

**TO:** Director, National Institute for Occupational Safety and Health

**FROM:** California Fatality Assessment and Control Evaluation (FACE) Program

**SUBJECT:** Laborer falls through opening in warehouse roof to the floor and dies in California

### ***SUMMARY***

#### **California FACE Report #98CA005**

A 40-year old laborer/helper (decedent) died when he fell through the opening in a warehouse roof approximately 27 feet to the floor below. The employer was demolishing the roof of the warehouse portion of a commercial building. The decedent had picked up a 4X8 foot sheet of damaged plywood and began to walk away when he fell through the opening in the roof.

Another worker, who had removed the damaged plywood, had walked away to obtain nails for the replacement piece of plywood. The opening was left unguarded when the decedent came over to remove the damaged piece of plywood. The crew was not informed that the opening was temporarily left unguarded. The CA/FACE investigator determined that, in order to prevent future occurrences, employers should:

- . ensure roof openings are properly guarded or covered.
- . equip all workers in the area of roof demolition with fall protection.
- . require that all job site hazards are communicated on an ongoing basis to all workers required to be in the area.

### **INTRODUCTION**

On April 20, 1998, at 12:35 a.m., a 40-year old male laborer/helper was fatally injured when he fell through an opening in the roof of a commercial building. He had picked up a 4X8 foot sheet of plywood and began to walk away when he fell through the opening to the floor approximately 27 feet below. The CA/FACE investigator learned of this incident on April 21, 1998 from the local legal office of the California Occupational Safety & Health Administration (Cal/OSHA). On April 22, 1998, the CA/FACE investigator traveled to the incident site where he met with the company owner and photographed the area where the incident happened.

The employer, a roofing demolition contractor, had been in business for approximately 40 years at the time of the incident, the last 20 years exclusively in roofing demolition. The company had 16 employees with all 16 working on site at the time of the incident. The decedent had worked for the company for 5 months and had worked at the site of the incident for 4 days. Company safety responsibilities were defined, with the site foreman having responsibility on the

day of the incident. The company had an Injury and Illness Prevention Program (IIPP) which contained all of the required elements and a code of safe practices. The decedent was trained in the hazards of the demolition of roofs as verified by documentation. Safety meetings were conducted once a week and tailgate safety meetings were held every morning at the job site. Prior to the job, a site survey was conducted by the company vice president, foreman and an engineer to identify potential hazards.

## **INVESTIGATION**

The site of the incident is a large, single-story commercial building under demolition (**exhibit 1**). The employer was hired by the general contractor to demolish the roof of the warehouse portion of the building. The warehouse roof measured approximately 280,000 square feet. The employer would work on a maximum of 15,000 square feet at a time.

The employer had to work at night because when the roof's coal tar was disturbed in the heat of the day, it released a gas which could affect employees. The job site was lighted with banks of 500 watt halogen lights set on standards about 6 to 7 feet high. There were four banks with 5 lights each illuminating the work area.

After the roofing material was removed, 4X8 foot sheets of plywood were exposed. The plywood sheets were seated in the framework of the roof. The plywood was of 1/2-inch, 5-ply construction. The city in which the work was being performed required that any sheet of plywood whose veneer had lifted needed to be replaced. To identify those sheets that needed to be replaced, an orange X was marked on the plywood.

The procedure for replacing the sheets of plywood was to pull the nails from the old sheet of plywood, move it aside, and then nail in a new sheet of plywood. The employees doing this particular job wore fall protection, a harness and lanyard, hooked to one of a number of large eyebolts attached at points all along the steel beams of the roof's framework. The job of the decedent was to follow the employees who were replacing the plywood, pick up the damaged pieces of plywood and dispose of them by placing them in a chute. The chute was attached to the roof and was pointed toward the ground at approximately a 45 degree angle (**exhibit 2**). The chute was moved along the roof as the job progressed.

On the evening of the incident, one employee who was replacing plywood removed a damaged piece of plywood but had run out of nails to attach the new piece of plywood. The damaged piece of plywood was left askew, as was normally done. A new piece of plywood was not placed into the opening from which the damaged piece was removed. The employee walked away to obtain more nails.

During this time the decedent recognized the piece of plywood by the orange "X" as one that needed to be disposed of. Since it was out of its framework, the decedent assumed that it was ready for disposal. He picked up the piece of plywood and began to walk away. As he did, he stepped into the hole from which the damaged piece of plywood had been removed. There was silver-colored insulation from the inside of the building's ceiling still covering the opening. When the decedent stepped into the hole, he ripped through the insulation (**exhibit 3**) and fell approximately 27 feet to the concrete floor striking his head. His co-workers immediately went to his aid, but his injuries were obviously massive and no first aid was attempted.

A call was made to emergency services. The paramedics were dispatched at 12:31 a.m.

and arrived at 12:36 a.m. They found the decedent to have such massive injuries, he was not treated and immediately pronounced dead.

### **CAUSE OF DEATH**

The death certificate stated the cause of death to be fractured skull, thoracic spine, and laceration of brain and spinal cord due to blunt force trauma.

### **RECOMMENDATIONS/DISCUSSION:**

#### **Recommendation #1: Employers should ensure roof openings are properly guarded or covered.**

Discussion: In this incident the opening where the damaged 4X8 foot sheet of plywood had been removed was left unguarded and uncovered. Openings in roofs are normally guarded by standard guardrails or equivalent means. Another means of providing protection from falling through the opening, is to place a cover over the opening that is capable of supporting the weight of employees and materials that may be placed upon it. Although the opening was normally covered with a new piece of plywood immediately after removal of the old piece of plywood, it was not done in this incident. If this opening had been properly guarded or covered, this incident most likely would not have happened.

#### **Recommendation #2: Employers should equip all workers in the area of roof demolition with fall protection.**

Discussion: The decedent was not required by the employer to wear fall protection on this job. It would not normally be required because the decedent was only supposed to walk in the area after the roof openings were closed. However, the employer should have reasonably anticipated the decedent could access the area when dangerous conditions existed. In those cases, fall protection would be required.

#### **Recommendation #3: Employers should require that all job site hazards are communicated on an ongoing basis to all workers required to be in the area.**

Discussion: The dangerous situation that existed in this incident, the roof opening unguarded, was not communicated to the other employees on the job. Because situations change on construction or demolition sites, a communications system should be established to inform others on the job site of hazards. This should be carried out on an ongoing basis so everyone concerned is continually informed of changes and the hazards the changes present.

### **References:**

Barclays Official California Code of Regulations, Vol. 9, Title 8, Industrial Relations, South San Francisco, 1998

For general information regarding protection of roof openings and demolition work refer to:  
<http://www.dir.ca.gov/title8/1632.html>, [/1734.html](http://www.dir.ca.gov/title8/1734.html), [/1735.html](http://www.dir.ca.gov/title8/1735.html), [/1736.html](http://www.dir.ca.gov/title8/1736.html), [/3212.html](http://www.dir.ca.gov/title8/3212.html)

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**FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM**

The California Department of Health Services, in cooperation with the California Public Health Foundation, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work 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.

NIOSH funded state-based FACE programs include: Alaska, California, Iowa, Kentucky, Maryland, Massachusetts, Maryland, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin.

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**Additional information regarding the CA/FACE program is available from:**

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