



Underground Utility Damage Prevention Guidelines for Contractors

There are hundreds of thousands of miles of underground utilities in the United States. Many of these are potentially dangerous or even deadly to the excavator, homeowners and others if they are damaged. In addition to the safety hazards of excavating around buried utilities, serious potential service outages could occur if a utility is damaged or severed. These outages include, among others, critical emergency services, general aviation, and transactions among financial institutions. Many hundreds of citizens could be affected by the loss of these services.



DOT's Research and Special Programs Administration (RSPA) established a Planning and Design Study Team to evaluate damage prevention practices associated with existing utility location systems and practices during intrusive activities. The following were determined by Team consensus as best practices for contractors performing excavations:

1. ONE-CALL FACILITY LOCATE REQUEST

The excavator should request the location of underground utilities at each site by notifying the

utility owner/operator through the one-call system. Unless otherwise specified in state law, the excavator should call the one-call center at least two working days and no more than 10 working days prior to beginning excavation.

2. WHITE LINING

When the excavation site cannot be clearly and adequately identified to the one-call system, the excavator should designate the route area to be excavated using white paint, flags, stakes, or a combination of these to outline the dig site before the locator arrives on the job. Pre-marking allows the excavators to accurately communicate to utility owners/operators where the excavation is to occur. A 1997 safety study "Protecting Public Safety Through Excavation Damage Prevention" by the NTSB reached the conclusion that pre-marking is a practice that helps prevent excavation damage. Additionally, utility owners/operators can avoid unnecessary work locating utilities that are outside of the planned excavation.

3. LOCATE REFERENCE NUMBER

The excavator should receive and maintain a reference number from the one-call center that verifies the locate requested. All calls processed by the one-call center receive a unique message reference number, which is contained on all locate request messages. The excavator should record this number as it is proof of notification, identifying the date, time, and sequence number of the locate request. This unique number allows for archiving of the ticket so that it can be recalled upon request.

4. PRE-EXCAVATION MEETING

For major, or unusual, excavations and when practical, the excavator should request a meeting with the utility locator at the job site prior to the actual marking of utility locations.

This meeting will facilitate communications, coordinate the marking with actual excavation, and assure identification of high priority facilities. This includes projects such as road, sewer, or water that cover a large area, progress from one area to the next, or that are located near critical or high priority utilities. Such utilities include, but are not limited to, high-pressure gas, high voltage electric, fiber optic communication, and major pipe or water lines.

5. FACILITY RELOCATIONS

The excavator should coordinate work that requires temporary or permanent interruption of a utility owner/operator's service with the affected utility owner/operator in all cases.

Any temporary or permanent interruption requires the active participation by the utility owner/operator and the excavator to ensure protection of utilities. One-call centers will note special contractor requests for joint meetings on the ticket to the utility owner/operator to initiate the process.

6. SEPARATE LOCATE REQUESTS

Every excavator on the job should have a separate one-call reference number before excavating. Often, there are several excavators on a job site performing work. The construction schedule may dictate different types of work requiring excavation from different specialty contractors simultaneously. In these situations it is imperative for each excavator to obtain a one-call reference number before excavation to ensure that the specific areas have been appropriately marked by any affected underground utility owner/operator.

7. POSITIVE RESPONSE

The excavator should be notified by the utility owner/operator of the tolerance zone of the underground utility by marking, flagging, or other acceptable methods at the work site, or be notified that a no conflict situation exists.

A positive response is the action taken by a utility owner/operator after it has received notification of intent to excavate to mark its underground facilities with stakes, paint or flags, or notify the excavator that the facility owner/operator has no underground facilities in the area of excavation. This process allows the excavator to begin work on time or in a timely manner. Upon notification to the one-call center, the excavator is informed which utility owners/operators will be notified. This information should be used to identify which utility owners/operators have responded.

If a utility owner/operator determines that the excavation or demolition is not near any of its existing underground utilities, it notifies the excavator that no conflict exists and that the excavation or demolition area is "clear." This notification may be provided in any reasonable manner including, but not limited to: face-to-face communications; phone or phone message, facsimile or other electronic means; posting at the excavation or demolition area; or marking the excavation or demolition area. If an excavator knows of the existence of an underground facility and has received an "all clear," a prudent excavator must communicate that a conflict does exist and that marking these utilities is a priority before excavation begins.

Furthermore, when a utility owner/operator does not respond by marking or clearing, this could signal that the utility owner/operator did not receive a locate notice or there is a database issue, either of which could result in calamity.

Once the excavator has all of the necessary information for the work area, he can then confidently excavate with safety in mind for the work crew and the public at large.

8. UTILITY OWNER/OPERATOR FAILURE TO RESPOND

If the utility owner/operator fails to respond to the excavator's timely request for a locate (e.g., within the time specified by state requirements) or if the utility owner/operator notifies the excavator that the underground utility cannot be marked within the time frame and a mutually agreeable date for marking cannot be arrived at, the excavator should notify the one-call center. However, this does not preclude the excavator from going on with the project. The excavator is authorized to proceed with excavation at the end of two working days, unless otherwise specified in state law, provided the excavator exercises due care in his endeavors.

The utility owner/operator and the excavator should partner together to ensure facilities are marked in an acceptable time frame to allow for underground utility protection. Prior to excavation, excavators verify they are at the correct location and verify locate markings and, to the best of their ability, check for unmarked utilities.

Upon arrival at the excavation site prior to beginning the excavation, the contractor should verify that the dig site matches the one-call request and is timely. Verify that all utilities have been marked, reviewing color codes if in doubt. Verify all service feeds from buildings and homes. Check for any visible signs of underground utilities, such as pedestals, risers, meters, and new trench lines. Check for any utilities that are not members of the one-call and contact someone to get them located. Use of a pre-excavation checklist is recommended by insurers and practiced by responsible excavating contractors.

9. DOCUMENTATION OF MARKS

An excavator should use dated pictures, videos, or sketches with distance from markings to fixed objects recorded, to document the actual placement of markings. The primary purpose of this best practice is to avoid unnecessary litigation and expensive legal fees for all parties involved.

10. WORK SITE REVIEW WITH COMPANY PERSONNEL

Prior to starting work, the excavator should review the location of underground utilities with site personnel. Sharing information and safety issues during an on-site meeting between the excavator and his excavating crews will help to avoid confusion and needless damage to underground utilities.



11. ONE-CALL REFERENCE NUMBER AT SITE

The excavator's designated competent person at each job site should possess the one-call ticket number. If a representative for the utility owner/operator sees work being conducted and is unaware of the work being done, they can stop and verify that the excavator does indeed have a valid ticket number or they can check the third-party locator's work. If an excavator is found working without a valid one-call ticket number, he should be requested to stop work immediately and appropriate actions should be taken.

12. CONTACT NAMES AND NUMBERS

The excavator's designated competent person at each job site should have access to the names and phone numbers of all utility owner/operator contacts the one-call center and/or local emergency personnel as situations arise that require

immediate notification. Additionally, the “home office” should also have immediate access to all appropriate names and telephone numbers.

13. FEDERAL AND STATE REGULATIONS

The excavator should adhere to all applicable federal and state safety regulations, which includes training in the protection of underground facilities. Excavators are required to comply with federal and state occupational safety and health requirements to protect employees from injury and illness, including training each employee in recognizing and avoiding unsafe conditions.

14. MARKING PRESERVATION

The excavator should protect and preserve the staking, marking, or other designations for underground utilities until no longer required for proper and safe excavation. The excavator should stop excavating and notify the one-call center for re-marks if any facility mark is removed or no longer visible.



15. EXCAVATION OBSERVER

An observer should be used to assist the equipment operator when operating excavation equipment around known underground utilities. The observer is responsible for watching the excavation activity to assist in the prevention of damaging buried utilities.

This is often common practice and is required by some state laws.

16. EXCAVATION TOLERANCE ZONE

The excavator should observe a tolerance zone that is comprised of the width of the utility plus 18” on either side of the outside edge of the underground utility or greater as dictated by state requirements.

17. EXCAVATION WITHIN TOLERANCE ZONE

When excavation takes place within the specified tolerance zone, the excavator must exercise reasonable care necessary for the protection of any underground utility in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include: hand digging when practical (pot holing), soft digging, vacuum excavation methods, pneumatic hand tools, other mechanical methods with the approval of the utility owner/operator, or other technical methods that may be developed. Hand digging and non-invasive methods are not required for pavement removal.

Safe, prudent, non-evasive methods that manually determine a utility location are considered “safe excavation practices” in a majority of state laws. Additionally, many states outline safe excavation practices to include hand digging or pot holing, and some states specifically allow for the use of power excavating equipment for the removal of pavement. State requirements must be taken into consideration as well as differing geologic conditions and weather related factors when recommending types of excavation within the tolerance zone.

18. MIS-MARKED FACILITIES

The excavator should notify the utility owner/operator directly or through the one-call system if an underground utility is not found where one has been marked or if an unmarked underground utility is found. Following this notification, the excavator may continue work if the excavation can be performed without damaging the utility, unless specified otherwise in state law.

Notice to utility owner/operator and one-call is critical should unidentified underground structures be identified during excavation. This will ensure databases are updated with accurate information for future reference.

19. EXPOSED UTILITY PROTECTION

Excavators should support and protect exposed underground utilities from damage. Protection of exposed underground utilities is as important as preventing damage to the utility when digging around it. Protecting exposed underground utilities helps to ensure that the utility is not damaged and at the same time protect employees working in the vicinity of the exposed utility. In addition, workers should be instructed not to climb on, strike, or attempt to move exposed utilities, which could damage protective coatings, bend conduit, separate pipe joints, damage cable insulation, damage fiber optics, or in some way affect the integrity of the utility.

This is more than a best management practice as the Occupational Safety and Health Administration (OSHA) has also addressed this issue in Subpart P - Excavation Standard 29 CFR 1926.651(b)(4) which states: "While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees." For example, an unsupported sewer main could shift, flooding the trench where employees are working and endangering their safety.

20. LOCATE REQUEST UPDATES

The excavator should call the one-call center to refresh the ticket when excavation continues past the life of the ticket (sometimes, but not always, defined by state law). This recognizes that it is a best practice to define ticket life. If not currently defined in state law, ticket life would best be 10 working days but not to exceed 20 working days.

Refreshing the ticket recognizes that markings are temporary and provides notification to utility owners/operators of ongoing excavation when a job is started but not completed as planned. Any excavation not begun during the life of the ticket should be recalled to the one-call center. Any

excavation that covers a large area and will progress from one area to the next over a period of time should be broken into segments when notifying the one-call center in order to coordinate the marking with actual excavation. The possibility exists that new utilities have been installed in the area where the excavation is to be conducted after the original notification and marking.

21. FACILITY DAMAGE NOTIFICATION

An excavator discovering or causing damage to underground utilities should notify the utility owner/operator and the one-call center. All breaks, leaks, nicks, dents, gouges, grooves, or other damages to utility lines, conduits, coatings or cathodic protection should be reported.

The majority of states require notification for damage or substantial weakening of an underground utility, as the possibility of utility failure or endangerment of the surrounding population dramatically increases when a structure has been damaged. While the utility may not immediately fail, the underground utility owner/operator should have the opportunity to inspect the damage and make appropriate repairs.

22. NOTIFICATION OF EMERGENCY PERSONNEL

If the protective covering of an electrical line is penetrated or gases or liquids are escaping from a broken line which endangers life, health or property, the excavator should immediately contact local emergency personnel or call "911" to report the damage location. This practice is already required by a majority of the states' one-call legislation. In these situations, local authorities are able to evacuate as appropriate and command substantial resources unavailable to the excavator or underground utility owner/operator.

23. EMERGENCY EXCAVATION

ACTIONS

When an emergency excavation, maintenance, or repair is required, initiation may be immediately performed, provided that the excavator notifies the one-call center and utility owner/operator as soon as reasonably possible. This includes situations that involve danger to life, health, or property, or that require immediate correction in order to continue the operation or to assure the continuity of public utility service or public transportation.



24. BACKFILLING

The excavator should protect all utilities from damage when backfilling an excavation. Trash, debris, abandoned lines, coiled wire, or other material that could damage existing utilities or interfere with the accuracy of future locates should not be buried in

the excavation. Extra caution must be taken to remove large rocks, sharp objects, and large chunks of hard packed clay or dirt.

25. AS-BUILT DOCUMENTATION

In order for a utility owner/operator to maintain accurate records of the location of their facilities, it is critical that the contractor installing the new facility be required to notify the utility owner/operator of deviations to the planned

installation. Some utility owners/operators do not require a full-time inspector and use a sampling process to insure the new utilities are being installed correctly and in adherence to the specifications. When this occurs, it becomes much more critical for the contractor to notify the utility owner/operator of changes. For example, it is common for the contractor to make adjustments in the location of the new utilities when rocks or other underground obstructions are encountered or the location of the new utility conflicts with another existing underground facility. This change in plan can be both changes in horizontal or vertical distances from the specified plans. Once these changes to the expected location are communicated to the utility owner/operator, it is their responsibility to take appropriate action to update their records so that an accurate locate can be conducted in the future.

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Information accurate as of July, 2007.



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