

CSI Country Wide Case Study Safety Strategy Discussion

Construction Safety Investigator



Instructions

The objective of this tool is to provide field supervisors with information to proactively engage workers and discuss safety related concerns that they may encounter. Safety discussions should not be limited to the subject above and should pertain to the activities that workers will be involved in that may have the potential for safety related exposures.

Case Day:

February 2005

Accident Type:

Struck by Accident -Temporary Steel

Bridge Support Dismantling

Relevant laws, rules and codes may include:

29CFR 1926.20(a)(1), 1926.21(b)(2), 1926.251

Case:

A 40 year-old ironworker sustained fatal injuries when sections of a temporary bridge support he was dismantling, broke apart and crushed him.

Accident Detail:

A general contractor working on a Department of Transportation (DOT) project erected a temporary bridge support structure designed to provide support for assembling and erecting a new bridge.

The temporary support structure was to be dismantled and removed as soon as the new bridge was erected. The fatal accident occurred during its dismantling.

The temporary support structure had four spans that were supported by six steel pile clusters. A steel pile cap was on top of each pile and the spans rested on the six plies. The spans included a pair of W36 -I beams and several W12- I beams.

In preparation for dismantling, the caps were welded and chained to the ends of the W36-I beam by a test chain. The spans, along with the attached pile caps, were removed one at a time from the temporary bridge support.

At the start of the work day, a safety meeting was held with the crew to review the tasks of the day, the potential safety hazards associated with the task, the preventive measures and required safety equipment.

To safely dismantle a cap, the crew was to follow 5 critical steps: 1) rig the pile cap with the crane hoist cable; 2) tension the crane cable; 3) remove the steel chain; 4) cut the welds with a torch to free the cap; and 5) signal the crane to lift the cap. These steps were not included in the written engineering project safety plan. Apparently the crew

discussed the steps in the morning meeting.

By late morning, the crew was prepared to dismantle the third cap of the day. The same crane that was used to lift the first two caps could not reach the third cap and had to be relocated. As the crane was being relocated and not yet set up, the victim allegedly stood on the third cap and according to other workers, began cutting the cap with his torch.

Before the crew was able to rig the cap to the crane cable, the cap broke apart from the W36-I beam. The victim was crushed between the swinging pile cap and the ends of the W36 beams.

Reconstructive Safety Evaluation:

- What are some of the possible causes of the accident being discussed?
- What actions could have been taken that might have prevented this accident from occurring?

Accident Scene Conclusion:

The post accident examination revealed that the cap had been welded to the W36-I beam with two welds. It appeared both welds had been partially cut prior to the accident.

Allegedly the original engineering plan dictated that all pile caps were to be bolted to the Ibeams with four 7/8" bolts and chained to the W36 beams with two 5,000 test chains.

Allegedly the project superintendent proposed to replace the bolts with welds and the company professional engineer (PE) approved the request and specified that each cap should be welded to the W36 beam with four welds and chained with two 5,000 lbs test steel chains.

However the cap that was involved in the accident had been welded to the beams with only two welds instead of four, and all pile caps were chained to the W36 beams with a single 12,000 lbs test chain rather than two 5,000 lbs test chains.

Allegedly these deviations were not communicated to nor discussed with the PE. According to the PE, the two welds on the cap could not have provided sufficient safety margin to support the weight of the pile cap and the additional loads.

Preventive Safety Measures Include:

- Strictly follow and adhere to project engineering plans and specifications and get approval from the project engineer responsible for that design and specification prior to and for any deviation from the original plans.
- Prior to the start of any new operation, complete a Job Safety Task Analysis (JSTA) and review with the crew. The JSTA should include but not be limited to review of means and methods and procedures noted in engineering plans as well as the safety aspects and equipment necessary to perform the operation safely.

