

Steel Worker Falls from Highway Bridge and Dies

Incident Number: 10KY043 Revised



Bridge where worker fell from. Photograph donated by, and property of, Kentucky State Government.

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Kentucky Fatality Assessment and Control Evaluation (FACE) Program
Incident Number: 10KY043 Revised
Release Date: November 29, 2011/ March 30, 2012
Subject: Steel Worker Falls from Highway Bridge and Dies

Summary

On a fall day in 2010, a 49 year-old steel worker fell from a highway bridge he was working from and died. The steel worker was in the process of leveling jacks for concrete forms. He had donned a fall protection harness with an attached lanyard then stepped outside the lifeline onto a 10"x2" wooden board to verify the jacks were level. As the steel worker stepped over the lifeline, he did not attach the lanyard and fell approximately 28 feet onto the railroad tracks below. He was taken to a nearby hospital where he died in surgery approximately two hours later.

To prevent future occurrences of similar incidents, the following recommendations have been made:

Recommendation No. 1: A safety analysis should be performed by a Competent person at each job site before work commences.

Recommendation No. 2: Employers should ensure all employees use personal fall arrest systems correctly.

Recommendation No. 3: Employers should implement and enforce a written safety policy which states the consequences of not following personal fall arrest policy.

Recommendation No.4: General contractors should ensure through contract language that all subcontractors implement and enforce appropriate safety and health programs and training specific to the work to be performed.

Recommendation No. 5: Small business owners should institute and enforce drug testing policies.

Background

The company the decedent worked for had been in business since 1971, with 65 employees. Its area of expertise was building and repairing bridges; however, the company also worked on sewer plants and other municipal projects. Prior to the incident the decedent worked for the company as a steel carpenter for four years and had eight years of experience working on bridges. He was a union member.

Company-wide annual safety meetings were held every January. Weekly toolbox talks were conducted and employees were given refresher safety courses on various topics throughout the year. Employees also received on-the-job training. The decedent received fall protection training in January 2007.

Temperatures on the day of incident ranged from 49 degrees Fahrenheit to 65 degrees Fahrenheit with zero precipitation.

Investigation

In the fall of 2010, the Kentucky Fatality Assessment Control and Evaluation program was notified via a state agency of an occupational fatality involving a steel worker who fell from a bridge. A site visit was conducted; a company official, and representatives from two state agencies were interviewed, and photographs were taken.

In the winter of 2009, a bridge repair company (Company A), working as a subcontractor for a paving company, began refurbishing east and westbound bridges on an interstate highway. The bridges were 30 – 40 feet apart and traversed private property of another company (Company B) over two sets of railroad tracks and an asphalt-paved roadway running north and south.

Initially, work began underneath the bridges. Approximately nine months later in the early fall of 2010, refurbishing efforts began on the top of the bridges. Traffic on each bridge was reduced from two lanes to one lane. Work tasks on each bridge were synchronized as much as possible with each other.

On the westbound bridge, the south side barrier wall had been removed and three to four inches of the concrete pavement had been chipped off the bridge deck. Work crews typically worked four nine hour days and one eight-hour day per week. However, to expedite the job, crews were working six days a week instead of five. They were trying to have the concrete poured so that asphalt could be laid before the asphalt plant closed for the season.

On the day of the incident, two work crews began at 7:00 am working on the westbound bridge. One crew was working above the deck while the second was working below the deck. The crew below the deck consisted of a foreman and two other workers. Above the deck, the crew consisted of the steel worker (decedent), a foreman, and a laborer. A state inspector was also at the job site.

The crews were preparing the work site to make concrete forms for the bridge decking and the permanent barrier walls. A two-cable barrier had been erected along the south side of the bridge which functioned as a guardrail, a lifeline, and a place for workers to tie-off to. Overhang jacks located on the south side at the bottom of the bridge's deck were spaced 4 feet on center and were part of the form being built. A 2x10 wood plank had been placed across the jacks.

After lunch, at approximately 12:35 pm, the laborer on top of the bridge had cleaned debris from an expansion joint and asked the foreman to inspect his work. Both men were approximately six

feet from the steel worker with their backs to him. The state inspector was in a pickup truck writing notes, looked up, saw the steel worker put on a fall protection harness with a lanyard attached, then went back to writing notes.

One of the steel worker's tasks was to ensure the jacks were level. To check and level the jacks, the steel worker had to be outside the lifeline and use string and a level. Upon donning his fall protection harness with the lanyard attached, he proceeded to step over the cable barrier which was 42" high and onto the 2'x10' wood plank which was laid across narrower wood boards that laid on top of the jacks. (none of the boards were secured to the jacks or the bridge). He fell 27 feet 7 5/8 inches onto the railroad tracks below.

Employees from Company B responded to the steel worker's fall and performed cardio-pulmonary resuscitation. Local emergency medical response was called to the scene. In order to provide medical services, they had to cut off the fall protection harness. An ambulance transported the steel worker to a hospital in a neighboring state where he died approximately two hours later while in surgery.

Toxicology results for the decedent showed ethanol levels of 0.085 %(w/v) (vitreous) and 0.051 %(w/v) (right chest).

Cause of Death

The Death Certificate states the cause of death as due to multiple injuries due to a fall from a height.

Recommendations and Discussions

Recommendation No. 1: A safety analysis should be performed by a Competent person at each job site before work commences.

The process for leveling the jacks involved the worker stepping over a 42" high cable lifeline located at the edge of the bridge deck and onto a 2"x10" wooden board that sat across thinner wooden boards which rested on the jacks. None of the boards were secured to the jacks or the bridge; nor was the wider board secured. This situation created a potential situation for a worker to slip while stepping from a firm surface onto an unstable surface.

According to the Code of Federal Regulation 1926.20(b)(2), employers are to designate a competent person to frequently conduct inspections of the job site. The Competent Person has the authority to cease work in hazardous situations. To abate this situation, a manlift should be used by the worker to level the jacks. A manlift would eliminate the need for the worker to step onto or walk on an unsecured board 37' in the air.

Another safety procedure would be to locate the cable away from the edge so the worker can safely step over the cable onto a secure surface, then onto the 2"x10" board.

Lifelines should be anchored in such a way as to prevent the lifeline from coming unanchored if a fall should occur and be able to withstand at least 5,400 pound dead weight. Non-continuous strands of lifeline should be properly attached to each other. The lifeline used in this instance was non-continuous and improperly anchored.

Recommendation No. 2: Employers should ensure all employees are trained to use personal fall arrest systems correctly.

In January 2010, the company held its annual safety training meeting and among the topics taught was how to properly use fall arrest systems. Another fall arrest training was held in June 2010. According to company records, the steel worker involved in this incident did not attend either training session. Proper procedures for wearing the fall arrest system and where and when to tie-off were standard components of the training. The steel worker was wearing a fall arrest system with an attached lanyard when he stepped over the cable barrier and onto the 2"x10" board laying across the jacks. Proper procedure would have the worker tie-off on the cable before stepping on to the wooden board. The Federal Code of Regulations for steel erection, 29 CFR 1926.760(a)(1) states that steel workers working at 15 feet and above are required to wear and use a personal fall arrest system. Kentucky law, 803 KAR: 2:417 Section 1(1)(b), states that steel workers working at 10 feet or higher have to use personal fall arrest systems. Both Federal and KY State regulations were applicable. Standards 29 CFR 1926.760(a)(1) and 803 KAR: 2:417 Section 1(1)(b), state that steel workers working above 10 feet, with an unprotected edge or side are to be protected from fall hazards by use of guardrails, safety nets, personal fall arrest systems, positioning devices, or fall restraint systems.

Recommendation No. 3: Employers should implement and enforce a written safety policy which states the consequences of not following personal fall arrest policy.

Occupational Safety Health Standard 29 CFR 1926.503(a)(1) states that the employer is responsible for providing a training program for each employee that might be exposed to fall hazards. The company involved in this fatality had written safety procedures and most employees were trained, and certified on how to use personal fall arrest systems. All training should be documented, and employees should be required to sign that they understand the safety and training program. Enforcement and consequences for failure to follow safety systems should be part of the standard operating procedures.

A section of the safety policy should include the development of a site specific safety plan. Occupational Safety and Health Standard 29 CFR 1926(502)(k)(1) states that a fall protection plan shall be prepared by a qualified person and developed specifically for the site where the work is being performed. Employees should conduct a hazard analysis and wear personal protective equipment to prevent injury while working.

Recommendation No. 4: General contractors should ensure through contract language that all subcontractors implement and enforce appropriate safety and health programs and training specific to the work to be performed.

General contractors should ensure that all subcontractors have safety and health training programs in place that address the tasks their workers are assigned to perform through contract language that requires all subcontractors to identify how they intend to implement a site-specific safety and health program before the initiation of work. The subcontractor's contract should contain clear and concise language describing which party is responsible for a given safety or health issue. Any differences should be negotiated before work begins. Once the provision for these responsibilities has been established, the respective parties should ensure that the provisions of the contract regarding safety and health are upheld through regular inspections of the work site.

Recommendation No. 5: Small business owners should institute and enforce drug testing policies.

Small business owners can get assistance to develop drug policies from the Associated General Contractors of America Association (AGC) which has signed an alliance with OSHA, MSHA and the Working Partners for an Alcohol- and Drug-free Workplace Program (Office of the Assistant Secretary for Policy Working Partners). This program provides “the construction industry with information, guidance, and access to training resources that will help them understand the benefits of drug-free workplace programs and protect employees' health and safety. The Alliance particularly focuses on educating workers on safety and productivity hazards created by the abuse of alcohol and other drugs in the workplace.”

Keywords

Bridge
Fall arrest systems
Steel worker

References

29 CFR 1926.20(b)(2)
29 CFR 1926.104(b)
29 CFR 1926.502 (b)-(e)
29 CFR 1926.760(a)(1)
803 KAR: 2:417 Section 1(1)(b)
29 CFR 1926.760(a)(1)
803 KAR: 2:417 Section 1(1)(b)
29 CFR 1926.503(a)(1)
29 CFR 1926(502)(k)(1)

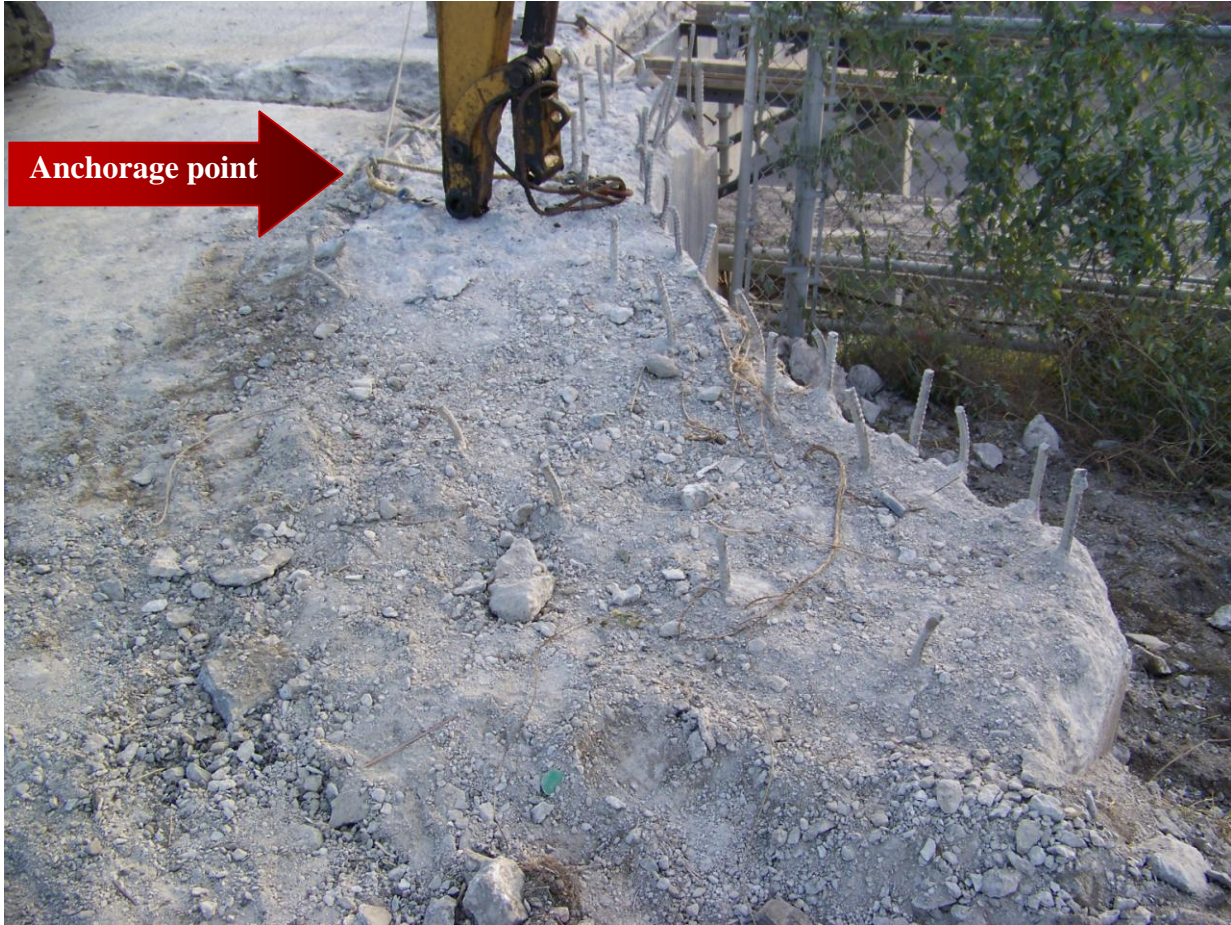
Acknowledgements

Kentucky Occupational Safety and Health Inspector
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Photograph of anchorage point at east end of bridge and location where worker fell from. A 2"x10" board was across the jacks. Photograph donated by, and property of, Kentucky State Government.



Anchorage point at west end of bridge. Photograph donated by, and property of, Kentucky State Government.



Westbound bridge.
Location where worker
fell.

Bridge that worker fell from. Photograph donated by, and property of, Kentucky State Government.