

Fatality Investigation Report

OR 2003-10-01

Home construction worker falls down elevator shaft

Summary

On May 16, 2003, a 41-year-old worker fell 23 feet down an elevator shaft during the construction of a new residence. The worker was part of a three person framing crew raising a third story in the home. The two co-workers were installing ceiling joists while the victim handed up needed materials. The framing crew was busy setting and nailing joists into place when they heard a sound like that of a “nail gun falling and hitting something”. They went to investigate and discovered the victim, at the bottom of the shaft, seriously injured. At the time of the incident, the shaft opening was not covered according to witnesses.

A 911 call summoned a fire and rescue team who found that the victim had expired, and a deputy medical examiner was called to the scene.

Cause of death: Severe head injury with skull fracture

Recommendations

1. **Employers should design and use comprehensive fall-protection programs to reduce the risk of serious or fatal injuries.**
2. **An unprotected opening, side or edge which is 6 feet or more above a lower level should be protected by the use of a guardrail system, safety net system, or personal fall arrest system.**
3. **Establish routine follow up to assure hazard correction or abatement.**
4. **In remote or obscure locations, make sure that workers know their location, and can provide directions to emergency responders, if needed. Develop an emergency plan that reflects the response time from local emergency services.**



Introduction

On May 16, 2003, a 41-year-old white male construction worker fell twenty-three feet to his death down an elevator shaft from the second floor to the basement of a new home under construction. The Oregon FACE field investigator was informed of the incident in the local newspaper the next day. The employer – a subcontractor at the worksite – agreed to meet for an interview on June 4. Also on that date, an onsite visit was completed with the general contractor. Reports were collected from the state medical examiner, emergency services, and Oregon OSHA.

The home under construction was in an isolated area, with three floors of living space on a reinforced hillside. An elevator shaft connects the basement, first, and second floors. A third floor is accessible via a stairs (no elevator service). The general contractor for the new home had the exterior walls and first two floors completed, but found the progress too slow, and subcontracted with the victim's employer to finish the framing for the third floor and roof.

The victim's employer had been in business about three years, but the victim had worked together with the two founders of the company for about 13 years, with a few years of additional experience in construction before then. One of the other crew members was an experienced framer, and had worked for the employer about 2 years. The victim's employer, a subcontractor, had no formal safety procedures or training program.

The crew had been at the worksite about 4 days when the incident occurred.

Investigation

On the day of the site investigation, eighteen days after the incident, the exterior and most of the interior walls were nearing completion. The third floor decking had been installed and the ceiling/roof were being built. Guardrails protected the elevator shaft and the opening was covered with a deck of boards and plywood.

The general contractor reported that scaffolding had been left in the home, on the second floor, for the subcontractor to use. Using the scaffolding meant that all required work to construct the third floor could be done from inside the home, without the need for fall protection. The subcontractor, however, reported that his crew was walking the joists and not using the scaffolding. The distance from the 2nd floor deck to the top plate was ~10 feet.

The victim and his two co-workers were the only workers onsite at the time of the incident. Two of the three members of the framing crew were working from the third floor level, nailing the joists into position, from the top plate. The victim was working from the second floor, pulling joists from a window opening to pass them along to the two workers above him. The internal walls of the second floor were already framed, creating a short hallway leading to the elevator shaft. The elevator shaft was mostly framed in at the time, according to the subcontractor.

It is not clear why the victim strayed near the elevator shaft. There was apparently no need for him to be at or near the elevator shaft, except perhaps that the hallway naturally led toward it.

The framing crew was busy setting and nailing joists into place when they heard an unusual sound. One of the co-workers saw the air hose to the nail gun slipping down the elevator shaft. They went to investigate and discovered the victim at the bottom of the shaft. He made no cry during the fall. There were no signs on the floor around the shaft to indicate what might have occurred.

The victim was unresponsive, but one of the co-workers detected what may have been a slight pulse. The victim was bleeding profusely from a severe head wound. One of the co-workers slipped a sweater under the victim's head to try to slow the bleeding. A 911 call was made immediately, but emergency services had trouble finding the house, because no address existed yet. The medical examiner reports that paramedics immediately pronounced the victim dead at 11:59 a.m., with no intervention. The paramedics called the medical examiner, and he in turn called the Oregon OSHA investigator.

Recommendation/Discussion

1. Employers should design and use comprehensive fall-protection programs to reduce the risk of serious or fatal injuries.

NIOSH recommends, at a minimum, employers should:

- incorporate safety in work planning
- identify all fall hazards at a work site
- conduct safety inspections regularly
- train employees in recognizing and avoiding unsafe conditions
- provide employees with appropriate protective equipment and train them in its use

Falls from elevation hazards are present at most every jobsite, and many workers are exposed to these hazards daily. Any walking/working surface could be a potential fall hazard. In the construction industry, falls lead all other causes of occupational death, but the risk is present in virtually every kind of workplace.

The victim's co-workers at this site were working at a hazardous height, and disregarded available safety equipment. Lifelines, fixed anchor points, and other fall protection devices are common to worksites, and alternatives could have been used if for some reason the existing scaffolding was not effective for the work at hand. In this case, worker experience may have led to a sense of false security.

The demand for speed may have also contributed to hazardous work practices. The continually changing environment at a construction worksite produces temporary hazards that must be addressed with suitable temporary safety measures. Achieving the will to stop and implement these measures, especially under a tight deadline, is an important point. Employers must continually reinforce that safety concerns always precede concerns for productivity.

2. An unprotected opening, side or edge which is 6 feet or more above a lower level should be protected by the use of a guardrail system, safety net system, or personal fall arrest system.

The open elevator shaft in this incident was a serious fall hazard requiring preventive measures. The opening of the shaft needed a weight-supporting deck as a temporary cover to protect workers as well as incidental visitors or unauthorized persons who gained access to the site.

The shaft may provide a convenient passageway that necessitates removing the cover during work, and this likelihood raises the importance of guardrails as an additional safety measure. A top rail should be placed about 42 inches above the floor, with an additional mid-rail, and a toe board to prevent items from being kicked into the hole. The top of the rail should be capable of withstanding 200 pounds of force.

3. Establish routine follow up to assure hazard correction or abatement.

The project superintendent for the general contractor had been onsite the day before the incident and found the guardrails and deck obstructing the elevator shaft had been removed by the subcontractor's crew. He said he discussed safety requirements with them and the need for guardrails. A co-worker of the victim confirmed that the deck over the shaft had been removed to frame-in the walls surrounding the elevator. The hole was also used to pass up materials from the lower floor. One of the subcontractor heads said he alerted the crew to cover the elevator shaft during a walk-through inspection, and assumed it was done. A 2x4 may have been placed diagonally over the shaft, but no evidence could be found that it was secured in place by nails or was accompanied by any more secure deck of boards and plywood. No guardrails were in place at the time of the incident.

4. In remote or obscure locations, make sure that workers know their location, and can provide directions to emergency responders, if needed. Develop an emergency plan that reflects the response time from local emergency services.

In this incident, the unknown address caused a delay in emergency response. Especially in remote or obscure locations, workers should be informed of their location, along with directions to it, in order to convey that information to emergency response teams when necessary.

Posting the printed information is an ideal solution. An emergency response plan was not posted at the home construction site before this incident, but a safety plan was posted in a conspicuous location after the incident, and workers seemed to be aware of it.

Emergency response times vary considerably depending on location from a few minutes in the city to a few hours in remote rural locations. Employers should anticipate and prepare for the emergency response time at their work location. In remote locations, additional protection may be achieved by maintaining a designated person onsite with first-aid training.

References

[NIOSH Update: Strategic Precautions Against Fatal Falls on the Job are Recommended by NIOSH](http://www.cdc.gov/niosh/fatalfal.html) <http://www.cdc.gov/niosh/fatalfal.html>

[Worker Deaths by Falls: A Summary of Surveillance Findings and Investigative Case Reports](#), T NIOSH (DHHS) Publication No. 2000-116 (November 2000)--  PDF

For More Information

The Center for Research on Occupational and Environmental Toxicology at Oregon Health & Science University performs Fatality Assessment and Control Evaluation (FACE) investigations through a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR). 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.

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