



## The National Institute for Occupational Safety and Health (NIOSH)



# Crane Operator Dies After Being Crushed by Collapsed Brick Building Wall

DATE: August 8, 1994

MN FACE Investigation 94MN02001

## SUMMARY

A 48-year-old male crane operator (victim) died after being struck and crushed by a portion of a brick building wall which collapsed. He and five coworkers were removing the roof of a two-story commercial building that was being renovated at the time of the incident. It had been vacant since being extensively damaged by fire two years earlier. A 75-ton crane parked near the building was used to lift sections of the roof from the building and lower them to the ground. The construction workers used chain saws to cut the wooden roof trusses and the roof into sections approximately 25 feet square. Before a section was completely cut free, holes were cut in each corner and chains were attached to the wooden roof trusses. Cables were attached from the crane to the chains attached to each corner of the section being removed. The crane securely held the roof section in place as the final cuts were made to completely detach it from the building. The construction crew was removing the second to the last roof section when the incident occurred. The victim was standing near a second story window using hand signals to communicate with the crane operator. As the section was lifted free of the building, a 4-foot high brick parapet wall above him suddenly collapsed inward and fell on him. MN FACE investigators concluded that, in order to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- ensure crane operators use two-way radio instead of line of sight hand signal communication with coworkers; and
- ensure all free standing walls more than one story in height are supported with lateral bracing.

## INTRODUCTION

On April 7, 1994, MN FACE investigators were notified of a construction fatality which occurred on April 6, 1994. A site investigation was conducted by MN FACE investigators on April 20, 1994. During the site investigation, releasable information concerning the incident was provided by the employer.

The victim was employed by a heavy equipment construction company for 24 years, the past several years as a crane operator. The company provided employees various types of safety training, including classroom seminars and on-the-job training.

## INVESTIGATION

The incident occurred at the site of a two-story commercial building that was being remodeled. It was extensively damaged by fire approximately two years earlier and had remained vacant since the fire. The construction company was contracted to remove the flat roof of the building. The victim was part of a six-person crew assigned to remove the roof. They began the one day task of removing the roof on the morning of the incident.

A 75-ton crane was delivered to the site the day before the incident occurred. It was positioned along one side of the building with its boom extending over the brick parapet wall which collapsed. The crane was used to lift sections of the roof and to lower them to the building parking lot. Chain saws were used to cut the wooden roof trusses and the roof into sections approximately 25 feet square. The last two sections at one end of the building were cut almost totally free from the perimeter of the building before being tethered to the crane. Before a section of the roof was completely cut free, holes were cut in each corner and chains were attached to the wooden roof trusses. Cables were attached from the crane to the chains attached to each corner of the section being removed. This allowed the crane to securely hold the roof section in a stable position as the final cuts were made to completely detach it from the building.

The crane operator's line of sight to the roof section being lifted was blocked by the building wall. Since the crane operator could not see the section as it was initially lifted, the victim stood next to a second story window and communicated the progress of the lift to the crane operator, via hand signals. From this position, the victim could see both the crane operator and the roof section being removed. As the next to last section of roof was lifted, the brick parapet wall collapsed inward and fell on the victim. At the same time, the last roof section planned for removal broke free from the building wall which collapsed and fell to the second floor. It remained in an inclined position resting against one of two second floor steel I-beam roof supports which extended through the center of the building.

Police and rescue personnel were immediately called and arrived on the scene within a few minutes. Resuscitation efforts were not performed on the victim by either coworkers or rescue personnel. He was pronounced dead at the scene by local medical personnel.

## CAUSE OF DEATH

The cause of death listed on the death certificate was massive crush injury.

## RECOMMENDATIONS/DISCUSSION

**Recommendation #1:** Ensure crane operators use two-way radio instead of line of sight hand signal communication with coworkers.

**Discussion:** During many operations, crane operators are unable to see the load which is being lifted. During such operations, a coworker assists the crane operator from a position where both the load and the crane operator can be observed. In this case, communication, via hand signals, between the victim and the crane operator required the victim to stand near a second story window directly below the brick parapet wall which collapsed. If communication had occurred via two-way radio, the victim would have been able to position himself at a location on the second floor where the roof had already been removed and the potential for being struck by falling material no longer existed. If two-way radios had been used in this case, this fatality might have been prevented.

**Recommendation #2:** Ensure all free standing walls more than one story in height are supported with lateral bracing.

**Discussion:** The two-story building had a brick parapet wall which extended approximately four feet above the roof. Removal of the roof resulted in a free standing brick wall which was more than one story in height. Since the wall was not originally designed and constructed as a free standing wall, lateral bracing should have been provided in accordance with OSHA Standard 1926.854 (b). If proper lateral bracing of the wall had been provided, this fatality might have been prevented.

## REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor, 29 CFR Part 1926.854 (b), US Dept. of Labor, Occupational Safety and Health Administration, Washington, D.C., July 1, 1992.

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Page last reviewed: November 18, 2015

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