As a Home Builder, we do not self-perform any work. This section is a resource guide only and is not intended to put any requirements on the company. All subcontractors, trade partners, suppliers and vendors are required to develop, implement and follow their own safety program, including providing the proper competent person(s) for the specific task they are responsible for.

**PURPOSE**

The objective of this program is to provide methods for protecting employees against cave-ins, and describes safe work practices for employees. This shall be accomplished by providing specific standards regarding Excavation and Trenching, as well as ensuring that each employee is adequately trained and fully aware of safety procedures associated with Excavation and Trenching. Elimination of injuries and illnesses improves employee morale, improves customer service, improves product quality, and reduces Workers' Compensation costs.

The company requires that excavation and trenching procedures be provided to and utilized by employees in the prevention of occupational injuries and illnesses.

A competent person and shall conduct routine safety inspections of jobsites to ensure compliance with this program. The competent person has the authority to enforce this program in accordance to any and all safety rules and applicable OSHA regulations. Additional competent persons shall be designated by management as necessary to assure compliance with the requirements of the applicable OSHA standards.

Employees are required to comply with the guidelines set forth, and to comply with the instruction of the competent person. In the event an unsafe condition arises in the absence of the competent person, employees shall alert the lead person on the jobsite and coworkers immediately of any unsafe conditions that arise. All work shall cease in the area of concern and be evacuated immediately upon such notification. Work shall not resume until the unsafe conditions are corrected and the competent person clears the area for work resumption.

Any employee or subcontractor who disobeys and/or disregards the guidelines set forth in this program or the company’s safety program shall be subject to disciplinary action.

The Excavation and Trenching Safety Program is managed by a Competent Person(s). The designated Competent Person(s) will be shown on the competent person roster in this safety program.

**RESPONSIBILITIES**

**Management**

- Make sure that the program is keeping employees safe, and that the departments are doing excavation work in a safe manner.
- Help departments select equipment that will protect workers.
- Train Project Managers, and help the Project Managers train other departmental employees.
- Review and update the program as needed.
Competent Person

- Evaluate the site prior to any excavation activities.
- Plan out all cave in protections to be used—classify the soil according to OSHA regulations.
- Inspect the excavation prior to work each day and after any activity such as rain that can change the cave in potential.

Employees

- Follow established procedures
- Enter an excavation only after receiving training and clearance by competent person
- Demonstrate a complete understanding of the safe work practices that are to be followed while working in an excavation.

Trench vs. Excavation

OSHA regulations apply to all open excavations made in the earth's surface, which includes trenches.

A “trench” is defined as a narrow excavation made below the surface of the ground in which the depth is greater than the width and the width does not exceed 15 feet. An excavation is any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. This can include excavations for anything from cellars to highways.

Planning for Safety

Many on-the-job accidents are a direct result of inadequate initial planning. Correcting mistakes in shoring and/or sloping after work has begun slows down the operation, adds to the cost, and increases the possibility of an excavation failure. The company will examine these major areas during our planning phase:

- Traffic
- Nearness of structures and their conditions
- Soil
- Surface and ground water
- The water table
- Overhead and underground utilities
- Weather

Before any excavation actually begins, the competent person shall determine the estimated location of utility installations—sewer, telephone, fuel, electric, water lines, or any other underground installations that may be encountered during digging. Also, before starting the excavation, the company will contact the utility companies or owners involved and inform them, within established or customary local response times, of the proposed work, and request the utility companies or owners to find the exact location of the underground installations. If they cannot respond within 24 hours (unless the period required by state or local law is longer), or if they cannot find the exact location of the utility installations, work may proceed with caution, with the approval of the Competent Person and senior management of the company. Workers shall use acceptable means to find the exact location of
Residential Excavation Resource Guide

underground installations. If underground installations are exposed, the competent person shall assure that they be removed, protected or properly supported.

When all the necessary specific information about the job site is assembled, the competent person will specify the amount, kind, and cost of the safety equipment needed. A careful inventory of the safety items on hand should be made before deciding what additional safety material must be acquired. Each job will be approached with the utmost care and preparation.

Before beginning work, the company shall provide employees who are exposed to public vehicular traffic with warning vests or other suitable garments marked with or made of reflectorized or high-visibility material and ensure that they wear them.

TRAINING
All applicable employees shall be trained on the elements of this program prior to engaging in any activities associated with trenching and excavation. All workers in excavations shall comply with this program. Specific training shall be conducted in the following areas:

- Safe work practices to be followed when working in excavations
- The use of personal protective equipment required during work in excavations, such as safety shoes and hardhats
- Safe work practices to be followed if a hazardous atmosphere is present in an excavation
- Emergency rescue methods and procedure for calling rescue services

ON-THE-JOB EVALUATION
The competent person shall inspect, on a daily basis, excavations and the adjacent areas for possible cave-ins, failures of protective systems and equipment, hazardous atmospheres, or other hazardous conditions. If these conditions are encountered, exposed employees must be removed from the hazardous area until the necessary safety precautions have been taken. Inspections are also required after natural (e.g., heavy rains) or man-made events such as blasting that may increase the potential for hazards. An inspection form can be found at the end of this section.

The job supervisor of the company will conduct independent safety inspections, investigate accidents, and anticipate hazards. They will also ensure that employees receive on-the-job safety and health training. Additionally, the supervisor will review and strengthen overall safety and health precautions to guard against potential hazards, get the necessary worker cooperation in safety matters, and make frequent reports to the contractor.

Managers and supervisors shall set the example for safety at the job site. When visiting the job site, all managers, regardless of status, shall wear the prescribed personal protective equipment such as safety shoes safety glasses, hard hats, and other necessary gear.
CAVE-IN PROTECTION

Excavation workers are exposed to many hazards, but the chief hazard is danger of cave-ins. The company requires in excavations 5 feet or deeper or if the excavation shows signs of collapse that employees exposed to potential cave-ins must be protected by sloping, or benching the sides of the excavation; supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

The protective system shall be designed in consideration of factors involved, including soil classification, depth of cut, water content of soil, changes due to weather and climate, or other operations in the vicinity. Soil classification and observed condition shall be used as primary factors to develop methods and approaches, with benching, shoring, and trench boxes being the options for designing protective systems that can be used to provide the required level of protection against cave-ins.

Soil classification shall be determined by the designated competent person (see 29CFR1926 Subpart P for acceptable soil type classification methodologies). Any unclassified soil shall be considered Type C. One method of ensuring the safety and health of workers in an excavation is to slope the sides to an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal). These slopes must be excavated to form configurations that are in accordance with those for Type C soil (found in Appendix B of 29CFR1926 Subpart P). A slope of this gradation or less is considered safe for any type of soil (see Figure 1). All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1. Notes: 1) Benching is not allowed in Type C soil, 2) Trenches deeper than 20’ must be approved by a registered professional engineer (PE).

![Figure 1. Excavations Made in Type C Soil](image)

The company may use a trench box that is either designed or approved by a registered professional engineer or is based on tabulated data prepared or approved by a registered professional engineer. A trench box, or multiple trench boxes, may be utilized either alone or in conjunction with sloping or benching.

The company will not normally install and use of a protective system when an excavation (1) is made entirely in stable rock, or (2) is less than 5 feet deep and a competent person has examined the ground and found no indication of a potential cave-in.
The company shall provide support systems such as shoring, bracing, or underpinning to ensure the stability of adjacent structures such as buildings, walls, sidewalks or pavements.

The company shall not excavate below the level of the base or footing of any foundation or retaining wall until (1) a support system such as underpinning is provided, (2) the excavation is in stable rock, or (3) a registered professional engineer determines that the structure is sufficiently removed from the excavation and that excavation will not pose a hazard to employees.

Excavations under sidewalks and pavements shall not be performed until an appropriately designed support system is provided or another effective method is used.

Excavation of 2 feet or less below the bottom of the shield system of a trench shall be conducted only if (1) the system is designed to resist the forces calculated for the full depth of the trench, and (2) there are no indications, while the trench is open, of a possible cave-in below the bottom of the support system.

The excavation will be back-filled as soon as possible after work is completed and the trench box is removed. The company is responsible for the safe condition of materials and equipment used for protective systems. Defective and damaged materials and equipment can result in the failure of a protective system and cause excavation hazards.

To avoid possible failure of a protective system, the competent person will ensure that (1) materials and equipment are free from damage or defects, (2) manufactured materials and equipment are used and maintained in a manner consistent with the recommendations of the manufacturer and in a way that will prevent employee exposure to hazards, and (3) while in operation, damaged materials and equipment are examined by the competent person to determine if they are suitable for continued use. Damaged or otherwise unsafe materials and equipment shall be removed from service immediately and tagged or otherwise clearly marked as being out of service. Such materials or equipment shall not be returned to service until proper evaluation and approval by a PE.

Secondary hazards to be considered and controlled by the company include exposure to falls, falling loads, and mobile equipment. To protect employees from these hazards, the company shall take the following precautions:

- Keep materials or equipment that might fall or roll into an excavation at least 2 feet from the edge of excavations, or have retaining devices, or both.
- Provide warning systems such as mobile equipment, barricades, hand or mechanical signals, or stop logs, to alert operators of the edge of an excavation. If possible, keep the grade away from the excavation.
- Provide scaling to remove loose rock or soil or install protective barricades and other equivalent protection to protect employees against falling rock, soil, or materials.
- Prohibit employees from working on faces of sloped or benched excavations at levels above other employees unless employees at lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.
- Prohibit employees under loads that are handled by lifting or digging equipment. To avoid being struck by any spillage or falling materials, require employees to stand away from vehicles being loaded or unloaded.
If cabs of vehicles provide adequate protection from falling loads during loading and unloading operations, the operators may remain in them.

The company shall not allow employees to work in excavations where water has accumulated or is accumulating until after adequate protection has been implemented to assure worker safety. If water removal equipment is used to control or prevent water from accumulating, the equipment and operations of the equipment will be monitored by a competent person to ensure proper use.

A competent person may prescribe utilization of diversion ditches, dikes, or other suitable means to be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. This is especially applicable in the event of excavations subject to runoffs from heavy rains.

A competent person shall test excavations greater than 4 feet in depth, as well as ones of lesser depth where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist, before an employee enters the excavation. If hazardous conditions are detected, controls such as proper respiratory protection or ventilation will be provided. The competent person shall conduct regular tests of all areas where controls are being used to reduce atmospheric contaminants to acceptable levels.

Where adverse atmospheric conditions may exist or develop in an excavation, the company shall provide and ensure that emergency rescue equipment, (e.g., breathing apparatus, a safety harness and line, basket stretcher, etc.) is readily available. This equipment must be attended when used.

The company shall assure an employee wears a harness with a lifeline whenever entering bell-bottom pier holes and similar deep and confined footing excavations. The lifeline shall be securely attached to the harness and must be separate from any line used to handle materials. An observer shall be present to ensure that the lifeline is working properly and to maintain communication with the employee while the employee wearing the lifeline is in the excavation.

Safe access and egress shall be provided for all excavations, especially when employees are required to be in trench excavations 4’ deep or more. Under such conditions, adequate means of exit, such as ladders, steps, ramps or other safe means of egress, shall be provided and be within 25 feet of lateral travel. If structural ramps are used as a means of access or egress, they shall be designed by a competent person if used for employee access or egress, or a competent person qualified in structural design if used by vehicles. Also, structural members used for ramps or runways shall be uniform in thickness and joined in a manner to prevent tripping or displacement.

**Residential Basement Excavations**

Because of some unique conditions with residential basement excavations, OSHA wrote a letter that changed the standard specifically for Residential Basement Excavations. This letter has commonly been referred to as the “Stanley Memo” based on the author. The following is rules apply only for residential basement excavations. These rules do not apply to other ancillary excavations such as water/sewer installations.
The house foundation/basement excavation is less than seven and one-half feet in depth or is benched for at least two (2) feet horizontally for every five (5) feet or less of vertical height;

The minimum horizontal width (excavation face to formwork/wall) at the bottom of the excavation is as wide as practicable but not less than two (2) feet;

There is no water, surface tension cracks, nor other environmental conditions present that reduce the stability of the excavation;

There is no heavy equipment operating in the vicinity that causes vibration to the excavation while employees are in the excavation;

All soil, equipment, and material surcharge loads are no closer in distance to the top edge of the excavation than the excavation is deep; however, when front end loaders are used to dig the excavations, the soil surcharge load shall be placed as far back from the edge of the excavation as possible, but never closer than two (2) feet.

Work crews in the excavation are the minimum number needed to perform the work; and

The work has been planned and is carried out in a manner to minimize the time employees are in the excavation.

This policy applies to all such house foundation/basement excavations including those which become trenches by definition when formwork, foundations, or walls are constructed. This policy does not apply to utility excavations (trenches) where 29 CFR 1926.652 shall remain applicable.

Figure 2. Stanley Memo Diagram for Residential Basement Excavations
PROTECTION OF THE PUBLIC
Protection of the public is an important part of any safety program. Liability is a huge risk that is often overlooked, misunderstood, or understated. The following practices should be performed, at a minimum, to protect the company from unnecessary liability:

• The competent person shall assure that barricades, walkways, lighting and signs are used as needed to protect the public during excavation work.

• An “Open Excavation” sign or other warning system shall be installed in front of every basement excavation and remain in place until the hazard is eliminated.

• Guardrails, fences, or barricades shall be used at excavations next to walkways or driveways used by pedestrians or vehicles. Warning lights and area lighting shall be used from sunset to sunrise as needed to protect the public and employees.

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

• Walkways or bridges with guardrails shall be used where the general public is permitted to cross over excavations.
EXCAVATION INSPECTION FORM

(This is to be completed by the competent person for each excavation/trench and turned into the jobsite superintendent at the start of each work day and/or prior to working in the trench)

Date/time: __________________ Weather: __________________ Previous rain/snow: ___________________

Competent Person Name: ___________________________ Company: ____________________________

Excavation/Trench Location: ___________________________________________________________________

SOILS


• __________ Soil layered?
• __________ Zones of weak soils or fracture planes in material?
• __________ Evidence of shrinkage cracks in or on trench walls?
• __________ Evidence of possible cave-in or slide?

PROPOSED SAFETY SYSTEM

• __________ Slope or Bench (circle which)
• __________ Shoring System (describe)
• __________ Trench box (describe)
• __________ Shield system (describe)
• __________ Other (describe in detail, use back side of inspection form)

HAZARDS

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proper barricades, cones, warning vests or other devices in use as needed?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>All underground utilities located and marked?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>All surface encumbrances removed, braced or protected?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Trenches &gt;4’ in depth have ladders at no more than 25’ travel distance?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Trenches &gt;5’ in depth have protective system in place? (as indicated above)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>If sloped, is it at the correct slope per soils class?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>All spoils at least 2’ from edge of trench?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Adjoining buildings, walls, pavements and sidewalks braced or protected?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>Guardrails installed at walkways across trench?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Any oxygen deficiency or toxic gas hazards in trench?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td>Any confined space requirements in the trench?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>Has a barricade, stop log or hand signals been provided when equipment works close to the trench edge?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>Is water accumulating in the trench?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>14</td>
<td>If water is in the trench, is it being removed before crew enters</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Comments: ________________________________________________

Competent Person Signature: ________________________________
RESIDENTIAL EXCAVATION CHEAT SHEET—ENGLISH

(This form can be used in the field as an easy reference for compliance with the “Stanley Memo”)

- **A′ Soil Type**—over 7 ½' from Grade (Sloping)
  - 12° Angle
  - No Support

- **C′ Soil Type**—will not stand vertical
  - 51° Angle
  - 1 x 1 Slope

- **B′ Soil Type**—over 7 ½' from Grade (Single Bench/Slope)
  - 45° Angle
  - 1 1/4 Slope

- **Excavation to 20′ deep and greater:**
  - Cave-In Protection must be designed by a Registered Professional Engineer.
  - *All must be engineered systems*

- **Other Types of Cave-In Protection:**
  - Timber Shoring
  - Shot-Crete
  - Shoring Piers (Caisson)
  - Sheet Pile Shoring
### RESIDENTIAL EXCAVATION CHEAT SHEET-SPANISH

(This form can be used in the field as an easy reference for compliance with the “Stanley Memo”)

<table>
<thead>
<tr>
<th>“Stanley Memo”</th>
<th>Tierra tipo ‘A’</th>
<th>Tierra tipo ‘C’</th>
<th>Otros tipos protección en el barranco:</th>
</tr>
</thead>
</table>
| *Hoja de Ayuda” de Seguridad para la Excavación Residencial* | Tierra tipo ‘A’: 1’ Sueltamente | Tierra tipo ‘C’: no se puede mantener verticalmente | • Soportes de Madera*
| *Stanley Memo* | Tierra tipo ‘A’: 1’ Sueltamente | Tierra tipo ‘C’: 45° Inclinado | • Rocios de Cemento*
| | No degradas / No Humedez | Tierra tipo ‘C’: 45° Inclinado | • Columnas de Concreto*
| | 1’ x 1’ de fondo | Tierra tipo ‘C’: 45° Inclinado | • Hojas de Madera*
| | | Tierra tipo ‘C’: 45° Inclinado | *Devan de sistemas de ingeniería*

Excavaciones de 20’ pies o más de hondo:

- Protección contra derrumbes debe ser diseñada por un ingeniero profesional registrado.

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