U.S. Department of Labor

Occupational Safety and Health Administration
Atlanta-West Area Office
2400 Herodian Way, Suite 250
Smyrna, Georgia 30080
770-984-8700 Telephone
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November 16, 2009

Dear Sir or Madame:

Based on recent news footage on an Atlanta, Georgia, news broadcast to the public showing the procedures used for digging and preparing graves, it has been brought to the Occupational Safety and Health Administration's (OSHA) attention that various hazards exist in the cemetery or burial industry that need to be addressed. Cemetery work can be a very hazardous job involving digging and working in and around graves. Employees are exposed to hazards such as falls, hazardous atmospheres (for ex. carbon monoxide, carbon dioxide, natural gas, methane from decomposing bodies, and oxygen deficient atmospheres), equipment hazards, falling loads, collapses, and cave-ins that could be deadly if the proper precautions are not taken.

A grave is an excavation defined as any human-made cut, cavity, trench or depression in the earth's surface formed by earth removal. Excavations create some of the most dangerous hazards in the cemetery industry and are covered under the OSHA trenching standard, 29 CFR 1926, Subpart P, Excavations.

Equipment hazards such as being struck by or ran over by equipment and riding in the bucket of equipment while it is moving or being lowered into a grave by the bucket is very dangerous. These hazards are covered under OSHA's General Duty Clause.

In the interest of work place safety and health, the Atlanta-West area office is issuing this hazard alert letter for businesses that perform grave digging and preparation. We recommend that you take these steps voluntarily to eliminate or reduce exposure to the hazards described above:

1) **Ensure that employees are trained on the OSHA excavation requirements and a competent person is present at the gravesite when the work is performed.**

2) **Ensure that employees are not allowed to work under or ride in the bucket of equipment.**

Enclosed with this letter is a list of the most frequently cited trenching and excavation standards, a trenching diagram, and other additional information for grave digging.

It is our sincere hope that you will take proactive steps to prevent costly injuries or fatalities and help us meet our ultimate goal which is to ensure a safe and healthful workplace for all employees.

If you have any other questions concerning this notification, please feel free to contact this office at 770-984-8700. Your personal support and interest in the safety and health of your employees is appreciated.

Respectfully,

Andre C. Richards
Area Director

U.S. Department of Labor

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Attachment: The occupational hazards generated during grave digging and while working in and around graves

A grave is an excavation. Therefore, employers are required to protect their employees from the hazards associated with excavations. First, the employer must designate a competent person(s) at their jobsite (cemetery). An OSHA "competent person" is defined as "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 authorization to take prompt corrective measures to eliminate them".[29 CFR 1926.32(f))]. By way of training and/or experience, a competent person is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operation, and has the authority to correct them.

The procedures used during grave digging and working in and around graves can create several occupational hazards. Cave-ins are perhaps the most feared trenching hazard. But other potentially fatal hazards exist, including exposure to falling loads or objects, hazardous atmospheres (asphyxiation due to lack of oxygen in a confined space, inhalation of toxic fumes, drowning, etc), working around with heavy machinery, falls, tripping hazards and ergonomic issues. Electrocution or explosions can occur when workers contact underground utilities.

The primary hazard of trenching and excavation is employee injury from collapse or cave-in. Therefore, employees shall be protected whenever they are working inside an excavation (grave) and they could be potentially exposed to cave-ins. OSHA's trenching standard, 29 CFR 1926, Subpart P, Excavations, required the use of a protective system for all excavations more than 5 feet deep. There are three different types of protective systems: shielding, shoring and sloping.

Shielding devices are commonly called trench boxes and they do not prevent a trench wall from collapsing. Trench boxes are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents. The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench boxes and the excavation side are backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those which the system was designed to withstand.

Shoring is the provision of a support system for trench faces used to prevent movement of soil, underground utilities, roadways, and foundations. Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. Shoring systems consist of posts, wales, struts, and sheeting. There are two basic types of shoring, timber and aluminum hydraulic.

Sloping involves cutting back the trench walls at an angle so there is little chance for collapse or cave-in. The maximum allowable slopes for excavations less than 20 ft (6.09 m) based on soil type and angle is described on the OSHA Technical Manual: Section V: Chapter 2, Excavations: Hazard Recognition in Trenching and Shoring.

It is important to highlight that the shielding and shoring protective systems only protect employees when they are inside the confines of the systems. Therefore, sloping is the preferred protective system. However, the employer could use the protective system that works best for their situation since the use of the system depends on many factors.

In addition, access to and exit from the trench require the following conditions:

- Trenches 4 ft or more in depth should be provided with a fixed means of egress.
- Spacing between ladders or other means of egress must be such that a worker will not have to travel more than 25 ft laterally to the nearest means of egress.
- Ladders must be secured and extend a minimum of 36 in (0.9 m) above the landing.
- Metal ladders should be used with caution, particularly when electric utilities are present.

Graves can potentially have hazardous atmospheres and be considered confined spaces. Potentially hazardous gases that could be encountered when digging graves include carbon dioxide, carbon monoxide, natural gas from potential leaks or cut lines, and methane from decayed matter. Employees shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

- Less than 19.5% or more than 23.5% oxygen;
- A combustible gas concentration greater than 20% of the lower flammable limit; and
- Concentrations of hazardous substances that exceed those specified in the *Threshold Limit Values for Airborne Contaminants* established by the ACGIH (American Conference of Governmental Industrial Hygienists).

All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls (see Subpart D of 29 CFR 1926) for personal protective equipment and for lifesaving equipment (see Subpart E of 29 CFR 1926). Engineering controls (e.g., ventilation) and respiratory protection

may be required.

When testing for atmospheric contaminants, the following should be considered:

- Testing should be conducted before employees enter the trench and should be done regularly to ensure that the trench remains safe.
- The frequency of testing should be increased if equipment is operating in the trench.
- Testing frequency should also be increased if welding, cutting, or burning is done in the trench.

Employees required to wear respiratory protection must be trained, fit-tested, and enrolled in a respiratory protection program. Some trenches qualify as confined spaces. When this occurs, compliance with the Confined Space Standard is also required.

Operators of heavy machinery are required to have training on the use and maintenance of the specific equipment they are using and they must inspect their equipment before each use. All employees must be aware of the swing radius of their heavy equipment because swinging loads can struck or caught a worker between the bucket and the machinery. Also, workers must be aware of the potential hazards of being run over by the heavy equipment.

Mobile equipment should have warning systems. The following steps should be taken to prevent vehicles from accidentally falling into the trench:

- Barricades must be installed where necessary.
- Hand or mechanical signals must be used as required.
- Stop logs must be installed if there is a danger of vehicles falling into the trench.
- Soil should be graded away from the excavation; this will assist in vehicle control and channeling of run-off water.

Cemetery employees are also exposed to falling loads. Employees must be protected from loads or objects falling from lifting or digging equipment. Procedures designed to ensure their protection include:

- Employees are not permitted to work under raised loads.
- Employees are required to stand away from equipment that is being loaded or unloaded.
- Equipment operators or truck drivers may stay in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.
- Keep materials or equipment that might fall or roll into an excavation at least two feet from the edge, or use retaining devices.

Cemetery work is very physical. Cemetery workers usually do a lot of lifting and reaching of either heavy or light objects, and using tools for extended periods of time. Injuries can result from doing these jobs with poor ergonomics. OSHA has a four-pronged comprehensive approach to ergonomics designed to quickly and effectively address musculoskeletal disorders (MSDs) in the workplace. You can learn more about preventing ergonomic injuries by following this link:
http://www.osha.gov/SLTC/ergonomics/index.html

Open graves should be clearly identified to prevent falls and guard rails must be provided if the grave is six feet deep or more. The cemetery should be continuously inspected to identify potential hazards and to immediately implement control measures.

This attachment provides some highlights of OSHA's policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations.

TECH Assist Program

Georgia Tech's Safety and Health Consultation Program http://www.gtassist.org

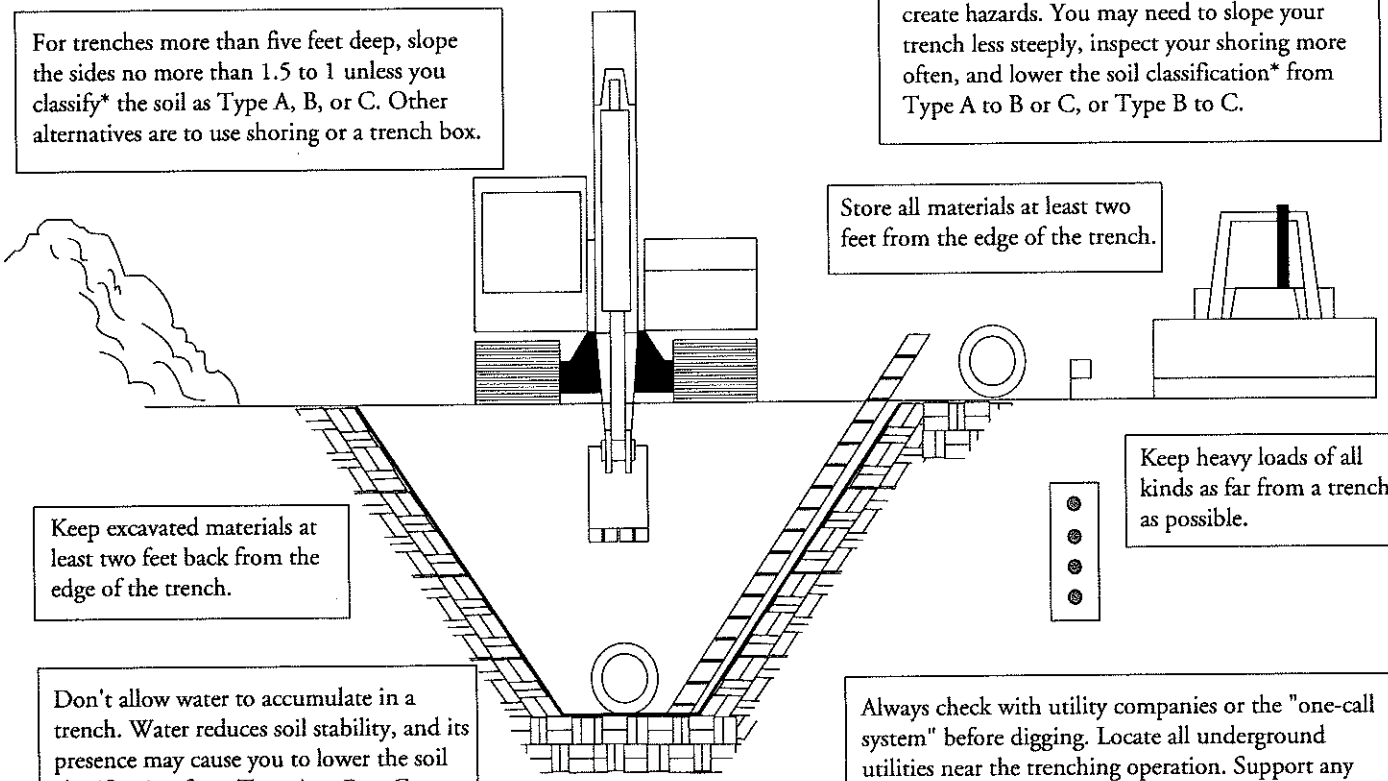
How to Prevent Trenching Accidents

Georgia Tech's Safety and Health Consultation Program is a free and confidential service funded by the U.S.Department of Labor and available to small businesses in the state of Georgia.

In trenches deeper than four feet, locate means of exit, such as ladders or steps, so they are no more than 25 feet of travel from anywhere in the trench.

Vibrations from construction equipment, nearby construction operations, traffic, etc., create hazards. You may need to slope your trench less steeply, inspect your shoring more often, and lower the soil classification* from Type A to B or C, or Type B to C.

For trenches more than five feet deep, slope the sides no more than 1.5 to 1 unless you classify* the soil as Type A, B, or C. Other alternatives are to use shoring or a trench box.



Store all materials at least two feet from the edge of the trench.

Keep heavy loads of all kinds as far from a trench as possible.

Keep excavated materials at least two feet back from the edge of the trench.

Don't allow water to accumulate in a trench. Water reduces soil stability, and its presence may cause you to lower the soil classification from Type A to B or C, or Type B to C.

Always check with utility companies or the "one-call system" before digging. Locate all underground utilities near the trenching operation. Support any utilities adjacent to or crossing the trench. Overhead power lines are also a potential hazard.

Soil classification must be performed by a competent person using acceptable visual and manual tests such as those noted in Appendix A, paragraph (d).*

***A competent person is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous, and who has the authority to take prompt corrective measures to eliminate them.*

A competent person** must inspect the trench, adjacent areas, and any protective systems for possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions. Inspections must be performed daily: before work begins, throughout the shift, and after every rainstorm or other hazard-increasing occurrence.

updated 11/01

Georgia Tech Research Institute

For more information, contact the Tech Assist Program
Electro-Optics, Environment and Materials Laboratory
Safety, Heath, and Environmental Technology Division, Atlanta, Georgia 30332-0837
404-894-3806 http://www.gtassist.org

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UNITED STATES DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

Standards Cited for SIC 1794; All sizes; Federal

1794 *Excavation Work*

Listed below are the standards which were cited by **Federal OSHA** for the specified SIC during the period October 2008 through September 2009. Penalties shown reflect current rather than initial amounts. For more information, see definitions.

Standard	#Cited	#Insp	$Penalty	Description
Total	1138	405	1613214	
19260651	417	253	474110	Specific Excavation Requirements.
19260652	298	264	835407	Requirements for protective systems.
19260021	72	71	55425	Safety training and education.
19260100	53	52	40192	Head protection.
19261053	38	29	19298	Ladders.
19260020	23	21	22302	General safety and health provisions.
19260251	19	13	9928	Rigging equipment for material handling.
19100134	18	10	3654	Respiratory Protection.
19260200	14	12	11925	Accident prevention signs and tags.
19260602	14	12	10972	Material handling equipment.
19101200	12	6	1835	Hazard Communication.
19260550	12	5	6550	Cranes and derricks.
5A0001	12	12	13358	
19260501	10	10	7963	Duty to have fall protection.
19260102	9	9	6974	Eye and face protection.
19040029	8	6	2900	Forms.
19260028	8	8	4012	Personal protective equipment.
19040032	7	5	1880	Annual summary.
19260095	7	7	4260	Criteria for personal protective equipment.
19260152	7	5	4195	Flammable and combustible liquids.
19260201	7	6	5025	Signaling.
19260050	6	4	4500	Medical services and first aid.
19260350	5	4	4000	Gas welding and cutting.
19100178	4	4	2625	Powered industrial trucks.
19260054	4	3	450	Nonionizing radiation.
19260250	4	1	4250	General requirements for storage.
19260416	4	4	6100	General requirements.
19260600	4	4	3588	Equipment.
19100146	3	1	1500	Permit-required confined spaces
19260405	3	3	3375	Wiring methods, components, and equipment for general use.
19030019	2	1	800	Abatement verification.

19040040	2	2	700	
19260150	2	2	300	Fire protection.
19260202	2	1	1500	Barricades.
19260403	2	2	875	General requirements.
19260404	2	1	3000	Wiring design and protection.
19260502	2	1	750	Fall protection systems criteria and practices.
19260601	2	2	525	Motor vehicles.
19260950	2	1	6000	General requirements.
19261052	2	2	555	Stairways.
19261060	2	2	0	Training requirements.
19100106	1	1	1050	Flammable and combustible liquids.
19100252	1	1	0	General requirements.
19260034	1	1	450	Means of egress.
19260101	1	1	0	Hearing protection.
19260302	1	1	158	Power-operated hand tools.
19260305	1	1	0	Jacks-lever and ratchet, screw, and hydraulic.
19260351	1	1	750	Arc welding and cutting.
19260451	1	1	3000	General requirements.
19260453	1	1	750	Aerial lifts.
19260552	1	1	2500	Material hoists, personnel hoists, and elevators.
19260701	1	1	0	General requirements
19260850	1	1	7000	Preparatory operations.
19260859	1	1	7000	Mechanical demolition.
19260951	1	1	3000	Tools and protective equipment.

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