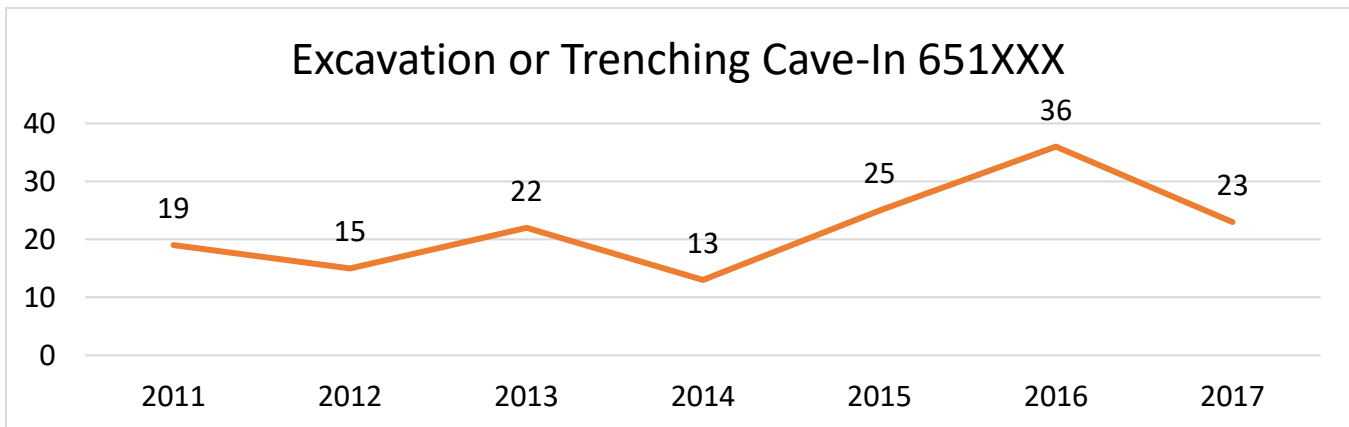


2019 National Trench Safety Stand Down

Trenching and excavation work presents serious hazards to all workers involved. Cave-ins pose the greatest risk and are more likely than some other excavation-related incidents to result in worker fatalities. One cubic yard of soil can weigh as much as a car. An unprotected trench can be an early grave. In the Houston OSHA offices we've had 14 deaths during excavation work since 2009 with seven of them from cave-ins. We encourage you to participate in the National Trench Safety Stand Down, raising awareness of the danger of excavation work. OSHA has also established a goal to increase the number of employees removed from excavation hazards by 10% nation-wide by September 2019.



BLS Fatalities by Event or Exposure



Important Excavation Safety Rules Include:

- Trenches 5 feet 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. For excavations greater than 5 feet the competent person determines the type of protective system to be used:
 - Sloping involves cutting back the trench wall at an angle inclined away from the excavation. The required angle of the slope depends on the type of soil being excavated.
 - 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 non-cohesive soils



- 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 protect workers against cave-in. 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



- Trenches 20 feet deep or greater require the protective system to be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer.
- Employers must have a competent person inspect trenches daily prior to work 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.
- Safe access and egress for all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet or deeper. These devices must be located within 25 feet of all workers.
- 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 from trench edges.
- Know where underground utilities are located before digging.
- A Competent person must 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 and following a rainstorm or other water intrusion.
- Ensure work does not occur 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.

Examples of Cave-In Fatalities that Occurred in the U.S. in Fiscal Year 2018

- Employee was doing sewer repair work in an excavation approximately 70' long when the excavation caved in killing him and hospitalizing another worker.
- Employee entered a 5' deep trench to install piping to tie in a sewer line. A section of the trench caved-in on the employee as he was working killing him.
- Employees were engaged in sewer installation of an 8", 14' long, PVC sewer pipe inside a trench approximately 5 1/2' deep. The trench wall sheared off and caved in buying one worker.

- Employee directing crane operations near the excavation when the ground collapsed, engulfing him.
- An employee working in a 15' trench was buried up to his neck when the trench collapsed.
- Employee was fixing a leak in a trench when it caved in killing him.
- Four employees were cutting in the key way in the bottom of a trench in preparation to install forms for footings. A previous constructed cement retaining wall, buckled, broke apart and a section of the wall and soil behind the wall collapsed and killed one of the workers.
- An employee died while working in an unprotected trench approximately 3-4' wide and up to 13' deep when the walls collapsed.
- Employee was working inside an 8' trench box located inside a trench greater than 16' deep when the trench wall caved-in trapping him inside the trench box. After the trench box was removed he was covered by a second cave-in.
- Two workers in a trench died when a concrete barrier fell over landing on them. The trench was adjacent to a previously poured/placed 121' concrete highway barrier. The soil beneath the barrier collapsed causing the barrier to topple on top of them.
- Company owner was repairing a water main when the trench collapsed.
- An employee was attempting to cap off the sewer line in an excavation approximately 29' long, 6' wide, and 9-12' deep when the excavation collapsed/caved-in on him.
- Employer was installing a French drain on an undeveloped residential lot. An employee had stepped into trench with a shovel to level out a layer of gravel above a perforated pipe. As he was stepping out of the 4' deep, 2' wide trench, a side wall collapsed striking him on his lower body pinning him against an opposite wall. He died 4 days later.
- Employee working in an excavation getting ready to install water and sewer lines when the wall sloughed off trapping him.
- Employee was working at the bottom of a 17' deep trench installing pipe. The Type C soil had been benched and sloped for what had been perceived as Type B soil. An approximately 30' wide by 4' section siltstone began to slide into the trench due to an unstable layer below the stone. One employee was buried and died.
- An employee was in an excavation approximately 15' deep assisting in the repair of a storm drain when the excavation collapsed killing him.
- Employee working inside of an 8' trench when it caved in and buried the employee resulting in his death.
- Crew was installing sewer pipeline in 10-14' deep x 11' wide trench when the trench collapsed trapping one worker and resulting in his death.
- Excavation contractor was performing trenching work to install storm sewer structures and piping. A 10' portion of the benched trench wall sheared off and struck the worker in the trench. He was hospitalized for seven days with multiple fractures and internal injuries and later died.
- A worker was replacing a sewer line when the trench collapsed killing him from compressional asphyxia.
- Worker was connecting pipes in a 7'-10' trench for a drainage system when the trench collapsed, burying him alive.
- Two workers were installing French drain pipes in a 12' deep, 4' wide, 41' long trench when it collapsed, asphyxiating one of the workers.

In FY 2018 we were fortunate not to have any cave-in related fatalities in the Houston area.

Examples of Other Excavation Related Fatality Incidents U.S. in Fiscal Year 2018

Cave-ins aren't the only fatality related events associated with trench work. Working around heavy equipment and material handling hazards among other dangers present hazards to be identified and eliminated to safely perform excavation work.

- Employees were preparing to set a trench shield in an excavation for cave in protection. They were using a back hoe to lift the shield into place. As one employee was lifting the shield with the hoe attachment, a second employee stood on the top of the 6' high spoil pile signaling when to swing and raise the shield. Another employee moved next to the right outrigger of the back hoe and the trench shield made contact with the spoil pile. The rigging came unhooked from the attachment point on the back hoe and the shield fell, tipped over, and crushed the employee near the outrigger.
- Concrete pipe in trench struck the employee and severed an artery in the neck and he bled out.
- Employee was inside a trench box compacting gravel with other employees. They finished working and the employees exited the trench box. The employees believed everyone was out of the trench and signaled the operator to fill the trench. The operator began filling the trench and an employee was buried inside.
- Employee was hand digging in an excavation to complete a water main tie-in. A valve on the 12" water main separated from the pipe resulting in the excavation rapidly filling with water trapping him under water.
- Employee was working inside a trench approximately 20' deep installing 30" x 15' PVC sewer pipe. He was standing inside an 8' tall x 24' long trench box. Another employee placed a steel sling in the middle of the pipe as the excavator operator lifted the pipe to level it before moving towards the trench. Once the pipe was leveled, excavator swung slowly towards the trench box and then proceeded to move the excavator in a forward position to get closer to the trench. Once the excavator was in position, the employee who placed the sling and helped guide the pipe over to the trench box let go. The wind caught the pipe and pushed it towards the road side of the trench. Another employee jumped into the trench to maneuver the pipe back into position to be lowered but before the employee was able to get to the pipe, the sling around the pipe slide down the entire length of the pipe and the pipe fell into the trench box and struck him on the back of the head, neck and back area killing him.
- Employee was supervising the excavation of a hole for a concrete foundation while another subcontractor was operating the excavator. The subcontractor finished digging and began to rotate the bucket so he could place the machine in park. While rotating, the back end of the excavator struck the employee and knocked him about 15' into the excavation and he later died.
- Sand bags filled with crushed stone fell onto victim while he was working in a trench.
- Employee was helping to set storm water pipes in trench when he dove under a 48" concrete storm water pipe being lowered into a trench.
- Employees were taking apart a trench box and had stood the trench box upon the ground. The operator told the employees to remove all the pins and then stand back out of the way. The operator utilizing the bucket of the excavator grabbed the side shield to release the side shield and spreaders. When the side shields hit the ground one of the spreader bars remained in the receiver and caused the spreader to pop back up and fall through the excavator's window striking the operator in the chest.
- An employee in a trench performing spotting duties was struck by the bucket of the excavator and pinned between the excavation wall and the bucket. He died from blunt force trauma to the chest.
- Employee was inside an engineered trench box/shoring system compacting fill at about 4' deep. While the superintendent was removing the pieces of the shoring system, the strut cart supporting the outside walls was removed. A co-worker went into the trench to attach one hook of a 4 legged bridal chain from a backhoe pick point to a pick hole in the linear rail which was embedded vertically into the ground. The coworker exited the trench. The linear rail which was 13'7" long, 16" wide, and 7" thick steel was being lifted out with the backhoe. The back-hoe was not large enough to lift it directly out of the excavation to grade. Instead it was laid down horizontally, additional legs of the bridal attached and then lifted to grade. While attempting to lay it down the hook/chain became slack and the linear rail spun around, broke the safety latch on the hook, and spun out of the hook and fell into the trench box striking the employee in the head killing him.






- An employee was in the trench installing lifting pins in the middle section of a manhole. One pin hole was accessible and the second was against the dirt wall. Employee in trench asked the operator to use the excavator to move the manhole a small amount so he could insert the lift pin. When doing so the manhole came loose from the base and fell, crushing the employee against the wall of the trench.
- Employee climbed up on top of the spoil pile then unexpectedly slid down into the 36" deep excavation. The backhoe operator removing soil struck him in the chest with the bucket and he later died of his injuries.
- Three employees replacing a sewer line in a trench were overcome by hydrogen sulfide and methane gas. One employee died and the two others were admitted to the hospital for treatment.
- While inspecting an irrigating line for a leak, a concrete fence post/pillar became unstable and tipped into the excavation crushing the employee causing internal damage to body systems and loss of life.
- A first responder had responded to, and assisted in, rescue efforts to remove a worker from the trench. This required him to descend 20 feet into the trench using a rope rescue system and once the victim was freed, he had to ascend back up 20 feet and assist with loading the subject into the EMS unit. He later found unresponsive in the restroom/shower area of the fire station after returning to the station from a trench rescue operation.
- A laborer was working inside a trench and was crushed between two steel road plates sustaining internal bleeding, head contusions, and neck fractures.

FY 2018 Federal OSHA Most Frequently Cited Subpart P Excavations

Standard	Cited	Narrative
1926.652(a)(1)	434	Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except...
1926.651(c)(2)	178	A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees
1926.651(k)(1)	138	Daily inspections of excavations, the adjacent areas, and protective systems shall 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 shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated
1926.651(j)(2)	115	Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) 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
1926.651(k)(2)	55	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 shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
1926.651(h)(1)	28	Employees shall not work in excavations in which there is accumulated water, or in excavations in which 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 use of a safety harness and lifeline.
1926.651(i)(3)	19	Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures
1926.651(j)(1)	13	Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection
1926.652(b)(4)	12	While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.
1926.651(d)	12	Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material
1926.651(e)	12	No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with §1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

Resources

	<p>NUCA Trench Safety Stand Down Webpage</p> <p>http://www.nuca.com/tssd</p> <p>Tools and resources on excavation safety that can be used to for a safety stand down. A certificate of participation can also be obtained.</p>
	<p>OSHA Trench and Excavation Publications and Videos</p> <p>https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=213 and https://www.osha.gov/video/</p>
	<p>OSHA Trenching and Excavation Safety and Health Topic Page</p> <p>https://www.osha.gov/SLTC/trenchingexcavation/index.html</p> <p>Excavation and trenching hazards and safety information</p>
	<p>OSHA Technical Manual Trenching and Excavations</p> <p>https://www.osha.gov/dts/osta/otm/otm_v/otm_v_2.html</p> <p>Information on trenching and excavation</p>
	<p>National Trench Safety Trenching App</p> <p>Obtainable from the Apple and Google stores this free app contains excavation data and references</p>



TRENCH Protective Systems SAVE LIVES!
SHIELD IT, SHORE IT, or SLOPE IT

Trench Safety Stand Down Week
June 17–21, 2019

OSHA's National Emphasis Program on Trenching and Excavation remains a high agency priority. NUCA, OSHA, NAXSA, TSSA, and NAHB have teamed up for our 4th annual TSSD Week to educate workers on trenching hazards.

Who Should Participate
Companies or organizations whose companies or members engage in trenching operations, including contractors, builders, military, unions, trade schools, safety professionals, and safety equipment manufacturers.

How Companies Can Hold A Stand Down

- Hold a 20-Minute Toolbox Talk
- Show an Excavation Safety Video
- Hold a Training Class

Recognition
Every company or organization that holds a TSSD will receive a certificate of participation, as well as hard hat stickers for all employees who participated. Recognition will also be given in a press release, and in NUCA, NAXSA, TSSA, and NAHB publications.

Details and TSSD Materials: nuca.com/tssd



Also sponsored by NUCA's Safety Ambassadors Club

- | | |
|-----------------------------|-------------------------------------|
| Alex E. Paris Contracting | John Osara |
| Atlas Excavating | Johnson Bros. |
| Barber Utilitas | Kumatsu America Corp. |
| Casa Constructive Equipment | L.G. Robert Construction |
| Calcraft, Inc. | McLaughlin Boring Systems |
| Carson Tech, Inc. | National Trench Safety |
| Cow & Main | Orland Products USA |
| CRA | Pellecaud-Schmitt Civil Contractors |
| Ditch Witch | Safety Management Services |
| Ethelwyn Production | Sundata Equipment Co. |
| Ferguson Motorworks | Team Fitwell |
| Ging Stronwick & Associates | United Rentals |
| HTSS | Uptown |
| HRP Construction | Wacker Neuson Corp. |
| Hymat by Kruse | |

*Disclaimer: Preliminary information - Fatalities and Catastrophes are logged or recorded in various mediums and reports generated using various criteria. Late reporting, natural causes which may have generated an initial report, fatalities transferred to other jurisdictions and other factors may affect the overall numbers over time. Data is edited and key word search to determine a count of fatalities/catastrophes under OSHA jurisdiction and may change over time as records are updated. Narratives are rewritten and edited and may not reflect the final results of an investigation. In some cases narratives may be updated using news sources regarding the incident. The numbers and information are for accident prevention purposes and trending and is not intended to be a statistical study or evaluation. For questions contact the Houston North OSHA Office, Jim Shelton, CAS, at shelton.james@dol.gov

Mention of third party products is not an endorsement. This information has been developed by an OSHA Compliance Assistance Specialist and is intended to assist employers, workers, and others as they strive to improve workplace health and safety. While we attempt to thoroughly address specific topics [or hazards], it is not possible to include discussion of everything necessary to ensure a healthy and safe working environment in a presentation of this nature. Thus, this information must be understood as a tool for addressing workplace hazards, rather than an exhaustive statement of an employer's legal obligations, which are defined by statute, regulations, and standards. Likewise, to the extent that this information references practices or procedures that may enhance health or safety, but which are not required by a statute, regulation, or standard, it cannot, and does not, create additional legal obligations. Finally, over time, OSHA may modify rules and interpretations in light of new technology, information, or circumstances; to keep apprised of such developments, or to review information on a wide range of occupational safety and health topics, you can visit OSHA's website at www.osha.gov.