EXCAVATION, TRENCHING AND SHORING SAFETY AND THE OSHA EXCAVATION STANDARD

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AFSCME TRAINING AND EDUCATION INSTITUTE MANUAL

INTRODUCTION

Construction work is dangerous; and work involving trenching and excavating activities tends to be the most hazardous in the industry. Yet, we see trenching and excavating work going on all around us. Excavations are needed for the installation and repair of utility lines, replacement of water and sewer lines, swimming pool construction, even grave digging. Excavation projects vary considerably, each with its own set of unique problems.

In 1971, OSHA issued its first standard related to excavations and trenching. Since that time, OSHA has changed the standard in an effort to reduce injuries and fatalities. Despite these efforts, accidents related to excavations and trenching activities continue to occur at a high rate: over one hundred deaths and thousands of disabling injuries occur every year. You don't have to lose your life to lose your livelihood. Accidents of this kind are most common in municipal and county governments, as well as small and medium size businesses.

Many who work in construction will tell you that accidents should be expected — "it's just the cost of doing business". **This is not acceptable**. We must ask the question, "Why do these accidents continue to occur?" The answer can only be that the message is not getting out to those who need it most — the workers involved in trenching and excavation activities. Only informed and fully trained workers can recognize dangerous situations and therefore protect themselves. This booklet is designed to inform and educate those who must work in excavations and trenches about the dangers they face and the safe work practices that must be followed for their protection.

CHAPTER 1: HAZARDS OF EXCAVATIONS

There are many potential hazards when working in excavations and trenches. Probably the most common hazard at any work site is the threat of ***cave-in***. A cave-in occurs when walls of an excavation collapse.

Cave-ins can be deadly. Wall failures often occur suddenly, with little or no time for the worker to react. The weight of the soil crushes and twists the body, causing death or serious injury in a matter of minutes. Excavations need not be deep or large to create a life threatening hazard, so **every** excavation must be taken seriously.

Why do cave-ins occur? Undisturbed soil is kept in place by natural horizontal and vertical forces of the nearby soil. When we dig in the earth, these natural forces are no longer able to hold back the soil left behind. With no support, eventually the laws of gravity take over, and the soil from the excavation walls move downward and inward into the excavation. The result is a cave-in. Cave-ins are more likely to occur in unprotected excavations where:

- The excavation is dug in unstable soil, or in soil that has been dug in before;
- There is excessive vibration from construction equipment or vehicle traffic around the excavation ;
- Too much weight near the sides of an excavation, most frequently from equipment or the excavated material (spoil pile) too near to the edge;
- Water has collected in the excavation;
- Changes in weather conditions (freezing, melting, sudden heavy rain, etc.)

Although there isn't much that can be done about the weather, there are ways to help control these conditions. In order to safely and efficiently work around excavations and prevent cave-ins from occurring, always follow the points below:

- Re-route traffic whenever possible, and keeping only the heavy construction equipment needed near the excavation;
- Keeping the spoil pile **at least** 2 feet back from the edge of the excavation;
- Pumping water out of the excavation before anyone enters it;
- Using protective systems when required.

The threat of a cave-in is not the only safety concern when working around excavations and trenches. Other hazards to be considered include ***accidental contact with utility lines***, crushing and striking hazards posed by ***mechanized equipment***, and ***hazardous atmospheres***. These hazards will be discussed in greater detail in later chapters. All of these hazards, however, can be kept to a minimum with thorough planning. A pre-job survey allows contractors and owners the opportunity to avoid costly changes after the work has begun.

CHAPTER TWO: REQUIREMENTS OF THE STANDARD

The standard covering excavation safety is Title 29 Code of Federal Regulations, Part 1926.650-652, (Subpart P), OSHA's Rules and Regulations for Construction Employment. A copy of the complete standard is found in Appendix A of this workbook. The standard covers all excavations made in the earth's surface, including trenches, and the requirements for protective systems to be used.

OSHA defines an ***excavation*** as **any** man-made cut, cavity, trench, or depression in the earth's surface as formed by earth removal. This can include anything from excavations for home foundations to a new highway. A ***trench*** refers to a narrow excavation made below the surface of the ground in which the depth is greater than the width-and the width does not exceed 15 feet. Trenching is common in utility work, where underground piping or cables are being installed or repaired.

If an excavation is more than 5 feet in depth, there must be a ***protective system*** in place while workers are in the excavation. Excavations more than 4 feet in depth must have a way to get in and out, usually a ladder, for every 25 feet of horizontal travel.

OSHA says no matter how deep the excavation is, a **competent person must inspect conditions at the site on a daily basis and as frequently as necessary during the progress of work to make sure that the hazards associated with excavations are eliminated before workers are allowed to enter.** A competent person has the following qualifications:

- Thorough knowledge of the OSHA standard 29 CFR 1926.650-652 / Subpart P
- Understands how to classify soil types
- Knows the different types and proper use of excavation safety equipment (e.g. protective systems.)
- Has the ability to recognize unsafe conditions, the authority to stop the work when unsafe conditions exist, the knowledge of how to correct the unsafe conditions, *and does it!*

If someone else has to be called in order to stop the work, or the designated competent person does not stop unsafe acts and conditions, the person is not acting "competently" within the meaning of the standard.

It is the responsibility of the competent person is to conduct daily inspections **prior** to the start of any work and **as needed** throughout the shift. He/she may use a checklist to ensure all operations are reviewed (A sample checklist is found in Appendix B). Part of this inspection process includes determining the soil classification. OSHA has included in Appendix A of its excavation standard methods to make it easier for a competent person to classify soils. (See Chapter 3 for details on soil classification.) The ability to determine soil type correctly is critical, because soil type is one of the determining factors in specifying protective systems.

A protective system must be used if an excavation is 5 feet or greater in depth. The three most commonly used kinds of protective systems are: ***shoring, shielding, and sloping***. Chapter Four goes into more detail about these protective systems. Each of these protective systems is acceptable to OSHA; it is up to the competent person to determine which method will be most effective for the job. The competent person must inspect these systems regularly to ensure that they are functioning properly.

CHAPTER THREE: WHAT IS SOIL?

Soil is a mixture of sand, gravel, silts, clay, water, and air. The amounts of these ingredients determine its "cohesiveness", or how well a soil will hold together. ***Cohesive soil*** does not crumble. It can be molded easily when wet, and is hard to break up when dry. Clay is a very fine grained soil, and is very cohesive. Sand and gravel are coarse grained soils, having little cohesiveness and often called ***granular***. Generally speaking, the more clay that is in the soil being excavated, the better the trench walls will hold up.

Another factor in soil cohesiveness is water. Soil that is filled with water is termed ***saturated.*** Saturated soil does not hold together well, and is particularly dangerous in excavation work. However, the opposite can also be true. Soil that has little or no water in it, or ***oven-dry,*** can crumble easily, and will not hold together when excavated.

Soil is heavy. A cubic foot can weigh as much as 114 pounds, and a cubic yard can weigh over 3,000 lb. — as much as a pick-up truck! Most workers don't realize the force that will hit them when a cave in occurs. A person buried under only a few feet of soil can experience enough pressure in the chest area to prevent the lungs from expanding. Suffocation can take place in as little as three minutes. Heavier soils can crush and distort the body in a matter of seconds. It's no wonder trench accidents involve so many deaths and permanently disabling injuries.

OSHA classifies soils into four categories: **Solid Rock, Type A, Type B, and Type C.** Solid Rock is the most stable, and Type C soil is the least stable. Soils are typed not only by how cohesive they are, but also by the conditions in which they are found. Stable rock is practically unachievable in the excavation of a trench. This is because the excavation of rock typically requires drilling and blasting, which fractures the rock, making it less stable. **Type A soil can be clay, silty clay, or sandy clay.**

A soil **cannot** be considered Type A if it is fissured (has cracks) or other conditions exist that can adversely affect it, such as:

- subject to vibration from heavy traffic, pile driving, or similar effects
- having been previously disturbed/excavated
- where it is part of a layered system, where less stable soil is near the bottom of the excavation, with the more stable soils on top.
- subject to other factors which would make it unstable-such as the presence of ground water, or freezing and thawing conditions.

Many OSHA compliance personnel believe that construction equipment at the site create enough vibrations to prevent any soil from being typed as "A". If vibrations can be felt while standing next to an excavation, the competent person should consider downgrading Type A soil to Type B or Type C.

Type B soils include both cohesive and non-cohesive soils. They include silts, sandy loams, medium clays, and unstable rock. Soils that might be classified as A, but have fissures, or are subject to vibration, may also be classified as "B" soils

Type C soils are the most unstable (and therefore most dangerous) of the four soil types. They are easily recognized by the continual sloughing of the sides of the walls of excavation. If soil is submerged, or water is seeping from the sides of an excavation, it's very probably "C" soil. Soil may be classified as Type C if an excavation is dug in "layered" soils, where different soil types lay on top of each other. When an unstable soil type is underneath a stable soil type in an excavation, the "weakest link" will soon give way.

In many construction projects, the soil that is being excavated has been ***previously disturbed.*** This means the soil has been dug up or moved in the past. This is another factor a competent person must consider when typing soils. Previously disturbed soils are rarely as strong as undisturbed soils, and are usually typed as "C" soil. Previously disturbed soil is commonly found above existing utilities, such as water, sewer, electrical and gas lines. This makes work around these utilities more dangerous due to the unstable nature of the soil. Much of the excavation work AFSCME members perform is along rights-of-way, where the soil is almost always likely to be Type C. Because of where we dig, it's important to understand that once soil has been excavated, it will never be returned to the way it was naturally formed.

Per 1926 Subpart P, Appendix A (c)(2), a *competent person* must type soils by using at least one ***visual*** and one ***manual*** test. A visual test can include inspecting the soil as it is being removed, and examining the spoil pile and the color and make-up of the excavation walls. A manual test means working with the soil with either your hands or with an instrument designed to measure soil strength. For example, if you can roll the soil in your hands into a long "worm" or ribbon, the soil is cohesive and may be classified as A or B, depending on other conditions. One useful instrument for measuring soil strength is a ***penetrometer.*** When you press this instrument into a soil sample, it measures its unconfined compressive strength in tons per square foot (tsf).

Regardless of the methods used, the typing of soils must be done by the competent person ***prior anyone entering the excavation***. The weaker the soil, the greater the need for protective systems.

Note: If you are uncertain of the soil type, ALWAYS assume Type C soil!

CHAPTER FOUR: PROTECTIVE SYSTEMS

Protective systems are methods of protecting workers from cave-ins of material that can fall or roll into an excavation, or from the collapse of nearby structures. As mentioned in earlier chapters, if an excavation is less than 5 feet deep, OSHA does not require a protective systems ***unless the competent person sees signs of a potential cave-in.*** (It is important to remember that a wall collapse in a trench four and 1/2 feet deep can still have serious results!) For trenches between 5 feet and 20 feet deep, **shoring and sheeting, shielding, sloping and benching** are all acceptable protective measures. It is up to the planners of the construction project and the competent person on site to determine which systems will work best. If an excavation is greater than 20 feet deep, a ***registered professional engineer*** must design the protective system.

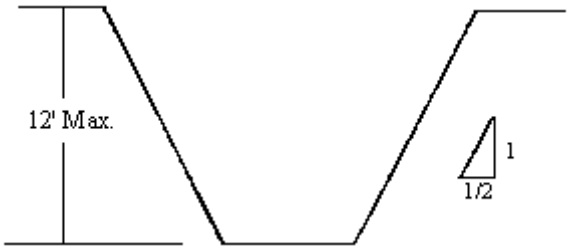
Shoring systems are structures of timber, mechanical, or hydraulic systems that support the sides of an excavation and which are designed to **prevent** cave-ins. **Sheeting** is a type of shoring system that keeps the earth in position. It can be driven into the ground or work in conjunction with a shoring system. Driven sheeting is most frequently used for excavations open for long periods of time. Another type of sheeting, in which plates or shoring grade plywood (sometimes called Finland form) is used in conjunction with strutted systems such as hydraulic or timber shoring. These strutted systems are also referred to as ***active systems***. The most frequently used strutted system involves **aluminum hydraulic shores** which are lightweight, re-usable and installed and removed completely from above ground.

A **shield,** also known as a trench box, is another common protective system used by contractors. Trench boxes are not designed to prevent cave-ins, but rather serve to "shield" workers within the structure should a cave-in occur. This is an excellent choice when placing continuous installations, as in pipe laying. The box is placed in the trench and dragged along with the progress of the work. A few important points about shields:

- Personnel should be out of the box and above ground when the shield is being moved. You could be caught between the moving box and fixed object(s);
- The top of the shield should extend at least eighteen (18) inches above the level of any materials that could cave or roll into the trench;
- Some shields are designed to be stacked, one on top of another. **Never** stack shields that are not designed for that purpose, and do not stack shields from different manufacturers, as they may not be compatible.
- The forces of a cave-in can literally push a box sideways, causing a crushing hazard. After a box is positioned for the work, the voids between the box and the trench wall should be filled with excavated material to prevent displacement caused by a cave-in.
- Shielding should always be used according to manufacturer's tabulated data.

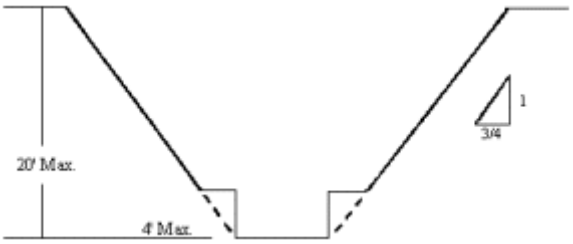
With both shoring and shielding, workers are only protected as **long as they stay within the confines of the system.**

Sloping and benching are another means of protecting workers from cave-in hazards. Sloping is a method of cutting back the trench walls at such an angle that there is little chance of collapse. This is referred to as an "angle of repose", and must be suitable to the type of soil.

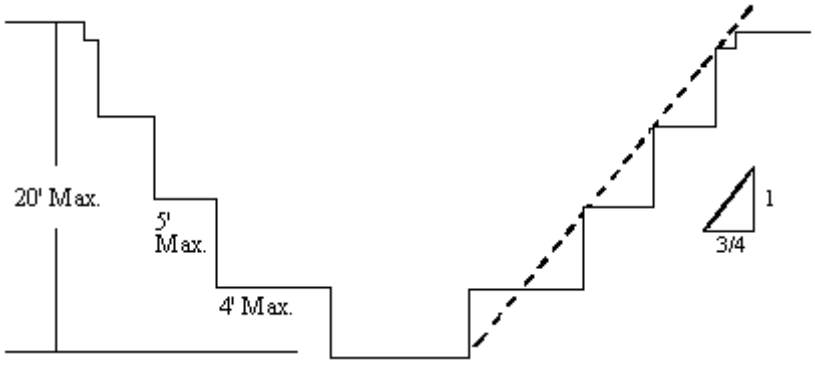


Simple Slope Type A

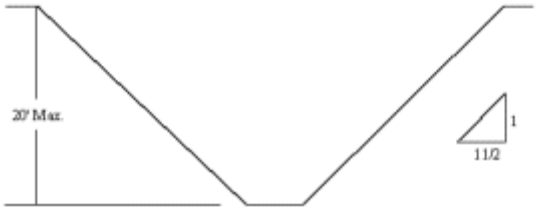
Benching is a process of stepping off the earthen walls of an excavation.



Sloping can be used as a system by itself or in conjunction with benching.



In the real world, there are very few applications where sloping and/or benching can be used. Why? Most often, the luxury of available space is the first consideration. Many excavations are dug in right-of-ways where the presence of other utilities and traffic become major considerations. Moreover, for every cubic yard of soil that is removed, it is very likely that nearly the same amount of material must be put back, ***and compacted as well***.



Simple Slope in Type C Soil

If the location to be excavated has been previously disturbed, as it frequently is along a right-of-way, the soil type will very likely be classified as "C". With Type C soil, the excavation walls must be sloped back on each side of the excavation one and one half feet for every foot of depth.

Add all these factors up and it soon becomes clear: sloping, even in conjunction with benching, may be desirable-but not always very practical and economical.

A competent person must be familiar with the various sloping and benching configurations available, should that be the choice for protecting workers. In sloping and benching, important points to remember are the "weakest link" in determining what type of soil is supporting what type. If type C is supporting type B or any other type of combination, the sloping and benching configuration chosen must be in accordance with the OSHA standard. Refer to Appendix A of this workbook for the various conditions in which sloping and/or benching can be used.

CHAPTER 5: MATERIALS HANDLING AND MECHANIZED EQUIPMENT

Construction, by its nature, is an ever-changing environment and involves a constant movement of personnel and materials. The use of mechanized equipment in that process poses significant crushing and striking hazards, particularly in excavation work. Below are some examples of safe work practices when working around mechanized equipment:

- Mark off areas around the swing radius of digging equipment and move the barriers with the progress of the work. This is particularly important when the back-hoe is operating in close proximity to trees and other solid objects such as sections of pre-cast. Most track-type back-hoes have a serious blind-spot that's usually the rear of the machine on a diagonal to the operator's position.
- Remember that loaders and backhoes are primarily earth-moving equipment. Traveling with material suspended from buckets poses a special hazard. Swinging loads may catch a worker between the suspended load and the machinery or the worker may trip on uneven grade and be run over by the equipment.
- Back-up alarms and other warning devices tend to be "tuned out" over time. In many pieces of equipment, the operators may only have a partially unobstructed vision to the rear. Still other types of equipment, such as track equipment and skid-steer loaders make it difficult for an operator to turn completely around when backing up. Don't rely on back-up alarms as the sole warning of which direction a machine is going to move. Always make sure the operator is aware of your position.
- You may not be working next to an active motor way, but reflective vests or clothing are still a good idea. Never ***assume*** an equipment operator can see you.
- When any load is brought under tension, regardless of the equipment being used to hoist it, stay away! The load should be controlled with a tag line while aloft **and only after being positioned in the location of placement** should workers be anywhere near it.
- No one should have any part of their body under any portion of a suspended load.

CHAPTER 6: HAZARDOUS ATMOSPHERES

We often take the air we breathe for granted. However, many gases in the environment have no color or smell, and we can not tell if the air is dangerous simply by looking at it. In excavations , these ***hazardous atmospheres*** frequently go unrecognized by workers until it's too late. Then workers rush in to rescue their co-workers and often become the victims as well. Indeed, 60% of all workers who die from such atmospheres are the rescuers themselves.

The OSHA standard says that when working in trenches **deeper than four feet** that are dug in locations where hazardous atmospheres are likely to be present, atmospheric testing, ventilation, and respiratory protection, must be provided. Areas such as landfills, hazardous waste sites, chemical plants, refineries, and areas where underground storage tanks are present are all locations which may produce hazardous atmospheres. Planners who perform pre-construction site surveys should look for potential atmospheric hazards as well as the physical conditions of the area to be excavated.

Hazardous atmospheres include ***oxygen deficient environments***, ***flammable/combustible/explosive*** environments and ***toxic*** environments. An **oxygen-deficient atmosphere** means there is not enough oxygen in the space. Normal air has 20.8% oxygen. Levels below 19.5% are considered oxygen-deficient. Oxygen deficient atmospheres are dangerous and can cause unconsciousness, brain damage, and death. **Flammable/combustible/explosive** atmospheres contain gases or vapors in a certain concentration that can catch fire or explode if there is an ignition source. **Toxic** atmospheres contain gases or vapors which, if breathed in, can make you sick, or even die. Here are a few examples of the most common sources for hazardous atmospheres in excavations:

Oxygen deficient atmospheres:

In an open excavation, rain water passing over limestone, causes an acidity reaction, and in turn produces carbon dioxide. Carbon dioxide is a simple asphyxiant which replaces oxygen in the air we breathe and can result in death.

Flammable/Combustible/Explosive Atmospheres:

Volatile organic compounds found in petroleum products can move through small spaces in soils and accumulate in excavations. This can create both a fire and toxic hazard. Buried tanks next to an excavation site are a common source of these compounds.

Another common flammable gas is Methane. Methane occurs naturally from the breakdown of organic materials, such as sewage, leaves or weeds.

Toxic Atmospheres:

Carbon monoxide from vehicles or equipment too near the excavation can accumulate and create a toxic environment for the workers.

When dealing with potential hazardous environments, early recognition is very important. Years ago, miners had to rely on canaries to tell them if the air they were breathing was hazardous. In today's world, testing equipment for atmospheric hazards are compact and easy to use. One instrument can be purchased to detect the three most common atmospheric hazards found in excavation. **The competent person** understands and uses these direct reading instrument(s) that can detect the most common atmospheric hazards found in excavations. Continuous air monitoring is always a good idea because of changing conditions that can occur at a construction site

CHAPTER 7: RIGHTS AND RESPONSIBILITIES

We have discussed the various hazards associated with excavations. We also have discussed some of the protective measures that should be taken when working around excavations and trenches.

It is one thing to know what makes a safe work site. It is quite another to assure that workplace conditions are safe and that the requirements of the law and the recommendations in this workbook are followed.

Remember, ***you*** are the one going into the excavation or trench. Don't take chances - check out for yourself the equipment being used, including shoring materials and the ladder used for getting in out of the trench. Check the location of the spoil pile and what equipment is near the excavation. Protect your health and safety by following the safe work practices mentioned in this workbook.

What should ***you*** do when you face a safety problem? Remember, the **competent person** at the excavation site has the responsibility to ensure that workers are adequately protected. If you have any questions or concerns about the excavation, its protection, or the nearby surroundings, always check with the competent person **before you go into an excavation** . Many times the competent person is also the supervisor on site. However, if this is not the case, the next step is to go to your supervisor if you still have safety concerns, and ask him/her to correct them. If this doesn't work, (and you are represented by a union), contact your union steward. He or she can:

- Try to get the situation corrected through informal discussions with management;
- File a grievance;
- If represented by AFSCME, the steward can request assistance through their local union president or Council Staff Representative.

- Your local union leadership or council staff representative may also know if the problem is being worked on, or if other locals are having similar problems. The Council Staff Representative may also contact the International Union in Washington, DC to request information and technical assistance;
- Contact OSHA. If you are a public employee, you are only covered by OSHA if your state has a federally approved OSHA Plan. Some states also have non-federally approved public employee laws that may also provide protection. Private sector employees may file an OSHA complaint with either federal or sate OSHA, depending on who has jurisdiction in your area.

No worker should have to choose between their life and their job. **As a last resort**, if you believe you are in a life-threatening situation, refuse to work in an unsafe trench or excavation. Before refusing to do the work, you must try in good faith to fix the situation by contacting your supervisor and management. Immediately tell your supervisor that you believe there is an imminently dangerous situation. If not remedied immediately, offer to do other work instead. You should also immediately contact the union. But never leave the work site until the supervisor tells you to go home.

SUMMARY:

You can protect your health and safety on the job by following safe work procedures and by communicating with your supervisor, management, and your union. If necessary, you can file grievances and use federal and state laws. As a last resort, you can refuse work that puts your life in danger.

Excavation Checklist

EXCAVATION CHECKLIST
(To be completed by a Competent Person)

SITE LOCATION:		
DATE:	**TIME:**	**COMPETENT PERSON:**
SOIL TYPE: (See attached form):		
SOIL CLASSIFICATION:	**EXCAVATION DEPTH:**	**EXCAVATION WIDTH:**
TYPE OF PROTECTIVE SYSTEM USED:		

Indicate for each item: YES - NO - or N/A for not applicable

1. General Inspection of Jobsite:	
A. Excavations, adjacent areas, and protective systems inspected by a competent person daily before the start of work.	
B. Competent person has the authority to remove employees from the excavation immediately.	
C. Surface encumbrances removed or supported.	
D. Employees protected from loose rock or soil that could pose a hazard by falling or rolling into the excavation.	
E. Hard hats worn by all employees.	
F. Spoils, materials, and equipment set back at least two feet from the edge of the excavation.	
G. Barriers provided at all remotely located excavations, wells, pits, shafts, etc.	
H. Walkways and bridges over excavations four feet or more in depth are equipped with standard guardrails and toeboards.	
I. Warning vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic.	
J. Employees required to stand away from vehicles being loaded or unloaded.	
K. Warning system established and utilized when mobile equipment is operating near the edge of the excavation.	
L. Employees prohibited from going under suspended loads.	
M. Employees prohibited from working on the faces of slopes or benched excavations above other employees.	
2. Utilities:	
A. Utility companies contacted and/or utilities located.	
B. Exact location of utilities marked.	
C. Underground installations protected, supported, or removed when excavation is open.	
3. Means of Access and Egress:	
A. Lateral travel to means of egress no greater than 25 feet in excavations four feet or more in depth.	

Excavation Checklist

B. Ladders used in excavations secured and extended three feet above the edge of the trench.	
C. Structural ramps used by employees designed by a competent person.	
D. Structural ramps used for equipment designed by a registered professional engineer (RPE).	
E. Ramps constructed of materials of uniform thickness, cleated together on the bottom, equipped with no-slip surface.	
F. Employees protected from cave-ins when entering or exiting the excavation.	
4. Wet Conditions:	
A. Precautions take to protect employees from the accumulation of water.	
B. Water removal equipment monitored by a competent person.	
C. Surface water or runoff diverted or controlled to prevent accumulation in the excavation.	
D. Inspections made after every rainstorm or other hazard-increasing occurrence.	
5. Hazardous Atmosphere:	
A. Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible or other harmful contaminant exposing employees to a hazard.	
B. Adequate precautions taken to protect employees from exposure to an atmosphere containing less than 19.5% oxygen and/or to other hazardous atmospheres.	
C. Ventilation provided to prevent employee exposure to an atmosphere containing flammable gas in excess of 10% of the lower explosive limit of the gas.	
D. Testing conducted often to ensure that the atmosphere remains safe.	
E. Emergency equipment, such as breathing apparatus, safety harness and lifeline, and/or basket stretcher readily available where hazardous atmospheres could or do exist.	
F. Employees trained to use personal protective and other rescue equipment.	
G. Safety harness and lifeline used and individually attended when entering bell bottom or other deep confined excavations.	
6. Support Systems:	
A. Materials and/or equipment for support systems selected based on soil analysis, trench depth, and expected loads.	
B. Materials and equipment used for protective systems inspected and in good condition.	
C. Materials and equipment not in good condition have been removed from service.	
D. Damaged materials and equipment used for protective systems inspected by a registered professional engineer (RPE) after repairs and before being placed back into service.	
E. Protective systems installed without exposing employees to the hazards of cave-ins, collapses, or threat of being struck by materials or equipment.	
F. Members of support system securely fastened to prevent failure.	
G. Support systems provided in ensure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc.	
H. Excavations below the level of the base or footing supported, approved by an RPE.	

Excavation Checklist

I.	Removal of support systems progresses from the bottom and members are released slowly as to note any indication of possible failure.	
J.	Backfilling progresses with removal of support system.	
K.	Excavation of material to a level no greater than two feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth.	
L.	Shield system placed to prevent lateral movement.	
M.	Employees are prohibited from remaining in shield system during vertical movement.	

Excavation Checklist

CORRECTIVE ACTIONS AND REMARKS:

Excavation Checklist

SAMPLE - Daily Trenching Log

DAILY TRENCHING LOG

DATE:	**SIGNATURE:**
WEATHER:	**PROJECT:**
Was One Call System contacted:	**Yes** _____ **No** _____

Protective system: Trench shield (box) _____ Wood shoring _____
Sloping _____ Other _____

Purpose of trenching: Drainage _____ Water _____
Sewer _____ Gas _____
Other _____

Were visual soil tests made: Yes _____ No ____
If yes, what type?

Were manual soil tests made: Yes _____ No ____
If yes, what type?

Type of soil: Stable Rock _____ Type A _____ Type B _____ Type C _____

Surface encumbrances: Yes _____ No ____
If yes, what type?

Water conditions: Wet _____ Dry _____ Submerged _____

Hazardous atmosphere exists: Yes _____ No _____
(If yes, follow confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es))

Is trenching or excavation exposed to public vehicular traffic (exhaust emission): Yes _____ No ____
(If yes, refer to confined space entry procedures; complete Confined Space Entry Permit; monitor for toxic gas(es))

Measurements of trench: Depth _____ Length _____ Width _____

Is ladder within 25 feet of all workers: Yes _____ No ____

Is excavated material stored two feet or more from edge of excavation: Yes _____ No ____

Are employees exposed to public vehicular traffic: Yes _____ No ___
(If yes, warning vests required) _____

Are other utilities protected: Yes _____ No _____
(Water, sewer, gas or other structures) _____

Are sewer or natural gas lines exposed: Yes _____ No _____
(If yes, refer to confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es))

Periodic inspection: Yes _____ No _____

Did employees receive training in excavating: Yes _____ No ____

NOTES