

F.A.C.E. INVESTIGATION REPORT

Fatality Assessment and Control Evaluation Project

FACE #94-NJ-073-01
Iron Worker Dies After Falling 55 Feet
Through A Bridge Deck Under Construction



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FROM: Fatality Assessment and Control Evaluation (FACE) Project
New Jersey Department of Health (NJDOH)

SUBJECT: FACE Investigation #94-NJ-073-01
Iron Worker Dies After Falling 55 Feet Through A Bridge Deck Under Construction

DATE: February 16, 1995

SUMMARY

On May 26, 1994, a 53 year-old male iron worker was killed after falling through an opening in a bridge under construction. The incident occurred at the construction site where steel deck pans were being secured to concrete beams to form the bridge deck. The victim had been placing and securing the pans when he apparently tripped or lost his balance and fell through the opening covered with an unsecured pan. He fell 55 feet to the foot of a concrete pier. NJDOH FACE investigators concluded that, in order to prevent similar incidents in the future, these safety guidelines should be followed:

- o Employers should ensure that fall protection is used at all times.
- o All contractors and subcontractors should conduct a job hazard analysis of the work area with their employees.
- o Employers should ensure that that company safety policies are enforced at all times.
- o Contracting authorities should utilize contract language requiring general and subcontractors to implement a safety and health program prior to starting work.

INTRODUCTION

On May 26, 1994, NJDOH FACE personnel were informed by the county medical examiner of a work-related fatal fall at a bridge construction site. The next day, a FACE investigator visited the site and met with the general contractor of the project. The FACE investigator interviewed a witness and photographed the incident site. At the employer's request, the FACE employer interview was postponed until October 19, 1994. Additional information was obtained from the the OSHA compliance officer and the police and medical examiner's reports.

The employer of the deceased was a small metal siding contractor who specialized in erecting metal siding on industrial buildings such as warehouses. The company had been in business for nine years and employed five workers on the job at the time of the incident. The company had been subcontracted by the manufacturer of the bridge decking pans (who had been subcontracted by the site general contractor) to secure their pans onto a new bridge. After being cited by OSHA for safety violations during a previous stage of the project, the decking subcontractor created a safety program which included using safety nets or other personal protection equipment (PPE) for fall protection. The decking subcontractor did not have a formal job training program but hired trained workers from the union hall.

The victim was a 53 year-old male steel worker who had been hired from a union hall. He had worked for the decking subcontractor since the beginning of the project, about 2 1/2 years.

The employer considered him a good worker and was planning to promote him to foreman of a second work crew.

INVESTIGATION

The site of this fatality was the construction site of a large bridge spanning an intercoastal waterway. The project was started in early 1992 to replace the deteriorating wooden bridges leading into the area. This consisted of building two new concrete girder and steel spans, the first being a 904 foot long, flat (level) bridge that spanned a marsh. The second was a 2,768 foot long bridge that spanned the intercoastal waterway. This span rose at a 3% grade to a height of 55 feet above the water at the center to allow boats to pass under it. The victim's company had been subcontracted by the decking manufacturer to install the corrugated steel decking pans onto both bridges. Reportedly, this was the decking contractor's first experience in doing bridge work, and it was during the construction of the first (flat) bridge that the company was cited by OSHA for various safety violations, including not using fall protection.

After completing the first bridge, work started on the 2,500 foot bridge over the waterway. The bridge was constructed by two crews of workers starting at the opposite ends of the bridge and working their way towards the center. In the area where the incident occurred, large steel and concrete beams had been laid across the concrete pylons that rose above the waterway. This resulted in about 5 and 1/2 feet of empty space between the beams that would be covered by the deck pans (see photograph). The galvanized steel corrugated deck pans measured 5'6" by 2'6" and were attached with screws that were fastened onto angle irons set onto the concrete beams. Once the pans were placed, reinforcing bar (rebar) was laid across the pans and concrete poured over the rebar to form the bridge deck.

The day of the incident was a cool, windy, spring day. The victim started work with an apprentice ironworker at 7 a.m. that morning and worked on the bridge until 10:30 a.m. when they ran out of materials. During this time, they were joined by the foreman. At 11 a.m., they were joined by two new workers that had been hired two days before. The crew of five divided themselves into two teams, with the foreman free to supervise their work. Each team positioned itself on opposite sides of the bridge and continued installing the pans. The pans were installed by first placing the pans across the bays (the openings between the beams) and then screwing them down with an electric drill fitted with a nutdriver. The foreman checked the pans alignment before the workers secured them. Although this area of the bridge was equipped with safety rails running along the sides, there were no rails or safety lines along the beams where the pans were being replaced.

At about 11:40 a.m. the victim was preparing to finish securing the last full sized pan in one bay of the bridge span. He was last seen walking towards the pan carrying the drill. Apparently, as he walked towards the pan, he lost his balance or tripped on a piece of rebar imbedded in the concrete and fell against the unsecured pan. Witnesses state that they heard a noise as the pan fell to the ground, and one witness reportedly saw the victim's feet disappear through the opening. The victim was killed instantly after falling 55 feet and landing head first on the the base of the concrete pylon below. Other workers immediately called 911 for help, and the victim was declared dead at the scene by the medical examiner's investigator.

CAUSE OF DEATH

The county medical examiner determined that death was caused by multiple injuries of the head and trunk.

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: Employers should ensure that fall protection is used at all times.

Discussion: To prevent future incidents, the FACE project recommends that fall protection be used when employees are working at heights above six feet. In addition to personnel nets, safety harnesses and lanyards, a number of fall protection devices are available that may provide the mobility needed by iron workers. One example is to use a retractable reel system that feeds out safety line as the employee moves.

Recommendation #2: All 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. A job hazard analysis should include an examination of all work areas for fall, electrical, confined space, or other hazards the workers may encounter. All 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: Employers should ensure that that company safety policies are enforced at all times.

Discussion: After being cited by OSHA, the company developed a detailed written safety program which required the use of fall protection. To prevent future incidents, FACE recommends that company safety policies must be enforced at all times. In most cases, the foreman should be responsible for ensuring that the proper PPE is available and that workers are using it.

Recommendation #4: Contracting authorities should utilize contract language requiring general and subcontractors to implement a safety and health program prior to starting work.

Discussion: The general contractor did not have any direct control over the decking subcontractor since that company had been sub-contracted by the pan manufacturer. Contracting authorities (such as the state or municipal agency contracting the project) should use written contracts requiring all general and subcontractors to specify how they intend to implement a safety and health program prior to starting work. This program should clearly specify each party's safety and health responsibilities. Any differences in the programs should be negotiated and resolved before work begins.

REFERENCES

29 CFR 1926 Code of Federal Regulations, Washington, D.C., U.S. Government Printing Office, Office of the Federal Register.

It is important that employers obtain correct information about OSHA regulations and methods of ensuring safe working conditions. Because it is often difficult for a small business to obtain this type of information, the following sources may be helpful:

U.S. Department of Labor, OSHA

On request, OSHA will provide information on safety standards and requirements for fall protection. OSHA has several offices in New Jersey which cover the following areas: Hunterdon, Union, Middlesex, Warren and Somerset Counties....(908) 750-3270
Essex, Sussex, Hudson and Morris Counties.....(201) 263-1003
Bergen and Passaic Counties.....(201) 288-1700

Atlantic, Gloucester, Burlington, Mercer, Camden, Monmouth,
Cape May, Ocean, Cumberland and Salem Counties.....(609) 757-5181

NJDOL OSHA Consultative Services

The New Jersey Department of Labor OSHA Consultative Service will provide free advice for business owners on methods of improving health and safety in the workplace and complying to OSHA standards. Their telephone number is (609) 292-3922.

New Jersey State Safety Council

The NJ Safety Council provides a variety of courses on work-related safety. There is a charge for the seminars. Their address and telephone number is:
NJ State Safety Council, 6 Commerce Drive, Cranford, New Jersey 07016. Phone (908) 272-7712

Other Sources

Building trade organizations and labor unions are a good source of information on suppliers of safety equipment and training.