The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

Concrete Contractor/Finisher Dies in Virginia Following a 36-foot Fall Through a Floor Opening

FACE 9025

SUMMARY

A concrete contractor/finisher fell 36 feet to his death through a floor opening after stepping on a sheet of particle board which had been laid across the opening to cover it. At the time of the incident, concrete had been poured onto floor panel forms on the third story of a building under construction. The victim and a co-worker, holding opposite ends of a 16-foot aluminum strike-off (a straightedge used to remove excess freshly-placed concrete), were moving backward as they screeded (smoothed off/leveled up) the concrete. The victim had reached a point on the floor where an 8-inch by 8-inch support “H” column was located. Directly behind the “H” column was a 48-inch by 91-inch floor opening covered by a sheet of particle board. As the victim worked around the “H” column, he inadvertently stepped on the particle board. The particle board bowed causing it to slip from its supports, and the victim fell 36 feet to the ground floor. The victim was pronounced dead 1 hour later at the incident site. NIOSH investigators concluded that, in order to prevent future similar occurrences, employers should:

- **implement 29 CFR 1926.500 (f)(5)(ii), which requires that floor opening covers be capable of supporting the maximum intended load and so installed as to prevent accidental displacement**
- **consider and address worker safety in the planning phase of construction projects**
- **develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, training and educating employees in the proper methods of covering/guarding floor openings to prevent falls through the openings.**

Additionally, prime contractors should:

- **utilize contract language that requires subcontractors to implement a site-specific safety and health program prior to the initiation of work.**

INTRODUCTION

On February 6, 1990, a 42-year-old, male concrete contractor/ finisher died after falling 36 feet through a floor opening. On February 20, 1990, officials of the Virginia Occupational Safety and Health Administration notified the Division of Safety Research (DSR) of the death, and requested technical assistance. On March 1, 1990, a safety specialist traveled to the

incident site to conduct an investigation. The safety specialist reviewed the incident with the general contractor of the project and the state OSHA compliance officer assigned to the case, and investigated and photographed the incident site. Reports (police, emergency medical service, and medical examiner) were obtained at this time.

The employer in this incident was a concrete contractor/finisher who had been in operation for 20 years. The contractor employed 6 workers and had no written safety rules or procedures. Additionally, the contractor did not require the use of any personal protective equipment on the job.

INVESTIGATION

A concrete contractor/finisher had been subcontracted to supply and finish the concrete for flooring work in a newly constructed three-story 60,000-square-foot building. The building skeleton steel, outer walls, floor joists, concrete floor form panels, and reinforcement wire had been previously constructed at the third-story level.

On the day of the incident, two crews of three men each were working in different locations on the third floor of the building. The crews were screeding (smoothing off/leveling up) the concrete as it was being poured on the formwork. The victim (the owner) and one co-worker were using a 16-foot aluminum strike-off (a straightedge used to remove excess, freshly-placed concrete, mortar, or plaster) to screed the concrete surface, while the third co-worker spread the concrete with a rake (Figure). The three workers were moving backwards as they worked on the concrete surface. An 8-inch by 8-inch support “H” column was located directly in the path of the victim. Approximately 2 feet behind the “H” column was a 48-inch by 91-inch floor opening designed to accommodate future ductwork for the heating, ventilation, and air-conditioning system. The floor opening was covered with a 1/2-inch-thick by 48-inch-wide by 92 1/2-inch-long section of particle board (a generic term used to describe panel products made from discrete particles of wood or other ligno-cellulosic material rather than fibers). The words “DO NOT STEP ON THIS” were painted on the surface of the covering. As the victim and fellow co-worker screeded the concrete near the “H” column, the victim moved backwards around the column and stepped on the floor opening cover. The cover bowed under the victim’s weight, causing it to dislodge from its supports. The victim and cover fell through the opening 36 feet to the ground floor. Upon landing on the floor the victim struck the back of his head on the concrete foundation supporting the “H” column.

Workers on the ground floor observed the victim falling and striking the ground, whereupon they immediately summoned help. An emergency medical service (EMS), located two blocks from the incident site, arrived approximately 3 minutes after being called. Upon arrival at the scene, the EMS checked the victim but could not detect any vital signs. The medical examiner arrived 1 hour after the incident occurred and pronounced the victim dead at the scene.

CAUSE OF DEATH

The medical examiner’s report listed the cause of death as extensive basilar skull fracture.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should implement 29 CFR 1926.500 (f)(5)(ii), which requires that floor opening covers shall be capable of supporting the maximum intended load and so installed as to prevent accidental displacement (1).

Discussion: Employers should ensure that all floor openings are guarded with covers which can support the intended weight, and are installed to prevent movement or displacement.

Recommendation #2: Employers should consider and address worker safety during the planning phase of construction projects.

Discussion: Safety concerns should be addressed and incorporated into all construction projects during planning and throughout the entire project. Such a procedure would allow for the identification of potential hazards prior to the initiation of work so that appropriate intervention strategies could be implemented.

Recommendation #3: Employers should develop, implement, and enforce a comprehensive safety program.

Discussion: Employers should emphasize worker safety by developing, implementing, and enforcing a comprehensive safety program to reduce and/or eliminate worker exposures to hazardous situations. The safety program should include, but not be limited to, the recognition and avoidance of fall hazards and include appropriate worker training.

Recommendation #4: Prime contractors and subcontractors should contractually agree on specific site safety and health programs to be implemented before subcontractors begin work.

Discussion: Prime contractors should use contract language that requires all subcontractors to identify how they intend to implement a site-specific safety and health program prior to the initiation of work. Subcontractors' safety programs should be consistent and compatible with the prime contractor's safety program. Any differences should be negotiated before work begins.

REFERENCE

(1) Office of the Federal Register: Code of Federal Regulations, Labor 29 Part 1926. p.193. July 1, 1989.

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