



LESSONS LEARNED

Excavation Safety

CASE HISTORY

An environmental contractor had a project to install drainage piping at a wastewater treatment plant. A six-foot deep by thirty feet wide trench had been dug for the piping, and an environmental technician was working down in the trench to smooth out gravel bedding at the time of the accident. The trench had been dug horizontally with a backhoe the day before, and the soil was wet and muddy due to recent rain. There was no shoring, trench boxes, or other means of supporting the trench walls. The backhoe used for the job was parked approximately three feet from the edge of the trench.



As the technician was raking gravel within the trench a sidewall suddenly collapsed dropping the backhoe directly on top of him. The weight of the equipment caused a serious leg fracture and other internal injuries. Fortunately, he was wearing his hardhat and did not sustain serious head injuries. Since he was working alone in the trench at the time of the accident, he was not discovered until his supervisor arrived at the accident scene approximately twenty minutes later and heard him yelling for help. The supervisor called for emergency assistance and used a mobile crane to lift the backhoe off of the injured employee. He was then transported to a nearby hospital for emergency treatment. He was sub-

sequently sent for surgery to repair his fractured femur and then spent the next two weeks in the hospital before being released to his physician's care. He continued to require physical therapy for over one year and was unable to return to his prior job due to the physical demands required.

RESULTING COSTS

- The total cost of the accident, including medical bills, rehabilitation, and compensation, was over \$100,000.
- Additional untracked costs included the employee's considerable pain and suffering, the company's lost productivity, and the negative effect on employee morale following the accident.

ROOT CAUSES

There were several underlying causes that contributed to the accident including:

- The trench was not properly secured through shoring, trench boxes, or other means of protecting against a cave-in. Since the trench was over five feet deep, the contractor was in violation of OSHA Standard 1926.651 and could have been cited for willful lack of compliance. Refer to the OSHA website at: <http://www.osha.gov/> for more information on the OSHA Excavation Standard.
- The heavy equipment that injured the employee should not have been parked close to the edge of the trench; the weight placed additional stress on the unsupported soil.

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- The technician was working alone; subsequently, the discovery of his injury and emergency response was delayed. The delay in medical treatment compounded his already life threatening injuries.

LESSONS LEARNED

- Performing work in excavations requires several precautionary measures to ensure personal safety. Several factors should be considered when entering trenches:
 - How is the trench wall secured?
 - What are the depth, soil type and slope of the walls?
 - What natural hazards are nearby that increase the chances of unstable soil?
 - Are underground utilities identified?
 - Are any heavy objects or ground intrusive activities adjacent to the trench wall? A fact sheet entitled Excavation Safety is available to you that identifies trenching hazards and common safety controls.
- Employees performing potentially hazardous work activities should work in a buddy system to ensure that fellow employees are available to assist in the event of an accident or other emergency situation occurs.

ACTIONS TAKEN

- Following the accident, safety training meetings were held by the project supervisor to review the precautions necessary to protect

employees working in excavations.

- The use of pre-fabricated trench boxes became mandatory for all work involving entering trenches deeper than five feet or where the likelihood of collapse was possible due to steep sloping, water intrusion, loose soil composition, or other factors.
- Employees working onsite were required to work in two-man teams when entering trenches or other potentially hazardous work environments.
- Employees and supervisors were provided with a review of emergency procedures to follow in the event of an accident/incident.



Please contact the XL Insurance risk control division at 610-321-9159 if you have any questions regarding excavation safety or other health, safety, or environmental issues affecting your operations.

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5239-04/08