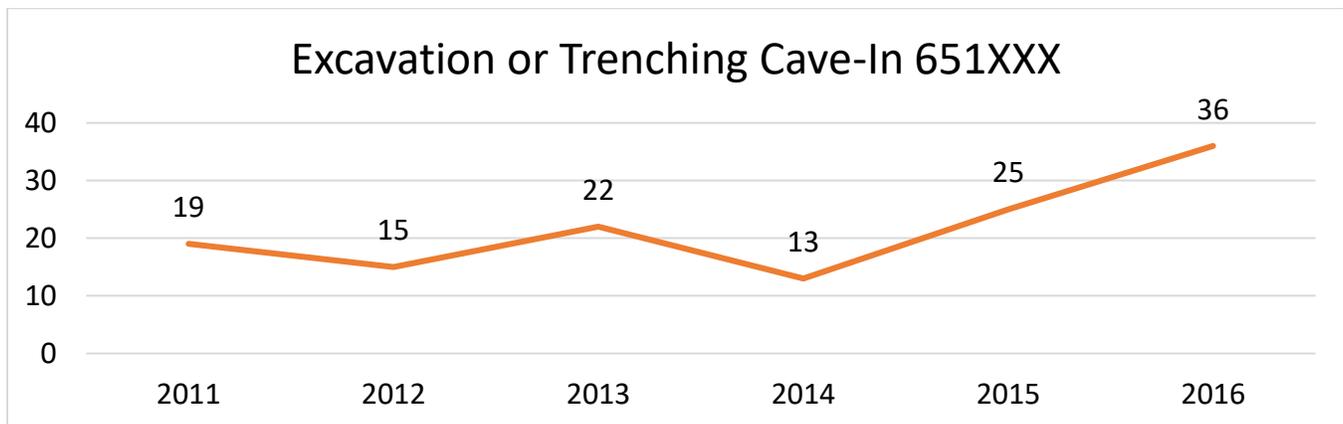


2018 National Trench Safety Stand down June 18 – 23. 2018

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 from excavation hazards by 10% nation-wide in 2018.



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 Fatalities that Occurred in the U.S. in Fiscal Year 2017

- Preparing a trench for installation of a new sanitary sewer line two workers in a trench at a depth of 11'-11" died when the vertical (unsloped) walls of the trench caved in and a fire hydrant came loose from the water main from which it was attached. Soil covered the workers and water flooded what remained of the trench.
- A backhoe operator struck the sewer stub with backhoe bucket, breaking the stub going to the sewer. The operator dismantled the excavator and climbed in the unprotected excavation to investigate. While digging the dirt away from the sewer stub the trench wall caved in burying the employee in the trench.

- Worker was using a tape measure to get a measurement inside of an unprotected excavation approximately 6.5' deep with vertical side walls when it collapsed. The worker was struck in the midsection by the collapsing excavation wall and became buried from the midsection down. The impact of the falling material crushed his internal organs rupturing his aorta causing severe internal blood loss and died at the scene.
- Two employees were preparing hot plates to use during fusion of plastic piping while other workers were backfilling a trench. Other workers were welding and using oxyacetylene torches to connect steel piping in a trench. The piping was connected to a crude oil tank that had been partially emptied, but not washed out or vented. Flammable vapors ignited and three crude oil tanks exploded. Flash fire spread to area of trench causing 4th degree burns and fatality to one worker; three workers sustained third degree burns and were hospitalized and two other workers sustained first and second degree burns.
- Employees on the site were preparing to excavate under a foundation in a pit. They began hand digging this pit as they did with the previous pit. Shovels were utilized along with an electric impact hammer to loosen the earth. During this process co-worker was observing the worker excavate the last stages of the pit when a large 2600 lb rock that formed part of the foundation and which was located on the top of the area that was excavated dislodged falling and crushing the employee.
- Worker was inside of a 7-1/2' trench raking rock when a 15' x 8' 4900 lb trench plate fell on top of him. The protective system was a slide rail system. The storm drain did not fit inside of the trench and the spreader would not go down as designed so a trench plate and a shore jack was used to secure the metal trench plate to the trench wall. The trench caved in causing the trench plate to fall onto the worker crushing him.
- An employee had been locating and marking a waterline in the excavation area. He was walking uphill to the south past the excavator. The employee marked the waterline position just behind the excavator. The excavator cab rotated and the employee was crushed between the counterweight and the dirt bank.

Examples of Excavation Fatalities that Occurred in the Houston Area in FY 2016

- Two employees were in an excavation installing sanitary sewer lines near a gas line when the trench collapsed. One employee was able to get out of the trench without injury, but the other employee was caught in the cave-in. The trench was approximately 14 feet deep and cave-in protection was not being used. The employee died at the scene.
- Employee had entered excavation to rig trench boxes that were in the work area. One box had been removed and the crew was making ready to remove the last one. Employee had entered the work area to tie off the next box when the walls of the excavation began to crumble and slide into the area where the employee was. The material struck the employee and he was buried by the debris. The other members of the crew entered the excavation to dig him out by hand. He died before paramedics arrived on site.
- The employer was excavating land for a retention pond. The worker had begun the excavation three days prior to accident using an excavator. The trench measured approximately 100' in length, 12- 16' wide and 10-12' deep. Over the weekend there was a hard rain and the trench had filled with water. The worker started to work that morning and the back hoe slid and turned over into the deeper section of the trench. The employee drowned.
- An employee working on road doing excavation work was struck by vehicle.

In FY 2017 we were fortunate not to have any excavation related fatalities in the Houston area. Remaining vigilant and following safe excavation work practices along with inspection oversight by the competent person we can ensure Houston workers continue to make it home safely in the future.

FY 2017 Federal OSHA Most Frequently Cited Subpart P Excavations

Standard	Cited	Narrative
1926.652(a)(1)	419	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)	201	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)	183	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)	155	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)	48	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)	25	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)	18	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
1926.652(b)(2)	15	Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart
1926.651(j)(1)	14	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
1926.651(d)	13	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

Excavations Turn Deadly – That’s Why We Have Safety Rules



Excavation 8' deep, 12' long, 11' wide with vertical walls. Employees were boring under the roadbed to install a 6" sewer line tap on south end of trench.



The ground surface on the road side of the trench has no fissure. Time: 12:42 PM.



The ground surface on the road side of the trench begins to fissure. Time: 1:05:50 PM.



The ground surface/wall on the road side of the trench collapsing. Time : 1:06:16 PM.

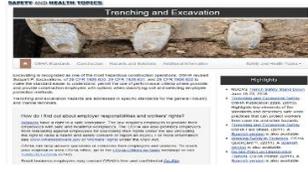


Wall collapses. The portion of the wall that fell was 15" wide by 9' long by 5' deep. Weight of the dirt was calculated to be 6,187 pounds... just over 3 tons.



It took 26 seconds from the appearance of the fissure to the collapse of the wall. The employees would have been struck-by the collapsed wall while installing the sewer line.

Resources

 <p>NUCA's Trench Safety Stand Down Sponsored by NUCA and NASSA</p> <p>The 2018 Trench Safety Stand Down will be held between July 16-23</p>	<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>Trenching and Excavation From the Department of Labor, Occupational Safety and Health (OSHA), U.S. Department of Labor</p> <p>OSHA Trenching and Excavation Publications</p>	<p>OSHA Trench and Excavation Publications</p> <p>https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=213 and https://www.osha.gov/video/</p>
 <p>SAFETY AND HEALTH TOPICS Trenching and Excavation</p> <p>Excavation and trenching hazards and safety information</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>Section V: Chapter 2 Excavations: Shoring Recognition in Trenching and Shoring</p> <p>Information on trenching and excavation</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>MITA Calculate Angle of Repose Calculation History Contact MITA</p> <p>Obtainable from the Apple and Google stores this free app calculates trench slopes</p>	<p>Michigan Infrastructure and Transportation Association Trench Right App</p> <p>Obtainable from the Apple and Google stores this free app calculates trench slopes</p>
 <p>NTS MATERIAL PRODUCTS TAB DATA SEARCH JOB SITE EXCAVATION CHECKLIST REQUEST ENGINEERED PLAN SLOPING/BENCHING QUICK REFERENCE SOIL EXCAVATION QUICK REFERENCE</p> <p>Obtainable from the Apple and Google stores this free app contains excavation data and references</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>

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