DATE: December 6, 1996

FROM: Minnesota Fatality Assessment and Control Evaluation (MN FACE)

Program Minnesota Department of Health

SUBJECT: MN FACE Investigation 96MN07301
Construction Worker Dies After Being Buried In A Trench That Caved In

SUMMARY

A 20-year-old construction worker died of injuries he sustained from a trench cave-in. The worker was at the bottom of the trench at the time it collapsed. Workers were using the trench to install a new city water line. During this type of work, a backhoe is used to dig a trench prior to laying the new water line. Completion of the project required installing 12,000 feet of 12 inch diameter ductile iron water pipe.

On the day of the incident workers were re-excavating around an area of the water supply line that had been laid 3 days earlier. They were doing this in order to tighten two bolts at a bend in the line that had not been tightened at the time of installation. The trench was located near a highway in a filled area of land that was mainly made up of sand and silt. After the cave-in, the trench measured 44 feet wide by 47 feet long and 8 feet deep. A trench box was located near the incident site but sloping the trench was used as a safety precaution rather than using the trench box**.** Three workers were standing in the area of the cave-in when it occurred. Two of the workers were buried up to their chests, but were not injured. The worker that was fatally injured was completely buried. A coworker not involved in the cave-in made a 911 call to emergency rescue personnel. Rescue personnel responded within minutes and used shovels to aid the backhoe operator in locating and freeing the buried victim. The victim was freed and taken by ambulance to a local hospital where he was pronounced dead.

MN FACE investigators concluded that, in order to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- employers should ensure that employees working in trenches are protected from cave-in by an adequate protection system designed in accordance with 29 CFR 1926.652;

- employers should ensure that excavations are inspected by a competent person[1] prior to start of work and as needed throughout a shift to look for evidence of any situation that could result in possible cave-in; and

- employers should design, develop, and implement a comprehensive safety program.

INTRODUCTION

On October 23, 1996, MN FACE investigators were notified of a work-related fatality that occurred on October 15, 1996. The city police department was contacted and a releasable copy of their report and photos of the incident site were obtained. An investigation was conducted by a MN FACE investigator on November 4, 1996. During MN FACE investigations, incident information is obtained from a variety of sources such as law enforcement agencies, county coroners and medical examiners, employers, coworkers and family members.

The victim worked for a construction company that mainly works in flood control, such as building dams and levies. They do underground utility work if there is rocky terrain that requires the use of explosives. They are affiliated with a similar company in another state. The company has been in business for 38 years and employees between 20 and 105 workers depending on the time of the year. The employer tends to hire employees from the area in which the construction project is taking place because projects may take months or years to complete. The employer has a safety program and a safety officer who dedicates up to 25% of his work time to safety. The victim had worked for the company as a pipe layer for 3 years.

INVESTIGATION

The victim was working on a construction project installing a new water line for a city. The new

[1] Competent person: One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.

water line would loop the water supply line of two areas of the city together. This would facilitate water line repairs without shutting the water supply down to part of the city. During this type of work, a backhoe is used to dig a trench prior to laying the new water line. Completion of the project required installing 12,000 feet of 12 inch diameter ductile iron water pipe. On average, workers were able to install 500 to 1000 feet of water line per day. The victim had worked at the incident site since the construction project began approximately 11 months earlier.

On the day of the incident, workers were re-excavating around an area of the water supply line that had been laid 3 days earlier. They were doing this in order to tighten two bolts at a bend in the line that had not been tightened at the time of installation. On the day the water supply line was initially installed, the workers did not tighten the bolts due to the location of the water supply line and the position of the backhoe. Because of the slope of the terrain the backhoe was not in position to be able keep the soil away from the line long enough for the workers to tighten the bolts.

The trench was located near a highway on a terrain of sand and silt. After the cave-in, the trench measured 44 feet wide by 47 feet long and 8 feet deep. A trench box was located near the incident site but sloping the trench was used as a safety precaution rather than using the trench box. Three workers were standing in the area of the cave-in when it occurred. Two of the workers were buried up to their chests, but were not injured. The worker that was fatally injured was working within the trench at the time it collapsed. He was completely buried. A coworker not involved in the cave-in made a 911 call to emergency rescue personnel who responded immediately. Rescue personnel used shovels to aid the back hoe operator in locating and freeing the buried victim. The victim was freed and taken by ambulance to a local hospital where he was pronounced dead.

CAUSE OF DEATH

The cause of death listed on the death certificate was suffocation as a result of burial under earthen cave-in.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that employees working in trenches are protected from cave-ins by an adequate protection system designed in accordance with 29 CFR 1926.652.

Discussion: OSHA standard 29 CFR 1926.652 requires that employees working in trenches are protected from cave-ins by adequate protective systems. These systems may include either sloping techniques or support systems such as shoring or trench boxes. Sloping involves positioning the

soil away from an excavation trench at an angle that would prevent the soil from caving into the trench. Shoring systems use materials such as timber products to provide support to the walls of the trench. If either adequate sloping or shoring had been used in this incident, this fatality may have been prevented.

Recommendation #2: Employers should ensure that excavations are inspected by a competent person prior to start of work and as needed throughout a shift to look for evidence of any situation that could result in possible cave-in.

Discussion: OSHA standard CFR 1926.651(k)(1) requires that daily inspections of excavations, the adjacent areas, and protective systems be conducted by a competent person for evidence of a situation that could result in cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions. These inspections shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Had a timely inspection been conducted by a competent person, the unsafe condition may have been identified and this fatality may have been prevented.

Recommendation #3: Employers should design, develop, and implement a comprehensive safety program.

Discussion: Employers should ensure that all employees are trained to recognize and avoid hazardous work conditions. A comprehensive safety program should address all aspects of safety related to specific tasks that employees are required to perform. OSHA Standard 1926.21(b)(2) requires employers to "instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury." Safety rules, regulations, and procedures should include the recognition and elimination of hazards associated with tasks performed by employees.

REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor, 29 CFR part 1926.21 (b)(2), 29 CFR part 1926.651 (k)(1) and 29 CFR part 1926.652, U.S. Department of Labor, Occupational Safety and Health Administration, Washington, D.C., July 1, 1994.

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