Table of Contents

I. PURPOSE 2
II. SCOPE 2
III. DEFINITIONS 2
IV. KEY RESPONSIBILITIES 4
IV. PROCEDURE 4
VI. UTILITIES AND PRE-WORK SITE INSPECTION 5
VII. PROTECTION OF THE PUBLIC 5
VIII. PROTECTION AGAINST FALL 5
IX. PROTECTION OF WORKERS IN EXCAVATIONS 5
X. EXPOSURE TO VEHICULAR TRAFFIC 6
XI. EMPLOYEE EXPOSURE TO FALLING LOADS 6
XII. WARNING SYSTEM FOR MOBILE EQUIPMENT 7
XIII. HAZARDOUS ATMOSPHERES 7
XIV. PERSONAL PROTECTIVE EQUIPMENT 7
XV. PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION 8
XVI. STABILITY OF ADJACENT STRUCTURES 8
XVII. PROTECTION OF EMPLOYEES FROM FALLING OBJECTS AND LOOSE ROCKS OR SOIL 9
XVIII. SOIL TYPES 9
XIX. DAILY INSPECTION 10
XX. TRAINING 10

I. PURPOSE

The purpose of this training program is to protect employees from safety hazards that may be encountered during work in trenches and excavations.

II. SCOPE

Gallant Builders (Gallant) is required to participate as a contract employer at client locations with trenching and excavation work; however Gallant does not initiate trenching operations.
When work is performed on a non-owned or operated site, the operator's program shall take precedence; however, this document covers Gallant employees for basic awareness purposes that addresses all items and shall be used when an operator's program doesn't exist.

III. DEFINITIONS

Accepted Engineering Practices - means the standards of practice required by a registered professional engineer.

Aluminum Hydraulic Shoring - means a manufactured shoring system consisting of aluminum hydraulic cylinders (crossbraces) used with vertical rails (uprights) or horizontal rails (wales).

Bell-Bottom Pier Hole - means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

Benching (Benching System) - is a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or more horizontal steps, usually with vertical or near-vertical surfaces between levels.

Cave-In - means the movement of soil or rock into an excavation, or the loss of soil from under a trench shield or support system, in amounts large enough to trap, bury, or injure and immobilize a person.

Cross Braces - mean the horizontal members of a shoring system installed from side to side of the excavation. The cross braces bear against either uprights or Wales.

Excavation - means any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

Faces or Sides - mean the vertical or inclined earth surfaces formed as a result of excavation work.

Failure - means the movement or damage of a structural member or connection that makes it unable to support loads.

Hazardous Atmosphere - means an atmosphere that is explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, which may cause death, illness, or injury.

Kickout - means the accidental movement or failure of a cross brace.

Protective System - means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp - means an inclined walking or working surface that is used to gain access to one point from another. A ramp may be constructed from earth or from structural materials such as steel or wood.

Sheeting - means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield System) - means a structure used in an excavation to withstand cave-ins and which will protect employees working within the shield system. Shields can be permanent structures or portable units moved along as work progresses. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring System) - means a structure that is built or put in place to support the sides of an excavation to prevent cave-ins.

Sides - See "Faces."

Sloping (Sloping System) - means sloping the sides of the excavation away from the excavation to protect employees from cave-ins. The required slope will vary with soil type, weather, and surface or near surface loads that may affect the soil in the area of the trench (such as adjacent buildings, vehicles near the edge of the trench and so forth).

Stable Rock - means natural solid mineral material that can be excavated with vertical sides that will remain intact while exposed.

Structural Ramp - means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

Support System - means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated Data - means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench (Trench Excavation) - means a narrow excavation (in relation to its length) made below the surface of the ground.

Trench Box or Shield - See "Shield".

Uprights - mean the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

Wales - are horizontal members of a shoring system placed in the direction of the excavation face whose sides bear against the vertical members of the shoring system or earth (the uprights or sheeting).

IV. KEY RESPONSIBILITIES

Management shall determine if this program is required for regulatory compliance within his/her region. If this program is deemed necessary, then management shall determine which employees within his/her region is required to receive this training. Management shall select a training facility or use an in-house qualified trainer to supply the training.

Only trained personnel can be involved in working in trenches or excavations. Gallant personnel DO NOT initiate trenching.

V. PROCEDURE

COMPETENT PERSON DUTIES
The Safety Director or their designee shall have the following duties:

PROTECTIVE SYSTEMS OR EQUIPMENT

- Monitoring water removal equipment and operations.
- Removal of workers if conditions dictate.
- Atmospheric testing.
- Inspecting excavations subject to runoff from heavy rains to determine need for diversion ditches, dikes, or other suitable protection.

Determining cave-in potential to assess need for shoring or other protective system. Examining damaged material or equipment used for protective systems to determine its suitability for continued use.
Classifying soil and rock deposits, by both visual analysis and by testing, to determine appropriate protection; re-classifying, if necessary, based on changing conditions.

Determining the appropriate slope of an excavation to prevent collapse due to surcharge loads from stored material or equipment, operating equipment, adjacent structures, or traffic, and assuring that such slope is achieved.

INSPECTING TRENCH AND PROTECTIVE SYSTEMS
Inspections prior to entry and authorizing immediate removal of employees from the hazardous area where evidence of possible cave-in, failure of protective systems, hazardous atmospheres, or other hazardous conditions exists.

UNSAFE ACCESS / EGRESS
Designing structural ramps that are used solely by employees as a means of access or egress. Structural ramps used for access or egress of equipment must be designed by a competent person qualified in structural design.

VI. UTILITIES AND PRE-WORK SITE INSPECTION

The location of underground installations shall be determined before excavation. An 811-utility identification 48 hrs. shall be executed and discussed with client/owner for approval. Gallant at no time will assume any utility risk.

In such cases, Gallant may proceed, provided it does so with caution and provided detection equipment or other acceptable means such as but not limited to hydro excavation, probing, and or manual hand digging to locate utility installations.

Excavation shall be done in a manner that does not endanger the underground installations or the employees engaged in the work. Utilities left in place shall be protected by barricades, shoring, suspension or other means as necessary to protect employees.

VII. PROTECTION OF THE PUBLIC

Barricades, walkways, lighting and posting shall be provided as necessary for the protection of the public prior to the start of excavation operations.

Guardrails, fences, or barricades shall be provided on excavations adjacent to walkways, driveways and other pedestrian or vehicle thoroughfares.

Warning lights or other illumination shall be maintained as necessary for the safety of the public and employees from sunset to sunrise.

Wells, holes, pits, shafts and all similar hazardous excavations shall be effectively barricaded or covered and posted as necessary to prevent unauthorized access. All temporary excavations of this type shall be backfilled as soon as possible.

VIII. PROTECTION AGAINST FALL

Walkways or crossovers shall be protected by standard guardrails or railings shall be provided where employees and the general public are permitted to cross over excavations. Where workers in the excavation may pass under these walkways or bridges, a standard guardrail and toe board shall be used.

IX. PROTECTION OF WORKERS IN EXCAVATIONS

ACCESS AND MEANS OF EGRESS

Stairs, ladders or ramps shall be provided where employees are required to enter trench excavations over 4 feet deep. The maximum distance of lateral travel (e.g., along the length of the trench) required to reach the means of egress shall not exceed 25 feet.

STRUCTURAL RAMPS

Structural ramps used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a person qualified in structural design, and shall be constructed in accordance with the design.

Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent movement or displacement.

Structural members used for ramps and runways shall be of uniform thickness.

Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

Structural ramps used in place of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

LADDERS

When portable ladders are used, the ladder side rails shall extend a minimum of 3 feet above the upper surface of the excavation.

Ladders shall have nonconductive side rails if work will be performed near exposed energized equipment or systems.

Two or more ladders, or a double-cleated ladder, will be provided where 25 or more employees will be conducting work in an excavation where ladders serve as the primary means of egress, or where ladders serve two-way traffic.

Ladders will be inspected prior to use for signs of damage or defects. Damaged ladders will be removed from service and marked with "Do Not Use" until repaired.

Ladders shall be used only on stable and level surfaces unless secured. Ladders placed in any location where they can be displaced by workplace activities or traffic shall be secured, or barricades shall be used to keep these activities away from the ladder.

Non-self-supporting ladders shall be positioned so that the foot of the ladder is one-quarter of the working length away from the support.

Employees shall not be allowed to carry any object or load while on the ladder that could cause them to lose their balance and fall.

X. EXPOSURE TO VEHICULAR TRAFFIC

Employees exposed to vehicular traffic shall be provided with, and shall wear vests or other suitable garments marked with or made of reflectorized or high-visibility material. Warning vests worn by flagmen shall be red or orange, and shall be of reflectorized material if worn during night work.

XI. EMPLOYEE EXPOSURE TO FALLING LOADS

No employee shall be permitted underneath loads (or where loads may fall) handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles provide adequate protection for the operator during loading and unloading operations.

XII. WARNING SYSTEM FOR MOBILE EQUIPMENT

A warning system shall be used when mobile equipment is operated adjacent to the edge of an excavation if the operator does not have a clear and direct view of the edge of the excavation. The warning system shall consist of barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

XIII. HAZARDOUS ATMOSPHERES

The atmosphere shall be tested for air contaminants (oxygen, flammable gases, etc.) in excavations over 4 feet deep or 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.

Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or forced ventilation of the workspace.

Forced ventilation will be provided where necessary to ensure the atmosphere is safe.

When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, continuous air monitoring will be performed. The device used for atmospheric monitoring shall be equipped with an audible and visual alarm.

Atmospheric testing will be performed using a properly calibrated direct reading gas monitor.

Direct reading gas detector tubes or other acceptable means may also be used to test potentially toxic atmospheres.

XIV. PERSONAL PROTECTIVE EQUIPMENT

All employees working in trenches or excavations shall wear approved hard-hats and steel toed shoes or boots.

Employees exposed to flying fragments, dust, or other materials produced by drilling, sawing, sanding, grinding and similar operations shall wear approved safety glasses with side shields.

Employees exposed to hazards produced by, or performing, welding, cutting, or brazing operations shall wear approved spectacles or a welding faceshield.

Employees entering bell-bottom pier holes or other similar deep and confined footing excavations shall wear a harness with a lifeline securely attached to it.

The lifeline shall be separate from any line used to handle materials and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

Employees shall wear approved gloves or other suitable hand protection.
Employees using, or working in the immediate vicinity of, hammer drills, masonry saws, jackhammers or similar high noise producing equipment shall wear suitable hearing protection.

Each employee at the edge of an excavation 6 feet or more deep shall be protected from falling.

Fall protection shall be provided by guardrail systems, fences or barricades.

Emergency rescue equipment, such as breathing apparatus, a safety harness and line, and a basket stretcher shall be readily available where hazardous atmospheric conditions exist or may develop during work in an excavation.

This equipment shall be attended when in use. Only personnel that have received approved training and have appropriate equipment shall attempt retrieval that would require entry into a hazardous atmosphere.

XV. PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION

Employees shall not work in excavations that contain or are accumulating water unless precautions have been taken to protect employees against the hazards posed by water accumulation.

The precautions taken must include inspection by a competent person before work begins, special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water or use of safety harnesses and lifelines.

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operation shall be monitored by a competent person trained in the use of the equipment.

If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation.

Precautions shall also be taken to provide adequate drainage of the area adjacent to the excavation.

The competent person shall inform workers of the precautions or procedures that are to be followed if water accumulates or is accumulating in an excavation.

XVI. STABILITY OF ADJACENT STRUCTURES

The competent person will determine if the excavation work could affect the stability of adjoining buildings, walls, sidewalks or other structures.

Support systems (such as shoring, bracing, or underpinning) shall be used to assure the stability of structures and the protection of employees where excavation operations could affect the stability of adjoining buildings, walls, or other structures.

Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted.

XVII. PROTECTION OF EMPLOYEES FROM FALLING OBJECTS AND LOOSE ROCKS OR SOIL

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of:

- Scaling to remove loose material;
- Installation of protective barricades, such as wire mesh or timber, at appropriate intervals on the face of the slope to stop and contain falling material; or
- Benching sufficient to contain falling material.

Excavation personnel shall not be permitted to work above one another where the danger of falling rock or earth exists.

Employees shall be protected from excavated materials, equipment or other materials that could pose a hazard by falling or rolling into excavations.

Protection shall be provided by keeping such materials or equipment at least 2 feet from the edge of excavations, by the use of restraining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Materials and equipment may, as determined by the competent person, need to be stored further than 2 feet from the edge of the excavation if a hazardous loading condition is created on the face of the excavation.

Materials piled, grouped or stacked near the edge of an excavation must be stable and self-supporting.

Using the following categories, soil is classified into different types, which determine the kind of cave-in protection required. Only a competent and trained person can determine the soil type by using these classifications.

- Grain sizes are usually classified into four types: gravel, sand, silt, clay. Gravel is the least stable, and clay is the most stable.
- Saturation is the amount of water that the soil is currently holding. Complete saturation is much less stable than soil that is only slightly damp. However, soil with no water content is unstable.
- Cohesiveness is a test that determines how well the soil sticks together. The more it sticks together, the more stable the trench walls will be. The field test usually consists of rolling the soil in your hand into the shape of a worm and observing how and when it separates.
- Unconfined compressive strength determines how much weight per square foot the soil can withstand. This will determine how easily the soil will shear and cave in

XVIII. SOIL TYPES

Soil classifications must be determined by testing and protective systems designed according to soil classifications.

- The most stable type of soil is Type A. It is dense and heavy and consists primarily of clay.
- Type B has a medium level of stability and is made of soils such as silt, sandy loam, and medium clay.
- The least stable soil is Type C, which consists of gravel, loamy sand, and soft clay.

Timber shoring or aluminum hydraulic shoring must be determined according to the appendixes A & C of 29 CFR 1926 (Excavations).

The devices should be used while in good repair and maintenance. If damaged they must be inspected.

Employees should be protected from hazards of falling, rolling or sliding materials or equipment.

Shields should not be subjected to excessive forces and will be installed to protect employees from lateral loads. Employees are restricted from being in the shield when installing or removing. The shield must be designed to resist calculated trench forces.

XIX. DAILY INSPECTION

The competent person shall conduct daily inspections of excavations, adjacent areas, and protective systems for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres or other hazardous conditions.

An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence.

These inspections are only required when the trench will be or is occupied by employees.

Where the competent person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmosphere, or other hazardous conditions, exposed employees shall be immediately removed from the hazardous area until precautions have been taken to assure their safety.

There shall be a written log of all inspections conducted. This log shall include the date, work site location, results of the inspection, and a summary of any action taken to correct existing hazards.

XX. TRAINING

All personnel involved in trenching or excavation work shall be trained in the requirements of this program and regulatory requirements.

Training shall be performed before the employee is assigned duties in excavations.

Retraining will be performed whenever work site inspections conducted by the competent person or Safety Director indicate that an employee does not have the necessary knowledge or skills to safely work in or around excavations.

Training records shall include the date(s) of the training program, the instructor(s) of the training program, a copy of the written material presented, and the names of the employee(s) to whom the training was given.