



# Chapter 4: Excavations

- Competent Person
- Emergency Response Plan
- Atmospheric Conditions
- Barricades
- Site Conditions
- Soil Types
- Basic Requirements
- Trench Box/Shields

# AGC Tool Box Safety Talk

## COMPETENT PERSON

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

OSHA requires that a “Competent Person” be responsible for the safety of all workers in a trenching/excavation operation. OSHA defines a Competent Person as “an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees and who is authorized to take prompt corrective measures to eliminate or control these hazards and conditions.” The Competent Person is required to:

- Have training in soil analysis and the use of protective systems, be knowledgeable about OSHA requirements, and have authority to immediately eliminate hazards.
- 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.
- Review a pre-task plan with supervisor on a daily basis.
- Assure that the location of underground installations or utilities have been properly located.
- Identify and ensure use of adequate protective systems, work methods, and personal protective equipment (PPE) on the excavation site.
- Test for low oxygen, hazardous fumes and toxic gases, especially when gasoline engine-driven equipment is running, or the dirt has been contaminated by leaking lines or storage tanks. Insure adequate ventilation or respiratory protection, if necessary.
- Provide safe access within 25 feet of workers into and out of the excavation.
- Provide appropriate protections if water accumulation is a problem.



# AGC Tool Box Safety Talk

## EMERGENCY RESPONSE PLAN

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

Trench collapses cause dozens of fatalities and hundreds of injuries each year. Because trench collapse rescues are technical and demanding, it's essential to have an Emergency Response Plan in place before an emergency occurs. Quick and efficient response can save lives. Follow these procedures for emergency preparation:

- Prior to beginning an excavation project, determine and implement procedures for emergency response that is specific for that site. Ensure the plan is part of the overall site safety plan.
- Notify all personnel involved with the project of the emergency response procedures.
- Include at a minimum the following items: procedures for notification of emergency response agencies; responsibilities of individuals on the site; posting of local emergency response agencies; notification of these agencies of the scheduled work prior to commencement; and identification of the nearest accessible telephone, radio, or other methods of communication.
- Where hazardous atmospheric conditions exist or could develop during the course of the work in the excavation, keep emergency rescue equipment such as a safety harness and line or basket stretcher readily available to personnel working at the excavation site.
- If you are about to be buried in a cave-in, yell to get attention. Cover your face with your arms. Do not struggle to free yourself, just wait calmly for rescue.
- If you are watching someone being buried in a cave-in, do not attempt to rescue them yourself. Never enter the excavation. Follow emergency procedures designated for your work site.
- Review the emergency plan. Make sure new hires and new workers to the site are aware of the emergency response plan



# AGC Tool Box Safety Talk

## ATMOSPHERIC CONDITIONS

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

One hazard associated with excavation and trenching is the possible presence of hazardous atmosphere. A hazardous atmosphere is an atmosphere that by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen-deficient, toxic, or otherwise harmful may cause death, illness, or injury to persons exposed to it. In excavation work, hazardous atmospheres may be generated as toxic gasses and can be released by the digging or accumulate at the bottom of the trench. To help ensure exposure to hazardous atmospheres, take these steps:

- Ensure that the competent person tests the atmosphere in excavations over 4 feet deep if a hazardous atmosphere exists or could reasonably be expected to exist. A hazardous atmosphere could be expected, for example, in excavations in landfill areas, in excavations in areas where hazardous substances are stored nearby, or in excavations near or containing gas pipelines.
- Conduct testing for atmospheric contaminants before employees enter the trench and on a regular basis to ensure that the trench remains safe.
- Increase the frequency of testing if equipment is operating in the trench or if welding, cutting, or burning is done in the trench. These operations, too, can generate toxic fumes.
- Take precautions to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions may include providing proper respiratory protection or forced ventilation of the workspace.
- Make sure that employees required to wear respirators are trained, fit-tested, and enrolled in the respiratory protection program.



# AGC Tool Box Safety Talk

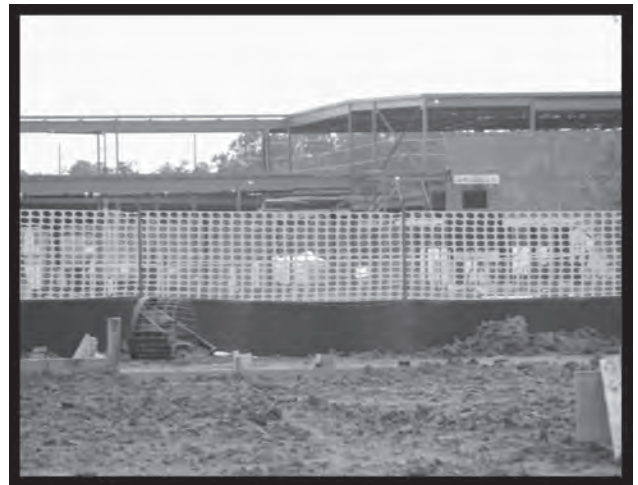
## BARRICADES

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

An open trench can be a hazard not only to the workers on the site, but also to the public. In many instances, barricades and/or warnings are required to prevent unauthorized or accidental entry. Here are some “barricade basics” to help ensure a safe excavation site for everyone:

- Install barricades, fences, protected walkways and/or signs to protect the public from the excavations site. Install warning systems prior to excavation.
- Install barricades, guardrails, or fences around excavations adjacent to walkways, roads, paths or other traffic areas.
- Install standard guardrails on walkways or bridges used by the general public to cross excavations.
- Install barricades or other means to protect employees from underground utilities left in place during excavation.
- Install a barricade or fence on any excavation left unattended to protect against accidental entry from pedestrians. If the excavation is in a remote location where visitation by residents is unlikely, a barricade of posts and warning tape, with a sign, is sufficient. If the excavation is in a traveled area, however, a physical barrier such as a fence must isolate it.
- Install barricades around the site to help control both vehicular and pedestrian traffic.
- Install a warning system such as a barricade, hand or mechanical signal or stop logs when mobile equipment is operated adjacent to the edge of an excavation.



# AGC Tool Box Safety Talk

## SITE CONDITIONS

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

No two excavation sites are alike. Each job must be treated individually because conditions vary from job to job, and hazards may vary from job to job. Follow these procedures to help ensure a safe site:

- Conduct a soil test to determine appropriate sloping, benching, and shoring.
- Remove surface encumbrances such as equipment, materials, supplies, trees, brush, boulders and other objects at the surface that could present a hazard to employees working in the excavation.
- Check the location of underground utilities/ installations that may be encountered during excavation before digging. Arrange with the appropriate utility agency for the protection, removal, shutdown, or relocation of underground installations.
- Install barricades and/or warnings to protect employees and the public from the excavation and from vehicular traffic.
- In excavations deeper than four feet with the potential for a hazardous atmosphere or oxygen deficiency check the atmosphere with a gas monitor as often as necessary to ensure the atmosphere remains safe. Provide adequate protection.
- Ensure that workers are protected in excavations where water is accumulating. This protection involves specific shoring, water removal to control the level of accumulating water, use of lifelines and harnesses, and careful monitoring by a competent person.
- Check the stability of adjacent structures or sources of vibration. Do not excavate below the base or footing of a foundation, wall, sidewalk, pavement or other structure unless shoring or bracing is provided to prevent cave-in or the excavation is in stable rock.
- The competent person should check the excavation on a daily basis or as site conditions change.



# AGC Tool Box Safety Talk

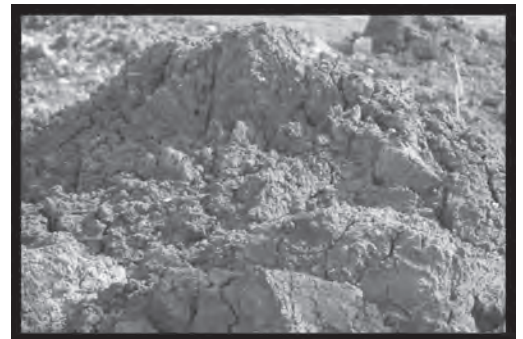
## SOIL TYPES

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

The greatest hazard in excavation and trenching is the risk of a cave-in. Of the deaths resulting from excavation and trenching incidents, the majority are from injuries received during the collapse of the trench. The type of soil in the trench influences the stability of the trench. A soil analysis is critical in determining appropriate sloping, benching, and shoring.

- Trench failure can be deadly. Trench failures often occur in multiples, starting with a movement of soil material near the bottom of the trench wall. After the failure of the base, the support of the wall will quickly erode and the wall will collapse. The collapsing soil is extremely heavy and can weigh one and a half tons per cubic yard, producing a tremendous crushing force
- Before excavation, ensure that a “Competent Person” conducts a soil test to determine the stability of the soil.
- Type A soil (clay, silty clay and hardpan) is the most stable.
- Type B soil (silt, sandy loam, medium clay, and unstable dry rock) has medium stability.
- Type C (gravel, loamy sand, soft clay, submerged soil, or dense, heavy, unstable rock) is the least stable, and requires the greatest safety precautions when excavating.
- Stable Rock is a natural, solid mineral material can be excavated with vertical sides and remains intact while exposed.
- After the soil has been classified, use prescribed methods of wall retention, piling, cribbing, sloping, shoring, trench boxing and sheeting to maintain trench and excavation walls. For each trenching or excavation situation, employ the proper sloping, shoring and bracing structures and measures designed specifically for the particular situation.



# AGC Tool Box Safety Talk

## BASIC REQUIREMENTS

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

Trenching and excavation are among the most hazardous jobs in construction. The primary hazard is employee injury from collapse. Other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment. Follow these basic safety procedures when working on excavation sites:

- Inspect trenches before each shift. Look for evidence of possible cave-ins, indications of failure of protective systems, presence of hazardous atmospheres and other hazardous conditions. Make necessary repairs before starting operations.
- Make sure trenches 5 feet or more in depth are stabilized by either shoring, sloping, or have some protective system to prevent a cave-in.
- Verify that there’s a safe means of access and egress (ladders, stairways etc.) in trenches that are over four feet deep. Make sure the means of access/egress requires no more that 25 feet of lateral travel for a person to reach the exit structure. The top of the ladder must extend at least 3 feet above the walk-off surface.
- Place spoil piles at least two feet from trench edges.
- Ensure underground utilities are marked and their location verified.
- Test for low oxygen, hazardous fumes and toxic gases.
- Trenches 5 feet deep or greater require a protective system unless the excavation is made entirely in stable rock.
- Keep heavy equipment away from trench edges.
- Know who the competent person is for your crew. It is their responsibility to ensure that proper protection is in place for that excavation. Know your rescue plan





# AGC Tool Box Safety Talk

## TRENCH BOX/SHIELDS

### INTRODUCTION

1. Review any accidents or “near accidents” from the past week.
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.
3. Give the TOOL BOX SAFETY TALK

The greatest risk in trenching and excavation is the risk of cave-ins. Cave-ins are much more likely than other excavation-related accidents to result in worker fatalities. To ensure safety, it's important to install a protective system such as a trench box or shield to protect employees workers from collapsing material. Follow these safety requirements when installing a trench box/shield:

- Install a trench box/shield on all excavations five feet or deeper. Unless a competent person provides no indication of a potential cave-in.
- Ensure that the protective system has been designed by a registered professional engineer and is constructed to exact engineering specifications.
- Install trench box/shields in such a way as to restrict lateral or other hazardous movement in the event of sudden trench failure.
- Install trench box/shields so they extend to no more than two feet from the bottom of the trench and no less than eighteen inches above the vertical top of the trench or excavation face.
- Avoid exposing the trench box/shield system to load exceeding the design standard.
- Make sure workers are protected from the hazards of cave-ins when entering or leaving the area protected by the shield.
- Do not enter the shield or ride on the shield during installation, removal, or relocation of the trench box/shield.

