Trench Safety Stand-down Week Toolkit

UNICO

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Table of Contents

Trench Safety Stand-down Week

Trench work involves some of the most dangerous activities within the construction sector. In fact, according to recent data from the U.S. Bureau of Labor Statistics, approximately 25 workers are killed every year in trench-related incidents. Among these incidents, 75% are caused by trench cave-ins.

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Nevertheless, these incidents are largely preventable. That's why Trench Safety Stand-down (TSSD) Week was created. TSSD Week is an annual campaign put together by the National Utility Contractors Association (NUCA) and supported by the Occupational Safety and Health Administration (OSHA). According to NUCA, the goal of this weeklong event is to encourage construction employers to educate their staffs on trench and excavation hazards, as well as emphasize the importance of implementing trench protective systems to prevent cave-ins.

As an employer, you are responsible for protecting your workforce from trench cave-in concerns during excavation projects—but we're here to help. We developed this expansive toolkit to provide you with the resources necessary to make the most of TSSD Week and conduct a successful safety stand-down. In this toolkit, you will find additional information about TSSD Week, as well as a wide range of both employer- and employee-facing guidance related to trench and excavation safety.

For additional workplace safety resources, industry-specific risk management guidance and insurance solutions, contact UNICO Group today.

Frequently Asked Questions

What is a safety stand-down?
A safety stand-down is a voluntary event that gives employers the opportunity to talk directly to their workforces about safety. TSSD Week focuses on trench and excavation hazards, as well as reinforcing the importance of trench protective systems (e.g., sloping, shoring and shielding).

When is TSSD Week?
This year's TSSD Week is June 19-23, 2023. It will be the main event featured during NUCA's annual Trench Safety Month, a campaign that takes place throughout the month of June.

How do companies conduct a safety stand-down?
Companies can conduct a safety stand-down by taking a break to have a toolbox talk or by engaging in another safety activity—such as conducting safety equipment inspections, developing rescue plans or discussing job-specific hazards. A safety stand-down should provide an opportunity for an employer and employees to talk about hazards, protective methods, and the company's safety policies, goals and expectations.

Who can participate in TSSD Week?
Anyone who is interested in educating employees on trench and excavation hazards can participate—especially those who frequently conduct excavation projects.

Specifically, NUCA encourages employers from several construction subsectors (e.g., utility, residential and highway), plumbers, military personnel, unions, associations, educational institutes and safety equipment manufacturers to get involved. During the 2022 TSSD Week, 22,500 employees across 1,967 worksites participated.

How does a company participate, and how does it get recognized afterwards?
Participation is easy. All an employer has to do is hold a stand-down event or activity during TSSD Week and fill out this online completion form. This form asks for feedback on how the stand-down went, when it took place, how many employees participated and what type of event or activity was held.

From there, NUCA will send out certificates of participation to each company that got involved and hard-hat stickers for every worker who participated by the end of July. NUCA will also publish the names of the participating companies and organizations within its printed publications.

Our company already received a certificate of participation and hard-hat stickers for previous TSSD events. Why should we continue to participate?
One of the most important reasons to continue participating is to showcase a continued commitment to trench and excavation safety. Employees and other employers alike recognize the importance of demonstrated, top-level commitment to promoting a positive safety culture. NUCA also utilizes the attendance data and feedback from the online completion form to improve future TSSD events.

We are a small company with just a handful of employees. Can we still participate in TSSD Week?

Yes. Any number of people can participate in TSSD Week. Companies of all sizes should take time during the workday to discuss trench and excavation safety with their employees, and participate in a stand-down event or activity. For more information on TSSD Week events and activities, click here.

How long does a typical safety stand-down take to conduct?

It's up to the employer. A stand-down could be as simple as a 15-minute toolbox talk, or several hours of training and activities throughout TSSD week.

Source: NUCA and OSHA

How to Prepare for a Successful Stand-down

1. **Start early.** Designate a coordinator to organize the stand-down. If you have multiple worksites, identify the team that will lead TSSD Week events or activities at each site.
2. **Get assistance.** Think about asking your subcontractors, owners, architects, engineers or others associated with your project to participate in TSSD Week.
3. **Review your trench and excavation safety measures.** This will help provide a more effective stand-down. Here are some considerations to think about:
    a. Remember that per OSHA standards, trenches at a worksite that are more than 5 feet deep and not made entirely of solid rock must have one of three protective systems in place to prevent cave-ins:
        i. *Sloping*—This process reduces the risk of cave-ins by sloping the soil of the trench back from the trench bottom. Slope angles will vary depending on the type of soil around the trench.
        ii. *Shoring*—This process involves installing aluminum, hydraulic or other types of supports to prevent soil movement and cave-ins. Shoring systems typically consist of posts, wales, struts and sheeting.
        iii. *Shielding*—This process refers to the use of trench boxes or other types of supports to avoid soil cave-ins. These shields and supports are typically designed or approved by a registered professional.
    b. What needs improvement? Are your protective systems effective? Are you experiencing fatalities, injuries or near misses? Are employees aware of the company's protective systems?
    c. What training have you provided to your employees? Does it need revision?
    d. What equipment have you provided to your employees? Is better equipment available?
4. **Develop presentations or activities that will meet your needs**. Decide what information will be best for your workforce. The meeting should provide information to employees about hazards, protective methods and the company's safety policies, goals and expectations. Hands-on exercises (e.g., worksite walk-arounds and equipment checks) can increase retention.
5. **Decide when to hold the stand-down and how long it will last.** Decide if TSSD Week events or activities will take place over a break, a lunch period or some other time.
6. **Promote the stand-down.** Try to make TSSD Week events and activities interesting to employees. Some employers find that serving snacks increases participation.
7. **Hold your stand-down.** Try to make TSSD Week events and activities positive and interactive. Let employees talk about their experiences and encourage them to make suggestions.
8. **Follow up.** If you learned anything that could improve your trench and excavation safety measures, consider making changes.

Source: OSHA

Trench and Excavation Safety Program

REFERENCE STANDARD

This program is developed in accordance with provisions as outlined in the OSHA Safety and Health Regulations for Construction (Part 1926), Subpart P: Excavations. Specifically, this program references the standards 29 CFR 1926.650 (scope, application and definitions), 29 CFR 1926.651 (specific excavation requirements) and 29 CFR 1926.652 (requirements for protective systems).

PURPOSE

This program establishes how will enhance safe working conditions at excavation and trenching sites through the establishment of trench protective systems.

SCOPE

This program applies to all employees, company contractors, visitors and vendors.

RESPONSIBILITIES

Senior management will:

- Require the full application and integration of this program into daily operations, as applicable, in all areas of responsibility and with all direct reports.
- Assess managers and supervisors on their ability to apply this program in their areas of responsibility.
- Provide trench protective systems for projects.

The safety administrator will administer all aspects of this program, including:

- Maintaining and updating the written program as required
- Coordinating necessary training for all affected employees
- Providing necessary technical assistance to managers and supervisors
- Periodically assessing its effectiveness and whether it's being implemented in all affected areas of the company

Managers and supervisors will:

- Know how this program applies to those under their direct control.
- Integrate and enforce the provisions of this program in their areas of responsibility.
- Periodically audit the effectiveness of this program in their areas of responsibility.
- Coordinate training for all affected employees.
- Provide appropriate coaching and corrective action when necessary to ensure this program is fully integrated.
- Investigate and document all incidents that result in employee injury.

All affected employees will:

- Integrate the provisions of this program into their daily activities as applicable.
- Follow all training, instructions and directives related to this program.
- Seek clarification whenever there are questions concerning the application of this program into daily operations.
- Bring to management's attention any unsafe or hazardous conditions or practices that may cause injury to themselves or other employees.
- Report any incident that causes injury to an employee, regardless of its nature.

PROGRAM EVALUATIONS AND UPDATES

It is our goal to maintain an understandable and effective safety program that promotes a safe work environment. Any employee can make recommendations for improvement to this program or any other aspect of our safety system. These suggestions should be directed to any member of management, any safety committee member or to the safety administrator.

As a matter of policy, this program will be reviewed on an annual basis by the safety administrator to determine if all aspects still meet the needs of this organization. If there are significant events that take place during the year that indicate the program is less than effective, an immediate evaluation will be conducted and appropriate steps taken to increase the reliability of this plan.

Date of Review	Name of Reviewer	Changes Required (Yes or No)	Current Revision Number

DEFINITIONS

The following OSHA definitions are intended to clarify key words or phrases found in this program:

- *Accepted engineering practices*—Those requirements which are compatible with standards of practice required by a registered professional engineer.

- *Aluminum hydraulic shoring*—A pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such a system is designed specifically to support the side walls of an excavation and prevent cave-ins.

- *Bell-bottom pier hole*—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)*—A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

- *Cave-in*—The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
- *Competent person*—One who is capable of identifying existing and predictable hazards in surroundings (or working conditions) that are unsanitary, hazardous or dangerous to employees,

and who has authorization to take prompt corrective measures to eliminate them.

- *Cross braces*—The horizontal components of a shoring system installed perpendicular to the sides of an excavation, the ends of which bear against either uprights or wales.

- *Excavation*—Any human-made cut, cavity, trench or depression in an earth surface, formed by earth removal. **Please note that although trenches and excavations are not the same, OSHA's definition of excavations includes trenches.**

- *Faces or sides*—The vertical or inclined earth surfaces formed as a result of excavation work.

- *Failure*—The breakage, displacement or permanent deformation of a structural component or connection that reduces its structural integrity and its supportive capabilities.

- *Hazardous atmosphere*—An atmosphere which—by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic or otherwise harmful—may cause death, illness or injury.

- *Kickout*—The accidental release or failure of a cross brace.

- *Protective system*—A method of protecting employees from:
  - Cave-ins
  - Material that could fall or roll from an excavation face or into an excavation
  - A collapse of adjacent structures

  Protective systems include support systems, sloping and benching systems, shield systems and other systems that provide necessary protection.

- *Ramp*—An inclined walking or working surface that is used to gain access to one point from another and is constructed from earth or from structural materials such as steel or wood.

- *Registered professional engineer*—A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

- *Sheeting*—The components of a shoring system that retain the earth in position and, in turn, are supported by other components of the shoring system.

- *Shield (shield system)*—A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

- *Shoring (shoring system)*—A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

- *Sloping (sloping system)*—A method of protecting employees by carving the side walls of an excavation so that they are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure and application of surcharge loads.

- *Stable rock*—Natural, solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

- *Structural ramp*—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*—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*—Tables and charts approved by a registered professional engineer and used to design and construct a protective system.

- *Trench (trench excavation)*—A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 meters). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

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

- *Wales*—Horizontal components of a shoring system that are placed parallel to an excavation face, and the sides of which bear against the vertical components of the shoring system or earth.

TRENCH AND EXCAVATION HAZARD ANALYSIS

Prior to implementing trench and excavation procedures, authorized facility personnel will conduct an excavation hazard analysis to identify all real or potential trench hazards. OSHA's trench and excavation e-tools help employers identify hazards and provide possible solutions to those hazards. The additional resources located at the end of this toolkit offer further guidance for addressing any hazards while in the process of work on an excavation project.

When conducting the trench and excavation hazard analysis, the person or persons conducting the analysis must be familiar with trench and excavation hazard definitions, as well as the work environment. When conducting the hazard analysis, consideration must also be given for specialized functions, such as the use of heavy equipment and protective systems.

The trench and excavation hazard analysis will identify one or more methods to eliminate or control each identified hazard. The analysis will also identify the responsible person(s) and completion date(s) for protective measures to be resolved. Trench and excavation hazard analysis reports must be revised or rewritten whenever there is a change to the task, process, structure or equipment that would render past surveys obsolete.

SPECIFIC EXCAVATION REQUIREMENTS

When performing trench and excavation work, all surface encumbrances must be moved or supported to safeguard employees. Specific excavation requirements apply to the following aspects:

- **Underground installations**—The estimated location of utility installations, such as telephone, fuel, electric or water lines, or any other underground installations that reasonably would be expected to be encountered during excavation or trenching must be determined prior to opening an excavation. must contact utility companies within the established or customary local response times, advise them of the proposed work and asked the utility company to establish the location of the utility underground installations prior to the start of actual excavation.
    - When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, may proceed, provided does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used. When these estimated underground installations are approached by excavation operations, the exact locations must be determined by safe and acceptable means.
    - If the underground installations can be removed, they should be. Otherwise, employees must protect or support them as necessary for safeguarding.
- **Access and egress**—Structural ramps that are used solely by employees as a means of access or egress should be designed by a competent person qualified in structural design. Ramps and runways constructed of two or more structural components (must be made of uniform thickness) must have the structural components connected together to prevent displacement. This can be done by using cleats or other appropriate means to connect runway structural components to the bottom of the runway to prevent tripping. Structural ramps used in lieu of steps must be provided with cleats or other surface treatments on the top surface to prevent slipping.
- **Means of egress from trench excavations**—A stairway, ladder, ramp or other safe means of egress must be located within 25 lateral feet from employees working in trench excavations that are 4 feet or more in depth.
- **Exposure to vehicular traffic**—When exposed to areas with traffic, employees must be provided with and wear reflective or high-visibility safety vests.
- **Exposure to falling loads**—When working around lifting and digging equipment, no employee should move underneath any load. Employees must stay away from any vehicles that are being loaded or unloaded to avoid being struck by any falling materials. Operators can stay in the cabs

of their vehicles while they are being loaded or unloaded when the vehicles provide adequate protection to the operators during loading and unloading operations.

- **Warning system for mobile equipment**—A warning system (e.g., barricades, hand or mechanical signals, or stop logs) must be used:
  - When an operator does not have a clear and direct view of the edge of an excavation
  - When an operator is operating adjacent to an excavation
  - When equipment is required to approach the edge of an excavation

  If possible, the grade should be away from the excavation.
- **Hazardous atmospheres testing and controls**—To prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements apply:
  - Where oxygen deficiency (atmospheres containing less than 19.5% oxygen) or a hazardous atmosphere exists or could exist, atmospheres must be tested before employees enter excavations greater than 4 feet in depth. Some environments that could have oxygen-deficient atmospheres are landfill areas or areas where hazardous substances are stored nearby.
  - Adequate precautions that include—but are not limited to—proper respiratory protection or ventilation (in accordance with Subparts D and E) must be used to prevent employee exposure to atmospheres containing less than 19.5% oxygen and other hazardous atmospheres.
  - Adequate precaution must be taken—such as providing ventilation—to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20% of the lower flammable limit of the gas.
  - When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing must be conducted as often as necessary to ensure that the atmosphere remains safe.
- **Emergency rescue equipment**—Breathing apparatuses, a safety harness and a line or basket must be readily available while hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. The equipment must be attended when in use. Employees entering bell-bottom pier holes or other deep and confining footing excavations must wear a harness with a lifeline security attached to it. The lifeline must be separate from any line used to handle materials and must be individually attended at all times while the employee wearing the lifeline is in the excavation.
- **Protection from hazards associated with water accumulation**—Employees must not work in excavations in which there is accumulated water or where water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water or the use of a safety harness and lifeline.

- If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations must be monitored by a competent person to ensure proper operation.
- If excavation work interrupts the natural drainage of surface water, then diversion ditches, dikes or other suitable means must be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with the protections from hazards associated from water accumulation.

- **Stability of adjacent structures**—Where the stability of adjoining buildings, walls or other structures is endangered by excavation operations, support systems such as shoring, bracing or underpinning must be provided to ensure the stability of such structures for the protection of employees. Sidewalks, pavements and appurtenant structures must not be undermined, unless a support system or another method of protection is provided to protect employees from the possible collapse of such 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 must not be permitted except when:
  - A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure.
  - The excavation is in stable rock.
  - A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity.
  - A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.
- **Protection of employees from loose rock or soil**—Adequate protection must 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 must consist of:
  - Scaling to remove loose material
  - Installed, protective barricades at intervals as necessary on the face to stop and contain falling material
  - Other means that provide equivalent protection

  Employees must be protected from excavated (or other) materials or equipment that could pose a hazard by falling or rolling into excavations. Protection must be provided by placing and keeping such materials or equipment at least 2 feet (0.61 meters) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both, if necessary.

- **Inspections**—Daily inspections of excavations, the adjacent areas and protective systems must be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres or other hazardous

conditions. An inspection must be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections must also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions, exposed employees must be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- Walkways must be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with 1926.502(b) must be provided where walkways are 6 feet (1.8 meters) or more above lower levels.

PROTECTIVE SYSTEMS REQUIREMENTS

- **Protection of employees in excavations**—Each employee in an excavation shall be protected from cave-ins by an adequate protective system. Protective systems must have the capacity to resist (without failure) all loads that are intended or could reasonably be expected to be applied or transmitted to the system. These systems must be designed in accordance with sloping systems, benching systems, support systems, shield systems and other protective systems, except when:
  - Excavations are made entirely in stable rock.
  - Excavations are less than 5 feet (1.52 meters) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.
- **Design of sloping and benching systems—**The slopes and configurations of sloping and benching systems must be selected and constructed by or its designee, and must be in accordance with the requirements of the following options:
  1. **Option 1 (allowable configurations and slopes)**—Excavations must be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless uses one of the other options listed below. These slopes must be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.
  2. **Option 2** (**determination of slopes and configurations using Appendices A and B**)—Maximum allowable slopes and configurations for sloping and benching systems must be determined in accordance with the conditions and requirements set forth in Appendix A and Appendix B of 1926 Subpart P.
  3. **Option 3** (**designs using other tabulated data)**—Designs of sloping or benching must be selected from and be in accordance with tabulated data, such as tables and charts. The tabulated data shall be in written form and must include all of the following:
     - Identification of the parameters that affect the selection of a sloping or benching system drawn from such data
     - Identification of data use limitations, to include the magnitude and configuration of slopes determined to be safe

- Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data

At least one copy of the tabulated data that identifies the registered professional engineer who approved the data must be maintained at the job site during construction of the protective system. After that time, the data may be stored off the job site, but a copy of the data must be made available to the secretary upon request.

4. **Option 4 (design by a registered professional engineer)**—Sloping and benching systems not utilizing options 1, 2 or 3 must be approved by a registered professional engineer. Designs must be written and include all of the following:
   - The magnitude of the slopes that were determined to be safe for the particular project
   - The configurations that were determined to be safe for the particular project
   - The identity of the registered professional engineer approving the design

   At least one copy of the design must be maintained at that job site while the slope is being constructed. After that time, the design need not be at the job site, but a copy must be made available to the secretary upon request.

- **Design of support systems, shield systems or other protective systems**—Designs of support systems, shield systems and other protective systems must be selected and constructed by or their designee. Designs must be selected in accordance with the requirements of the following options:

1. **Option 1 (designs using Appendices A, C and D**)—Timber shoring designs in trenches must be determined in accordance with the requirements and conditions set forth in Appendices A and C. Designs for aluminum hydraulic shoring must be in accordance with the manufacturer's tabulated data, but if that data cannot be utilized, then the designs must be in accordance with Appendix D.
2. **Option 2 (designs using the manufacturer's tabulated data**)—Design of support systems, shield systems or other protective systems that are drawn from a manufacturer's tabulated data must be in accordance with all specifications, recommendations and limitations issued or made by the manufacturer. Deviations from the specifications, recommendations and limitations issued or made by the manufacturer must only be allowed after they issue specific written approval. The manufacturer's specifications, recommendations and limitations and the manufacturer's approval to deviate from the specifications, recommendations and limitations must be in writing at the job site during the construction of the protective system. After construction, the data may be stored off the job site, but a copy must be provided to the secretary upon request.
3. **Option 3 (designs using other tabulated data**)—Designs of support systems, shield systems or other protective systems must be selected from and in accordance with tabulated data such as tables and charts. The tabulated data must be in writing and including the following:
   - Identification of the parameters that affect the selection of a protective system drawn from such data
   - Identification of data use limitations

- Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data

At least one copy of the tabulated data that identifies the registered professional engineer who approved the data must be maintained at the job site until the construction of the protective system is completed. After construction is completed, the data may be stored off-site, but a copy must be made available to the secretary upon request.

4. **Option 4 (designs by a registered professional engineer)—**Support systems, shield systems and other protective systems that do not utilize the above options must be approved by a registered professional engineer. Designs must be in writing and include the following:

   - A plan indicating the sizes, types and configurations of the materials to be used in the protective systems.
   - The identity of the registered professional engineer approving the design.

   A copy must be kept for this option on the job site during construction, but after construction is done it can be stored off-site.

- **Materials and equipment—**Materials and equipment used for protective systems must be free from damage or defects that might impair their proper function. Manufactured materials and equipment used for protective systems must be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards. When material or equipment that is used for protective systems is damaged, a competent person must examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment must be removed from service, evaluated and approved by a registered professional engineer before being returned to service.
- **Installation and removal of support—**Components of support systems must be securely connected together to prevent sliding, falling, kickouts or other predictable failures. Support systems must be installed and removed in a manner that protects employees from cave-ins, structural collapses or from being struck by components of the support system. Individual components of support systems must not be subject to loads exceeding those which those components were designed to withstand. Before temporary removal of individual components begins, additional precautions must be taken to ensure the safety of employees, such as installing other structural components to carry the loads imposed on the support system. Removal must begin at—and progress from—the bottom of the excavation. Components must be released slowly so as to note any indication of possible failure of the remaining components of the structure or possible cave-in of the sides of the excavation. Backfilling must progress together with the removal of support systems from excavations.
- **Additional requirements for support systems for trench excavations—**Excavation of material to a level no greater than 2 feet below the bottom of the components of a support system must be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system. Installations of support systems must be closely coordinated with the excavation of trenches.

- **Sloping and benching systems—**Employees must not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling or sliding material or equipment.
- **Shield systems—**Shield systems must not be subjected to loads exceeding those which the system was designed to withstand. Shields must be installed in a manner to restrict lateral movement or other hazardous movement of the shield in the event of the application of sudden lateral loads. Employees must be protected from the hazard of cave-ins when entering or exiting the areas protected by shields. Employees must not be allowed in shields when shields are being installed, removed or moved vertically.
- **Additional requirements for shield systems used in trench excavations—**Excavations of earth material to a level not greater than 2 feet below the bottom of a shield must be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

ENFORCEMENT

Constant awareness of and respect for trench and excavation safety systems, as well as compliance with these and all other company safety rules, are considered conditions of employment at . The crew supervisor or foreman reserves the right to issue disciplinary warnings to employees—up to and including termination—for failure to follow the guidelines in this plan.

ACCIDENT RESPONSE AND INVESTIGATION

All incidents that result in injury to workers (including near misses), regardless of their nature, must be reported and investigated. When an accident occurs, employees must notify management. Management will either promptly rescue injured workers (directly or indirectly through a third party) or provide workers the equipment to rescue themselves. All incidents will be investigated as soon as possible to identify the cause and means of preventing future occurrences.

In the event of an incident, this program will be reviewed to determine if additional provisions, practices, procedures or training should be implemented to prevent future incidents.

Source: OSHA

Employer Resources

CHECKLIST | TRENCHING SAFETY CHECKLIST

Presented by UNICO Group

Date: **Review conducted by:**

In accordance with OSHA 29 CFR 1926 Subpart P, safety and health programs must be in place to address the variety of hazards workers face while in excavation sites. The following checklist is designed to provide best practices to prevent trenching injuries and fatalities for trenches less than 20 feet deep.

PREPLANNING	COMPLETED	NOT COMPLETED	N/A
Contact utilities to locate all underground lines prior to digging.	☐	☐	☐
Evaluate soil conditions (see chart).	☐	☐	☐
Based on soil type, determine maximum allowable slope for excavations less than 20 feet based on the angle to the horizontal (see chart).	☐	☐	☐
Select appropriate protective systems.	☐	☐	☐
Determine the proximity to the structures that could affect the choice of protective system.	☐	☐	☐
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.	☐	☐	☐
Ensure there is adequate ventilation or respiratory protection, if necessary.	☐	☐	☐
Provide a warning system for mobile equipment, if necessary.	☐	☐	☐
Plan for vehicle traffic control, if necessary.	☐	☐	☐
Train all workers to recognize existing or potential hazards and how to protect themselves from cave-ins.	☐	☐	☐

SOIL TYPE	HEIGHT/DEPTH RATIO	SLOPE ANGLE
Stable Rock (granite or sandstone)	Vertical	90 degrees
Type A (clay)	¾:1	53 degrees
Type B (gravel, silt)	1:1	45 degrees
Type C (sand)	1 ½:1	34 degrees
Type A (short-term)—for a max. excavation depth of 12 feet	½:1	63 degrees

This checklist is merely a guideline. It is neither meant to be exhaustive nor meant to be construed as legal advice. It does not address all potential compliance issues with federal, state or local standards. Consult your licensed commercial property and casualty representative at UNICO Group or legal counsel to address possible compliance requirements. © 2006, 2011, 2014, 2021 Zywave, Inc. All rights reserved.

PROTECTIVE SYSTEMS	COMPLETED	NOT COMPLETED	N/A
Always use a protective system, such as sloping, shoring or shielding, for trenches 5 feet deep or greater. • Use benching to protect workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels. Benching cannot be done in Type C soil. • Use sloping to protect workers by cutting back the trench wall at an angle inclined away from the excavation that is not steeper than a height/depth ratio of 1 ½:1, according to the sloping requirements for the type of soil. • Use shoring to protect workers by installing supports to prevent soil movement for trenches that do not exceed 20 feet in depth. • Use shielding to protect workers by using trench boxes or other types of supports to prevent soil cave-ins.	☐	☐	☐
Instruct employees to never enter an unprotected trench.	☐	☐	☐

ACCESS & EGRESS	COMPLETED	NOT COMPLETED	N/A
If a trench is 4 feet deep or more, provide stairways, ladders, ramps or other safe means of egress.	☐	☐	☐
Ensure structural ramps used solely for access or egress are designed by a competent person.	☐	☐	☐
Provide ladders or steps within 25 lateral feet of workers.	☐	☐	☐
When two or more components form a ramp or runway, they must be connected to prevent displacement and be of uniform thickness.	☐	☐	☐
Cleats or other means of connecting runway components must be attached in a way that would not cause tripping.	☐	☐	☐
Structural ramps used in place of steps must have a nonslip surface.	☐	☐	☐
Use earthen ramps as a means of egress only if a worker can walk them in an upright position, and only if they have been evaluated by a competent person.	☐	☐	☐
Only keep excavations open the minimum amount of time needed to complete operations.	☐	☐	☐

Inspection Procedures

Inspections should be conducted by a competent person who has training in soil analysis and the use of protective systems, is knowledgeable about OSHA requirements, and has authority to immediately eliminate hazards. Inspect trenches daily for evidence of possible cave-ins, hazardous atmospheres, failure of protective systems or other unsafe conditions. Inspect the trench during the following periods:

INSPECTION PROCEDURES	COMPLETED	NOT COMPLETED	N/A
Before construction begins	☐	☐	☐
Daily, before each shift	☐	☐	☐
As needed throughout the shift	☐	☐	☐
After any hazard-increasing event, such as rainstorms, vibrations or excessive surcharge loads	☐	☐	☐

Considerations for Excavated Materials

Excavated materials (spoils) are hazardous if they are set too close to the edge of a trench. The weight of the spoils can cause a cave-in, or spoils and equipment can roll back on top of workers, causing serious injuries or death. Provide protection through one or more of the following actions:

SPOIL PROCEDURES	COMPLETED	NOT COMPLETED	N/A
Set spoils and equipment at least 2 feet back from the excavation.	☐	☐	☐
Use retaining devices, such as a trench box, that will extend above the top of the trench to prevent equipment and spoils from falling back into the excavation.	☐	☐	☐
Where the site does not permit a 2-foot setback, temporarily haul spoils to another location.	☐	☐	☐

Source: OSHA

CHECKLIST | DAILY INSPECTION OF TRENCHES AND EXCAVATIONS

Presented by UNICO Group

Date:	**Location:**	**Review Conducted By:**
Weather:	**Soil Type:**	**Trench Depth:**
Trench Length:	**Trench Width:**	**Type of Protection System:**

EXCAVATION	COMPLETED	NOT COMPLETED	N/A
Excavations and protective systems are inspected by a competent person daily, before the start of work.	☐	☐	☐
A competent person has been given authority to immediately remove workers from the excavation.	☐	☐	☐
Surface encumbrances have been supported or removed.	☐	☐	☐
Employees are protected from loose rock or soil.	☐	☐	☐
Hard hats are being worn by all employees.	☐	☐	☐
Spoils, materials and equipment are set back a minimum of 2 feet from edge of the excavation.	☐	☐	☐
Barriers are provided at all remote excavations, wells, pits, shafts, etc.	☐	☐	☐
Walkways and bridges over excavations 6 feet or more in depth are equipped with guardrails.	☐	☐	☐
Warning vests, or other highly visible personal protective equipment, have been provided and are being worn by all employees exposed to vehicular traffic.	☐	☐	☐
Employees have been explicitly prohibited from working or walking under suspended loads.	☐	☐	☐
Employees have been explicitly prohibited from working on faces of sloped or benched excavations above other employees.	☐	☐	☐
A warning system has been established and is ready to be used when mobile equipment is operating near the edge of the excavation.	☐	☐	☐

UTILITIES	COMPLETED	NOT COMPLETED	N/A
Utility companies have been contacted and/or utilities have been located.	☐	☐	☐
Exact locations of utilities have been marked when they fall near the excavation.	☐	☐	☐
Underground installations are protected, supported or removed when the excavation is open.	☐	☐	☐

WET CONDITIONS	COMPLETED	NOT COMPLETED	N/A
Precautions have been taken to protect employees from water accumulation.	☐	☐	☐
Water removal equipment is always monitored by a competent person.	☐	☐	☐
Surface water has been controlled or diverted.	☐	☐	☐
Inspections are made after each rainstorm.	☐	☐	☐

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CHECKLIST | DAILY INSPECTION OF TRENCHES AND EXCAVATIONS

HAZARDOUS ATMOSPHERE	COMPLETED	NOT COMPLETED	N/A
The atmosphere is always tested when there is a possibility of oxygen deficiency or a buildup of hazardous gases.	☐	☐	☐
Oxygen content has been verified to be between 19.5% and 21%.	☐	☐	☐
Ventilation has been provided to prevent flammable gas buildup beyond 20% of the lower explosive limit of the gas.	☐	☐	☐
Testing is routinely conducted to ensure that the atmosphere remains safe.	☐	☐	☐
Emergency response equipment is readily available where a hazardous atmosphere could or does exist.	☐	☐	☐
Employees have been trained in the use of personal protective and emergency response equipment.	☐	☐	☐
Safety harnesses and lifelines are individually attended when employees enter deep, confined excavations.	☐	☐	☐

Competent Person Overview - Trenching and Excavation

Provided by UNICO Group

This handout is designed to help excavation contractors understand what is meant by the term "competent person." However, it is not intended to be a substitute for Occupational Safety and Health Administration (OSHA) regulations, which should always be reviewed for compliance purposes.

Certain activities or safety procedures at a construction site require design, inspection or supervision by a competent person. The *OSHA Construction Standard* defines a competent person as "one who is capable of identifying existing and predictable hazards in surroundings (or working conditions) that are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." Excavation and trenching work is dependent on these specialized employees because of its highly technical nature, as well as its inherent hazards, which require a greater level of training and experience than a normal worker would possess.

A "competent person" can be anyone at the job site. It can be the backhoe operator, the supervisor or any other individual. Most contractors appoint their supervisor, superintendent or lead individual as the competent person. Regardless of who is designated, the competent person must—based on experience, training and knowledge—be capable of recognizing existing and potential hazards, and have the authority to stop work and immediately correct them. Care must be exercised in evaluating the qualifications of an individual before they are designated as a competent person. For example, completing a single basic training course may not be sufficient to enable that individual to act as a competent person, since they may still not be capable of identifying existing and potential hazards. The following trenching and excavation activities require a competent person:

PROTECTIVE SYSTEMS OR EQUIPMENT

- Monitoring water removal equipment and operations
- Inspecting excavations subject to runoff from heavy rains to determine the need for diversion ditches, dikes or other suitable protection
- Determining cave-in potential to assess the need for shoring or other protective systems
- 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 testing, to determine appropriate protection, and reclassifying (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 a slope is achieved

INSPECTION OF TRENCH AND PROTECTIVE SYSTEMS

- Authorizing the 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

STRUCTURAL RAMPS FOR ACCESS/EGRESS

- Designing structural ramps that are used solely by employees as a means of access or egress, as structural ramps used for access or egress of equipment must be designed by a competent person qualified in structural design

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Employee Safety Talks

Safety Matters Construction

Preventing Trench Collapse

It's a simple matter of physics—trench walls want to collapse. When they do, it happens quickly and the results can be fatal. It doesn't take much dirt to trap and crush a worker, which is why it is important that you take the proper precautions during excavations that require a trench deeper than 5 feet.

Keep the Surface Clean

Trench collapse occurs when the trench walls can no longer contain the large amount of pressure put on them by the surrounding soil. While this can be a problem at any depth, it is made worse when excavated materials are piled at the edge of the trench. To reduce some of the pressure put on trench walls:

- Pile all excavated materials at least 2 feet back from the edge of the trench. If there is not enough room to allow at least 2 feet, remove excavated materials from the immediate location.
- Do not work around the edge of the trench when others are below.
- Keep equipment away from the trench edge. Not only can it cause cave-ins but there is also a chance that it could fall on those working below.

Slope for Stability

Another way to reduce the pressure put on trench walls is to use a sloping or benching system.

- Sloped Walls – A 34-degree slope should be used when digging to prevent a section near the top from giving out and burying the bottom of the trench.
- Benching – When there is enough space available, benching allows a trench to be dug in a series of steps that slowly descend to the deepest point.

Reinforce Trench Walls

Once a trench has been dug, the walls should be braced in a way that will protect those working in the area if a cave-in does occur.

- Construct a support system made with posts, beams, shores or planking and hydraulic jacks.
- Never excavate more than 2 feet past the bottom of the support system.
- Make sure there is always a safe exit route within 25 feet of where you are working in the trench.

Trench Boxes

A trench box can be used as a convenient alternative to building a support system directly into a trench. However, for it to provide the proper protection, it must be used properly.

- Always place the trench box before entering the trench.
- Enter directly into the box.
- Never move the box while workers are in the trench.
- Never perform work in the trench outside of the box.

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Trenching and Excavating Rules by the Numbers

On average, two workers are killed every month in trench collapses. To ensure your health and safety, it's important to understand various rules related to trenching safety.

Let's examine some of the trenching and excavating rules by the numbers:

1. The 18-inch rule—In situations where sloping is being used in combination with protective systems, but the protective system does not reach ground level, shoring or shielding must extend a minimum of 18 inches above the vertical side of the trench.

2. The 2-foot rule—Those working around a trench must keep soil piles and heavy equipment at least 2 feet away from the edge of trenches. This helps to prevent cave-ins and crushing injuries.

3. The 4-foot rule—For your safety, access and egress to all excavations will be provided—including ladders, steps, ramps or other safe means of exit—to employees working in trench excavations 4 feet or deeper. These devices will be located within 25 lateral feet of you at all times to ensure you can exit a trench quickly in an emergency.

4. The 5-foot rule—Trenches 5 feet deep or greater require a protective system, unless the excavation is made entirely in stable rock. Protective systems are determined by the designated competent person and refer to sloping, shoring and shielding. If the trench is less than 5 feet deep, a competent person may determine that a protective system is not required. If you have questions regarding who the employer-designated competent person is, ask your supervisor.

5. The 20-foot rule—Trenches 20 feet deep or greater require protective systems designed by a registered professional engineer.

While it's the competent person's responsibility to do formal inspections of the trenches, employees should speak up if they notice worksite issues. For questions related to trenching safety, speak to your supervisor.

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Safety Matters Construction

Understanding Protective Systems in Trenching and Excavating

Excavating is one of the most hazardous construction operations, and approximately 54 workers are killed at excavation sites each year.

Excavations are any human-made cuts, cavities, trenches or depressions formed by earth removal. Of these, trenches—narrow excavations made below the surface of the ground—create the most significant workplace hazards, particularly as they relate to:

- Cave-ins
- Hazardous atmospheres (e.g., carbon monoxide, noxious gas, vapors or a lack of oxygen)
- Falls (e.g., a worker accidently falls into a trench and injures themselves)
- Floods or water accumulation
- Mobile equipment (e.g., equipment operated or stored too close to the excavation site falls into the trench)

Even with the proper protections in place, trenches naturally want to refill themselves, which can create major cave-in hazards for those unprepared. As such, it's important to have an understanding of the different protective systems uses to safeguard workers:

Shoring

Shoring involves installing aluminum, hydraulic or other types of supports to prevent soil movement and cave-ins. Shoring systems typically consist of posts, wales, struts and sheeting.

Shoring can help prevent the movement of excavated walls, soil, underground utilities, roadways and foundations, improving worker safety in trenches.

There are several kinds of these systems, with hydraulic and timber shoring systems being the most common.

Benching and Sloping

Benching and sloping refers to carving the sides of an excavation to form one (sloping) or a series (benching) of horizontal levels or steps.

Sloping, if done correctly, removes the risk of cave-ins by sloping the soil of the trench back from the trench bottom. Slope angles will vary depending on the type of soil around the trench.

Shielding

Shielding refers to the use trench boxes or other types of supports to prevent soil cave-ins. These shields and supports are typically designed or approved by a registered professional.

Trench boxes are different from shoring because, instead of supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents.

Shields can be permanent structures or can be designed to be portable and moved along as work progresses.

For questions related to trenching safety, speak to your supervisor.

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Safety Matters Construction

Excavation Site Safety Practices

Each year, trench collapses are one of the leading causes of injury and death on construction sites. Of these incidents, most of the victims were new employees who lacked training and guidance prior to entering the job site. Sadly, most accidents were preventable.

Whether you are a new or seasoned employee, it is essential that you adhere to Occupational Safety and Health Administration (OSHA) regulations to ensure the safety of the entire work crew.

Trench Requirements

- Trenches 4 feet or more in depth require a safe means of entrance and exit.
- Trenches 5 feet or more in depth require a protective system.
- Trenches 20 feet or more in depth require an exit system designed by a registered professional engineer.

Protective Systems

The designated competent person should inspect the area and determine which protective system will suit the job site and soil most effectively. This is essential, as equipment movement, underground utilities and vibrations can cause a surcharge load on the sides of the trench, forcing it to cave in on the workers inside. The following are the most commonly used protective systems:

- Sloping: Protects workers by cutting back the trench wall at an angle inclined away from the excavation
- Shoring: Protects workers by installing aluminum hydraulic supports to prevent soil movement
- Shielding: Protects workers by using trench boxes to prevent cave-ins

In addition to one of these three safety measures, a low-traffic zone must be designated around the trench that allows only essential equipment to enter. This will minimize the amount of vibration to which the trench is exposed.

Avoiding Accidents

Excavation accidents can occur if underground utilities are not located and removed prior to digging a trench. Contact your local one-call system to locate all of the utility lines. Then, label or remove them to prevent injury.

Trench accidents can also happen if safe entrance and exit routes are not present or adequate for the situation. Workers may slip back into the trench as they are trying to climb up a ladder if it is unsupported, placed on a steep slope or is poorly built.

To prevent injury while entering and exiting a trench, only the designated competent person should approve the structural device used. Workers should also place the ladder in a trench shield while trying to enter and exit to avoid a cave-in.

By complying with OSHA regulations and following these safety precautions, the risk of injury at your job site will be greatly reduced. wants everyone on our team to keep safety in mind.

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Soil Classification

Soil classification is an important part of preparing for excavation or trenching work. According to the Occupational Safety and Health Administration (OSHA), trenching is one of the most dangerous types of work in the construction sector. In fact, 40 construction workers are killed annually from being caught in trench cave-ins. However, with proper precautions, such deaths are largely preventable.

One method for detecting hazards in trenching operations is to conduct investigations to identify trenching conditions. Part of the identification process is having a competent person classify the soil that is being excavated to determine the hazards that could occur with that particular soil.

This guidance discusses the different types of soil classifications, how to identify them and how different soils impact excavations.

Soil Classifications

OSHA measures unconfined compressive strength to classify soil. This refers to the amount of pressure the soil can take before it collapses. Soils can be classified as Type A, Type B or Type C. The most stable soil is Type A, while the most unpredictable soil is Type C. Each type of soil has its own description:

- Stable rock is cohesive. This is natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
- Type A soil is cohesive. This type of soil is normally known as clay, silty clay, sandy clay and clay loam. This is the most stable soil to excavate, with a high unconfined compressive strength of 1.5 tons per square foot, or greater.
- Type B soil is also cohesive, but has been cracked or disturbed. This type of soil does not stick together as well as Type A soil. This soil is best known as angular gravel, silt and silt loam. It also includes soil that is fissured or located near sources of vibration. This soil has a medium unconfined compressive strength of between 0.5 and 1.5 tons per square foot.
- Type C soil is the least stable soil for excavating. This soil is best known as gravel or sand. In this soil, the particles do not stick together, and it has a low compressive strength of 0.5 tons per square foot, or less. If there is water seeping through soil, it is automatically classified as Type C soil, regardless of its other characteristics.

How to Determine Soil Classifications

Soil classification is based on determining the unconfined compressive strength of the soil and must be made based on the results of at least one visual and at least one manual analysis. These tests must be completed by a competent person.

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Any tests used must be recognized methods of soil classification by either the American Society for Testing and Materials' or the U.S. Department of Agriculture's textural classification systems. Some common tests used include:

- Visual tests
- Pocket penetrometer tests
- Observations of the soil being excavated
- Observations of the excavation itself and the areas adjacent to the excavation
- Manual analyses of the soil
- Plasticity tests
- Dry strength tests
- Thumb penetration tests
- Drying tests

When determining soil types, it is important for the competent person to complete an inspection of the surrounding area in which the construction will take place. Questions a competent person should ask include:

- Are there sources of vibration near the excavation?
- Are there signs of disturbed soil?
- Is there water seeping into the soil?

When observing the site, the competent person should pay attention to whether the soil that is being excavated is clumpy or granular. If the soil is clumpy, this means the soil is cohesive and stronger.

The Impact of Soil Classifications

Once soil has been classified, this information is used to determine what trenching protective systems should be used to prevent cave-ins and whether any additional support systems are needed to ensure adjacent structures remain stable for the protection of the workers.

Protective systems that can be used in excavations to prevent cave-ins include:

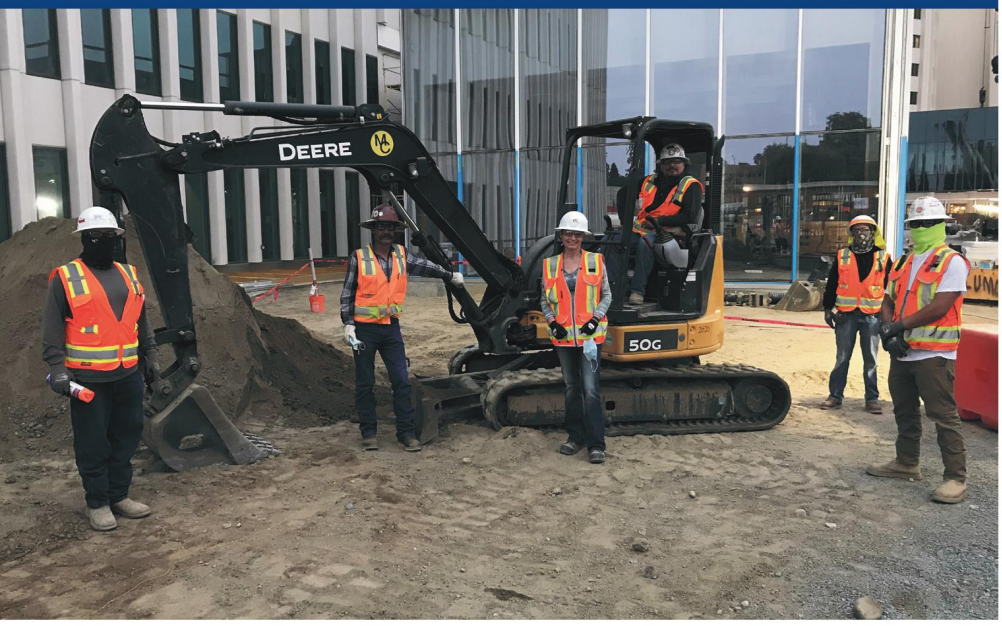
- Sloping the sides
- Benching the sides
- Using shields between the side of the excavation and the work area (trench box)
- Shoring

It is important to understand the soil classifications and the processes to identify hazards that could occur during excavations. Regardless of your job title, working safely is everyone's responsibility at .

NUCA and OSHA Resources

JUNE IS TRENCH SAFETY MONTH!

Safety Training and Protective Systems Save Lives



Trench Safety Stand Down Week | June 20–24, 2022

Make plans for your company to participate in this year's NUCA Trench Safety Stand Down Week. Being a part of our popular 6th annual TSSD Week will help educate your employees on trenching hazards at the jobsite.

OSHA's National Emphasis Program on Trenching and Excavation is a high agency priority. NUCA and OSHA have teamed up again this year for our annual trench safety program. More than 22,000 employees on 2,200 jobsites from 340 companies participated in the 2021 TSSD.

Every company or organization that holds a TSSD will receive a certificate of participation, as well as hard-hat stickers for every employee who participated. Recognition will also be given in NUCA publications. Please plan for your company to be a part of this vital industry safety event this year.

NUCA We Dig America OSHA®

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For more details and TSSD materials: nuca.com/tssd #TSSD22 #TrenchSafetyMonth

OSHA® FactSheet

Trenching and Excavation Safety

Trench collapses, or cave-ins, pose the greatest risk to workers' lives. When done safely, trenching operations can reduce worker exposure to other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment.

OSHA standards require that employers provide workplaces free of recognized hazards. The employer must comply with the trenching and excavation requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA-approved state plan requirements.

Trench Safety Measures

Trenches 5 feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a competent person may determine that a protective system is not required.

Trenches 20 feet (6.1 meters) deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 1926.652(b) and (c).

Competent Person

OSHA standards require, before any worker entry, that employers have a competent person inspect trenches daily and as conditions change to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

Access and Egress

- Keep heavy equipment away from trench edges.
- Identify other sources that might affect trench stability.
- Keep excavated soil (spoils) and other materials at least 2 feet (0.6 meters) from trench edges.
- Know where underground utilities are located before digging.
- Test for atmospheric hazards such as low oxygen, hazardous fumes and toxic gases when > 4 feet deep.
- Inspect trenches at the start of each shift.
- Inspect trenches following a rainstorm or other water intrusion.
- Do not work under suspended or raised loads and materials.
- Inspect trenches after any occurrence that could have changed conditions in the trench.
- Ensure that personnel wear high visibility or other suitable clothing when exposed to vehicular traffic.

Protective Systems

There are different types of protective systems.

Benching means a method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels. *Benching cannot be done in Type C soil.*

Sloping involves cutting back the trench wall at an angle inclined away from the excavation.

Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.

Shielding protects workers by using trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water

content of soil, changes caused by weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

Additional Information

Visit OSHA's Safety and Health Topics webpage on trenching and excavation at www.osha.gov/trenching.

Workers' Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
  Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information, see OSHA's Workers page (www.osha.gov/workers).

How to Contact OSHA

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthful workplaces for their employees. OSHA's role is to help ensure these conditions for America's working men and women by setting and enforcing standards, and providing training, education and assistance. For more information, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

This is one in a series of informational fact sheets highlighting OSHA programs, 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. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

U.S. Department of Labor

OSHA® Occupational Safety and Health Administration

DOC FS-3476 09/2011

OSHA ALERT

Keep Trenches Safe for Workers

Trench collapses and cave-ins are a serious threat to workers, but they can be prevented. OSHA reminds employers that worker safety is a priority, and the agency has resources available to protect workers.

Trench Safety

The following safe work practices will help keep trenches safe for workers:

- **PREPARE** *a safe trench.*
  - Provide safe entry and exit before starting work.
  - Keep materials at least 2 feet away from the edge.
- **PROTECT** workers from a cave-in by using protective systems.
  - Sloping or benching trench walls, or
  - Shoring trench wall with supports, or
  - Shielding trench walls with trench boxes.
- **INSPECT** *the trench for hazards.*
  - Look for standing water and other environmental hazards.
  - Never enter a trench unless it has been inspected and approved by the competent person.

For more information on common hazards, visit OSHA's Trenching and Excavation page.

Employers can also take advantage of OSHA's On-Site Consultation Program, which offers no-cost and confidential occupational safety and health services to small- and medium-sized businesses. Consultation services are separate from enforcement, and do not result in penalties or citations. Contact the local OSHA area office for assistance.

OSHA alerts are issued on occasion to draw attention to worker safety and health issues and solutions.

TRENCHING SAFETY

5 Things You Should Know to Stay Safe

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1 **Ensure there's a safe way to enter and exit.**

See 1926.651(c)

2 **Trenches must have cave-in protection.**

See 1926.652(a)

3 **Keep materials away from the edge of the trench.**

See 1926.651(j)

4 **Look for standing water or other hazards.**

See 1926.651(h)

5 **Never enter a trench unless it has been properly inspected.**

See 1926.651(k)


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