RECOMMENDATIONS/DISCUSSION**

This incident could have been prevented through the use of tie-downs, safety belts, or lanyards for rooftop workers; or by the use of guardrails or standard railings on the work platform. While there was a process for "safety talks" during employee lunch breaks and periodic distribution of safety literature, and while the victim was knowledgeable about the operation, the use of formalized safety briefings would have been advantageous.

Both active and passive fall protection systems are essential to protect the lives of workers in areas where the potential for falls from elevation exists. In this instance, several factors should have alerted both the employer and the employees to the need for such protection. The roof had an extremely steep pitch. The temperature was quite low, increasing the probability of sluggish reactions and slick surfaces. The mechanism for lifting the sheets of plywood to rooftop level was ground based and was not secured to the platform. With those factors evident, the company should have recognized a need for both active fall protection, such as belts, harnesses, and/or lanyards, and passive fall protection, such as safety nets or guardrails.

Personal lifeline systems should be used to give workers the flexibility of freedom of movement, yet stop a fall and help absorb the resulting shock. These systems have some type of harness or belt that the worker wears around the waist, and a lanyard or rope-grabbing device attached to the belt or harness. The safety belt or harness is used for securing, suspending, or retrieving a worker in or from a hazardous work area. In this instance such a lifeline system would have caught the worker as he slid down the roof and he would not have fallen over the edge.

Guard rails meeting OSHA Standard #1926.500 should be provided for any work surface in excess of 6' from the ground. A passive system would have served in this instance to catch the victim and prevent his falling from the rooftop.

Specific training and education should be provided to workers who face situational hazards such as height and potential for fall from elevation. The company should institute safety education and training beyond the lunch hour safety talks and distribution of safety materials that currently exists. Employee safety is not only a benefit to the worker who might be injured or killed in the workplace, but also an

economic benefit to the company with workers who maintain maximum productivity as a result of knowing they work in a safe environment.

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## **FATAL ACCIDENT CIRCUMSTANCES AND EPIDEMIOLOGY ( Wyoming FACE ) PROJECT**

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology ( Wyoming 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.

States participating in this study include: Kentucky, Maryland, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia.

NIOSH Funded/State-based Wyoming FACE Projects providing surveillance and intervention capabilities to show a measurable reduction in workplace fatalities include: Alaska, California, Colorado, Georgia, Indiana, Iowa, Massachusetts, New Jersey, Minnesota, Missouri, Wisconsin and Wyoming.

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Additional information regarding this report is available from:

Wyoming Occupational Fatality Analysis Program  
522 Hathaway Building - 2300 Capitol Avenue  
Cheyenne, WY 82002  
(307) 777-5439

**Please use information listed on the Contact Sheet on the NIOSH FACE web site to contact [In-house FACE program personnel](#) regarding In-house FACE reports and to gain assistance when State-FACE program personnel cannot be reached.**