Construction Foreman Dies After Falling 32 Feet Through a Floor Opening

DATE: April 4, 1994

SUMMARY

On September 16, 1993 a 56 year-old male construction foreman was critically injured after falling 32 feet through a floor opening at the construction site of a sewage pumping station. The incident occurred while the victim and his crew were constructing wooden forms for a concrete pour. While walking across a concrete slab that covered the pumping station, the victim stepped onto several sheets of plywood used to cover a floor opening in the slab. The plywood shifted, causing the victim to fall through the opening into the cement vault below. He died of complications related to his injuries six days after the incident. NJDOH FACE investigators concluded that, in order to prevent similar incidents in the future, these safety guidelines should be followed:

- **Employers should ensure that all floor openings are protected with a standard railing or floor opening cover secured against displacement.**
- **General contractors and subcontractors should conduct a job hazard analysis of the work area with their employees.**
- **General contractors should utilize contract language requiring subcontractors to implement a safety and health program prior to starting work.**

INTRODUCTION

On September 28, 1993, a safety officer from another company informed NJDOH FACE personnel of this work-related fatal fall. After contacting the company and the incident site owner, a FACE investigator conducted a site visit on November 9, 1993 to interview a witness and photograph the scene. Further information was gathered from the OSHA investigation file, the police and medical examiner's reports, and newspaper articles.

The employer was a concrete construction contractor who has been in business for 47 years and employed a total of 20 workers. The victim was a construction foreman who had worked for the company for 28 years. He was considered by the owner to be the company's safety officer.

INVESTIGATION

The incident occurred at the construction site of a new sewage pumping station. The general contractor had been working on the station for the past six months, and the station was about 50% complete. The victim's company had been subcontracted to pour the concrete for the pumping station and had been on

the job for about 3 months. They were nearly finished with the job and needed a day or two more to complete the pouring of a concrete stairway.

The pumping station consisted of two large adjoining vaults that were 32 feet deep. One vault was to be a wet well where sewage would enter and the second was to be a dry well containing equipment to pump the sewage out of the wet well. At this phase of the project, the vaults had been completed and were recently capped with a concrete slab. The slab had two large floor openings leading into the dry well, one for a stairway and a second for an equipment hatch. Both openings had been covered by the victim's company with wooden boards and sheets of plywood. The stairway opening measured 9' 5" by 3' 10" and was covered with an 8 by 4 foot sheet of plywood laid over 2 by 4 inch boards. Since the plywood did not fully cover the opening, two smaller sheets of plywood were also put down to overlap the larger sheet.

The day of the incident was a cloudy Thursday with temperatures in the low 70's. As usual, the concrete company arrived at about 7 a.m. to start work. The crew of three included a foreman (the victim) and two carpenters who were to construct forms (wooden molds for the concrete) for a stairway to the wet well. This stairway was being constructed to the side of the wet well vault, away from the openings in the concrete slab. At about 11:30 a.m., the site supervisor for the general contractor was working on a PVC sleeve imbedded in the concrete slab near the stairway floor opening. Using a power tool, he was chipping away the concrete to remove the sleeve, which would leave a hole in the concrete for a handrail. While doing this, he moved the boards covering the opening a few inches. He was having trouble with the sleeve and asked the victim (who was standing nearby) to come over and help. The victim walked across the slab and onto the plywood covering the stairway opening. He apparently stepped on the edges of the overlapping plywood sheets which separated and caused him to fall through the opening. He fell 32 feet to the concrete bottom of the dry well, suffering injuries to his head, chest, pelvis, and leg.

The general contractor saw the victim fall and immediately told the carpenters to call 911. He then uncovered the equipment hatch opening and climbed down a ladder to the victim, who was conscious. As he helped the victim, the contractor smelled vapors from the epoxy paint recently used to paint the adjoining wet well. He ordered the workers to get a blower to ventilate the area and warned the arriving police and EMS of the hazard. The rescuers donned self-contained breathing apparatus (SCBA) and conducted the rescue as a confined space entry. The victim was removed from the vault and air lifted to the regional trauma center where he was admitted. He died of complications related to his injuries on September 22, 1993, six days after the incident. A police officer was also taken to a local hospital for exposure to paint vapors and released.

CAUSE OF DEATH

The county medical examiner attributed the cause of death to a pulmonary embolism associated with multiple blunt injuries to chest and pelvis.

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: Employers should ensure that all floor openings are protected with a standard railing or floor opening cover secured against displacement.

Discussion: In this situation, the floor opening was loosely covered with plywood that could be accidentally moved by people or machinery. In addition, the opening had not been provided with guard rails. To prevent accidents such as this, all floor openings should be provided with a cover secured against accidental displacement. Floor openings should also be provided with a guard rail on all exposed sides. The use of floor opening covers and guard rails is required under the federal OSHA standard 29 CFR 1926.500(b)(1)-(9).

Recommendation #2: General contractors and subcontractors should conduct a job hazard analysis of the work area with their employees.

Discussion: Due to the variety of hazards at construction sites, it is recommended that general contractors conduct a job hazard analysis of the work area with each subcontractor. A job hazard analysis should include an examination all work areas for fall, electrical, confined space, or other hazards the workers may encounter. The subcontractors should then perform their own job hazard analysis with their employees. After identifying any hazards, the employees should be instructed on how to correct or avoid them.

Recommendation #3: General contractors should utilize contract language requiring subcontractors to implement a safety and health program prior to starting work.

Discussion: In this case, the general contractor was responsible for overseeing the work of a number of different subcontractors. General contractors should use health and safety language in the contracts requiring all subcontractors to specify how they intend to implement a safety and health program prior to starting work. These programs should be compatible with the general contractor's safety and health program and clearly specify each party's responsibilities. Any differences in the programs should be negotiated and resolved before work begins.

REFERENCES

Code of Federal Regulations 29 CFR 1926, 1991 edition. U.S. Government Printing Office, Office of the Federal Register, Washington DC. pg 188-189.

ATTACHMENTS

Job Hazard Analysis. OSHA 3071, US Department of Labor, Occupational Safety and Health Administration, Washington DC. 1988.

Information Bulletin: Joint Labor/Management Safety & Health Committees. NJ Department of Health, Public Employees Occupational Safety and Health Program, Trenton NJ.

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