

## Excavation Job Planning

<b>Purpose</b>	This document contains items to consider when developing a job plan to excavate safely around underground facilities.
<b>Reference</b>	<ul style="list-style-type: none"><li>• 49 CFR 195.442 – “Damage Prevention Program”</li><li>• Company permits, job plans, and procedures</li><li>• API RP1166</li><li>• API RP1172</li><li>• CGA Best Practices (current edition)</li><li>• State laws and regulations</li></ul>
<b>Appendices</b>	<ul style="list-style-type: none"><li>• Appendix: Procedures and Forms</li></ul>
<b>Related Toolbox Topics</b>	<ul style="list-style-type: none"><li>• Excavation Monitoring and Observation</li></ul>

**Introduction:**

Operators have various methods or procedures within their organization that describes or define how pipeline excavation projects should be conducted. Operators are responsible for implementing construction and excavation practices that prevent damage to underground facilities.

**CONSIDERATIONS:**

- Review all applicable State and Federal regulations and Company procedures
- Effectively plan out the excavation, so it complies with all Local ordinances, State and Federal regulations and Company procedures
- Verify proper documentation has been obtained prior to construction or excavation (One Call ticket, Operator Qualifications, Job Scope, Construction/Excavation Plans, etc.)
- Survey area to identify and locate aboveground and belowground structures
- White line the proposed construction and excavation area prior to one call notifications
- Conduct project meetings with stakeholders prior to construction and/or excavation to discuss project plans and activities
- Obtain crossing or encroachment requirements from stakeholders
- Locate underground and aboveground pipeline/structures for proper placement of heavy equipment
- Locate and mark underground facilities with temporary markers in response to a One Call
- Assure owners/operators of underground facilities have located and temporarily marked their facilities prior to construction or excavation activity
- Evaluate safety risks before excavating and implement risk mitigations where applicable
- Establish communication channels with stakeholders about any changes to the project, plans, scope, excavation activities, equipment changes or schedule
- Prepare and communicate emergency procedures for the site
- Inspect and monitor excavation site

**Planning:**

Pipeline operators may use a variety of methods to effectively plan an excavation project.

**CONSIDERATIONS: Items to consider when developing an excavation job plan**

- Establish a Project Manager to oversee and plan the Excavation project
- Verify alignment sheets, proposed drawings, and any additional mapping for route / project
- Coordinate One Call tickets for the project
- Identify what equipment type is necessary to safely perform the excavation project

- Establish that personnel shall comply with the Operator Qualification Program where applicable
- Establish clear roles and responsibilities of all project team members (examples: Authorized Representative, Competent Person, spotter, etc.) responsible for monitoring and inspecting the excavation
- Evaluate and mitigate all known and anticipated risks associated with project(s)
- Establish excavating boundaries and required set-back distances from utilities in proximity of work
- Establish isolation measures (pot-holing, barriers, permits, etc.)
- Establish Authorized activities (pot-holing, mechanized equipment, attachments, etc.)

When evaluating and mitigating Operator's Risk associated with the project:

#### **CONSIDERATIONS: Risk Assessment**

- Contractor History of performance and experience
- Excavating equipment operator experience level
- Location of excavation
- Number of Contractors and Subcontractors
- Inspection (soil, pipe, equipment, route, etc.)
- Environmental Review (permits, spills, remediation, etc.)
- Types of facilities involved (active, idle, or abandoned)
- Excavating machine type (size, flat bar vs. toothed bucket, operator visibility, etc.)
- Excavation Type (Pit-type, Trench-type, bore, etc.)

#### **Project Planning Leader/Manager Responsibilities:**

The Pipeline Operator should identify appropriate personnel to manage the project who will be accountable for project planning, site safety, and daily work activities.

#### **CONSIDERATIONS: Responsibilities**

- Complete a Daily Excavation Checklist prior to beginning the excavation
- Verify all OQ Qualifications, Permits, and Procedures are being followed
- Identify when risk levels, isolation measures, and unauthorized activities arise

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## 1 Appendix A: Procedures and Forms

*This appendix contains company-specific operating practices, forms, checklists, reports, or other company practices. The purpose of this information sharing is to promote pipeline safety by allowing companies to consider a variety of company safety practices that may enhance pipeline safety in appropriate situations. API takes no position on whether the practices described below are appropriate for any particular pipeline operator, pipeline facility, or operating condition. These examples are not API Standards or Recommended Practices (although some examples may incorporate portions of API Standards or Recommended Practices). Use of mandatory or advisory terms such as “shall,” “shall not,” “must,” “may,” “may not,” or similar terms reflect the submitting company’s particular practice, and should not be interpreted as necessarily reflecting mandatory or advisable practices by API.*

### 1.1 Planning for Excavation and Trenching Work Procedure Example

1. The Contractor conducting the excavation activities:
  - a. Is responsible for compliance with One Call notification, including any needed updates, as defined by applicable State requirements. Emergency One Call notifications should only be made as defined by applicable State One Call law.
  - b. Shall attempt to receive positive response from all underground utilities identified on the One Call ticket(s) and ensure Company assets are identified on the One Call ticket(s).
  - c. Should complete a secondary sweep of planned excavation area to identify any unknown utilities.
2. The Authorized Representative will complete sections 1 and 2 of the Daily Excavation Checklist prior to beginning the excavation.

Note: All Company owned and/or operated lines must be marked by the Company to ensure the party performing the work is aware of all lines in and/or adjacent to the excavation.

1. All above ground structures within the boom radius of the excavation equipment being used must be identified, and proper precautions with respect to location and spacing of equipment are taken:
  - a. A minimum 10’ clearance from electrical equipment is required.
  - b. If the 10’ clearance distance cannot be maintained, arrangements must be made with the utility provider to cut the power or provide alternative means to protect the line from incidental contact.
2. Any underground vessel or other structure footings should be located and identified to avoid damage during the excavation work activities.

3. Alignment Sheets or other drawings will be reviewed to verify if known appurtenances such as stopple fittings, purge or equalization fittings, or other connections are in close proximity on any underground piping being excavated.
4. Pipeline Control Center (when applicable) will be notified and asked to monitor the pipeline system during the excavation.
5. All contract personnel must be approved under the Operator Qualification Program for the work assigned when the line is under the jurisdiction of DOT or a State regulatory agency.
6. Prior to any digging, the area of excavation is probed (or hydro-excavated) in a pattern extending at least 12" beyond the intended perimeter of the trench/hole:
  - a. At the discretion of the Company Operations Supervisor or Authorized Representative, hand digging or hydro-excavation may be required to obtain visual verification of the line identified during the probing process before any mechanical digging is commenced.
  - b. All Company assets must be marked as designated in the line locating procedure.

Note: All excavations must be in compliance with 29 CFR 1926, Subpart P.

### **1.1.1 Mechanical Excavation**

1. When soil conditions permit, all backhoe buckets used by contractors for excavation near existing facilities or equipment must have a safety bar across the "teeth" to prevent line snagging that may cause damage to line and/or coatings.
  - a. In addition, "side-cutters" may need to be removed from the bucket if soil conditions permit.
2. The Company Operations Supervisor or designated employee must approve:
  - a. The use of teeth and/or side-cutters on backhoe buckets.
3. The use of handheld mechanical devices such as jackhammers and chipping guns.
  - a. No track-hoe with a hydraulic excavator will be allowed to be used on any project or excavation job with quick-connect couplers unless the excavator has been retrofitted to allow the safety pin to be manually inserted behind the front and/or rear lever of the coupler assembly.
4. The Inspector and Operations Supervisor or Authorized Representative on the job site will inspect all equipment with hydraulic excavators before excavation work commences to ensure that the safety pin has been properly inserted behind either the front or rear locking lever.
  - a. Any operational and/or mechanical failure of the excavation equipment is immediately corrected, or the equipment is taken out of service or replaced.

5. Inspections of the equipment, prior to operating, are the responsibility of the equipment owner/operator and are done daily and in accordance with OSHA requirements.
6. Alternative excavation methods are required for the following conditions:
  - a. Rocky soil conditions when determining the exact depth and location of a line; OR
  - b. Multiple lines exist in close proximity to each other; OR
  - c. Known foreign crossings are present.
7. These conditions and situations create a risk of line damage in using the conventional excavation equipment and require the application of the following methods:
  - a. Excavating parallel to the pipeline(s) from a location upstream or downstream where centerline and depth of cover can be positively verified;
  - b. Pot holing the area of activity with hydro-excavation equipment; and
  - c. Hand digging.
8. In some cases, the combination of one or more of the listed techniques may be used in conjunction with conventional excavation equipment. This must be reviewed and approved by the Authorized Representative.
9. When excavating pipeline(s) for any type of foreign pipeline crossing, maintenance or inspection activity, the excavation is done parallel to the existing pipeline(s).
  - a. Digging perpendicular to the pipeline is prohibited until the line is exposed.

### **1.1.2 Tolerance Zone**

1. Tolerance Zone is defined as a minimum of 18" from the outer edge of the pipe (in all directions), or as defined by State regulations, whichever is greater.
2. Mechanical excavation equipment used to remove material surrounding a Company pipeline must maintain a minimum buffer of at least 18", or as defined by State regulations, whichever is greater, between the excavation equipment and the circumference of the pipeline(s).
3. Nonmechanical excavation equipment (hydro vacuum, hand tools, water jet) may be used within the tolerance zone at any time.

### **1.1.3 Mechanical Excavation within the Tolerance Zone**

Mechanical excavation within the Tolerance Zone of energized underground pipelines presents additional risks that must be addressed. As such, other reasonable alternatives must be reviewed during the Job Planning process, including lowering the line pressure and/or taking the pipeline out of service during the excavation activities. Mechanical Excavation within the Company's defined tolerance zone of in-service pipelines may be allowed only if all of the following conditions have been met:

1. Project Manager, Field Engineering or Operations must develop a written Job Plan that clearly identifies the mechanical equipment type(s), including the use of special attachments (i.e., hammer hoes, tampers, augers, etc.).
  - a. Special attachments, including any part of the powered equipment, may not be used within 6" of any in-service underground pipeline or facility.
  - b. The use of hammer hoes, or similar attachments, within the tolerance zone of energized underground pipelines, shall be limited to Integrity rehab projects where it is necessary to provide clearance to properly inspect and repair anomalies or where stopples must be installed with the pipeline in-service. Other activities may require a Variance.
2. The pipeline(s) must be free of buried side taps, split tees, or other buried appurtenances in the area being excavated. The most recent Internal In-Line Inspection (ILI) run and Alignment Sheets, for the pipeline(s) to be excavated, must be reviewed by Field Engineering, Operations or Pipeline Integrity to identify all PI's, taps, or other buried appurtenances:
  - a. If any buried side taps, split tees or appurtenances exist or potentially exist, no mechanical equipment can be used inside the tolerance zone.
  - b. If no pipeline data or drawings exist, no mechanical equipment can be used inside the tolerance zone.
3. A Company representative or Inspector must notify the local Operations Supervisor and Pipeline Control Center prior to the Excavator commencing the project.
4. The Excavator shall exercise all necessary reasonable care to protect the pipeline in or near the excavation area.
  - a. Excavators shall maintain a minimum of 6" of clearance between the pipeline and location of the hydraulic arm and any attachments (not just the end or tip of the bucket, hammer hoe, tamping or other device).

Note: Mechanical excavation inside the tolerance zone of in-service pipelines should only be performed by an experienced equipment operator who is proficient with the equipment and attachment(s) being used.

1. Mechanical excavation is allowed at a prescribed distance per state requirements, from the top of pipe (TOP).
2. Once within the prescribed distance per state requirements, the TOP must be exposed via hand digging or vacuum excavation until the TOP is continuously exposed and sides of pipe identified via probe bar(s).
3. If it has been determined, there are no buried side taps, split tees or other buried objects on the pipeline(s), then with the TOP exposed, and sides of pipeline identified via probe bars, mechanical excavation can begin to within 6" of the outer edge of the pipeline(s).



4. The remaining 6" of soil must be removed via hand digging or vacuum excavation.

#### **1.1.4 Competent Person**

1. A designated "Competent Person" is responsible for each excavation when the excavation is to be entered by workers.
2. The contractor is accountable for designating the qualified "Competent Person" for the job.
3. The "Competent Person" is responsible for:
  - a. Conducting soil testing by a visual and a manual method to determine the protective system(s) to be used in the excavation and documenting the results;
  - b. Removal of employees from the hazardous area where evidence of possible cave-in, failure of protective systems, hazardous atmospheres, or other hazardous conditions exists;
  - c. Completing the designated portion of the Daily Excavation Checklist form and maintaining the documentation at the work site; and
  - d. Identifying hazards and taking prompt corrective measures to eliminate identified and predictable hazards which endanger excavation entrants.
4. The "Competent Person" will have and be able to demonstrate the following: Training, experience, knowledge of soil analysis; use of protective systems; and requirements of 29 CFR Part 1926, Subpart P.
  - a. The "Competent Person" certificate of training will be completed, retained and available for review by an Authorized Representative upon request.

#### **1.1.5 Daily Inspection**

1. The "Competent Person" shall make daily inspections of excavations that will be entered by personnel, the adjacent areas, and protective systems for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. The "Competent Person" shall document the daily inspections in the Daily Excavation Checklist.
  - a. An inspection shall be conducted prior to the start of work and as needed throughout the shift.
  - b. Inspections shall also be made after every rainstorm or other hazard increasing occurrence.
2. If 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 will be removed from the area until the necessary precautions have been taken to ensure their safety.

## 1.2 Engineering and Construction Guideline Example

### 1.2.1 Engineering Guidelines

1. OPERATOR constructs, repairs, operates and maintains its pipelines in compliance with current U.S. Department of Transportation (DOT) regulations, industry and company standards for safe operations. Should Encroaching Party propose plans that infringe on OPERATOR's rights or affect OPERATOR's ability to meet these requirements, modifications to the pipeline or plans will be required. The cost of all such modifications shall be borne by the Encroaching Party. The following guidelines apply to Encroaching Party and any contractors, agents and or representatives it uses for construction activities conducted in OPERATOR's right-of-way and /or affecting OPERATOR's pipelines:
2. In order to maintain immediate and unimpeded access to the pipeline, no trees, shrubs, permanent structures (i.e., buildings, decks, sheds, swimming pools, inlets, drainage structures, hydrants, poles, etc.) bodies of water shall be placed within the pipeline right of way.
3. The depth of earth cover over the pipelines shall be maintained and never changed in any manner without the express written consent of OPERATOR. In some cases, additional cover may be required.
4. In areas where the pipeline currently has less than three feet (3') of cover, no grade cuts will be allowed. Cover over the pipeline shall be increased to a minimum of three (3) feet if there are proposed "improvements" over the pipeline or within the pipeline right-of-way. Proposed road crossings have additional requirements.
5. Proposed grading which will place the pipeline at depths greater than seven feet (7') shall require an OPERATOR Engineering Department written approval.
6. In areas where buildings are proposed within fifty feet (50') of the pipeline facility, vertical cover over the pipeline should be increased to a minimum of four feet (4"), maximum of seven feet (7').
7. The creation of steep slopes within the pipeline right of way that will hinder access and maintenance shall be avoided. Maximum slope of 5 to 1 within the ROW.
8. The creation of stormwater outfalls or other water management controls which would make the pipeline right-of-way more susceptible to erosion shall be avoided or mitigated. Proposed gabions and rip rap structures must adhere to the vertical one foot (1') vertical clearance requirement. Geotextile protection may also be required.
9. Drainage swales shall maintain a minimum of three feet (3') of vertical clearance between the O.D. of the pipeline and the bottom of the swale. Additional protection may be required in order to minimize erosion susceptibility over the existing pipeline and across its associated right of way.

10. No fences will be allowed on the ROW without OPERATOR's prior written approval. Fences shall be easily removable and not to obstruct the view of the ROW for inspection purposes. No Masonry, brick, or stone fences will be allowed. Fences that are perpendicular to the pipeline(s) shall include a gate sixteen feet (16') in width for equipment to pass through. Fence posts shall not be placed within 5 feet of the pipeline(s). Fences that are parallel to the pipeline(s) shall be located outside the pipeline's ROW.
11. Proposed residential driveway crossings shall be designed to provide a minimum of three feet (3') (maximum of 7 feet) of vertical clearance between the O.D. of the pipeline and the finished surface. Exceptions must be approved by OPERATOR's Engineering Department
12. Proposed driveway/road crossings should be designed to be as perpendicular to the pipeline as possible. Proposed crossings of angles less than 30 degrees will not be accepted.
13. Proposed commercial entrance crossings shall be designed to provide a minimum of four feet (4'), maximum of seven feet (7') of vertical clearance between the O.D. of the pipeline and the finished surface.
14. Proposed road ditches shall be designed to provide a minimum of three feet (3') (maximum of 7 feet) of vertical cover above the top of the pipeline and the bottom of the ditch.
15. Road underdrains shall maintain a two foot (2') or greater minimum vertical clearance from the top of the pipeline.
16. Construction of parking lots over the pipeline(s) shall not be permitted without OPERATOR's prior written approval in an Encroachment Agreement releasing OPERATOR from any and all future damages to the parking lot due to pipeline maintenance and repair.
17. Structures such as guide rails, concrete paving, sidewalks, curbing, etc. shall be designed in a manner that would facilitate their removal in the event of pipeline maintenance or an emergency repair.
18. Proposed crossings by utilities or underground structures shall be designed to pass under the pipeline unless otherwise approved by OPERATOR's Engineering Department.
19. Proposed utilities shall cross as perpendicular to the pipeline as possible.
20. All underground facilities or structures crossing the pipeline shall maintain a two foot (2') minimum vertical clearance between the O.D. of the pipeline and the proposed utility structure.
21. Utility crossings of the pipeline shall be shown on profile with field verified pipeline depths and proposed clearances clearly labeled.

## 1.2.2 Power Cable Installations

1. Secondary Crossings (less than 440 Volts):
  - a. Must be installed UNDER the pipeline, (unless otherwise approved by OPERATOR's Engineering Department), provided the two-foot (2') minimum vertical clearance is maintained between the bottom of the pipeline and the top of the conduit. The cable must be placed in conduit for the width of the right-of-way, and a drive post with an electric company marker shall be placed on each side of the pipeline right-of-way.
2. Primary Crossings (greater than 440 volts):
  - a. Must be installed UNDER the pipeline, (unless otherwise approved by OPERATOR's Engineering Department), with a minimum two-foot-six-inch (2'6") vertical clearance between the pipeline O.D. and the top of the conduit. The cable shall be placed in conduit for the width of the pipeline right-of-way. The conduit shall be protected by pouring of 2000 psi concrete, dyed red, into the ditch for a minimum distance of five feet (5') on both sides of the pipeline. The concrete must span the width of the ditch. A minimum two-foot (2') vertical clearance must be maintained between the O.D. of the pipeline and the top of the concrete.
  - b. For all electrical crossings, a drive post with an electric company marker shall be placed and maintained on each side of the pipeline right-of-way

## 1.2.3 Open Trench Fiber Optic Mainline Cable Installations

1. The cable must be installed UNDER the pipeline with a minimum two-foot-six-inch (2'6") vertical clearance between the bottom of the pipeline O.D. and the top of the fiber optic cable.
2. Fiber optic cables must be encased in six inches (6") of concrete, dyed orange, for a minimum distance of five feet (5') on both sides of the pipeline. The concrete must span the width of the ditch.
3. Fiber optic company markers must be installed and maintained at the crossing location on both sides of the pipeline right-of-way.
4. For bored or HDD installations see OPERATOR Construction Guidelines

## 1.2.4 Cathodic Protection:

1. Cathodic protection is employed to control corrosion on OPERATOR pipelines and other facilities. Cathodic protection may have a detrimental (interference) effect on adjacent and crossing metallic structures.
2. Possible detrimental cathodic protection effects should be evaluated by the owner/developer with appropriate mitigative actions taken if these effects are found to be an issue for the owner/developer facility. Mitigation of detrimental effects from cathodic protection is possible by using non-metallic structure materials, loose barrier

coatings, bonded coatings and/or bonded coatings with cathodic protection. However, it is best to consult with those knowledgeable in the field of cathodic protection and cathodic protection interference mitigation to determine what is best for the owner/developer structure and configuration

3. If cathodic protection is planned for the owner/developer structure, the OPERATOR One Call Engineering Department must be notified to allow our corrosion control personnel to install appropriate test facilities and evaluate possible detrimental cathodic protection effects on the OPERATOR facilities.

### 1.2.5 Proposed Residential Development

1. Submit a full set of plans, including detail sheets, whereby OPERATOR's easement is depicted through the proposed development.
2. Proposed residential layout shall be designed not to impede access along the OPERATOR right of way.
3. Designated equipment crossing locations must be identified, and prior to construction, a list of equipment types and weights must be supplied so that stress calculations can be completed to ascertain what type of protection over the pipeline right of way will be required to allow the crossings.
4. Proposed landscaping, utilities, drainage, grading and roadways and means of excavation, compaction, blasting, and rock removal within the development must comply with all restrictions stated in this document
5. Encroaching Party shall incorporate OPERATOR's Engineering and Construction Guidelines contained, herein, into any of the Encroaching Parties design and construction drawings issued "FOR BID purpose." All plan drawings issued either "FOR BID" or "For Construction" will display the following statement on the drawings in areas around OPERATOR's pipeline(s).

**WARNING: HIGH PRESSURE PIPELINE(S)**

No Excavation or Construction in this area without contacting the State One Call Center and OPERATOR at 1-888-xxx-xxxx

### 1.2.6 Construction Guidelines

The following guidelines apply to Encroaching Party and any contractors, agents and or representatives it uses for construction activities conducted in OPERATOR's right-of-way and/or affecting OPERATOR's pipeline(s).

1. State Law requires contractor and excavation companies contact the State One Call Center, prior to any excavation activity as required by your State Law. The nationwide telephone number for the State One Call Center is "811".
2. Encroaching Party shall conduct their activities in compliance with OPERATOR's Construction/Design Guidelines as well as any applicable agreement in place with Encroaching Party
3. The continued integrity of OPERATOR's pipelines and the safety of all individuals in the area of proposed work are of the utmost importance. Therefore, Encroaching Party shall meet with OPERATOR's operations and emergency representatives prior to construction. OPERATOR's on-site representative shall require discontinuation of any work that, in their opinion, endangers the operation or safety of personnel, pipelines, or facilities.
4. Notification shall be given to OPERATOR at least 10 days before the start of construction. A schedule of activities for the duration of the project shall be made available at that time to facilitate the scheduling of OPERATOR's work site representative. Any Encroaching Party schedule changes shall be provided to OPERATOR immediately.
5. Encroaching Party shall not commence work within OPERATOR's right of way or within twenty-five feet of an OPERATOR pipeline or appurtenance(s) without an OPERATOR representative being present.
6. No construction equipment will be allowed on the right of way unless approval to do so has been obtained from OPERATOR and the appropriate protection has been put in place to protect the pipeline and its right of way.
7. During installation of underground utilities or facilities that will utilize drilling, boring, or HDD the following must be adhered to:
  - a. Pot hole and expose the pipeline(s) to verify depth with a hydro-vacuum machine (with and OPERATOR representative on site).
  - b. Excavation of the boring and receiving pits shall be outside the right of way.
  - c. Each bore to be a minimum of three (3') from the bottom of the pipeline to top of proposed utility.
  - d. For HDD installation the completed drilled bore shall be a minimum of five feet (5') below the bottom of the pipeline(s).
  - e. Each bore shall cross existing pipeline as close to perpendicular (90 degrees) as possible.

- f. During pilot hole boring procedure, the boring subcontractor is to be aware of the depth of the boring bit head as it passes under the pipeline with metal detector type device.
  - g. Bore shall extend the entire width of the pipeline right of way.
  - h. Backfill and compact pot hole and bore pits.
  - i. Install above ground cable markers at each side of the ROW/easement.
  - j. The boring profile is to be available to OPERATOR upon request.
8. No "Non-Explosive" seismic testing or construction equipment with steady state vibrator, intermittent vibrator, or thumper sources shall be conducted within 150 feet of OPERATOR's pipeline without OPERATOR written approval.
  9. No blasting shall be allowed within 300 feet of OPERATOR's facilities without a blast plan review by OPERATOR and written approval. Notification of blasting shall be given to OPERATOR including a complete blasting plan. At a minimum, the blasting plan shall include a drawing with blast pattern, distance from orientation with respect to the pipeline. It must include spacing between holes, rows, amount of explosives in each hole, manufacturer, and associated energy release ratio. A pre-blast meeting shall be conducted by the organization responsible for blasting. OPERATOR requires a signed and executed blasting indemnification agreement before authorized permission to blast can be given. A written emergency plan shall be provided by the organization responsible for blasting.
  10. No materials or equipment are to be stored within the existing pipeline right-of-way without OPERATOR's prior written approval.
  11. No leach beds, wells, cesspools or sewer systems will be permitted within the OPERATOR ROW.
  12. An OPERATOR inspector must be on site during any work within the pipeline right-of-way.

**Note:** CONTACTING OPERATOR DIRECTLY DOES NOT EXONERATE YOU OF THE LEGAL OBLIGATION TO NOTIFY YOUR STATE ONE CALL CENTER. PLEASE CALL 811 BEFORE YOU DIG!

Additional questions can be submitted to OPERATOR by calling the OPERATOR Design Review Team at xxx-xxx-xxxx or 1-888-xxx-xxxx, You can also contact local OPERATOR field representatives at the following numbers for Line locates and depth verifications.

xxx-xxx-xxxx or 1-888-xxx-xxxx

## 1.3 Excavating Pressurized Lines and Excavating Near Other Utilities Procedure

### 1.3.1 Operator Initiated and Third Party Excavation Activities

1. Before power excavation within 24" (610mm) of the pipeline, or as specified by state law, whichever is more stringent, the line must be positively located with a water probe; probe rode, vacuum truck or exposed by hand. If a probe rod must be used, inspecting the coating in the excavated area is required, and any damaged areas must be repaired before backfilling. DO NOT locate pressurized lines using power equipment.
2. Power Equipment excavation should be done parallel to the pipeline unless right-of-way congestion prevents adequately positioning excavating equipment. Digging across the line with power equipment should be avoided wherever possible.
3. Once the pipeline is exposed, no power equipment shall dig closer than 24" (610mm) or as specified by state law, whichever is more stringent, to any point on the circumference of the pipeline and probing shall be done during excavation. A spotter will work with the equipment operator to ensure the pipeline or coating is not damaged. Report any damage to the pipeline to the Operator supervisor immediately.



## 1.4 Line Excavation Procedure

### 1.4.1 Purpose/Scope

The purpose of this procedure is to define the specific requirements for pipeline protection when conducting excavations in close proximity to OPERATOR pipelines. The user may also refer to OPERATOR Engineering and Construction Guidelines for Working Near Operator Right of Way, Pipelines, and Facilities. General, as well as, general Excavation Safety Requirements found in OPERATOR HES Procedure.

This controlled procedure applies to all Operator Partners units and facilities.

### 1.4.2 Definitions

#### Excavation

Any man-made cut, trench or depression in the earth's surface, formed by earth removal.

#### Trench

A narrow excavation below the surface of the ground, less than 15 ft. wide, with a depth usually greater than the width.

### 1.4.3 General

**Note** – Before any excavation begins, utilize the appropriate state One Call system to determine the location of utility installations (i.e., sewer, telephone, fuel, electric, or any other underground installations) that may be encountered.

1. All excavations must be conducted with strict adherence to the OPERATOR's Operator Qualification (OQ) Program, the Excavation Safety Requirements identified in the HES Procedure, and all Federal, State, Local, and OSHA requirements.
2. Excavations that involve exposing of a pipeline must employ the use of a toothless bucket; solid bar welded to bucket digging teeth, or plastic bucket to mitigate the potential of pipeline damage. Hydrovac excavation is an option. In all cases, a digging spotter is required.
3. Each OPERATOR representative on an excavation site is responsible for taking appropriate actions to ensure the safety of the public, protection of the environment, and the integrity of the pipeline. Such actions may include but are not limited to the following: shutting down the excavation, shutting down the pipeline operation, or making the appropriate notifications.

### 1.4.4 Key Responsibilities

The Supervisor or designee is responsible for ensuring compliance with this procedure and the Excavation Safety Requirements (see HES Procedure – Excavation Safety Program, & Competent Person Daily Excavation Check List) for all excavations that occur within their area of responsibility.

### 1.4.5 Procedure/Process

1. OPERATOR Performed Line Locate and Excavation Process - All excavations of OPERATOR DOT-regulated pipelines shall be recorded on a Maintenance Record Form. All OPERATOR excavations (including location by pot-holing) shall be conducted in the following manner:
  - a. Prior to excavation, clearly mark the area to be excavated per OPERATOR Procedure, "Performing Line Locates" and notify the appropriate One Call agency of planned excavation activities per local requirements. Marking requirements (method and color of markings) and the One Call notification requirements (timing and information) vary by state.
  - b. Ensure all utilities and known appurtenances are properly marked by the owner or located by the contractor and marked for exact location prior to the excavation.
    - i. Visually survey property and section lines for the presence of nonreported utilities.
    - ii. Review available information on the excavation site to identify non-reported utilities and pipeline appurtenances. Possible sources of information include alignment drawings (i.e., updated construction drawings, county maps, plat maps, etc.), Decision Support System (DSS), inline inspection data, and historical One Calls.
    - iii. Consider utilization of line locator to scan the excavation site in all directions from the centerline of the pipeline to identify possible underground structures.
  - c. The utmost care will be given to all utilities during excavation and the maintenance of the pipeline.
    - i. Identify/Develop a plan to excavate adjacent utilities and provide appropriate support to third party structures.
    - ii. Coordinate excavation work with involved third party utilities and or contractors
  - d. Acquire from a Company representative any specific third party crossing requirements.
  - e. Perform Site Evaluation noting all potential hazards and develop an action plan to eliminate potential danger (Hazard Assessment). Conduct a detailed documented Pre-Job Safety Meeting and complete the Excavation Work Permit.
  - f. Notify the Control Center of the location and type of work being performed and, if necessary per Technical Procedure ensure that the appropriate pressure restriction has been implemented prior to the excavation of an Immediate Repair Condition as defined in Operator Procedure.

- g. Excavation Observer: The excavator is required to have an observer to assist the equipment operator when operating equipment around known underground facilities.
  - h. Company or contract personnel will probe all OPERATOR pipelines within the ROW for exact depth and location prior to excavation. This will be achieved by using an Insulated Metal Soil Probe equipped with a blunt or ball nose probe bar tip (ex: Mighty Probe make or equal) to protect individuals from underground electrical potential. Company or contract personnel shall use extreme care during probing to not damage the pipeline protective coating. After locating the exact depth of the pipeline, the probes (a minimum of two probe bars per location required) will be offset to a minimum of one foot from the pipeline. These probes will be placed to the side of the line that the operator intends to dig on (this will allow the operator to view the angle that the pipeline is running).
  - i. Additional Excavation Safety Requirements that should be considered include Competent Person Requirements, proper sloping and benching, and the need for trench boxes.
  - j. The operator will commence digging to the side of the pipeline (maintaining an 18-inch distance until the pipeline has been exposed) until reaching a depth of two feet below the bottom of the pipeline. No machine work permitted within 18 inches of the pipeline.
  - k. The operator may use the back of the digging bucket (only if deemed safe by the company representative or inspection personnel) to crumb the soil off the top of the pipeline (crumbing can occur no closer than 12-inches above the pipeline).
  - l. Company or contract personnel shall remove the remaining soil (exposing pipe) by means of a shovel or other approved means, such as hydrovac.
  - m. Once the pipeline is clearly visible, the excavation of the pipeline using an excavator may continue. The operator shall exercise extreme care within the 18-inch tolerance zone for protection of the pipeline and underground utilities at or near excavation area.
  - n. Under no circumstances shall the operator be allowed to align the center of the excavator over the center of the pipeline. The excavator will be aligned in such a manner that the boom of the excavator will push straight down the long axis of the pipeline maintaining a minimum of one-foot distance from the pipeline. If the depth of the pipeline is shallow, consideration shall be given to the load distribution over the pipeline and the need for ramping or plating.
  - o. At any excavation site, all OSHA or State required equipment will be maintained.
2. Third Party Excavations Near OPERATOR Pipelines - No third party excavations of OPERATOR's pipelines shall be initiated until OPERATOR pipelines have been marked per the Performing Line Locates procedure. No excavation work shall be conducted within 25 feet of OPERATOR pipelines without an OPERATOR inspector present. The following limits

shall be observed on excavations near OPERATOR pipeline where the pipeline is not exposed and where an OPERATOR inspector is present to oversee work. Exemptions from the below standard may be granted from Operations or Engineering on a case by case basis (e.g., shared ROW).

- a. Plows, Trenchers, and Bulldozer rippers – no closer than 10-feet.
  - b. Track Hoes and Augers – no closer than 5-feet.
  - c. Rubber Tired Backhoes – no closer than 3-feet.
  - d. Hand dig only within 3-feet. (Use of alternate digging methods may be utilized if reviewed and approved by an onsite Company Representative, and work is monitored during digging).
3. OPERATOR Field Guidance Requirements for Foreign Line Crossings of OPERATOR Pipelines(s)  
The following requirements shall be met unless an alternative is approved and documented by OPERATOR Engineering Department or the Region/District Manager.
4. All crossings handled under these rules shall be documented utilizing the proper OPERATOR Maintenance Form, a copy of which shall be attached to the appropriate One Call ticket in the One Call Ticket Management system. The Excavator/Locator Orientation document shall also be completed and executed by the encroaching party and a copy attached to the appropriate One Call ticket in the Ticket Management System.
5. Refer to the Engineering and Construction Guidelines for an example of working near the OPERATOR. Right-of-Way, Pipeline, and Facilities.

Note: Any proposed foreign crossings that cannot meet the minimum requirements stated below or any proposed construction that requires encroachment into the OPERATOR Pipeline Easement or near OPERATOR Pipeline(s) must follow the process as outlined in Operator Procedure “Review Process for Third Party Planned Excavations.” Approval from OPERATOR Engineering is required along with written permission from the OPERATOR Right of Way Department prior to the start of any work within the OPERATOR Easement. Reference OPERATOR General Restrictions (ENGINEERING AND CONSTRUCTION GUIDELINES) for working in Pipeline Right of Way for additional information.

#### **1.4.6 Pipeline Crossings**

1. All foreign line crossings must cross below OPERATOR pipeline(s) and must adhere to the required minimum of 24 inches (2 ft.) of separation from the bottom of the OPERATOR Pipeline(s) and the top of the crossing entity.
2. An OPERATOR representative must be on site for all work that will take place within the OPERATOR pipeline easement. Excavation method to meet OPERATOR requirements.
3. Depth verifications shall be completed prior to any allowed crossing(s) to ensure that the two-foot (2') required clearance can be met during construction. Pot-holing may be required at contractor's expense.

4. The OPERATOR pipeline(s) must be exposed during construction to ensure the required two-foot (2') clearance is maintained while the crossing utility is installed
5. The proposed crossings must be designed to be as perpendicular to the pipeline(s) as possible. Proposed crossings of angles less than 30 degrees will not be accepted.

#### **1.4.7 Power Cable Installations (See Engineering Guidelines)**

1. Secondary crossings (less than 440 volts) must be installed with the required two-foot (2') minimum clearance, placed in conduit or concrete for the width of the right-of-way and a drive post with an electric company marker installed on each side of the pipeline right of way to identify the crossing.
2. Primary crossings (greater than 440 volts) shall be installed with a minimum clearance of two-foot-six-inch (2'6"), placed in conduit for the width of the right-of-way and protected by pouring 2000psi concrete, dyed red, into the ditch for a minimum distance of five feet (5') on both sides of the pipeline. The concrete must span the width of the ditch. A minimum two-foot (2') vertical clearance must be maintained between the O.D. of the pipeline and the top of the concrete. Electric company marker must be installed on each side of the pipeline right of way to identify the crossing.

#### **1.4.8 Fiber Optic Open Trench Installations (See Engineering Guidelines)**

1. The cable must be installed UNDER the pipeline with a minimum two-foot-six-inch (2'6") vertical clearance between the pipeline O.D. and the top of the fiber optic cable.
2. Fiber optic cables must be encased in six inches (6") of concrete, dyed orange, for a minimum distance of five feet (5') on both sides of the pipeline. The concrete must span the width of the ditch.
3. Fiber optic company markers must be installed and maintained at the crossing location on both sides of the pipeline right-of-way.

#### **1.4.9 Fiber Optic Installation by Method of Drilling or HDD (See Construction Guidelines)**

1. Pot hole and expose the pipeline(s) to verify depth with the hydro-vacuum machine (with an OPERATOR representative on site).
2. Excavate on the outside, each side, of pipeline Right-of-Way for boring and receiving pits.
3. Bore the hole for the proposed utility under the pipeline.
4. Each bore to be a minimum of three feet (3') from the bottom of the pipeline to top of proposed utility. For HDD installation the completed drilled bore shall be a minimum of five feet (5') below the bottom of the pipeline(s).
5. Each bore shall cross existing pipeline as close to perpendicular (90 degrees) as possible.
6. During pilot hole boring procedure, the boring subcontractor is to be aware of the depth of the boring bit head as it passes under the pipeline with metal detector type device.
7. Bore shall extend the entire width of the pipeline ROW/easement.

8. Backfill and compact pot hole and bore pits.
9. Install permanent above ground cable markers at each side of the ROW/easement.
10. The boring profile is to be available OPERATOR upon request.

#### **1.4.9.1 Cathodic Protection**

All pipeline crossings that utilize a cathodic protection system must be evaluated by the OPERATOR Corrosion Control Department. Notify the appropriate Corrosion Control Department Representative to determine if test leads are required to evaluate potential interference with the OPERATOR system.

#### **1.4.9.2 Verbal Approval by OPERATOR Field Techs- (Home Owner Utilities)**

On occasion, verbal approval may be provided for the crossing of homeowner “utilities” above the pipeline by OPERATOR Field Techs. These exceptions to the Engineering Guidelines must be documented and filed on the proper OPERATOR Maintenance Form.

#### **1.4.9.3 Ethane Pipelines-**

Refer to the OPERATOR Ethane Manual for special considerations related to excavations around Ethane piping.

#### **1.4.9.4 Required Clearance 24”**

The encroaching entity may not be able to adhere to the General Restrictions (Engineering and Construction Guidelines) of 24” below existing pipe due to existing underground utilities or unforeseen obstacles. Any variation of routing must be documented on the appropriate Maintenance Record form and redlined on the alignment sheets or facility drawings for final update submittal.

Exposed Pipeline Support Exposed pipeline must be supported if the excavation exceeds a certain length. Un-supported exposed pipe length varies based on pipe diameter and weld type. Refer to Attachment B for the maximum limits a pipeline can be exposed without supplemental supports.

*Acetylene Welds - The support guidelines listed in Attachment B do not apply for acetylene-welded lines. Acetylene welds should always be fully supported horizontally and vertically during excavation. A planned excavation longer than 5- feet on an acetylene welded line should be brought to the attention of Engineering and/or the Area Maintenance Supervisor. When acetylene welds are exposed, weld-wraps shall be installed per the OPERATOR Welding Manual (reference listing of identified acetylene welded OPERATOR pipelines). Care shall be taken to ensure no deflection occurs in an acetylene weld*

1. Pipeline Inspection - Exposed pipe must be inspected prior to backfill. Guidelines for the pipe inspection are outlined in Operator Procedure.

2. **Coating Requirements** If the external coating is damaged or removed, the external surface of the pipeline shall be coated with an approved coating per OPERATOR Construction Specifications, The coating shall be applied and cured (if applicable) per the manufacturer's specifications prior to backfill. The coating shall be inspected for coating holidays using visual inspection or a holiday detector, whichever is appropriate for the existing or repaired coating. The use of rock-shield shall be considered to protect the external pipeline coating from rocky backfill and underground pipe movement.
3. **Backfill Requirements** - The following steps shall be taken to ensure the OPERATOR pipeline is not damaged during the backfill operation:
  - a. Prior to excavation, the appropriate Maintenance Record must be filled out.
  - b. Excavation and backfill material shall be free of any trash and debris. In particular, any metal objects as they may damage coating and cause interference on ILL assessments.
  - c. Backfill material should be free of rocks or any non-soil material. If the material that came out of the hole has been mixed with rocky material, it should be manually segregated using the backhoe before returning to the area within a two-foot diameter around the pipeline.
  - d. Clean imported material such as sand is acceptable. Contaminated soils can damage the coating and or be mistaken for a release. No contaminated soils may be used as backfill unless approved and documented by the Maintenance Supervisor and Corrosion Control Supervisor.
  - e. Place backfill around the pipe. The material must be placed around (not pushed) on top of the pipe until there are two feet of clean fill around the pipe. Make sure the pipe is supported with clean fill below the pipeline prior to placing backfill on top of the pipe. Sandbags constructed of woven fabric (like burlap or woven geotextile) may be used to ensure adequate pipeline support. Solid plastic bags or concrete bags are not permitted for use.
  - f. Ensure that the material is properly compacted – Refill hole in maximum
  - g. 12-inch lifts and use hand or powered mechanical tamper to compact. Compaction equal to undisturbed soil must be achieved. No compaction may occur directly over the pipe until 18” of the cover has been established. Reference OPERATOR Construction Standard, 0308 – Pipe Padding, Shading, and Backfill
  - h. Installation of pipe protection or warning tape approximately 12-inches below finished grade above the pipeline with warning markings that indicate the presence of a High-Pressure Hazardous Liquid Pipeline or Natural Gas Pipeline may be required. Pipe protection may include warning/snow fence or marking tape, concrete slabs, or other material that provides a warning/barrier between the pipeline and the ground surface. Reference OPERATOR Construction Standard– Pipe Padding, Shading, and Backfill.

- i. In areas where the pipeline has less than 3-foot cover, no grade cuts will be permitted

#### **1.4.10 Key Documents/Tools/References**

- Procedure Performing Line Locates
- Procedure Pipeline Inspection
- OPERATOR Construction Standard Excavation
- OPERATOR Construction Standard Foreign Lines
- OPERATOR Construction Standard– Pipe Padding, Shading, and Backfill
- HES Procedure Excavation Safety Program, & Competent Person
- Daily Excavation Check List
- General Restrictions for Working within the Pipeline Right of Way (Damage Prevention Website) (including Engineering and Construction Guidelines)
- OPERATOR Ethane Manual
- Operator Emergency Response Manual



**ATTACHMENT A (For Reference Only)**

***OPERATOR - GENERAL RESTRICTIONS FOR WORKING WITHIN THE PIPELINE RIGHT  
OF WAY  
General Restrictions***

**Reference Only**  
**Right-of-Way General Restrictions**  
**Operator**

1. Detailed plans for proposed construction in accordance with OPERATOR's Engineering Restrictions must be submitted to Operator Engineering Department for review and approval to determine to what extent, if any, the pipeline or right-of-way will be affected by the proposed construction and/or development.
2. A driveway or roadway may cross the right-of-way and pipeline perpendicularly, but at no time will it be parallel to, over and within the right-of-way.
3. Buildings, swimming pools, sheds, decks, trees, shrubs or any obstruction of a permanent nature shall not be constructed, planted or placed within the right-of-way and easement. The width of the easements vary, but typically structures closer than (25') feet to any existing pipeline (50' easement) are not permitted. You must contact Operator' Right-of-Way Department at (xxx) xxx-xxxx to determine the easement width for a specific property.
4. Wells, leach beds, cesspools or sewer systems of any type shall not be placed within the right-of-way.
5. All underground facilities crossing the right-of-way shall cross under the existing pipeline with a minimum of 24-inches clearance. This includes, but is not limited to, sewer drain lines.
6. The earth cover over the pipelines shall be maintained and never changed in any manner without the express written permission of Operator.
7. Any parking area placed over the pipeline with permission of Operator shall be subject to an amendment to an agreement entered into by subject parties prior to construction of same.
8. If heavy equipment is to cross the existing pipeline for any reason, it will be necessary for the crossing party to provide and maintain a ramp of sufficient material to protect said pipeline. The operator will make the decision as to how much fill and what other type of protective structure, if any; will be required for the ramp. Upon completion of construction and discontinuation of heavy equipment passage over the pipeline, the ramp may be removed
9. An Operator' inspector must be present at the time that any work is done within Operator' right-of-way.
10. No blasting is permitted within 300 feet of the pipeline. Anything less than 300 feet must have the approval of an instruction from Operators' Engineering Department.
11. Should you have any questions or need additional information on the aforementioned Paragraphs 1 through 10, please call Operator' Right-of-Way Department at (xxx) xxx-xxxx.

12. State law requires you to contact your State One Call Center as listed below, at least two or three days in advance, as required by your state, prior to any construction activity:
13. In addition to the legally required notice referenced above and to schedule an Operator' Inspector to witness work in the vicinity of the pipeline, please call the selected Operator' Office below.

**NOTE: CONTACTING OPERATOR DIRECTLY DOES NOT RELIEVE YOU OF THE LEGAL OBLIGATION TO NOTIFY YOUR STATE ONE CALL CENTER. (PLEASE CALL COLLECT IF OUTSIDE THE AREA CODE)**

**ATTACHMENT B**  
*Pipe Span Support Requirements*

**PIPE SUPPORT TABLE**

<b>NOMINAL PIPE SIZE (IN.)</b>	<b>MIN. WALL THICKNESS (IN.)</b>	<b>MAX. UNSUPPORTED SPAN (FEET)</b>
3 - 5	0.188	12
6 -10	0.219	20
12 - 20	0.219	30
22 - 30	0.219	35

Listed spans are based on:

- A coated pipe filled with water.
- No external loading (valves, soil load, or other loads in the vertical or horizontal direction).
- This table does not apply to acetylene welded pipe. See Reference restrictions on acetylene welds.

If site conditions vary from those listed above, then contact engineering to have the span calculated in accordance with API 1117.

## 1.5 Excavation Standard Procedure

### 1.5.1 Scope

This Excavation Standard (“Standard”) establishes Excavation requirements for First and Second Party Excavation activities on or near Operator (OPERATOR) owned and/or operated assets for the purpose of protecting people from injury and Underground Facilities from damage during Excavation-related activities.

The application of this Standard meets the site-specific requirements for an Excavation program as required by U.S. Department of Labor 29 CFR 1926.650 –1926.652.

This Standard does not supersede any laws, regulations, or statutes, nor relieve any personnel responsible for work covered by this Standard from knowing and complying with applicable laws, regulations, or statutes.

**Out of Scope:** Requirements for Locating and Marking Third Party Excavations are included in OPERATOR Locating and Marking Underground Facilities Manual. Deviations from this Standard must be approved in advance of the work, using the process outlined in OPERATOR Policy, Development and Use of OPERATOR Approved Documents and are documented (see OPERATOR Management of Change).

### 1.5.2 Definitions

Also, refer to the OPERATOR’s Frequently Used Acronyms list on the OPERATOR employee website.

**Abandoned** – A Pipeline that has been physically separated from its source and is no longer maintained under regulation 49 CFR Parts 192, 195, or applicable state regulation, and has been permanently removed from service (i.e., OPERATOR will not reactivate), as defined in OPERATOR Inactive and Abandoned Pipeline Management Procedure.

**Benching** – 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 an Excavation Shield or Support System, and sudden movement of the soil or rock material into the Excavation, either by falling or sliding, in sufficient quantity that it could entrap, bury, or otherwise injure and immobilize a person.

**Competent Person** – A trained OPERATOR employee or Contractor who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees; and who has the authorization to take prompt corrective measures to eliminate them. The Competent Person must have specific training in, and be knowledgeable about, soils analysis and the use of protective systems.

**Contractor** – Any entity (other than OPERATOR or an Operator affiliate) or individual (other than an OPERATOR employee) contracted to provide services to/or on behalf of OPERATOR, including, but not limited to:

- Entities/individuals contracted or under purchase order to provide maintenance services, construction services, or to support process activities that cause them to be exposed to EH&S hazards
- Entities/ individuals under the direct supervision of OPERATOR personnel and/or entities/individuals providing services for OPERATOR under contracted supervision.
- Entities /Individuals Excavating on behalf of OPERATOR

**EH&S Blanket Work Permit** – Multi-part document that addresses communication, planning, and control of the risks associated with work practices. This permit is used in place of the EH&S Work Permit where the level of risk for the type of work or area where work is performed is low and unlikely to change.

**EH&S Work Permit** – Multi-part document (Safe Work, PPE, Hot Work, Confined Space, Energy Control, and Personnel Accountability) to address communication, planning, and control of the risks associated with work practices.

**Excavation** – Any manmade cut, cavity, trench, or depression in the earth’s surface formed by earth removal.

**Excavation Work** – Work performed to create an Excavation, which may include augering, blasting, boring, digging, ditching, dredging, drilling, driving-in, grading, plowing-in, pulling- in, ripping, scraping, trenching, tunneling, and vacuum using either air or water, or work performed in or around an Excavation.

**Excavator** – Any individual or entity engaging in or preparing to engage in Excavation Work.

- First Party Excavator – an Excavator who is an OPERATOR employee
- Second Party Excavator – Contractor hired by OPERATOR and performing Excavation activities on behalf of OPERATOR
- Third Party Excavator – an Excavator not associated with OPERATOR

**Exposed Underground Facility** – Any utility or structure buried or placed below the ground that has been visually verified through the use of Positive Locating Practices.

**Hazardous Atmosphere** –An atmosphere that can expose employees to risk of death, incapacitation, and impairment of ability to self-rescue (i.e., escape unaided from a Permit Required Confined Space or an Excavation), injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL).
- Airborne combustible dust at a concentration that meets or exceeds its LEL. **Note:** This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet or less.
- Atmospheric oxygen concentration below 19.5% or above 23.5%.
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit (PEL) is published in 29 CFR 1910 Subpart Z, Toxic and Hazardous Substances, which could result in employee exposure in excess of its dose or PEL.

- Any other atmospheric condition that is Immediately Dangerous to Life or Health.

**In-service** – Equipment or piping that has not been isolated and/or is under pressure or contains product or gas.

**Lower Explosive Limit (LEL)** –The minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source

**Locating and Marking** - Preliminary methods used to identify the existence of, and estimate the location and path of an Underground Facility through use of electronic line locators, probes, flags, paint, or other industry-accepted tools.

**One Call** – An approved state Excavation notification program designed to increase Excavation safety and reduce damage to Underground Facilities.

**Occupational Safety and Health Administration (OSHA)** – An agency of the Department of Labor with safety and health regulatory and enforcement authority for most U.S. businesses and industries.

**Permissible Exposure Limit (PEL)** – The level of exposure established as the highest level of exposure that an employee may be exposed to without incurring the risk of adverse health effects.

**Positive Locating Practices** –Methods used to expose an Underground Facility within the Tolerance Zone to the extent necessary to visually confirm the depth, dimension, path, and alignment of Underground Facilities. Methods include hand-digging, pot-holing, vacuum excavation, hydro excavation, or other non-mechanized methods.

**Positive Response** – A documented communication with an Excavator, or if required, a State One Call Notification Center, to advise that Underground Facilities are clear of the proposed Excavation, or have been marked (i.e., by phone, fax, e-mail, face-to-face, clear flags, or markers).

**Prohibited Zone** – At a minimum, a 1-foot distance from any side of the exposed In-Service Underground Facilities where Excavation methods using mechanical equipment are typically not permitted.

**Ramp** – An inclined walking or working surface, constructed from earth or structural materials, such as wood or steel, used to gain access from one point to another.

**Registered Professional Engineer** –. An individual who is registered as a professional engineer in the state where the work is to be performed. A professional engineer registered in any state is deemed a Registered Professional Engineer when approving designs for manufactured protective systems.

**Shall/Must/Will** – A mandatory requirement.

**Shield** – 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 pre-manufactured or job-built in accordance with 29 CFR 1926.652(c) (3) or (c)(4). Shields used in Excavations are usually referred to as “Excavation boxes” or “Excavation Shields.”

**Shoring** – A structure, such as a metal hydraulic, mechanical, or timber system, that supports the sides of an Excavation and is designed to prevent Cave-ins.

**Should** – A preferred or recommended action or methodology.

**Sloping** – A method of protecting employees from Cave-ins by excavating to form sides of an Excavation that 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 factors such as the soil type, environmental conditions of exposure, and application of surcharge loads.

**Soil Classification** – A method of classifying Type A, B, and C soil and rock deposits based on site and environmental conditions and on the structure and composition of the earth deposits.

**Type A Soil** – Cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils include clay, silty clay, sandy clay, clay loam, and in some cases, silty clay loam and sandy clay loam. Cemented soils, such as caliche and hardpan are also considered Type A.

Examples of non-Type A Soils include: fissured soil; soils subject to vibration from heavy traffic, pile driving, or; similar effects; soil that has been previously disturbed; soil that is part of a sloped, layered system where the layers dip into the Excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or soil material that is subject to other factors that would require it to be classified as a less stable material.

**Type B Soil** – Cohesive soil with an unconfined, compressive strength greater than 0.5 tsf (48 kPa), but less than 1.5 tsf (144 kPa), or granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam.

Also considered Type B, are previously disturbed soils, except those which would otherwise be classed as Type C soil; soil that meets the unconfined, compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; dry rock that is not stable; or material that is part of a sloped, layered system where the layers dip into the Excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

**Type C Soil** – Cohesive soil with an unconfined, compressive strength of 0.5 tsf (48 kPa) or less, or granular soils, including: gravel, sand, and loamy sand; submerged soil or soil from which water is freely seeping; submerged rock that is not stable; or material in a sloped, layered system where the layers dip into the Excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

**Spoil Pile** – Material removed during an Excavation.

**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** – Refers to a structure, such as underpinning, bracing, or Shoring, which provides support to an adjacent structure, underground installation, or the sides of an Excavation.



**Tolerance Zone** – The minimum distance (as defined by each state) from any side of an Underground Facility, where Positive Locating Practices shall be used prior to allowing the use of mechanical equipment. See Appendix A to this Standard for state-specific Tolerance Zone details.

**Underground Facility** – Any installation, utility or structure buried or placed below the ground for use in connection with the storage or conveyance of electronic, telephone, or telegraphic communications; water, sewage, cable television, electric, oil, gas, or other substances, and includes pipes, conduits, ducts, cables, wires, valves, manholes, catch basins, cathodic assets (AC mitigation cables, anode beds, rectifier cables, test leads, etc.) and attachments to these items.

**White-lined** – A practice by which the perimeter of a proposed Excavation location is identified on the ground surface

### 1.5.3 Responsibilities

#### 1.5.3.1 Competent Person

- OPERATOR employee or Contractor who has a shared responsibility for the continued safety of personnel and the protection of Underground Facilities in and around the Excavation Work, including ongoing verification/inspection, locating/marketing and has the sole responsibility for determining Soil Classification.
- Identifies and ensures there is readily available emergency rescue equipment, such as a breathing apparatus, safety harness, and line, or a basket stretcher, when a Hazardous Atmosphere exists or may reasonably be expected to develop during work in an Excavation.
- Performs the necessary inspections to identify situations that could result in hazardous conditions (e.g., possible Cave-ins, indications of failure of protective systems, Hazardous Atmospheres, or other hazardous conditions), and then ensure corrective measures are taken.
- Documents each inspection on OPERATOR Daily Excavation Checklist.
- Designs Ramps or Structural Ramps if applicable.
- Works with Permit Authorized Employee and the Safety Lead to ensure daily safety meetings are conducted for onsite personnel.

#### 1.5.3.2 Heavy Equipment Operator

- OPERATOR employee or Contractor who has a shared responsibility for the continued safety of personnel and the protection of Underground Facilities in and around the Excavation Work, including ongoing verification/inspection, locating/marketing and has the sole responsibility for determining Soil Classification.
- Prior to each shift, inspects the heavy equipment.
- Maintains safe operating condition of the heavy equipment.
- Understands and adheres to the Tolerance Zone requirements.
- Maintains visual contact with the spotter.

- Ensures that probing and marks are maintained and visible.
- Maintains a minimum one-foot distance from all known Underground Facilities.
- Ceases Excavation activities if the OPERATOR Inspector or other OPERATOR representative is not present and watching the Excavation while excavating in close proximity to an in-service Underground Facility Project Manager.
- Manages and provides oversight of the project schedule and execution of the Excavation Work in accordance with this Standard.
- Plans the Excavation, including all items listed in this Standard.

### 1.5.3.3 Permit Authorized Employee

- OPERATOR employee or Contractor who has a shared responsibility for the continued safety of personnel and the protection of Underground Facilities in and around the Excavation Work, including ongoing verification/inspection and locating/marketing.
- Writes, issues, and reviews with the Safety Lead the EH&S Work Permits and EH&S Blanket Work Permits, and initiates energy control to the process/equipment, as appropriate, for the work in his/her respective areas of responsibilities (see OPERATOR Policy Reference, EH&S Work Permit).
- When applicable, coordinates with a Project Manager for the Excavation project.
- Inspects the Excavation site daily to ensure all precautions are being followed upon issuance of the EH&S Work Permit.
- Works with the Competent Person and the Safety Lead to ensure daily safety meetings are conducted for onsite personnel.

### 1.5.3.4 Safety Lead

- OPERATOR employee or Contractor who, with the Permit Authorized Employee, ensures that the area is properly prepared to begin work, and hazards and precautions concerning the job are communicated to affected personnel.
- OPERATOR employee or Contractor who has a shared responsibility for the continued safety of personnel and the protection of Underground Facilities in and around the Excavation Work, including ongoing verification/inspection and locating/marketing,
- Is identified on the EH&S Work Permit and must be present at the job site while workers perform Excavation job tasks.
- Reviews information on the appropriate EH&S Work Permit or the EH&S Blanket Work Permit with the Permit Authorized Employee (see OPERATOR Policy Reference, EH&S Work Permit)
- Works with Permit Authorized Employee and the Safety Lead to ensure daily safety meetings are conducted for onsite personnel.

### 1.5.3.5 Heavy Equipment Spotter

- OPERATOR employee or Contractor who has a shared responsibility for the continued safety of personnel and the protection of Underground Facilities in and around the Excavation Work, including ongoing verification/inspection and locating/markings. Ensures that probing and marks are maintained and visible.
- Understands and adheres to the Tolerance Zone Requirements.
- Maintains visual contact with the heavy equipment operator.
- Ceases excavation activities if the OPERATOR Inspector or other OPERATOR representative is not present and watching the Excavation while excavating in close proximity to an In-Service Underground Facility.

### 1.5.3.6 Managing Director, Compliance & EHS

- Responsible for ownership and implementation of this Standard.
- Reviews deviations to this Standard as necessary.

## 1.5.4 Processes and Key Elements

The table below contains a summary of the information contained in this section.

Section	Description
A	<b>Excavation Plan Requirements</b> – The Excavation plan should include/address the following items prior to beginning Excavation activities: Project Manager, permits, pipeline operating pressure, Excavation site parameters, Underground Facility, One Call notification, overhead power lines, and landowner/tenant notification.
B	<b>Excavation Design Requirements</b> – The Competent Person shall make an initial determination of the Excavation design prior to commencing the Excavation Work, and revises the design as needed during the Excavation.
C	<b>Staking and Locating the Pipeline Requirements</b> – Prior to excavating near In-service or out-of-service pipelines, the qualified personnel shall use a line locator to stake or otherwise clearly mark the location, depth, and direction of the pipeline to be excavated. The pipeline or Underground Facilities to be excavated should not be considered positively located until it is visible from above grade.
D	<b>Excavating Along the Pipeline Requirements</b> – When excavating along the located pipeline, the heavy equipment operator shall not allow any part of the bucket to get closer than one foot (or a distance greater than one foot, as required by state and/or local regulations) to the top, side, or bottom of the pipeline during the Excavation process. Heavy equipment operator shall not use a bucket without a flat bar while excavating within 20 feet of the centerline of a pipeline or utility, a bucket with side cutters, and shall use caution when excavating remaining material around the pipe. At least one spotter shall be present at all times during Excavation.

Section	Description
E	<b>Worker Protection Requirements</b> – If for any reason, the Excavation appears unsafe, workers have the authority to STOP WORK. The Safety Lead must be present at the job site while workers perform job tasks. The Permit Authorized Employee, Competent Person, and/or Safety Lead conduct daily safety meetings. The Competent Person shall inspect the Excavation before work begins and before entry into Excavations four feet and/or deeper.
F	<b>Post-Excavation Work Area Requirements</b> – Prior to closing out the EH&S Work Permit or leaving the work area, an open Excavation shall be barricaded appropriately and backfilled.

### 1.5.4.1 Excavation Strategy

The Excavation strategy should include/address the following items prior to beginning Excavation Work:

#### 1.5.4.1.1 Project Manager

The Permit Authorized Employee shall identify a Project Manager for the Excavation project.

The Project Manager is responsible for:

- Consulting with the OPERATOR Integrity Group or designee about suspected pipeline defects to determine if a remedial action, such as a pressure reduction, is appropriate.
- Ensuring the appropriate resources are available for the project (i.e., crew, equipment, and materials).
- Ensuring onsite personnel is informed of who is the Competent Person.
- Ensuring the following personnel is identified:
  - Permit Authorized Employee
  - Safety Lead
  - Registered Professional Engineer (when required)
- Ensuring protective systems are designed by a Registered Professional Engineer as required by this Standard and applicable laws, statutes, or regulations.
- Providing facility drawings and alignment sheets to assist in locating the pipeline and other Underground Facilities.
- Ensuring that Excavation workers have access to copies of applicable alignment sheets and drawings when appropriate.
- Confirming Contractors comply with One Call regulations.
- Verifying and ensuring that the Excavation design includes documented Tolerance Zone agreements, if applicable.
- Verifying the appropriate Excavation methods (e.g., hydro, vacuum, hand, backhoe, track hoe, and mini excavator) are selected, communicated and used in the proper location.
- Ensuring backfill procedures include soil compaction requirements where specified.

### 1.5.4.1.2 Permits

- The Project Manager shall ensure the required regulatory and/or environmental permits, including crossing and access permits, are obtained.
- The Permit Authorized Employee completes either an EH&S Work Permit or an EH&S Blanket Work Permit for all Excavation activities per OPERATOR Policy Reference, EH&S Work Permit.

### 1.5.4.1.3 Pipeline Operating Pressure

- Remedial actions, such as reduction of OPERATOR pipeline pressures, shall be managed as required by the OPERATOR Reference, Pipeline Integrity Management Program, and appropriate welding procedure.

### 1.5.4.1.4 Excavation Site Parameters

The Project Manager:

- Specifies the parameters of the proposed Excavation site.
- Reviews the latest revisions of all relevant drawings and alignment sheets to:
  - Identify any indicated pipe bends or elevation changes.
  - Identify the estimated location of utility installations, such as sewer, telephone, gas, electric, water lines, or other Underground Facilities that may be encountered during Excavation Work before digging.

### 1.5.4.1.5 Underground Facilities

- Unless otherwise specified by state law, a face-to-face meeting should be conducted with the owner/operator of Underground Facilities located within 25 feet of the proposed Excavation.
- Prior to Excavating within the Tolerance Zone of Underground Facilities, the location of the Underground Facilities shall be estimated through probing with a snub-nosed or ball bearing-tipped probe bar and confirmed by the use of the appropriate Positive Locating Practice

### 1.5.4.1.6 One Call System Notification

- The Excavator shall notify the appropriate State One Call system and must give minimum notice per applicable State One Call system requirements.
- If the Excavation site cannot be clearly described on the One Call ticket, a face-to-face meeting with the Underground Facilities owner/operator(s) should be conducted.
- The Excavator shall maintain State One Call ticket information and responses to locate requests and other notifications.

- In cases where municipalities or privately owned facilities are not required to participate in an established One Call system, and the location of the Excavation appears to be in proximity to an Underground Facility owned/operated by a municipality or private entity, the Excavator should contact the municipality or private entity within established or customary local notification times to advise of the proposed Excavation, and request that they mark the location of their Underground Facilities prior to the start of Excavation.
- If utility companies or private owners do not provide Positive Response to a locate request within the required timeframe, or cannot establish the exact location of their Underground Facilities, the Project Manager is required to notify the appropriate OPERATOR operations supervisor; the operations supervisor or designee shall make additional attempts to notify and request the Underground Facilities owner/operator(s) to provide a Positive Response for their Underground Facility prior to the start of Excavation.
- If all attempts to establish a Positive Response are unsuccessful, the OPERATOR Operations supervisor may allow the Excavation to proceed.
- The Project Manager shall confirm that owners/operators of Underground Facilities have been notified by One Call.
- Follow OPERATOR Policy Reference, Reporting and Tracking Incidents and Near Misses Guideline upon discovery of any unmarked or mismarked Underground Facility.
- Unless otherwise specified by state law, the One Call notifications shall not exceed 10 working days for ongoing excavation projects.

#### **1.5.4.1.7 Overhead Power Lines**

Where access, staging areas, or the planned Excavation is located near high voltage power lines, the following minimum clearances shall be maintained:

- Vehicular and/or mechanical equipment that has parts of its structure elevated near energized overhead power lines shall be operated so that a 10-foot clearance is maintained.
- If the voltage is higher than 50 kV, the clearance shall be increased four inches for every 10 kV over that voltage.
- Note: Contact the overhead utility company if any of the following is required:
  - Movement of poles
  - Potential to undermine a pole
  - Minimum specified distances cannot be maintained

#### **1.5.4.1.8 Landowner/Tenant Notification**

- The Project Manager shall ensure that landowners and/or tenants whose property may be impacted are notified of the Excavation date.
- An attempt should be made to notify the landowner and/or tenant of the hazards associated with the Excavation, and the attempted notification documented.

- The landowner's and/or tenant's acknowledgment should be documented if notification is made.
- Notice to the landowner and/or tenant should include the scope of the Excavation that is to take place in the area and a request for their assistance in locating pipelines and other Underground Facilities.
- In the case of an emergency where there is a potential threat to safety or significant environmental damage, notice to the landowner and/or tenant is not required (if impracticable to do so).

#### **1.5.4.2 Excavation Design Requirements**

The Competent Person shall confirm with the Project Manager the Excavation design prior to commencing Excavation Work, and consult with the Project Manager as needed during the Excavation.

During initial determination, the Competent Person verifies that the following requirements have been satisfied (when applicable):

- Notifications to the State One Call Center
- Positive responses received from Underground Facilities owner/operators
- The depth and dimension of the Excavation
- Required services of a Registered Professional Engineer
- Soil Classification
- Sloping requirements
- Shoring and/or Shielding equipment
- Pipeline supports
- Supports for nearby structures
- Placement of Spoil Piles

When an Excavation is anticipated to be 20 feet deep or more and large enough to occupy or otherwise affect the safety of workers, a Registered Professional Engineer shall be used to design the Excavation.

The size, type and configuration(s) of the material to be used in the protective system must be identified on the Excavation plan. A copy of the design must remain at the Excavation site until the Excavation is complete.

Excavations that are four feet deep or more shall be evaluated by the Competent Person for the appropriate protective systems to be used.

#### **1.5.4.3 Soil Analysis and Classification**

During Excavation, the Competent Person has overall responsibility for:

- Conducting soil analysis and Soil Classification of Type A, B, or C using approved methods.  
Note: Soil Classification of Type A, Type B, or Type C requires specific training on the

application of approved methods, which include visual and manual testing of the soil characteristics.

- Ensuring that Soil Classification is made based on the results of at least one visual and at least one manual analysis unless defaulting to Type C Soil.
- Electing to default all Soil Classification to Type C.

Acceptable tests are listed on OPERATOR-0057, Daily Excavation Checklist and described in §1926 Subpart P App A.

#### 1.5.4.4 Surface Encumbrances

All surface encumbrances that are located so as to create a hazard to workers or the pipeline shall be removed when appropriate or supported as necessary to safeguard workers and the pipeline.

#### 1.5.4.5 Configuration of Sloping and Benching System

Unless the trench is stable rock, all trenches over four feet in depth shall be Sloped, Shored, or Shielded.

Even where the trench is less than four feet in depth, these measures are required unless an examination of the ground by a Competent Person provides no indication of a potential Cave-in.

Sloping shall be in accordance with Table 1 below:

Note: Where a less stable soil lies over a more stable soil (e.g., soil Type B lies over soil Type A), the slopes shown in Table 1 can be used for each soil type. But when a more stable soil lies over a less stable soil (e.g., soil Type A lies over soil Type B) the entire trench wall shall be sloped in accordance with the least stable soil.

**Table 1: Sloping**

Soil or Rock Type	Maximum Allowable Slopes (H:V) for Excavations less than 20 feet deep
Stable Rock	Vertical (90 Deg.)
Type A	¾:1 (53 Deg.)
Type B	1:1 (45 Deg.)
Type C	1½:1 (34 Deg.)

Design of Support Systems and Shield systems shall be per §1926.652(c).

While the Competent Person may select any of the OSHA-approved trench designs, in most cases, the following simplified system may be used, provided the soil is similar to the depth of the trench, or the soil that is sloped or shored is assumed to be the least stable soil present.



### 1.5.4.6 Sloping/Benching for "Type A" Soils

- Soil is cohesive with significant clay content or is cemented hardpan (e.g., caliche).
- A vertical slope can be maintained without spalling.
- A thumb penetration test indicates the soil can be penetrated only with great effort.

The configurations shown in Figure 1 and Figure 2 are allowed. Simple benching for Type A Soils is shown in Figure 3.

Figure 1: Unsupported Vertically Sided Lower Portion

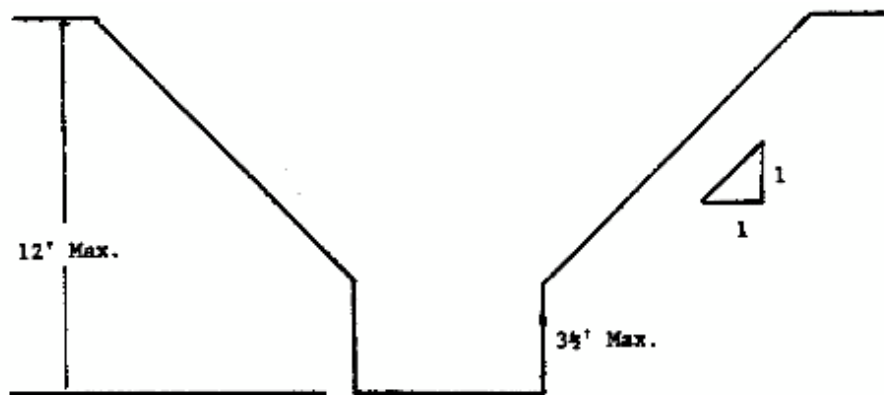


Figure 2: Simple Slope

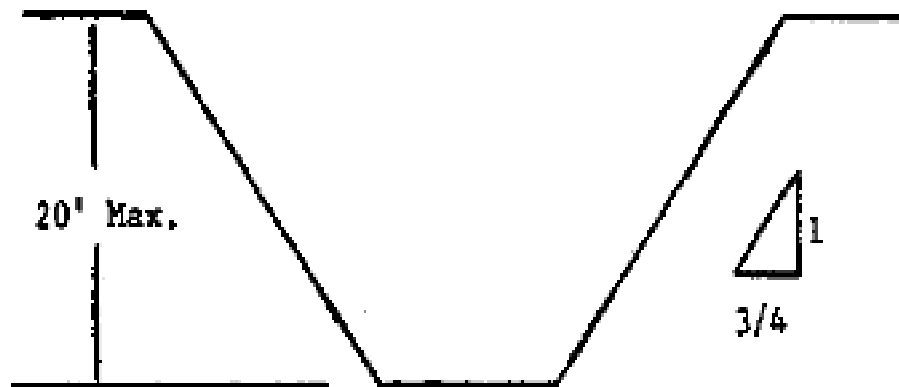
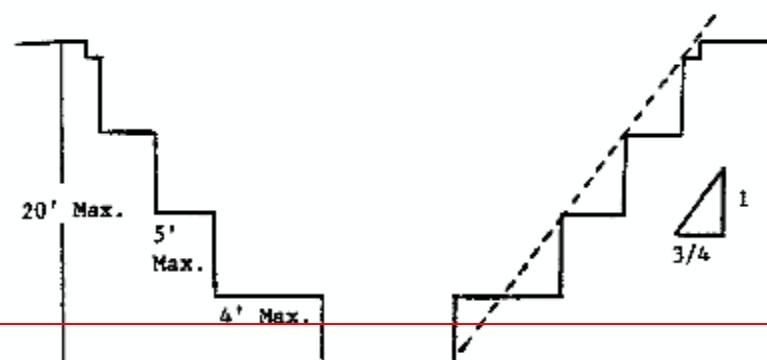


Figure 3: Simple Bench



### 1.5.4.7 Sloping/Benching for “Type B” Soils

- Soil with very low clay content or fissured soils.
- A vertical slope cannot be maintained without spalling.
- A moist sample cannot be rolled into 1/8” diameter threads. The configuration shown in Figure 4 is allowed.

Multiple 1:1 benching for Type B Soils is shown in Figure 5.

Figure 4: Simple 1:1 Slope

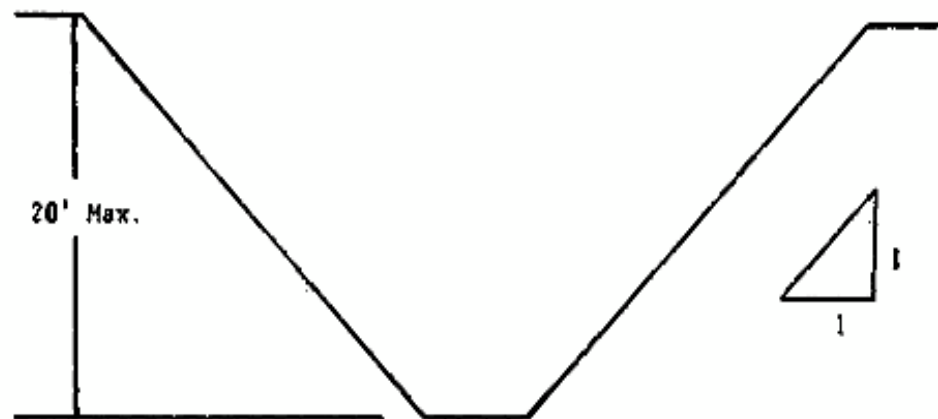
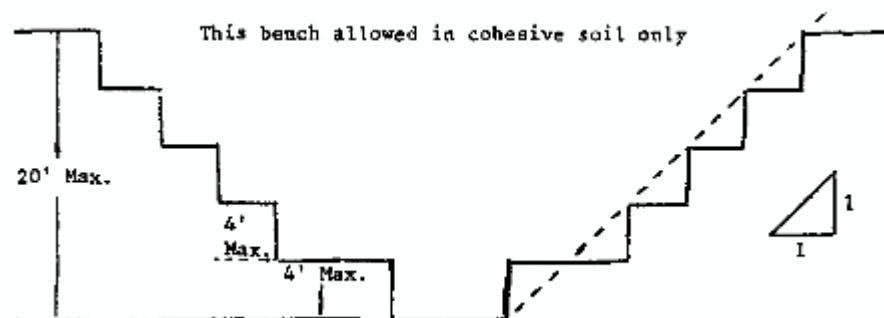


Figure 5: Multiple 1:1 Bench



### 1.5.4.8 Sloping/Benching for “Type C” Soils

- Soil is gravel, sand, coarse mixed sand, or unstable water-saturated soil.
- A thumb penetration test indicates the soil can be penetrated several inches. The configuration shown in Figure 6 is allowed.
- A trench box or trench Shield as shown in Figure 7 may be used for Type C Soils.

Figure 6: Simple 1½: 1 Slope

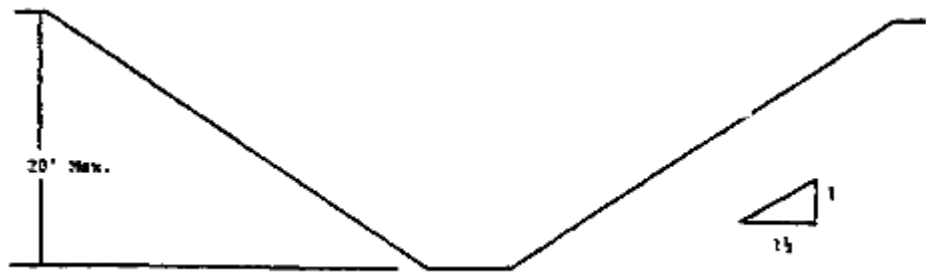
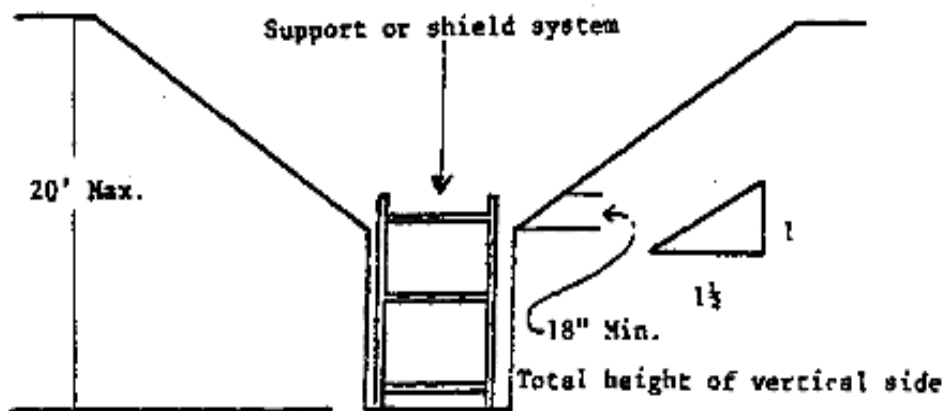
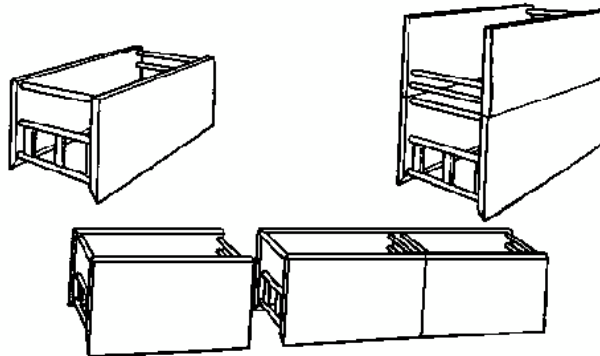


Figure 7: Trench Box (Trench Shields)



#### 1.5.4.9 Shoring and Shielding Systems

- Shoring and/or Shielding systems shall be designed by a Registered Professional Engineer.
- Only trench boxes (Shields) designed by a Registered Professional Engineer shall be acceptable (see Figure 8 below).
- Shields can be either pre-manufactured or job-built in accordance with OSHA 926.652(c)(3) or (c)(4).
- Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

**Figure 8: Trench Box (Shield) Examples**

## 1.5.5 Locating and Marking the Pipeline Requirements

### 1.5.5.1 Marking the Pipeline(s)

Prior to OPERATOR Excavating near In-service or out-of-service pipelines, qualified personnel shall:

- Use a line locator, such as an audio frequency conductive locator, to identify the location of stake placement or otherwise clearly mark the location, depth, and direction of the pipeline to be excavated. Where there is one or more parallel or adjacent pipeline or utility in the same right-of-way, all such pipelines/utilities shall be clearly marked.
- Mark the estimated location of the pipeline(s) with a maximum spacing between marks of 10 feet, and the markings shall extend at least 25 feet beyond both of the planned ends of the Excavation (unless state law specifies a greater distance).
- Stake all identified side bends along the entire length of the bend.

The electronic line locator shall only be used by qualified personnel per OPERATOR reference to Operator Qualification.

During Excavation, the Competent Person must verify:

- That the OPERATOR pipeline is marked and all other Underground Facilities in close proximity of the right-of-way and/or facility are marked.
- The positive location of the entire pipeline segment to be excavated from initial probing until the pipeline is visible from above grade.
- The pipeline/utility to be excavated and all other Underground Facilities on or near the right-of-way are properly identified and clearly marked.

**Note:** The line locating and marking practices described in this Standard are intended for OPERATOR Excavations on OPERATOR owned and/or operated Underground Facilities. Additional guidance and technical information provided in the OPERATOR Locating and Marking Underground Facilities Manual may also be used as a reference and applicable sections used in conjunction with the Excavation practices described in this Standard.

### 1.5.5.2 Positively Locating the Underground Facilities to be Excavated

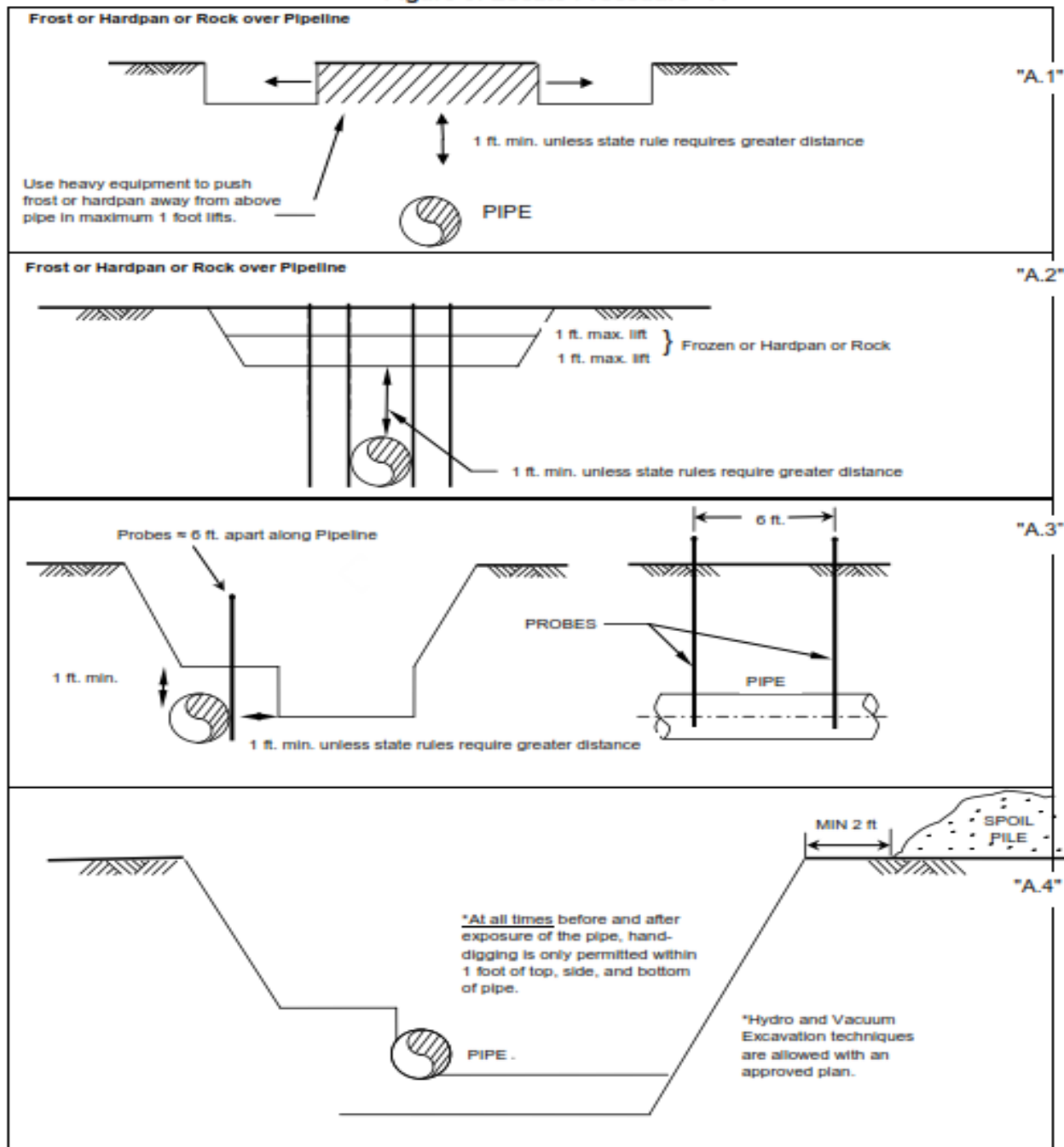
- All Underground Facilities to be excavated are considered positively located when they are visible from above grade.
- When probing, use a snub-nosed or ball bearing-tipped probe bar. Do not use a probe bar that has an edge or point of any kind. Exercise care when probing the line to avoid damaging the pipeline coating.
- The heavy equipment operator may dig no closer than the Prohibited Zone from any side of Underground Facilities, and at greater distances when required by applicable state law. See OPERATOR Daily Excavation Checklist

One or more of the procedures described below should be used to positively locate the pipeline in a safe manner.

### 1.5.5.3 Locate Procedure “A”

Step	Action
1	If frost or hardpan prevents probing, use heavy equipment to push frost or hardpan away from above the pipe in maximum 1-foot lifts (see Figure 9 below).
2	At two locations separated axially along the pipeline by approximately 6 feet, probe transversely across the pipeline at 90 degrees to the axis of the pipeline. Probe to identify both sides of the pipe and determine the depth of cover over the centerline of the pipe (see Figure 9 below).
3	Leave probes in the ground adjacent to the same side of the pipe at both axial locations 6 feet apart.
4	Excavate “offset trench” with heavy equipment parallel to, but offset from, the pipeline not nearer than 1-foot (600 mm) from the probes identifying the nearest edge of the pipe (see Figure 9 below).
5	Continue to deepen offset trench to a depth below the calculated bottom of the pipe, and allow the soil from above the pipe to fall (or be moved with a hand-shovel) into the offset trench until the pipe is visually exposed and visible to the heavy equipment operator (see Figure 9 below).

Figure 9: Locate Procedure "A"



#### 1.5.5.4 Locate Procedure “B”

Step	Action
1	Probe the pipeline to determine its location and depth.
2	Use hydro or vacuum Excavation or hand-Excavation to visually expose the pipe without using heavy equipment.
3	Expose a sufficient length of pipe to confirm the alignment.
4	Place a probe visible to heavy equipment operator at each edge of pipe visible to heavy equipment operator.
5	Excavate “offset trench” with heavy equipment parallel to, but offset from, the pipeline not nearer than 1-foot (600 mm) from the probes identifying the nearest edge of the pipe (see Figure 9 ).
6	Continue to deepen offset trench to a depth below the calculated bottom of the pipe, and allow the soil from above the pipe to fall (or be moved with a hand-shovel) into the offset trench until the pipe is visually exposed and visible to the heavy equipment operator (see Figure 9).

#### 1.5.5.5 Locate Procedure “C” – Rock Trench

Step	Action
1	Attempt to probe the pipeline to determine location and depth of cover.
2	Heavy equipment operator should slide or remove without digging, surface rock away from the Underground Facilities.
3	Hand-dig to the extent possible above the pipe.
4	Alternate probing, hand-digging, and rock lifting until the pipe is visually exposed.
5	Ensure rocks are not forced against the Underground Facilities.

#### 1.5.6 Excavating Along the Located Pipeline Requirements

When excavating along the located pipeline, the heavy equipment operator:

- Shall not allow any part of the bucket to get closer than the Prohibited Zone to the top, side, or bottom of the pipeline during the Excavation process. See OPERATOR, Daily Excavation Checklist.
- Shall ensure that probing and the continued use of paint, stakes, flags or other approved line locating and marking practices are maintained throughout the duration of the Excavation.

**Exception:** If the OPERATOR owned or operated pipe is going to be replaced, demolished, or Abandoned and it has been verified that the pipeline is isolated, depressurized and to the extent practicable, free of product, this limitation does not apply.

- Shall only use a bucket with a flat bar while excavating within 20 feet of the centerline of an Underground Facility. **Note:** Buckets with a paddle tooth design may be used on a case-by-case basis after a team review by OPERATOR Safety, Engineering/ Construction, and Operations personnel.
- Shall not use a bucket with side cutters.
- Shall use **caution** while excavating the remaining material around the pipe to prevent damage to the pipeline and the pipeline coating.
- Should consider and use soft digging practices, which include hydro or vacuum excavation, hand digging, etc., where appropriate. Examples of locations where soft digging practices should be considered include station work or multi-pipeline corridors where the location of Underground Facilities are unknown or can't be verified.
- At least one spotter shall be present at all times during an Excavation:
  - Where visibility is obstructed.
  - During equipment/material handling in or out of the Excavation.

The area over the pipeline must not be used as a pivoting point for moving heavy equipment without verifying the appropriate depth of cover or using construction mats that will prevent damage to the pipeline.

Note: Heavy equipment does not include Hydro Excavation or vacuum Excavation.

#### 1.5.6.1 Excavated Material

- Spoil Piles shall be placed no closer than two feet from the edge of the Excavation.
- Spoil shall be stacked at a minimum slope of 1.5 horizontal to 1 vertical, and at no more than a 45-degree slope.

#### 1.5.6.2 Worker Protection Requirements

If for any reason, the Excavation appears unsafe, workers have the authority to STOP WORK. The Excavation must be made safe and re-inspected by the Competent Person before entering.

No one is allowed to work alone in an Excavation without others present in the immediate area and maintaining communications.

The Competent Person ensures that workers are trained in the proper use, safety, and maintenance of Excavation safety equipment, methods, and techniques, as applicable.

The Safety Lead:

- Must be present at the job site while workers perform job tasks.
- Periodically monitors work.
- Verifies that a rescue pre-plan has been developed and communicated to workers if applicable.
- Prior to beginning Excavation Work, the Safety Lead:



- Reviews the appropriate EH&S Work Permit or EH&S Blanket Work Permit with applicable personnel.
- Ensures that workers and others that may be exposed to hazards controlled by the EH&S Work Permit are logged onto the permit.

### 1.5.6.3 Safety Meetings

The Permit Authorized Employee, Competent Person, and/or Safety Lead shall:

- Conduct daily safety meetings for onsite personnel.
- Ensure safety meetings are held prior to each shift and are specific to the Excavation practices and other important site-specific considerations covered by the EH&S Work Permit.

### 1.5.6.4 Excavation Inspections

The Competent Person shall:

- Inspect the Excavation before work begins and before entry into Excavations four feet or deeper for indications of sloughing, stress cracking, or other signs of soil failure, Cave-in, failure of protective systems, or Hazardous Atmosphere. Note: If any of these conditions are observed, including those that may affect the general public or the integrity of structures in or around the Excavation, they must be corrected before entry into the Excavation can be permitted.
- Inspect the Excavation as needed throughout the shift, as well as after every rain or another hazard that may occur.
- Document each inspection on OPERATOR, Daily Excavation Checklist.

The Permit Authorized Employee inspects the Excavation site daily to ensure all precautions are being followed upon issuance of the EH&S Work Permit.

### 1.5.6.5 Safety Precautions

- Workers should refer to the EH&S Work Permit, EH&S Blanket Work Permit, or PPE Hazard Assessment as applicable for PPE requirements. When a hazardous situation is identified, everyone must immediately exit the Excavation. Once necessary precautions are taken to eliminate the hazard and ensure the safety of those working at the job site, workers may return to the Excavation with the Competent Person's approval.
- Workers shall not be underneath suspended loads.
- When working in the Excavation, including during ingress and egress, workers shall remain within the protective system.
- Workers exposed to vehicular traffic or mobile construction equipment shall be provided with and shall wear a vest made of reflective material. Note: A minimum ANSI Class II reflective vest is required.

- Workers entering deep and confined footing Excavations shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials and shall be individually attended at all times while the employee wearing the lifeline is in the Excavation.
- Safe means of Ingress/Egress.
  - A stairway, ladder, Ramp, or other safe means of egress shall be located in trench Excavations that are four feet or more in depth so as to require no more than 25 feet of lateral travel for employees.
  - Ladders shall extend at least three feet above the top of the Excavation and shall be secured to eliminate movement.
  - Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

### **1.5.6.6 Water in the Excavation**

- Personnel 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.
  - If water is controlled or prevented from accumulating through the use of water removal equipment, the water removal equipment and operations shall be monitored by a Competent Person to ensure proper operation.
  - The Excavation shall also be evaluated by the Competent Person to determine if temporary flooring is required after water has been pumped out.

### **1.5.7 Atmospheric Monitoring**

The Safety Lead:

- Ensures initial atmospheric tests are performed with properly calibrated equipment.
- Ensures atmospheric tests are conducted and documented as specified by OPERATOR Policy Reference, EH&S Work Permit.

#### **1.5.7.1 Initial Monitoring**

- Adequate precautions shall be taken to prevent worker exposure to an atmosphere with less than 19.5% oxygen or more than 23.5% oxygen, and/or a concentration of flammable gas or toxic contaminants that exceed a PEL. See OPERATOR policy reference, EH&S Work Permit, Atmospheric Monitoring Log Section, for acceptable limits
- Prior to initial entry into the Excavation, the Permit Authorized Employee shall perform atmospheric testing of the Excavation.
  - The Permit Authorized Employee shall remain positioned outside of the Excavation using equipment that is capable of providing a representative sample of the Excavation atmosphere.

- Remote sampling pump, probes, and/or tubing shall be used to facilitate the initial monitoring.
- Emergency rescue equipment shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. The equipment shall be attended when in use. Examples of emergency equipment include:
  - Breathing apparatus
  - Safety harness and lifeline
  - Basket stretcher

### **1.5.7.2 Continuous or Periodic Atmospheric Monitoring**

Refer to OPERATOR policy reference, EH&S Work Permit, for requirements for continuous monitoring or periodic monitoring to protect employees working inside Excavations where a Hazardous Atmosphere may exist.

### **1.5.8 Walkway/Bridge across Trench**

- Where workers are required and/or permitted to cross over the Excavation, a walkway or bridge with standard guardrails and toeboards shall be provided.
- The walkway or bridge shall be approved for site use by the Competent Person and shall meet all applicable OSHA requirements.
- Guardrails which comply with 1926.502(b) shall be provided where walkways are six feet or more above lower levels.

### **1.5.9 Heavy Equipment and Tool Restriction**

- Do not place or position heavy equipment and tools so close to the Excavation that they would impact the structural stability of the Excavation.
- During entry operations, heavy equipment and tools shall be placed no closer than two feet from the edge of the Excavation at all times.
- If the equipment operator does not have a clear and direct view of the edge of the excavation, use a warning system, such as a barricade, hand-signals, or stop logs.
- Pile driving operations or any other construction operations that generate ground vibrations are not permitted around, near, or in the Excavation, while workers are in the Excavation.

### **1.5.10 Overhead Power Lines**

When workers are performing Excavation activities, including mobilizing equipment, in the vicinity of an overhead power line, the Competent Person shall ensure that the work is conducted in accordance with Operator Procedure.

### **1.5.11 Post-Excavation Work Area Requirements**

#### **1.5.11.1 Backfilling**

- Remove debris and rocks from the trench.

- Backfilling must proceed in a manner that will prevent personnel exposure to the hazards associated with Excavation and backfill activities while protecting the integrity of Underground Facilities.
- Backfill material shall be free of trash, debris, coiled wire, large rock, chunks of hard-packed clay or dirt, sharp objects, or other material that may damage the pipeline coating and/or pipeline or interfere with the accuracy of future locates.

### 1.5.11.2 Barricading

- Prior to closing out the EH&S Work Permit or leaving the work area, open Excavations shall be barricaded appropriately with orange construction fencing or equivalent protective methods and marked for easy recognition day or night.

**Note:** Trenches that are not feasible to barricade and do not pose a risk to people do not require barricading.

- Excavations must not be left open any longer than needed after the job task has been completed.

### 1.5.12 Assessment Criteria

The following criteria should be used to assess the effectiveness of this Standard:

- Review of a sampling of completed Daily Excavation Checklist
- Review of a sampling of completed EH&S Work Permits.
- Near Miss and Incident Investigations.
- On-site reviews of Excavation activities.
- Completion of training requirements
- Excavation oversight and trending data per Critical Work Oversight.

### 1.5.13 Training and Qualification Requirements

OPERATOR Employees and Contractors involved in Excavation Work:

- Shall complete initial training on the requirements of this Standard prior to performing Excavation Work or within 120 days of hire date or the start of role whichever comes first.
- Shall complete documented annual classroom training on this Standard and on OPERATOR Policy reference, EH&S Work Permit. Permit.
- Shall complete documented training on the following as applicable to the role of the individual performing Excavation Work:
  - Authorized Employee Certification
  - OPERATOR Excavation Standard
  - Soil Analysis/Protective Systems
  - Fire Extinguishers
  - Atmospheric Testing Equipment
  - HazCom

- Respiratory Protection
- Hearing Conservation
- First Aid/CPR
- Rescue
- Benzene
- Hydrogen Sulfide
- Asbestos

#### **1.5.14 Permit Authorized Employee**

- Must successfully complete applicable training requirements
- Must also be certified as qualified by the OPERATOR Operations Manager/Supervisor.
  - Certification is to be documented using the Authorized Employee Certification form

#### **1.5.15 Competent Person**

- Must successfully complete applicable training requirements
- Must have specific training in Excavation safe work practices, and Soil Classification of Type A, Type B, and Type C soils and the application of approved methods, which include visual and manual tests of the soil characteristics (unless defaulting to Type C).

#### **1.5.16 Operator Qualification Requirements**

Personnel must meet applicable requirements of reference to Operator Qualification.

#### **1.5.17 Refresher Training**

- Shall be assigned through the OPERATOR Management system
- Shall be conducted annually
- Shall target the same participants that received initial training

#### **1.5.18 Training Documentation**

Shall be retained per the OPERATOR Retention Schedule.

#### **1.5.19 References and Resources**

##### **1.5.19.1 OPERATOR Approved Documents**

- Development and Use of OPERATOR Approved Documents
- Reporting and Tracking Incidents and Near Misses
- Contractor Selection and Management Process
- Pipeline Integrity Management Program Manual
- Locating and Marking Underground Facilities Manual
- Training
- Operator Qualification

- EH&S Work Permit
- Management of Change
- Inactive and Abandoned Pipeline Management
- Daily Excavation Checklist
- Excavation Qualification Review
- EH&S Work Permit
- Authorized Employee Certification

### **1.5.19.2 Other Resources**

- OSHA FR 54:45909
- U.S. Department of Labor 29 CFR 1926.502(b), §1926.650(b), 1926.652(c)(3) or (c)(4), §1926 Subpart P, Excavations, App A

### **1.5.20 State Tolerance Zone Reference Sheets**

#### **1.5.20.1 Illinois Tolerance Zone Reference Sheet - (220 ILCSA 50/XXX) Illinois Underground Utility Facilities Damage Prevention Act**

##### **1.5.20.1.1 (220 ILCS 50/2.7)**

Sec. 2.7. Tolerance zone. "Tolerance zone" means the approximate location of underground utility facilities defined as a strip of land at least 3 feet wide, but not wider than the width of the underground facility plus 1-1/2 feet on either side of such facility based upon the markings made by the owner or operator of the facility. Excavation within the tolerance zone requires extra care and precaution including, but not limited to, as set forth in Section 4.

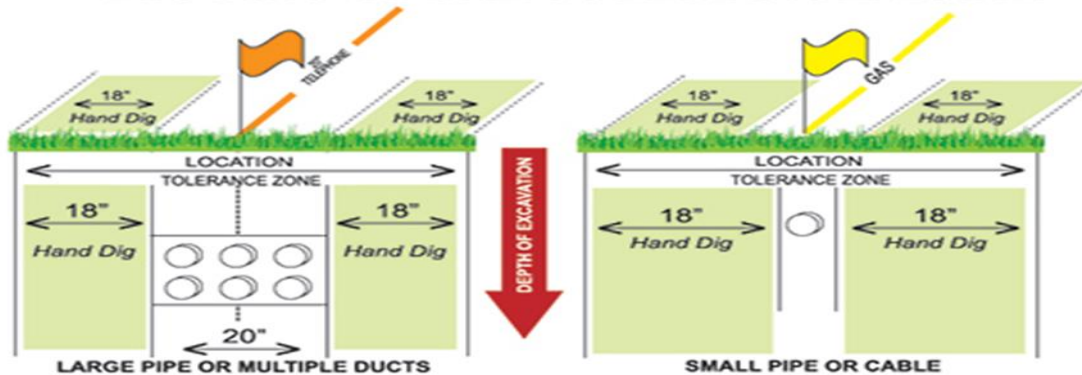
(Source: P.A. 92-179, eff. 7-1-02.)

##### **1.5.20.1.2 (220 ILCS 50/4) (from Ch. 111 2/3, par. 1604)**

Sec. 4. Required activities. Every person who engages in non-emergency excavation or demolition shall: (b) plan the excavation or demolition to avoid or minimize interference with underground utility facilities within the tolerance zone by utilizing such precautions that include, but are not limited to, hand excavation, vacuum excavation methods, and visually inspecting the excavation while in progress until clear of the existing marked facility;

Nothing in this Section prohibits the use of any method of excavation if conducted in a manner that would avoid interference with underground utility facilities.

## DIGGING IN THE TOLERANCE ZONE

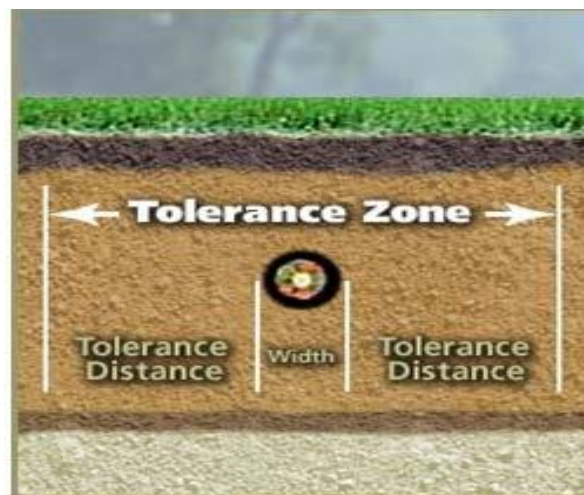


### 1.5.21 Iowa Tolerance Zone Reference Sheet

#### 1.5.21.1 Chapter 480, Iowa Code

The horizontal location of any underground facility is defined by Iowa law as including an area eighteen (18) inches on either side of the underground facility. This area is often referred to as the “tolerance zone.” Excavators should observe this tolerance zone and take precautionary measures to avoid encountering underground facilities when excavating near or within this area.

When excavations take place within the tolerance zone, excavators should hand-dig test holes to determine the location of the underground facilities. No equipment or machinery, other than accepted procedures, such as vacuum excavation, should be used for exposing underground facilities within the tolerance zone.





## 1.5.22 Minnesota Tolerance Zone Reference Sheet - Gopher State One Call

### 1.5.22.1 Excavating within a Tolerance Zone

Excavators are required to maintain a minimum horizontal (side to side) clearance of two feet (24") between an unexposed facility and the cutting edge or point of any power-operated excavating or earth-moving equipment. For example: if the markings indicate a 6" pipe is buried, the hand dig zone is 54" wide (24" + 6" + 24"). If the excavation is required within the hand dig zone, the excavation must be performed very carefully with vacuum excavation or hand tools and without damage to the facility or undermining of lateral support.

Excavators are reminded that a facility depth may vary due to installation practices, changes in grade, frost, erosion and other variables. Therefore, any depth readings given by a locator, if given at all, are only an estimation of the depth of the facilities, and the excavator is still responsible to safely expose the facility without damage.

### 1.5.22.2 Hand Dig with Care

Minnesota Law requires the use of hand tools (or vacuum excavation) when excavation will take place within 2 feet (24 inches) on either side of a marked underground facility. Gopher State One Call (GSOC) reminds you to use care when you are digging within this "hand-dig tolerance zone." Respect the marks to protect yourself and the underground lines' integrity. GSOC takes any, and all locate requests from excavators who plan on using hand tools. The detailed information regarding hand excavation for professional and casual excavators alike is available at [www.gopherstateonecall.org](http://www.gopherstateonecall.org).

GSOC also advises you that although hand tools are exempt from the requirement to contact GSOC before you dig, in some circumstances it may be safer for you to have underground facilities marked when using hand tools. Hand tools may pose a threat to you, others and underground facilities. Therefore, contact GSOC and submit an excavation request anytime you are unsure of the location of underground facilities or where the nature of your work may put them in danger.



## 1.5.23 Missouri “Approximate Location” Reference Sheet

### Underground Facility Safety and Damage Prevention Act

#### Sections 319.010 through 319.050

##### 1.5.23.1 Definitions

319.015 . For the purposes of sections 319.010 to 319.050 ,the following terms mean:

(1) “Approximate location,” a strip Missouri uses the term “Approximate Location rather than “Tolerance Zone.”

##### 1.5.23.2 Approximate Location

An “Approximate Location” is defined by Missouri law as a strip of land not wider than the width of the underground facility, plus two feet on either side thereof. Excavation within this area should be done in a “safe and prudent manner.” Hand digging is recommended.

319.015 . For the purposes of sections 319.010 to 319.050 ,the following terms mean (1) “...In situations where reinforced concrete, a multiplicity of adjacent facilities or other unusual specified conditions interfere with location attempts, the owner or operator shall designate to the best of his or her ability an approximate location of greater width.

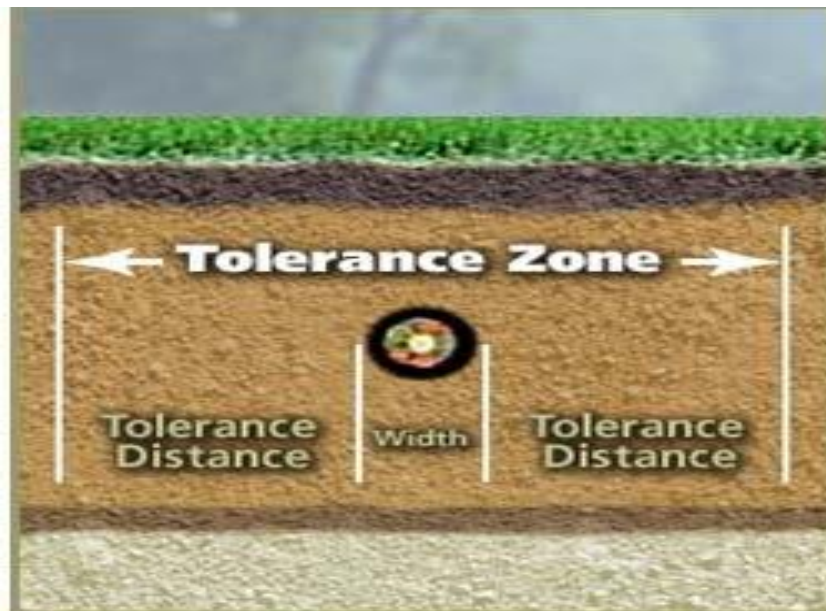


## 1.5.24 Wisconsin Tolerance Zone Reference Sheet

### 1.5.24.1 Special Digging Requirements within Tolerance Zone

Wisconsin Statutes § 182.0175 (2) (am) Excavation notice. An excavator shall do all of the following:

... 3. Maintain an estimated minimum clearance of 18 inches between a marking for an unexposed underground transmission facility that is marked under sub. (2m) and the cutting edge or point of any power-operated excavating or earth moving equipment, except as is necessary at the beginning of the excavation process to penetrate and remove the surface layer of pavement. When the underground transmission facility becomes exposed or if the transmission facility is already exposed, the excavator may reduce the clearance to 2 times the known limit of control of the cutting edge or point of the equipment or 12 inches, whichever is greater.



## 1.5.25 Texas Tolerance Zone Reference Sheet

### 1.5.25.1 TAC 16.1.18.2 - Definitions

(21) Tolerance zone--Half the nominal diameter of the underground pipeline plus a minimum of 18 inches on either side of the outside edge of the underground pipeline on a horizontal plane.

(b) When excavation is to take place within the specified tolerance zone, an excavator shall exercise such reasonable care as may be necessary to prevent damage to any underground pipeline in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include hand digging when practical, soft digging, vacuum excavation methods, pneumatic hand tools. Other mechanical methods or other technical methods that may be developed may be used with the approval of the underground pipeline operator. Hand digging and non-invasive methods are not required for pavement removal.

***Note: This appendix contains company-specific operating practices, forms, checklists, reports, or other company practices. The purpose of this information sharing is to promote pipeline safety by allowing companies to consider a variety of company safety practices that may enhance pipeline safety in appropriate situations. Please refer to state specific regulations for updated state damage prevention guidelines and regulations.***

***API takes no position on whether the practices described above are appropriate for any particular pipeline operator, pipeline facility, or operating condition. These examples are not API Standards or Recommended Practices (although some examples may incorporate portions of API Standards or Recommended Practices). Use of mandatory or advisory terms such as "shall," "shall not," "must," "may," "may not," or similar terms reflect the submitting company's particular practice, and should not be interpreted as necessarily reflecting mandatory or advisable practices by API.***

## 1.6 Excavation Damage Prevention Practices Procedure

### 1.6.1 Overview

**Purpose: This document provides:**

- Damage prevention work practices for excavation of pipelines or other utilities.
- A One Call Pre-Excavation process to:
  - Verify regulatory compliance, and
  - Provide consistent process performance.

**Scope: This document applies to:**

- Below ground piping and utilities operated by OPERATOR or others and/or regulated by Company (1st Party) or authorized Contractors (2nd Party) performing related activities prior to, during, and after excavation,
- All who have a role in the One Call process affecting OPERATOR operated assets, and
- Activities requiring a One Call:
  - Excavation that penetrates, bores, or drills into the earth, including, but not limited to:
    - Mechanical digging
    - Blasting, and
    - Manual/hand digging.
    - Demolition of any structure.
- This process does not cover the following activities, which do not require placement of a One Call:
  - Probing for line locating,
  - Staking for One Call placement, or
  - Replacing DOT markers in existing holes.

**Contents: This document contains the following sections:**

- Overview
- Health Environment and Safety (HES)
- Determine Scope (Stage 1)
- Excavation Plans (Stage 2)
- One Call Placement (Stage 3)
- Pre-Excavation Requirements (Stage 4)
- Determine Tolerance Zone
- Commence Excavation (Stage 5)
- Backfilling (Stage 6)
- Process Completion Activities (Stage 7)

- Excavation Variance
- Management of the Process
- Training and Competencies
- Definitions
- Forms
- Attachments
- References
- Variances
- Regulatory Compliance
- Records Management
- Additional Information
- Revision History

### 1.6.2 Health Environment and Safety (HES)

Damaging an underground pipeline could lead to serious, even catastrophic results. Safety on excavation sites includes, but is not limited to:

- Clear understanding of job site parameters and scope of work
- Placement of traffic and site warning signs
- Installation of barricades
- Emergency response/rescue equipment
- Proper personal protective equipment (PPE), and
- Compliance with the Occupational Safety Health Administration (OSHA) OSHA 29 CFR 1926.

Note:

- Damage prevention procedures, especially excavation planning, can help to avoid unnecessary or increased risks and devastating consequences during excavation.
- Refer to the following for more details on excavation safety practices:
  - Trenching and Excavation Safety Procedure/Policy (reference)
  - Personal Protective Equipment (PPE) Procedure/Policy (reference), and
  - Contractor Safety Policy - (reference).

### 1.6.3 Determine Scope (Stage 1)

#### 1.6.3.1 General Information

Prior to commencing excavation activities, the Marketing and Transportation Engineering (MTE) Project Leader or Area personnel leading the project (PL) reviews and completes the Excavation Plan and Scope (Stage 1). The Project Leader works with the contractor to obtain necessary information about the dig site.

#### 1.6.3.2 Research

The following steps are performed in Stage 1 of the research process.

Who	Step	What
PL	1	<p>Provides the Contractor with the following information. Site-specific information, such as:</p> <ul style="list-style-type: none"> <li>• Alignment sheet information</li> <li>• Segment</li> <li>• Station number</li> <li>• Right of way (ROW) number</li> <li>• County</li> <li>• Township</li> <li>• State</li> <li>• GPS coordinates</li> <li>• Section, and</li> <li>• Maps</li> </ul>
PL	2	<ul style="list-style-type: none"> <li>• Requests information about the dig site from the Contractor, or designee.</li> <li>• Determines if long excavations and potential pipe support is needed.</li> </ul>
Contractor	3	<p>Provides the PL with all site investigation information that includes, but is not limited to dig-site notes:</p> <ul style="list-style-type: none"> <li>• Land type:                             <ul style="list-style-type: none"> <li>○ General ROW</li> <li>○ Residential</li> <li>○ Road, or</li> <li>○ Tillable field.</li> </ul> </li> <li>• Who staked the dig location</li> <li>• Approximate pipe depth of cover, and</li> <li>• Site photographs with the date and time.</li> </ul>

Who	Step	What
Excavator	4	Gathers information for One Call and places a One Call based on the information in Step 1: <ul style="list-style-type: none"> <li>• Directions for locate</li> <li>• Date of planned excavation, and</li> <li>• Involved utilities and contacts.</li> </ul>
PL	5	Complete research prior to excavation to determine what excavation method type will be used. Gathers information, from: <ul style="list-style-type: none"> <li>• Alignment sheets, or facility drawings, including:                             <ul style="list-style-type: none"> <li>○ Foreign utilities in the area, and</li> <li>○ Appurtenances, such as:</li> <li>○ Cathodic Protection (CP) system wires, and site field knowledge from local operations field personnel, and other items to possibly consider:                                     <ul style="list-style-type: none"> <li>▪ In-line inspection tool (anomaly) data from the Analysis Process Leader, and</li> <li>▪ Previous pressure reductions/shut down.</li> </ul> </li> <li>○ Pipeline bends.</li> <li>○ As-Built drawings</li> </ul> </li> </ul>

Who	Step	What	
<p><b>PL and Excavator</b></p>	<p><b>6</b></p>	<p><b>When planning an excavation of an immediate condition or emergency situation:</b></p>	
		<p><b>If...</b></p>	<p><b>Then...</b></p>
		<ul style="list-style-type: none"> <li>• The excavation site is within 220 yards from any building intended for human occupancy</li> <li>• Within the ROW of an active:                             <ul style="list-style-type: none"> <li>○ Railroad</li> <li>○ Paved road</li> <li>○ Street</li> <li>○ Highway</li> </ul> </li> <li>• A location where a loss of hazardous liquid could pollute any:                             <ul style="list-style-type: none"> <li>○ Stream</li> <li>○ River</li> <li>○ Lake</li> <li>○ Reservoir, or</li> <li>○ Other body of water</li> </ul> </li> </ul> <p>Note: The distance is not defined. Contact the Project Leader if water is nearby.</p>	<p>Notify the Compliance for consideration of the completion of a Safety Related Condition (SRC) Report.</p> <p>Note: Compliance determines the SRC.</p>
<p>Note: See the Safety-Related Report - (Operator Procedure reference) for information regarding safety-related conditions.</p>			



### 1.6.3.3 Risk Evaluations

The PL uses the following to classify the site:

- Low-risk sites are excavations outside of stations, with no crossings or foreign utilities within 50 feet of the planned excavation area, and
- All others are high-risk sites.
  - The Excavation area is defined proposed dig site location plus 50 feet.
  - If PL would like to change the site from high to low risk based on other criteria, contact Excavation Process Leader.
- See Trenching and Excavation Safety - (Operator Policy reference) for other risks which could increase elevations of a site from low to high risk such as:
  - Soil conditions
  - Slope, and
  - Deep excavations.

### 1.6.4 Excavation Plans (Stage 2)

#### 1.6.4.1 Stakeholder Communications

All excavations must have a current approved excavation plan. The Excavation Plan Questionnaire (form) is to be used by the Project Leader (PL) as a planning tool prior to excavation. The excavation plan is project specific and can be used for multiple dig sites within the same project if all information is consistent per dig.

Important: If information changes, the excavation plan is required to be updated with new information.

It is the PL's responsibility to communicate the excavation plan with all appropriate stakeholders and obtain buy-in from stakeholders to move forward with the planned excavation. The PL can delegate this responsibility to the inspector on site.

The PL is the final approver of the plan.

All changes to the excavation plan must be communicated with the stakeholders prior to beginning excavation. If changes are needed to the plan once excavation has begun, work must stop until the changes are communicated with the stakeholders and approved.

#### Stakeholder Identification

The following lists internal/external stakeholders with whom the excavation plan is suggested to be communicated:

- Area Representative/Area Project Coordinator (APC)
- One Call Process Leader
- DP Supervisor/DP Process Leader
- Safety Representative

- Contractor/Excavator, and
- Inspector.

Note: Communication with stakeholders can be done at different times in the planning process.

### Low Risk

- Verbal plans are acceptable for Low-Risk Excavation sites.
- Note: Refer to Excavation Plan Questionnaire (form) for guidance.
- The PL or designee communicates the plan to stakeholders. This can be done during the pre-job meeting prior to starting work. See Work Permit Process - (reference).

### High Risk

- Written plans are required for High-Risk sites and are completed by the PL or designee.
- Note: The Excavation Plan Questionnaire (form) is the documentation for written excavation plans.
- The PL receives verbal approval from appropriate stakeholders. The PL provides the inspector on site with the approved Excavation Plan Questionnaire (form).

## 1.6.5 One Call Placement (Stage 3)

### 1.6.5.1 White Lining

The Contractor/Excavator **white lines** the excavation prior to placing a One Call.

- White lining is a damage prevention practice used to mark the proposed area of excavation and/or route with:
  - White flags
  - Stakes with white flags, or
  - White paint.

Note: White lining is an OPERATOR Best Practice and Common Ground Alliance (CGA) Best Practice and is required in some states. See attachment for details.

### 1.6.5.2 Place the One Call

The excavator places the One Call with State agency, see Placing Normal and Emergency One Calls - (Operator Procedure reference). For a normal One Call, it is required 48-72 hours before excavation, depending on state rules.

### 1.6.5.3 One Call Pre- Excavation Process

The steps below describe the One Call Pre-Excavation process for normal and emergency One Calls.

Who	Step	What																		
PL/ Excavator	1	Answers the following questions to verify compliance is met.																		
		<table border="1"> <thead> <tr> <th>Question</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>Was initial One Call placed by the excavator?</td> <td></td> <td></td> </tr> <tr> <td>Has mandatory wait time(s) been fulfilled? Note: A mandatory wait time may be applicable after placement of a second One- Call. Refer to <a href="#">StateOneCall Requirements</a> located in the Attachments section of <a href="#">Placing Emergency and Normal One Calls</a> - (Operator Procedure reference) for state-by-state wait time requirements.</td> <td></td> <td></td> </tr> <tr> <td>Do utility markings or flaggings match the One Call ticket information?</td> <td></td> <td></td> </tr> <tr> <td>Have positive response(s) been received?</td> <td></td> <td></td> </tr> <tr> <td>Has someone visually inspected the area for signs of other utilities prior to excavation, such as DOT markers.</td> <td></td> <td></td> </tr> </tbody> </table>	Question	Yes	No	Was initial One Call placed by the excavator?			Has mandatory wait time(s) been fulfilled? Note: A mandatory wait time may be applicable after placement of a second One- Call. Refer to <a href="#">StateOneCall Requirements</a> located in the Attachments section of <a href="#">Placing Emergency and Normal One Calls</a> - (Operator Procedure reference) for state-by-state wait time requirements.			Do utility markings or flaggings match the One Call ticket information?			Have positive response(s) been received?			Has someone visually inspected the area for signs of other utilities prior to excavation, such as DOT markers.		
		Question	Yes	No																
		Was initial One Call placed by the excavator?																		
		Has mandatory wait time(s) been fulfilled? Note: A mandatory wait time may be applicable after placement of a second One- Call. Refer to <a href="#">StateOneCall Requirements</a> located in the Attachments section of <a href="#">Placing Emergency and Normal One Calls</a> - (Operator Procedure reference) for state-by-state wait time requirements.																		
		Do utility markings or flaggings match the One Call ticket information?																		
		Have positive response(s) been received?																		
		Has someone visually inspected the area for signs of other utilities prior to excavation, such as DOT markers.																		
		<b>If...</b>	<b>Then...</b>																	
All Yes boxes have been checked above.	<ul style="list-style-type: none"> <li>• Pre-excavation is complete</li> <li>• The PL can authorize excavation to take place in compliance with:                             <ul style="list-style-type: none"> <li>○ State laws, and</li> <li>○ OPERATOR guidelines.</li> </ul> </li> <li>• Share important information with the excavator.</li> </ul>																			

Who	Step	What	
		<p>Any utilities are:</p> <ul style="list-style-type: none"> <li>• Unmarked</li> <li>• Incomplete</li> <li>• No response received from, or</li> <li>• Believe to be mismarked</li> </ul>	<ul style="list-style-type: none"> <li>• Do not begin excavation                             <ul style="list-style-type: none"> <li>○ Determine whether unmarked utilities or incomplete positive response(s) are:</li> <li>○ Dangerous</li> <li>○ Non-dangerous.</li> </ul> </li> <li>• Place a second One Call by referring to Placing Emergency and Normal One Calls - (Operator Procedure reference).</li> <li>• Contact the utility directly to determine utility impact and obtain clearance, and</li> <li>• The PL assembles a stakeholder call.</li> </ul> <p>(Assume the approvers of the plan would attend the call)</p>
<p><b>Project Leader</b></p>	<p><b>2</b></p>	<p>Evaluates all issues:</p> <ul style="list-style-type: none"> <li>• Decides whether excavation may begin, or</li> <li>• If Resolution will be taken.</li> </ul>	
		<p><b>If...</b></p>	<p><b>Then...</b></p>
		<p>All issues are resolved,</p>	<p>Authorizes excavation to take place in compliance with:</p> <ul style="list-style-type: none"> <li>• State laws, and</li> <li>• OPERATOR guidelines.</li> </ul> <p>Shares important information with Excavator, following the checklist below for OPERATOR's best practices:</p>
<p>All issues are <i>not</i> resolved,</p>	<p>Proceed to Resolution Process Section to begin resolution attempts.</p>		

### 1.6.5.4 Emergency One Calls

If there is a need to place an Emergency One Call, contact the One Call Process Leader prior to making an Emergency One Call.

If all issues are not resolved, then proceed to resolution process section to begin resolution attempts.

See Placing Emergency and Normal One Calls - (Operator Procedure reference).

- Wait two hours after placement of Emergency One Call before excavating.
- See State One Call Requirements located in the Operator Procedure for Placing Emergency and Normal One Calls - (Operator Procedure reference) for each case.
- If State law allows, excavation may begin before two-hour wait-time if all utilities listed on One Call Ticket provide positive responses.
- Visually inspect the area for signs of other utilities prior to excavation, such as DOT markers.

### 1.6.5.5 Resolution Process

If the positive response has not been received by all utilities, proceed to the resolution process.

#### Overview

The following provides a general overview of the Resolution Process. The Project Leader (PL) is responsible for the following:

If:	Then...
Unmarked utilities are not dangerous	<ul style="list-style-type: none"> <li>• Contact Damage Prevention Process Leader to elevate the issue, and</li> <li>• The Damage Prevention Supervisor must grant approval to move forward.</li> </ul>
One or more dangerous utility or high impact has not been marked	<ul style="list-style-type: none"> <li>• Contact Damage Prevention Process Leader to initiate a stakeholder, and</li> <li>• The Integrity, Damage Prevention, and Risk (IDPR) Manager must grant approval to move forward.</li> </ul>

## 1.6.6 Pre-Excavation Requirements (Stage 4)

### 1.6.6.1 OQ Requirements

The tables below outline the Operator Qualifications (OQ) requirements when performing an excavation.

	Spotter	Contracted Equip. Op.	Operator Equip. Op.	Inspector
#8 Backfill [NCCER 39.0]	-----	Required	Required	Referred
#542 Inspect Excavation Excavation and Backfilling [NCCER 32.0]	Required	Required	Required	Required

Note: Line Locating is an OQ Skill - #1245 Locate Underground Pipeline.

For OPERATOR equipment operators, the following people project skills (PPS) are required:

- Excavation Pipeline [OPERATOR PPS]
- Operate Backhoe [OPERATOR PPS]
- Operate Dozer [OPERATOR PPS]

### 1.6.6.2 Excavation Documentation

Refer to the following documentation for job responsibilities and assigned tasks:

Checklist	Responsible Person	Description of Checklist
Operator Excavation of Active Line Inspection Checklist (form)	Inspector	To be filled out prior to every excavation
Competent Person Excavation Safety Review List (form)	Competent Person	To be filled out prior to bodily entering excavations 48 inches and deeper.
Operator Excavation Plan Questionnaire (form)	Project Leader	To be completed and communicated to stakeholders prior to excavations. Note: High Risk requires a written plan, and low-risk excavations require a verbal plan.

### 1.6.6.3 On-Site Requirements

The following information is required to be kept on the excavation site by the Inspector and/or Contractor.

- One Call Reference Number, and
- Contact names/numbers.

### 1.6.6.4 Other Requirements

- An Inspector is required to be on-site for 2nd party excavations.
- Note: If project work is specifically for adding soil or mats for depth of cover purposes, the inspector requirement may be waived at the IDPR Quality Assurance Process Leader's discretion.
- A Spotter is required to be on-site for all mechanical excavations.

### 1.6.6.5 Determine Tolerance Zone

#### 1.6.6.5.1 Tolerance for All Excavation Procedures

Refer to the Tolerance Zone illustration for guidance when marking the Tolerance Zone. Tolerance Zones - OPERATOR Operating States.

Example:

- Pipeline is 10-inch nominal diameter
- From the pipeline centerline, calculate:
  - 5 inch (1/2 the 10-inch nominal diameter)
  - +24 inches (Tolerance Zone)
  - = 29 inches on each side from the center line. (Grand total 58 inches: across).

The tolerance zone is the area close to the pipe/facility that requires special care during excavation. It is the area within 18 inches, 24 inches, or 48 inches (depending on the state) of the pipe. [insert operator illustration as applicable]

### 1.6.7 Commence Excavation (Stage 5)

#### 1.6.7.1 All Excavation Procedure

The following describes the excavation method and type of equipment used during an excavation. The PL is responsible for overseeing all activities in this section.

Step	Procedure
1	The PL is responsible for determining the excavation method selection and equipment.
2	Determine Tolerance Zone, Refer to Tolerance Zone Section.

Step	Procedure	
	<p><b>Indiana and Louisiana Excavation Procedures</b></p>	<p>Indiana and Louisiana-specific requirements in addition to All Excavation Procedure are:</p> <ul style="list-style-type: none"> <li>• Prior to beginning any mechanical excavation, Operator, and/or third party lines must be visually identified by pot holing or soft digging, and</li> <li>• If impractical process leader to initiate a stakeholder call</li> </ul>
	<p><b>Michigan Excavation Procedures</b></p>	<p>Michigan specific requirements in addition to All Excavation Procedure are:</p> <ul style="list-style-type: none"> <li>• Third party (Foreign) lines must be exposed by soft digging in the 48-inch caution zone unless the third party agrees to less strict requirement and will be on site during excavation.</li> </ul> <p>Note: Document excavation plan on Operator Excavation Plan Questionnaire. Operator lines fall under all excavation procedure abiding by the 24-inch tolerance zone.</p>
<p><b>3</b></p>	<p>Complete risk evaluation to determine what method of excavation/equipment type to use. (Example: High or Low Risk)</p> <ul style="list-style-type: none"> <li>• High Risk - go to Step 4</li> <li>• Low Risk - go to Step 5</li> <li>• Note: Risk may change for Crossings and Parallel</li> <li>• If parallel pipeline or crossings are within planned excavation area, then follow tolerance zone graphic to expose pipe.</li> <li>• Note: Risk may change for Soil Conditions and Complex Excavations</li> <li>• If soil conditions make the excavation more complex, involve Damage Prevention Excavation process leader to work through an excavation plan.</li> </ul>	
<p><b>4</b></p>	<p><b>High-Risk Excavations</b></p> <ul style="list-style-type: none"> <li>• Use Line Finders and Probe rods to locate lines as in Locating and Marking Underground Pipelines (Operator Procedure reference).</li> <li>• Actively Probe the dig area to confirm location and depth of assets.</li> <li>• Note: Active Probing during excavation is an Operator Best Practice within the tolerance zone.</li> <li>• Use Vacuum Excavation (hydro or air) or another soft digging method.</li> </ul>	



	<b>If...</b>	<b>Then...</b>
	Soft digging is not practical	Use electronic line finders and probe rods, and one or more of the following Risk Mitigation techniques to verify or expose all lines in the excavation area: <ul style="list-style-type: none"> <li>• Use Ground Penetrating Radar (GPR)</li> <li>• Vacuum-excavate a box around the dig location to identify utilities, and</li> <li>• Soft Dig to positively expose crossings and parallel pipelines in planned excavation area.</li> </ul>
	<ul style="list-style-type: none"> <li>• Mechanical excavation may be used.</li> <li>• Note: Mechanical Excavation within the tolerance zone, if approved in excavation plan, can commence after Operator assets, crossings, and parallel pipelines are positively identified. This can be done with Active Probing and digging outside the tolerance zone with Mechanical Excavation to expose Operator assets.</li> </ul>	
	<b>If...</b>	<b>Then...</b>
	Variance from procedure is requested	Contact the Damage Prevention Excavation process leader first to determine plan and then submit a Management of Change (MOC) request
5	<b>Low-Risk Excavations</b> <ul style="list-style-type: none"> <li>• Use line finders and probe rods to locate underground facilities.</li> <li>• Actively Probe the dig area to confirm location and depth of assets.</li> <li>• Note: Active Probing during excavation is an Operator Best Practice.</li> <li>• Soft Dig inside tolerance zone to positively identify an asset.</li> </ul>	
6	<b>Outside Tolerance Zone</b> <ul style="list-style-type: none"> <li>• To initially expose assets in planned excavation area start excavation outside tolerance zone with mechanical equipment.</li> <li>• The equipment operator/spotter excavates outside the tolerance zone with extreme caution.</li> </ul>	
	<b>Role</b>	<b>Step/Description</b>
	<b>Equipment Operator/Spotter</b>	<b>Step 1</b> <ul style="list-style-type: none"> <li>• Begins excavation on one side of the pipeline/utility.</li> <li>• Physically locates and visually confirms the pipeline to be excavated.</li> </ul>
	<b>Spotter</b>	<b>Step 2</b> <ul style="list-style-type: none"> <li>• Provides guidance or appropriate layer depths and ensures Equipment Operator excavates in shallow layers to help manage risks (4 inches - 6 inches) above the pipe.</li> </ul>

		<p><b>Step 3</b></p> <ul style="list-style-type: none"> <li>Identifies any large rocks or other foreign material that may damage the pipeline/utility coating inside the tolerance zone and/or above the pipe.</li> </ul>
		<p><b>Step 4</b></p> <ul style="list-style-type: none"> <li>Repeats probing (Active Probing) across the entire width and length of excavation at appropriate cut intervals to confirm the pipeline/utility and appurtenance locations</li> </ul>
	<b>Equipment Operator</b>	<p><b>Step 5</b></p> <ul style="list-style-type: none"> <li>Decreases the depth of soil removal cuts and increases probing when within 2 feet-3 feet of the assumed depth of the utility</li> </ul>
	<b>Spotter</b>	<p><b>Step 6</b></p> <ul style="list-style-type: none"> <li>Confirms the probe is in contact with the pipe/utility within the tolerance zone.</li> </ul>
<b>7</b>	<p><b>Inside Tolerance Zone</b> To initially expose Operator and Foreign utilities in Planned excavation area.</p>	
	<b>Role</b>	<b>Step/Description</b>
	<b>Excavator</b>	<p><b>Step 1</b> Soft dig inside the tolerance zone to expose the asset and foreign utilities.</p>
	<b>Spotter</b>	<p><b>Step 2</b></p> <ul style="list-style-type: none"> <li>Monitors the pipeline for defects, so the excavator does not damage the pipe.</li> <li>Reports any damages done to the pipe to the inspector, such as:                             <ul style="list-style-type: none"> <li>Nicks</li> <li>Scrapes, or</li> <li>Scratches.</li> </ul> </li> </ul>
<b>8</b>	<p><b>Mechanical Excavation</b></p> <ul style="list-style-type: none"> <li>When assets are exposed, mechanical excavation can continue inside tolerance zone if approved in excavation plan.</li> <li>Use extreme caution when mechanical excavation is in the tolerance zone.</li> <li>Note: Contact the DP Excavation Process Leader for other excavation concerns, such as:                             <ul style="list-style-type: none"> <li>Blasting, and</li> <li>Fang Teeth on excavations.</li> </ul> </li> <li>Do not use:                             <ul style="list-style-type: none"> <li>Bucket side-cutters, or</li> <li>Tiger, fang-like, pick bucket teeth (See examples below).</li> </ul> </li> </ul>	



### 1.6.7.2 Roles and Responsibilities During Excavation

The following describes the roles and responsibilities performed during an excavation.

Who	Responsibilities
<b>Project Leader</b>	Follow the approved excavation plan. Note: If the plan changes, the PL is required to communicate changes to stakeholders.
<b>Equipment Operator/ Foreman</b>	<ul style="list-style-type: none"> <li>• Operates excavation equipment.</li> <li>• Receives site information from the PL.</li> <li>• Understands and exchanges site information with site personnel.</li> <li>• Observes and honors other utility markings.</li> <li>• Re-checks alignment sheets and other site documents for:                             <ul style="list-style-type: none"> <li>○ Line locations</li> <li>○ Appurtenances</li> <li>○ Bends, and</li> <li>○ Approximate depth.</li> </ul> </li> <li>• Communicates line location and depth information for all utilities with appropriate on-site personnel.</li> </ul> Reminder: Excavation within the tolerance zone (see graphic section) shall only be done by soft digging to expose the pipeline. <ul style="list-style-type: none"> <li>• Communicates with the spotter.</li> </ul>

<p><b>Spotter</b></p>	<ul style="list-style-type: none"> <li>• Required to be on-site when mechanical excavation equipment is used.</li> <li>• Works with the equipment operator in the immediate work area and is assigned on the ground in close proximity to the excavation.</li> <li>• Assists equipment operator when:             <ul style="list-style-type: none"> <li>○ Moving</li> <li>○ Swinging, or</li> <li>○ Operating equipment around and below ground facilities, including activities such as:                 <ul style="list-style-type: none"> <li>▪ Digging</li> <li>▪ Padding, and</li> <li>▪ Backfilling.</li> </ul> </li> </ul> </li> <li>• Informs equipment operator of observed facilities and obstructions.</li> <li>• Manually removes objects from the excavated area, such as:             <ul style="list-style-type: none"> <li>○ Rocks</li> <li>○ Debris, and</li> <li>○ Foreign objects.</li> </ul> </li> <li>• Promotes general safety for self and others near the excavation area.</li> <li>• Re-checks depth information when digging over the active line by probing after each layer of earth has been removed.</li> <li>• Informs the Equipment Operator of any changes.</li> <li>• Verifies line locating has been completed, or the foreman:             <ul style="list-style-type: none"> <li>○ Checks excavation plans noting the diameter of the pipeline/utility to be excavated</li> <li>○ Determines the tolerance zone by measuring from each side of the facility edge, or</li> <li>○ Marks the pipeline utility centerline for the distance of the planned excavation.</li> </ul> </li> </ul>
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<p><b>Inspector</b></p>	<ul style="list-style-type: none"> <li>• On site for excavations performed by 2<sup>nd</sup> Party Contractors using mechanical excavation equipment.</li> </ul> <p>Note: If project work is specifically for adding soil or mats for depth of cover purposes, the inspector requirement may be waived at the IDPR Quality Assurance Process Leader's discretion.</p> <ul style="list-style-type: none"> <li>• Receives site information from the PL such as addresses and station numbers.</li> <li>• Understands Tolerance Zone and ensures it is honored by the contractor.</li> <li>• Leads on-site scheduled activities with the PL.</li> <li>• Verifies that work permit has been issued and received.</li> <li>• Understands the excavation plan and its requirements.</li> <li>• Performs site re-assessments, such as:             <ul style="list-style-type: none"> <li>○ Confirms notification of landowners with land agent/PL/foreman.</li> </ul> </li> <li>• Keeps the approved excavation plan on-site for high-risk excavations.</li> <li>• Verifies the contractor follows the excavation plan.</li> <li>• Completes responsibilities as listed on the Excavation of Pipeline Inspection Checklist (form).</li> <li>• Maintains the OPERATOR Inspector Quality Control and Progress Report, including:             <ul style="list-style-type: none"> <li>○ Construction activities</li> <li>○ Observations, and</li> <li>○ Digital photographs.</li> </ul> </li> <li>• Contacts the PL when other issues arise</li> <li>• Documents each excavation on the Land and Pipe Management Report (form) and submits to the PL, and</li> <li>• Verifies padding and backfill are completed properly per the Lowering, Bedding, Padding and Backfill Process (operator procedure reference).</li> </ul>
<p><b>Inspector/ Foreman</b></p>	<ul style="list-style-type: none"> <li>• Performs site re-assessments, such as:             <ul style="list-style-type: none"> <li>○ Considers weather conditions and the impact to planned activities</li> <li>○ Notifies the PL of changed conditions or risks, and</li> <li>○ Evaluates with necessary adjustments and communicates the plan.</li> </ul> </li> </ul>

<p><b>Contractor</b></p>	<p>Support Pipe:</p> <ul style="list-style-type: none"> <li>• Supports the pipe as needed for long excavations.</li> <li>• Contacts the Pipeline System Integrity Leader.</li> <li>• See Lowering, Bedding, Padding and Backfill Process - (Operator Procedure reference).</li> </ul> <p>Overnight Excavations:</p> <ul style="list-style-type: none"> <li>• Secures the site if leaving overnight.</li> <li>• Supports spanning pipe.</li> <li>• Secures the site with barricades/safety fence to prevent public access.</li> </ul>
<p><b>Competent Person</b></p>	<ul style="list-style-type: none"> <li>• Becomes familiar with the OPERATOR Excavation Training Program.</li> <li>• Makes recommendations as needed for improvements and employee safety.</li> </ul>

### 1.6.7.3 Why Stop Excavation

The following table contains a list of reasons to stop the excavation.

If...	Then...
<p>A pipeline defect is unexpectedly discovered, such as:</p> <ul style="list-style-type: none"> <li>• nicks</li> <li>• scrapes</li> <li>• gouges</li> <li>• dents, and</li> <li>• scratches</li> </ul>	<p>Stop the work and contact the PL and/or the Pipeline System Integrity Leader immediately.</p> <p>Note: Contact the Operations Center (OC) to initiate the Stop-Help-Start Escalation Notification Process - (Operator Procedure reference) if the defect poses a threat to the safety and security of:</p> <ul style="list-style-type: none"> <li>• Employees</li> <li>• Contractors, or the</li> <li>• Public.</li> </ul>
<p>Another utility is contacted</p>	<p>Stop work and call the One Call Center to report the contact or damage.</p>
<p>There is an emergency, such as:</p> <ul style="list-style-type: none"> <li>• An escape of:                             <ul style="list-style-type: none"> <li>○ Flammable</li> <li>○ Toxic, or</li> <li>○ Corrosive gas/ liquid</li> </ul> </li> <li>• Potential endangerment to:                             <ul style="list-style-type: none"> <li>○ Life</li> <li>○ Health, or</li> <li>○ Property.</li> </ul> </li> </ul>	<p>The excavator calls 911.</p> <p>Note: This is a mandatory requirement. Stop the work and contact the PL and/or the Pipeline System Integrity Leader immediately.</p> <p>Note: Contact the Operations Center (OC) to initiate the Stop-Help-Start Escalation Notification Process (Operator Procedure reference) if the defect poses a threat to the safety and security of:</p> <ul style="list-style-type: none"> <li>• Employees</li> <li>• Contractors, or</li> <li>• The public.</li> </ul> <p>Determined by anyone on site.</p> <p>See Responding to Anomalies - (Operator Procedure reference) for guidance.</p>

### 1.6.8 Backfilling (Stage 6)

#### 1.6.8.1 Backfilling Process

The Contractors and Inspectors on site perform the backfilling process in accordance with the Lowering, Bedding, Padding and Backfill Process - (Operator Procedure reference).

Note: Honor the Tolerance Zone - Extreme Caution while backfilling.

## 1.6.9 Process Completion Activities (Stage 7)

### 1.6.9.1 Process Completion

The following are roles and responsibilities for process completion.

Role	Responsibility
Inspector	<ul style="list-style-type: none"> <li>• Inspects the ROW to verify that the following is repaired prior to leaving the site:               <ul style="list-style-type: none"> <li>○ Damaged drain tiles</li> <li>○ Sewer pipes</li> <li>○ Other underground facilities, and</li> <li>○ All aboveground facilities.</li> </ul> </li> <li>• Completes documentation, including:               <ul style="list-style-type: none"> <li>○ Inspecting the pipe and documents findings in accordance with the Land and Pipe Management Report (LPMR) - (Operator Procedure reference).</li> </ul> </li> </ul>
PL	<ul style="list-style-type: none"> <li>• Placing OQ reports in the Project File for those completing OQ tasks, including:               <ul style="list-style-type: none"> <li>○ Line locating</li> <li>○ Excavation, and</li> <li>○ Backfill.</li> </ul> </li> <li>• Reports to area to replace line markers/signage.</li> <li>• Notifies stakeholders that excavation is complete and considers the following personnel:               <ul style="list-style-type: none"> <li>○ Area/APC (if not involved when excavation is complete)</li> <li>○ Land Agent</li> <li>○ Field Services and Planning (FSP) ROW Specialist, and</li> <li>○ Corrosion Specialist.</li> </ul> </li> </ul>



## 1.6.9.2 Excavation Variance

### 1.6.9.2.1 Variance Requirements

The following process activities have been identified as critical to the Process and require submittal of an MOC (reference) request.

Request to obtain	Activity
Exemption from	Spotter requirement. Work Practice: Spotter is required to be on-site when mechanical excavation equipment is used. Note: No exemption will be allowed for High-Risk sites or if required by Regulation.
Exemption from	On-Site Company Representative (Inspector) requirement. Work Practice: A Company Representative (Inspector) is to be on-site for excavations performed by 2nd-Party Contractors using mechanical excavation equipment. Note: If project work is specifically for adding soil or mats for depth of cover purposes, the inspector requirement may be waived at the IDPR Quality Assurance Process Leader's discretion.
Allowance to	Use specialty tiger/fang-like bucket teeth or bucket side cutters. Work Practice: Do not use tiger/fang-like/pick bucket teeth or bucket side cutters due to increased pipeline damage risk!
Exemption from	Following excavation procedure.
Allowance to	Use blasting.

Notes:

- Deviations to the process that are not approved prior to execution are documented (operator compliance management system reference).
- Refer to Variances (section) for more information.

## 1.6.9.3 Training and Competencies

### 1.6.9.3.1 Training and Competencies

**OPERATOR Employees:**

Training and competencies associated with this document are:

- Level I:

- View and Credit of governing document and PowerPoint completed in Passport Learning (reference).
- Level II:
  - OPERATOR's Best Practice is to wait two hours after placing emergency One Call before excavating. Refer to State One Call Requirements located in Placing Emergency and Normal One Calls (Operator Policy Reference)

**Operator Trained Engineer:**

- New Engineers: Face to Face Training during onboarding.
- Existing Engineers: Annual refresher training through Passport Learning (Operator Policy reference).
- Inspectors: Standards and Forms provided on Contractor Website.
- Contractors: Standards and Forms provided on Contractor Website.

**1.6.10 Definitions**

<b>Active Probing</b>	Probing down 1 – 2 feet or every 1 – 2 feet to confirm no OPERATOR or foreign utility is present.
<b>Appurtenances</b>	A device designed to contain commodities shipped by pipeline or any apparatus that is attached to the pipe. Examples include valves, pumps, Plidco sleeves, instrumentation piping and tubing, and sample tubing.
<b>Backfill</b>	To fill the void created by excavating. Includes techniques for covering a completed pipeline so that adequate fill material is underneath and over the pipe to protect it from undue stresses, loose rocks, abrasion, shifting and washouts.
<b>Blasting</b>	A controlled use of explosives to excavate. See Third-Party ROW Encumbrances (Onshore) - (Operator Procedure reference) and the Pipeline System Integrity Leader when considering blasting as an excavation method. Note: An approved variance is required for Blasting.
<b>Caution Zone</b>	The area within 48 inches of either side of the facility marks provided by a facility owner or facility: <ul style="list-style-type: none"> <li>● An excavator shall expose all marked facilities in the caution zone by soft excavation. If conditions make complete exposure of the facility impractical, an excavator shall consult with the facility owner or facility operator to reach agreement on how to protect the facility</li> </ul> Note: An excavator may use power tools and power equipment in a caution zone only after the facilities are exposed or the precise location of the facilities is established.

<b>Company Representatives</b>	A Company (Operator or its subsidiaries) employee or contracted individual performing Company-authorized activities on behalf of the Company. For Company excavation activities, this individual is typically the Company PL or a contracted Company-authorized Inspector.
<b>Competent Person</b>	As defined by OSHA, an individual who is trained to identify existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them. Corrective measures include a selection of sloping, benching or other protective systems. Under OPERATOR's program, Competent Persons must have received Competent Person Training approved by OPERATOR. Contractor Competent Persons should have training consistent with their approved Excavation Program. As defined by OSHA 29 Subpart P-CFR 1926.650 thru 1926.652 Excavations. See Trenching and Excavation Safety - (Operator Policy reference).
<b>Contractor</b>	A commercial/industrial organization comprised of employees performing tasks for OPERATOR or its subsidiaries via a legally binding agreement such as a contract or job order.
<b>Crossing</b>	Any OPERATOR or foreign facility that crosses an OPERATOR pipeline.
<b>Dangerous Utilities</b>	Includes electric, gas pipelines, hazardous liquid (DOT) pipelines, which could cause immediate and potentially catastrophic impact on life and property if damaged.
<b>Emergency</b>	A condition or crisis situation which poses an imminent threat or danger to life, health, or significant loss of property, and requires immediate action. Note: Each State defines what constitutes an emergency. Some State statutes may include language accepting a loss of service as an emergency.
<b>Emergency (or Short Notice) One Call</b>	A One Call placed by an OPERATOR authorized excavator requesting immediate line locates, in order to initiate accelerated excavation activity, with reduced or anything less than the state-mandated wait time, to address a qualified emergency situation/event. OPERATORs Best Practice is to wait two hours after placing emergency One Call before excavating. See State One Call Requirements in the Attachment section of Placing Emergency and Normal One Calls - (Operator Policy reference).
<b>Equipment Operator</b>	A person trained, experienced and possessing specified Operator Qualifications (OQ) and skills to operate machinery (such as a backhoe) for an Excavator

Any operation using non-mechanical or mechanical equipment or explosives to move to following below existing grade:

- Earth
- Rock, or
- Other material.

**Excavation**

Note: Excavation definitions, laws, and provisions vary by state.

Augering	Drilling	Ripping
Blasting	Driving-in	Scraping
Boring	Geo-probing	Stump grinding
Digging	Grading	Trenching
Ditching	Plowing-in	Tunneling
Dredging	Pulling-in	Backfilling

**Extreme Caution**

During excavation, use extra caution when operating mechanical equipment inside the tolerance zone after the pipeline has been positively identified. Take all necessary precautions to protect buried utilities from damage. This could mean different caution depending on the experience of the operator.

**Facility**

Work inside a pipeline station or other *fenced* facility often presents increased risks and challenges different than what is typically experienced when working within a pipeline right-of-way.

**Fang/Bucket Teeth**

Placement of a bar over the bucket teeth is recommended due to potential increased pipeline damage risk.

**Foreign**

Not a Company pipeline asset. This term is usually used to indicate utilities, pipelines, drainage tile, etc. owned, operated, or maintained by a party other than the Company.

**Ground Penetrating Radar (GPR)**

Produces an underground cross-sectional image of the soils and subsurface features including underground pipeline facilities. This technology is beneficial when planning to excavate within a station facility where there is often pipeline congestion.

**Hand Digging**

A non-mechanical form of excavation. Hand-digging is recognized as soft digging and is a manual labor using shovels. This method is preferred in tight areas where there are many unknowns and when approaching near or digging within the Tolerance Zone

**High Risk**

- Excavations with one or more crossings or foreign utilities within 50 feet of the planned excavation area, or
- Excavations inside of stations.

**Inclines**

- Excavating on inclines may have stability or maneuverability concerns that present challenges and risk.

<b>Incomplete Response</b>	Not having a positive response from all affected members on the One- Call Ticket.
<b>Lifting, Reaching, Dumping</b>	<p>Careful consideration, planning, and implementation are required when:</p> <ul style="list-style-type: none"> <li>• Moving earth/rock materials in a fenced or tight area involving:             <ul style="list-style-type: none"> <li>○ Lifting</li> <li>○ Reaching, or</li> <li>○ Dumping.</li> </ul> </li> <li>• There is nearby above ground live process equipment or other hazards.</li> </ul> <p>In accordance with damage prevention, plan the:</p> <ul style="list-style-type: none"> <li>• Placement of spoils /backfill materials, and</li> <li>• Equipment used. Avoid:             <ul style="list-style-type: none"> <li>○ Lifting/sweeping of full buckets containing materials over the extended unsupported pipe.</li> <li>○ Use of large mechanized excavation equipment within a station facility to:                 <ul style="list-style-type: none"> <li>▪ Lift</li> <li>▪ Reach, or</li> <li>▪ Dump.</li> </ul> </li> </ul> </li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>• Consider using mini mechanized excavation equipment to reduce risks.</li> <li>• Using manual techniques are recommended, such as hand tools (shovels).</li> </ul>
<b>Line Locating</b>	<p>Locate the underground pipeline by:</p> <ul style="list-style-type: none"> <li>• Using electronic line finders, and</li> <li>• Validating with probing.</li> </ul>
<b>Low Risk</b>	Excavations with no crossings or foreign utilities within 50 feet of the planned excavation area.
<b>Mechanical Equipment</b>	Types of mechanical equipment include backhoes, backhoe loaders, and bulldozers.
<b>Member</b>	The company that has a database and/or facility mapping at the State One Call Center level for purposes of receiving and handling One Call Tickets (notifications).
<b>No Response</b>	Not receiving a response to a One Call Ticket placed
<b>Non-Dangerous Utilities</b>	All other utilities that do not include electric, gas pipelines, hazardous liquid (DOT) pipelines, which could cause immediate and potentially catastrophic impact on life and property if damaged

<b>Normal One Call</b>	A One Call placed by a Company authorized Excavator in advance of a planned excavation project where there is no urgent/emergency need for excavation to occur prior to the normal State-mandated wait time.
<b>One Call</b>	A damage prevention call-before-you-dig system established to act as a communication link between Excavators and Operators of underground facilities to have buried utilities located prior to excavation.
<b>One Call Center</b>	A damage prevention call before you dig system established to provide a means of notification to have buried utilities located prior to excavation and acts as a communication link between the Excavators and operators of underground utilities. Member utilities are required to locate and mark their affected underground utilities for damage prevention purposes.
<b>One Call Ticket</b>	A notification of intended excavation, initiated by an excavator that is produced by a One Call Center. The One Call Ticket typically includes: <ul style="list-style-type: none"> <li>• Ticket ID number</li> <li>• Estimated dig site</li> <li>• Work to be conducted</li> <li>• Time and date of excavation</li> <li>• Excavator, and</li> <li>• Contact information.</li> </ul>
<b>Padding</b>	Screened or sifted dirt, clean gravel, or foam placed in a ditch to protect the pipe from damage that could be caused by sharp rocks or rough soil.
<b>Positive Response</b>	A means of communication from the utility prior to an excavation that the utility owner/operator has located and marked their underground facilities or cleared any potential conflicts with the areas of planned excavation. Depending on the state, communications from the utility may go to the One Call Center, directly to the excavator, or both.
<b>Positively Identify</b>	Soft dig to expose 100 percent of the asset, not just top of the asset.

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<b>Protective Systems</b>	<ul style="list-style-type: none"> <li>• Benching protects workers from cave-ins by excavating the sides to form one or more series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.</li> <li>• Protective systems guarding against materials falling or rolling into the excavation include:             <ul style="list-style-type: none"> <li>○ Support systems (trench boxes)</li> <li>○ Sloping and benching systems</li> <li>○ Shoring or shield systems (sheet piling), and</li> <li>○ When using sheet piling or other shoring methods:                 <ul style="list-style-type: none"> <li>▪ Sheet piling may be required when using hydrovac excavation technology (especially if soils are sandy),</li> <li>▪ Do not drive in sheet pilings/support without knowing what is beneath. Use care when placing shoring materials.</li> </ul> </li> </ul> </li> <li>• Prior to the implementation of shoring materials, an agreement is made by the:             <ul style="list-style-type: none"> <li>○ Excavator</li> <li>○ Equipment operator</li> <li>○ PL, and</li> <li>○ Competent person.</li> </ul> </li> <li>• Agreements are based on             <ul style="list-style-type: none"> <li>○ Site and soil conditions</li> <li>○ Other nearby facilities</li> <li>○ Obstructions, and</li> <li>○ Risk management.</li> </ul> </li> </ul> <p>Note: Protective systems such as shoring devices or trench boxes, qualifies the excavation as a category High Risk. Enhanced damage prevention planning is necessary for placement and removal tactics.</p>
<b>Pot-Holing</b>	Non-damaging (non-invasive) excavation method for the purpose of exposing and identifying underground utilities through a small diameter hole (typically 6 inches - 12 inches). Pot-holing methods include hand-digging and vacuum excavation methods (high-pressure water or air).
<b>Probe</b>	A T-shaped tool, 4-6 feet long, used to locate underground installations by pushing into the soil repeatedly at regular intervals. Typically used in combination with electronic line locating techniques.
<b>Project Leader</b>	A designated Company-authorized individual assigned to develop, plan, and ensure the execution of an excavation project. Project Leader is usually a Marketing Transportation and Engineering (MTE) employee, but could also be an OPERATOR employee leading the excavation.

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<b>Safe Zone</b>	<p>An area 48 inches or more from either side of the facility marks provided by a facility owner or facility operator.</p> <ul style="list-style-type: none"> <li>• Soft dig.</li> </ul>
<b>Second One Call</b>	<p>Definition - Certain states require a second one call be placed if there is an incomplete response to the One Call Ticket.</p>
<b>Soft Digging</b>	<p>Uses non-damaging, non-invasive excavation tools, reducing risk/ harm to buried utilities. Examples include hand-digging, hydro-vac or air vacuum excavation technologies.</p>
<b>Stakeholder</b>	<p>Potential stakeholders to consider include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• Internal:             <ul style="list-style-type: none"> <li>○ OPERATOR processes, including:                 <ul style="list-style-type: none"> <li>▪ Field Operations</li> <li>▪ Operations and Logistics (OL)</li> <li>▪ Fire Safety</li> <li>▪ Compliance</li> </ul> </li> <li>○ Operator processes, including:                 <ul style="list-style-type: none"> <li>▪ Refining</li> <li>▪ Terminal, Transport, and Rail (TTR)</li> <li>▪ Marine Transportation</li> <li>▪ Law Department, and</li> <li>▪ Public Affairs.</li> </ul> </li> </ul> </li> <li>• External:             <ul style="list-style-type: none"> <li>○ ROW Landowner</li> <li>○ Third-party (party requesting movement of pipeline)</li> <li>○ Utilities in/near the planned excavation area</li> <li>○ Excavation contractor, and</li> <li>○ Regulatory.</li> </ul> </li> </ul>
<b>Stakeholder Meeting</b>	<p>A meeting composed of relevant individuals and subject matter experts in order to:</p> <ul style="list-style-type: none"> <li>• Facilitate efficient information flow, and</li> <li>• Decision making.</li> </ul> <p>Typically meetings are conducted by teleconference.</p>



<b>State One Call Center</b>	Definition - The (state) organization that excavators and landowners (third parties) contact to report intended excavation activities. This organization acts as a communication link and clearing house between the excavators and operators of underground facilities. The One Call Center is responsible for distributing reports of planned excavation (One Call Tickets) to potentially affected Member underground utilities. In turn, Member utilities are required to locate and mark their affected underground utilities for damage prevention purposes.
<b>Support Devices under Pipe When Exposed</b>	<ul style="list-style-type: none"> <li>• Consider the lengths of the pipeline to be excavated.</li> <li>• Support for extended pipelines during the excavation process is at intervals of approximately 25’.</li> <li>• Support devices include: <ul style="list-style-type: none"> <li>○ Skids,</li> <li>○ Earth padding (<i>plugs</i>), or</li> <li>○ Sandbags.</li> </ul> </li> </ul>
<b>Test Pit</b>	See Pot-Holing definition.
<b>Tolerance Zone</b>	The width of the underground utility plus a typical minimum of 18 or 48 inches measured from the outer edge of each side of the underground pipeline/utility on a horizontal plane where special care and precaution are to be taken, including COMPANY-specified excavation damage prevention requirements during excavation and backfilling. See tolerance zone graphic for more detail.
<b>Utility</b>	Includes electric, gas pipelines, hazardous liquid (DOT) pipelines which have the potential to cause immediate and catastrophic impact on life and property if damaged.
<b>Vacuum Excavation</b>	A non-invasive technology using vacuum equipment with high- pressure water or air to safely uncover underground utilities without damaging property or personnel.

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**Wait Time**

- After One Call placement, a Wait Time is a block of time that must be honored before a dig can be performed.
- The Wait Time allows utilities identified on the One Call Ticket to mark or clear the utility prior to excavation.
- A typical Wait Time after initial One Call placement is:
  - Normal One Call: 48 hours to 72 hours;
  - Emergency One Call: two to three hours.
  - See State One Call Requirements in the Attachments section of Placing Emergency and Normal One Calls (reference).

Note: There may be a second Wait Time required by the state after placement of the second One Call.

Example: When there is an incomplete positive response. See State One Call Requirements in the Attachments section of Placing Emergency and Normal One Calls (reference).

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**White Lining**

White lining is a damage prevention practice used to mark the proposed area of excavation and/or route with:

- White flags
  - Stakes with white flags, or
  - White paint.
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### 1.7 Application for Encroachment Review Form

<b>Project Information</b>			
Project Title:			
Project Address:		City:	State:
			Zip Code:
Latitude:	Longitude:	Municipality:	County:
<b>Application Information</b>			
Name and Title of Applicant:		Company:	Phone #:
Address:		City:	State:
			Zip Code:
Email address:		Fax #:	
<b>LEGAL NAME OF INDIVIDUAL, COMPANY, OR ENTITY TO WHICH PERMISSION WILL BE GRANTED:</b>			
Name and Title of authorized signatory for company or entity:			
Address:		City:	State:
			Zip Code:

<b>Application must contain the following:</b>	
Completed and Signed "Application for Design Plan Submission and Encroachment Review" Form	
Full set of Construction plans, depicting the following minimum elements	
	The pipeline shall be labeled appropriately on the plans and drawings as "OPERATOR" (dia.) High-Pressure Petroleum Pipeline" The pipeline diameter must be shown where specified (dia.)
	The pipeline right of way width shall be clearly depicted and labeled as fifty feet (50') in width, the centerline of which is the existing pipeline (unless otherwise determined by OPERATOR Right-of-Way Department.
	The OPERATOR "Construction Guidelines" shall be incorporated into the project plans (see attached)
	All areas in which there is a proposed encroachment of the pipeline and or right-of-way we will require depth verifications, which must be shown on the submitted plans and profile sheets. Be advised that depth verifications are at the expense of the requestor with an OPERATOR representative on site
	All utility crossings must be designed to cross under the pipeline and must be shown on the profile sheets showing the required two foot (2') minimum separation

	If plan depicts paving over the pipeline and right-of-way paving details (cross sections) must be on the plans.
	Proposed location(s) where construction equipment will cross the pipeline right-of-way *We will also require a list of all equipment and vehicle weights to complete stress calculations, include equipment footprint (track shoe size and length of track on ground where it applies)*
<b>Supplemental Plan Information</b>	
	Blasting Vibrating Plan
	Seismic Vibrating Plan
	Support Plan
	Drill Plan

<b>SUBMIT PLANS TO</b>			
Operator Address		OR	OPERATOR@OPERATOR.COM with the subject line "Encroachment Review Application."
City:	State & Zip:		
ATTN :One Call/Damage Prevention Dept.			
<p>OPERATOR requires a minimum of <u>60 days</u> for technical review upon receipt of complete application and complete and accurate design plans including all previously provided OPERATOR review comments. Submission of plans electronically to the above email address is encouraged and acceptable.</p>			
<p>Permission / Notification: A fully executed Letter of No Objection, Encroachment Agreement is needed prior to construction. The local OPERATOR field office must be notified 10 days prior to construction to allow for the scheduling of an OPERATOR representative to be present.</p>			
<p>I certify that the Information provided is accurate and I realize that Incomplete Information may delay processing or Invalidate this application.</p>			
Signature of Applicant:			
By:	Name & Title:	Date:	

### 1.8 Daily Excavation Checklist Example 1

Excavation Location				
Site:		Date:		
Location:		Time:		
Description of Work:				
Pre Dig Checklist				
1	Is a copy of the current, cleared One Call Ticket on site? Ticket #:		Yes	No
2	Have area alignment sheets, plot plans or drawings been reviewed?	N/A	Yes	No
3	Have underground utilities been located and marked?	N/A	Yes	No
4	Have the property owners been asked if there are any underground facilities that we need to be aware of prior to digging?	N/A	Yes	No
5	Has positive identification of all underground lines been completed by probing or hydro-excavation?		Yes	No
6	Has the secondary sweep of the proposed excavation site been conducted?		Yes	No
7	Have affected operations been notified?		Yes	No
8	Is the area clear of flammable materials?		Yes	No
9	Are safety pins on excavator's hydraulic quick connects?	N/A	Yes	No
10	Is a safety bar covering excavator bucket's teeth? If no, why? (e.g., rocky conditions) Authorized Approval by*:	N/A	Yes	No
11	Have all structures within the boom radius of excavators been identified and precautions taken?	N/A	Yes	No

12	Is a minimum of 10 ft. clearance from electrical equipment maintained?		N/A	Yes	No	
13	Is the work being performed per the Company OQ Program?			Yes	No	
<b>Inspection</b>						
1	Weather Conditions:					
2	Excavation Depth: (Approx. ft.)	Excavations greater than 20 ft. in depth require an engineering letter.  Is a copy of the letter on site?	N/A	Yes	No	
3	Visual Inspection findings (Check all applicable)	Fissured Ground	Poor drainage	Layered/ Stratified Soil		
		Vibration	Previously disturbed soil	Water seepage into excavation		
4	Soil Type:	Stable Rock	Type A	Type B	Type C	
4a	Manual tests used to determine soil classification (check test(s) used)	Thumb Penetration	Shearvane/ Torvane	Plasticity	N/A	
		Pocket Penetrometer	Dry Strength	Drying Test		
5	Have the physical hazards of ground moving, sloughing or trench wall collapse been eliminated by the use of a protective system?		N/A	Yes	No	
6	Type of protective system used:		Sloping	Benching	Shoring	Shielding
	Sloping/ Benching Angle:		Stable Rock: No slope	Type A: ¾:1	Type B: 1:1	Type C: 1½ : 1
	Shoring/ Shielding Type:		Hydraulic	Box or Shield	Using tab data	PE design
6a	Are Shields/Trench Boxes installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads (i.e., Backfill on both sides of the shield to prevent movement)?		N/A	Yes	No	
7	Are materials and tools set back at least 2 ft. back from the lip of the excavation to prevent them from falling/rolling into the excavation?			Yes	No	

8	Are all surcharge loads (spoil pile, heavy equipment, etc.) set back at least 2 ft. from the lip?		Yes	No
9	Are there any known underground piping, cables or structures that could affect work in the excavation? If yes, what type?		Yes	No
10	Are workers protected from falling/overhead loads?	N/A	Yes	No
11	Are barricades in place to warn unaware vehicular and foot traffic of the location of the excavation?	N/A	Yes	No
12	Is the excavation equipped with cross-over walkways?		Yes	No
	If yes, are the walkways higher than 6 ft. from the bottom of the excavation provided with appropriately graded guardrails?	N/A	Yes	No
13	Are warning systems being used for mobile equipment working around the excavation?	N/A	Yes	No
14	Are adjacent structures being protected from undermining? If yes, by what means?	N/A	Yes	No
15	Are workers in the excavation protected from water accumulation? If yes, by what means?		Yes	No
16	Are ladders or other suitable means of access/egress (earthen steps, slopes, etc.) provided for personnel at sufficient intervals so that personnel would be required to travel no more than 25 ft. in any direction to exit the excavation?		Yes	No
17	Are any ladders used for access secured and extended 3 ft. above the lip of the excavation?	N/A	Yes	No
18	Has the atmosphere within the excavation been tested and results documented on a safe work permit?		Yes	No
19	Does the excavation contain, or can it be reasonably expected to contain a hazardous atmosphere? If yes, how are the workers being protected?		Yes	No
20	Are emergency rescue personnel and appropriate rescue equipment available to rescue workers from the excavation?	N/A	Yes	No

21	Other Recognized Hazards (specify below)	Method of Control/ Elimination

<b>Special Instructions or Comments</b>			
	A review of the findings and corrective actions was completed on:		Date:
	Competent Person (print):	Signature:	
	Authorized Representative (print):	Signature:	



### 1.9 Daily Excavation Checklist Example 2

Daily Excavation Checklist									
Permit No.									
<b>Required for excavations 4' deep or greater and occupied by workers</b>									
<b>LOCATION</b>									
Division:	ALL	System	ALL	Index Name	Index #	Station #			
Dig Number:		Date/Time:		Station Name:					
<b>PRE-EXCAVATION CHECKLIST (complete prior to initial excavation) N/A</b>									
Has each excavating contractor submitted a separate notification to the State One Call Center?						Yes	No	N/A	
Have all utilities provided a positive response? This includes verification of notification to applicable municipalities.						Yes	No		
Have surface encumbrances that may create a hazard to employees been removed or supported?						Yes	No		
Have hazards related to the pipeline that surrounds the excavation site been identified and marked?						Yes	No	N/A	
For excavations 20' deep or greater; is the registered professional engineering design on site?						Yes	No	N/A	
<b>PRE - ENTRY EXCAVATION CHECKLIST</b>									
	Feet	Length		Feet	Width		Feet		
For excavations 20' deep or greater, is the excavation in compliance with the registered PE design?						Yes	No	N/A	
Have excavations, adjacent areas, and protective systems been inspected prior to entry?						Yes	No	N/A	
Have adjacent structures been evaluated and stabilized (where appropriate)?						Yes	No	N/A	
Are spoils, materials, and equipment set back a minimum of 2' from the edge of the excavation and placed in a location that does not affect the integrity of the pipeline?						Yes	No	N/A	

Are workers protected from hazards posed by water in the excavation?	Yes	No	N/A
Is exposed pipe supported as necessary and is it within the required span limitations?	Yes	No	N/A
Do all ladders extend 3' above the top edge of the excavation and secured?	Yes	No	N/A
Are stairways, ladders or ramps within 25' lateral travel of workers in the excavation?	Yes	No	N/A
Do the shielding or support systems extend a minimum of 18" above the top of the excavation's vertical sides?	Yes	No	N/A
Are the bottom edge of the shielding or support systems within 2' from the bottom of the excavation?	Yes	No	N/A
Is a Warning System used for mobile equipment where the operator does not have a clear view of the edge?	Yes	No	N/A
For an exposed pipeline, is the minimum 12" distance requirement between in-service pipeline or utilities and heavy equipment being maintained?	Yes	No	N/A
<b>POST EXCAVATION CHECKLIST (complete after backfill) N/A</b>			
Has the excavation been properly backfilled?	Yes	No	
Have pipeline markers been replaced?	Yes	No	
Comments and/or Notes			
Competent Person Signature			
	First Name	Last Name	
Return to Authorized Employee for document retention			

**1.10 Daily Excavation Checklist Example 3**

<b>Operator Excavation of Active Lines Inspection Checklist</b>				
<b>Inspector Last Name:</b>		<b>Inspector First Name:</b>		
<b>Inspection Date:</b>		<b>System:</b>		
<b>Location (GPS,ROW, Station):</b>				
<b>Complete</b>	<b>Not Applicable</b>	<b>Nonconformity</b>	<b>Task ID</b>	<b>Responsibilities</b>
			1	Obtain dig site information from the project leader (location, crossings in the area, special risks).
			2	Verify the Contractor has a current One Call.
			3	Verify staking of dig site using GPS and/or landmarks or pipeline features.
			4	Verify the Contractor uses a line finder in the planned excavation area to locate any utilities.
			5	Verify the Contractor locates the pipe using probe rods.
			6	Obtain a copy of the Contractor's approved excavation plan for the excavation method they plan to use. Note: These are generally not project-specific plans. Ex- mechanical excavation plan, excavation plan
			7	Verify the Contractor completes the excavation per their approved excavation plan.
			8	Verify the excavator uses a spotter at all times.
			9	Verify "tiger/fang-like/pick" bucket teeth or side cutters are not used.
			10	Verify all easement and special landowners
			11	Verify top soil is segregated from subsoil where required. Check with the land agent if unsure.
			12	Verify the Contractor does not use powered excavation the tolerance zone (24" around pipe) until pipe is positively exposed.
			13	Verify the Contractor has an excavation competent person (as defined by OSHA) on site.

			14	Verify the Competent Person Checklist has been completed by the competent person before entry.
			15	Verify the Contractor properly supports the exposed pipe (using skids) when more than ~10' of pipe is exposed
			16	Visually inspect the exposed pipe for pipe or coating damage (ex: corrosion, gouge, dent).
<b>Documentation</b>				
			17	Attach all Inspection checklists completed on a given day to that day's Operator Inspector.
			18	Comment progress and all nonconformities (including those not listed above) on the Operator Inspector.
			19	Fill out a Form Reference for all excavations. Document any damage to Operator or 3rd party on the Form
			20	Contact Operator Ops Center and project leader immediately if damage occurs to Operator asset. Contact the One Call Center immediately if damage occurs to 3rd Party utility.
<b>Notes</b>				
Excavations deeper than 20 ft require a PE stamped excavation plan.				
Contact project leader if the contractor needs to change excavation methods/plan				
Stop excavation anytime the pipeline or people are in danger				

### 1.11 Daily Excavation Checklist Example 4

One Call I.D. No.		Initial Call Date	
District/Location			
Excavator Company:			Person to contact:
LOCATION OF CONSTRUCTION WORK:			
Yes	No		
		1. Was the pipeline required to be located?	
		2. Does the excavation require temporary marker flags?	
		When are they needed? Date	Time <input type="checkbox"/> AM <input type="checkbox"/> PM
		Have they been placed? Date	From to
		3. Will the excavation (or heavy equipment above grade) cross or be within 50 feet of the Company's pipeline(s)?	
		4. Has crossing of the pipeline(s) or excavation encroachment within 50 feet of the pipeline(s) been completed?	
		If no, when will it begin/resume? Date	Time <input type="checkbox"/> AM <input type="checkbox"/> PM
Conditions found and type of equipment on site			
ADDITIONAL COMMENTS			

**NOTE TO EXCAVATOR**

Excavation equipment and blasting can damage pipelines resulting in the release of the product which may cause **serious injuries and/or death and severe damage to the environment.**

**No excavation is allowed within 10’ of any OPERATOR pipeline unless an OPERATOR representative is onsite or has given an explicit exception. All excavation within 2’ of an OPERATOR pipeline must be done either using hand tools or, with approval, a hydrovac unless state requirements are more stringent and require a larger tolerance zone.**

**To avoid damaging a pipeline:**

1. Look for evidence of a pipeline including such things as caution signs, aerial patrol markers, casing vents and above ground piping. When excavating, look for warning tape.
2. Never assume the location of pipelines because:
  - They can change directions abruptly between above ground physical evidence.
  - Their depths can vary substantially in short distances.
  - More than one pipeline may be present.
3. Call Operator to have its representative approximately locate the line and provide on-site assistance (both are free services) before **ANY** excavating activity.
4. If you encounter warning tape while excavating, cease excavation and contact the Operator representative immediately.

EXCAVATOR NAME:

EXCAVATOR REPRESENTATIVE:

TELEPHONE:

COMPANY REPRESENTATIVE NAME & NUMBER:

MEETING DATE

TIME

SIGNATURE (EXCAVATOR REPRESENTATIVE)

AM  PM

**IF YOUR PLANS AS INDICATED ABOVE CHANGE, CALL ( ), 24/7, BEFORE YOU DIG. IN ADDITION CONTACT APPLICABLE ONE CALL CENTER IF REQUIRED.**

**Instructions for completing the above checklist**

- A. Complete this form at the conclusion of the initial meeting with the excavator whenever a field site meeting is conducted. Complete the form after discussing in detail with the excavator's representative his intended excavation plans.
- B. If Operator's assistance will be required at a later date or time to mark the pipeline or monitor the excavation, record the pertinent information in the blanks provided and in the "Additional Comments" section. Confirm the specifics agreed to with the excavator's representative and point this information out to him on the completed form.
- C. Enter your name and the name of the excavator, and their on-site representative on the appropriate lines. Enter a phone number where the excavator may be reached. Enter a phone number where you may be reached at the bottom of the page.
- D. If assistance is not needed or is no longer needed, review the "Notice" section with the excavator.
- E. The form must be re-issued for changes in activities, including, but not limited to: Changes in the scope of work that could affect the safety of the line, changes of affected personnel on the site (excavators, foreman, etc.), changes to the schedule/work plan, that is, digging faster or moving to another area, i.e., across the street.
- F. Each time this form is used, give the copy with the sketch on the back to the excavator's representative and file the other copy.

### 1.12 Daily Excavation Checklist Example 5

<b>OPERATOR COMPETENT PERSON EXCAVATION SAFETY REVIEW LIST For All Excavations 48" And Deeper That Will be Bodily Entered</b>		
Complete the form, indicating with a "Yes" or "No" in the right column. If "No" specify protective mitigation in the comments section.		
<b>REVIEW PRIOR TO EXCAVATING</b>		Yes / No
1	Has the State "One Call" been notified and have utility companies or owners been contacted and underground utilities and installations properly marked and probed? (48 hrs. in advance if required)	
2	Have precautions been taken to avoid equipment contact with overhead electrical lines?	
3	Are underground and surface utility installations protected, supported, or removed to safeguard employees?	
4	If exposure to public vehicular traffic is likely, are personnel wearing safety vests and sufficient barricades in place?	
5	Are warning systems incorporated? (Examples: hand signals, barricades, stop logs, signal person)	
<b>SOIL CLASSIFICATION</b>		
<b>Minimum of One (1) Manual Test and One (1) Visual Test Required for Soil Classification</b>		Yes / No
6	<b>Manual Test:</b> (Circle One) Plasticity Dry Strength Thumb Penetration Instrument Test (If defaulting to Class C- No test required)	
7	<b>Visual Test</b> (Competent Person to observe the...) Soil during excavation Samples of the soil that are excavated and soil in the sides of the excavation Side of the opened excavation and the surface area adjacent to the excavation Adjacent area and excavation for evidence of surface water, location of water table Opened side of the excavation to identify layered systems Adjacent area and excavation for evidence of existing utility to identify previously disturbed soil Adjacent area and excavation for sources of vibration that may affect the stability of the excavation face	
8	Is the excavation free of the following hazards? (circle all present) <b>Layered Systems      Vibrations      Water      Slopes      Fissures</b> If <b>NO</b> , indicate protective mitigation actions on comments section in the back. (Examples: trench shields and traffic control)	
9	Is the excavation free of potential conditions that could lead to a cavein or a failure of the protective system? If <b>NO</b> , indicate protective mitigation actions on comments section in the back. (Examples: trench shields and traffic control)	
10	<b>Soil Type:</b> (circle one)      Stable Rock      Class A      Class B      Class C Allowable Soil Slopes for Excavations <b>NOTE: Benching is NOT permitted in Type C Soil!</b> Soil Type A ¾ Horizontal to 1 Vertical or 53 degrees Soil Type B 1 Horizontal to 1 Vertical or 45 degrees Soil Type C 1½ Horizontal to 1 Vertical or 34 degrees	
<b>EXCAVATION REVIEW PRIOR TO PERSONNEL ENTRY</b>		Yes / No
11	Is the excavation free of, or the potential to, contain an acutely hazardous atmosphere, unsanitary condition, limited egress, or any other serious safety hazards? (If no, select protective measure below.) If atmospheric hazards are present or reasonably expected, take measures as appropriate to mitigate the hazards.	



	(circle one) Air Horn Purge Vac Truck/Air Ejector Other	
1 2	If an acutely hazardous atmosphere exists, or could reasonably be expected to develop, <b>AND/OR</b> If egress is limited, or rescue could not be performed by retrieval line, such as a deep trench box with vertical sides around its entire perimeter: Emergency rescue equipment, including breathing apparatus and a rescue harness and life line, should be on site. Provisions for outside rescue should be identified as necessary.	
1 3	Have adequate precautions been taken to protect employees against the hazards posed by water accumulation?	
1 4	If water removal equipment is used, is its use monitored by the competent person or delegate to prevent standing water?	
1 5	Is the spoil pile at least two 2 feet from the edge of the excavation?	
1 6	Are employees protected from loose rock or soil or other materials that could pose a hazard by falling or rolling into the excavation?	
1 7	For excavations, four feet or more in depth, is a ladder or other safe means of egress (Example: sloped ramp) provided?	
1 8	If ladders are used, do they extend at least three feet above the surface and are they secured?	
1 9	Are exits located so as not to require more than 25 feet of lateral travel by personnel?	
2 0	For excavations greater than 20 feet deep, has a Registered Professional Engineer designed the protective system?	
2 1	For excavations, five feet in depth or greater, or any other excavation that has the potential to cave-in on personnel (regardless of depth), a protective system must be implemented. Which system is being used? (circle all that apply) Trench Box Bench Slope Shoring PE Designed (Field Fabricated Protective System)	
2 2	Has access to the excavation been limited to those personnel essential to the job task?	
2 3	Will the excavation be backfilled as soon as the work is completed; if not, will the excavation be barricaded or marked to prevent accidental entry?	
2 4	The excavation shall be inspected daily and re-inspected after every rainstorm, freeze or thaw, change in trench depth or configuration, or other hazard increasing occurrence. Time: _____ for _____ Re-inspection: Reason _____ Safe to Enter? (Y/N)	
Competent Person - Printed Name:		
Competent Person - Signature/Date/Time:		
Competent Person - Employer/Phone #:		
<b>Comments:</b>		

**1.13 Daily Excavation Checklist Example 6**

<b>OPERATOR Excavation Plan Questionnaire</b>	
Date(s):	Project ID:
Project Name:	
1	Who is the Spotter? (Name/Company)
2	Who is the Inspector? (Name/Company)
3	Who is the Equipment Operator? (Name/Company)
4	Who is the Competent Person? (Name/Company)
5	When is work scheduled to start/end?
6	Was a One Call placed by the Excavator? (Y/N)
7	What is the scope of the excavation?
8	What is the purpose of the excavation?
9	<p>Is this excavation High/Low Risk?</p> <p>High Risk: excavations with one or more crossings or foreign utilities within 50 feet of the planned excavation are or excavations inside of stations</p> <p>Low Risk: excavations with no crossings or foreign utilities within 50 feet of the planned excavation area.</p>
10	How is the excavation performed?
11	What type of equipment is used?
12	Is a variance required? (Y/N)
13	Was the Tolerance Zone reviewed? (Y/N)
14	Is the Spotter on-site for Mechanical Excavations? (Y/N/ N/A) Note: A Spotter is required for mechanical excavations.
15	Is the Inspector on-site for 2nd Party Excavations? (Y/N/ N/A) Note: An Inspector is required for 2nd Party excavations.
16	Operator Qualifications verified? (Y/N) (Include list of applicable Operator Qualification requirements)
17	Project Leader reviewed with inspector and provided copy of questionnaire (Y/N)
18	Project Leader/Inspector reviewed with Stakeholder (Y/N)
19	Project Leader/Inspector Approval (Y/N)

## 1.14 Excavation Risk Assessment

### 1.14.1 Directions to complete the assessment form

Complete Form as follows:

1. Facility or Pipeline Name (use Asset Naming convention)
2. Alignment Sheet Drawing Name/ Map Number
3. Pipeline Stationing (Mile Post and Station, Engineering Stationing, etc.)
4. Company representative completing the form.
5. Date when the form was completed.
6. Complete the environmental review questions. If wetlands are impacted, or construction will disturb the land surface in excess of one acre, construction cannot begin until an environmental project assessment is complete and, where required, necessary regulatory notifications and permits are completed / obtained.
7. Check the applicable block for each risk factor in the chart.
8. Written excavation plan is not required if the following conditions are met:
  - a. No environmental regulatory approvals, notifications or permits are required: AND
  - b. One of the following
    - i. Excavation only involves an abandoned pipeline that has been purged; OR
    - ii. Excavations will be performed by hand or other nonmechanical methods such as vacuum excavation; OR
    - iii. Excavations confirmed to be more than the prescribed distance per state requirements, above any pipeline or service utility except for HVL and gas pipelines where the prescribed distance is larger (ex: minimum of 24 in. is required); OR
    - iv. Excavation is Pit-type, is less than 10 feet deep, no shoring or shielding required, and no hydrocarbon lines exist within a radius of two times the excavation depth; OR
    - v. Excavation is Trench-type and more than two times (2x) the excavation depth from the pipeline or other utility, but not less than 4 feet and no shoring or shielding is required.
9. Signature and title of approver or approval can be documented by email for written excavation plans.

**1.14.2 Excavation Risk Assessment Form**

Facility/Pipeline		Completed by:	
Drawing Name/ Map No:		Date:	
Pipeline Stationing:			

<u>Section1: Environmental Risk Review</u>	Yes	No
Will the excavation impact a Wetland area?		
If yes, has an Environmental project assessment been completed and where required, necessary regulatory approvals obtained?		
Will the Excavation result in surface disturbance of more than 1 acre?		
If yes, have appropriate regulatory notifications/permits been obtained and required storm water Pollution Prevention Plan developed?		

Risk Factor	Risk Level			
	Low	Moderate	High	Very High
Population Density (within 220 yds of excavation)	No occupied dwellings	Less than 10 dwellings or individual units	10 to 46 dwellings or individual units	More than 46 dwellings or individual units, public areas, school, church, hotel, etc.
Excavation Protection System	Slope/bench no PE required Excavation <10ft deep	Shore/shield no PE required Excavation <10ft deep	Shore/shield PE required Excavation <10ft deep	Excavation greater than 10 ft deep
Road/highway within 100 ft excavation	Two lanes or no road within 100 ft	Four lanes	More than 4 lanes or controlled-access interstate	
Proximity to environmentally sensitive area (not applicable to gas or HVL lines)	Release cannot reach water or Superfund site	Release could reach water or Superfund site	Release would reach water or Superfund site	
Product in line(s)	Hydrocarbon vapor, crude oil, gasoline, or distillate	Gas, sour crude, or HVL		
Equipment operator	Good work history on previous projects	Experienced operator, not a frequent contractor	Operator qualifications and experience unknown**	

Risk Factor	Risk Level			
	Low	Moderate	High	Very High
Excavating equipment	Barred teeth on bucket	Teeth with no bar		
Visibility	Daylight and clear	Low light or obscured by darkness, rain, snow, fog, dust storm, etc.		
Location of other lines or utilities	All locations and depths are known	Locations and/or depths unknown		
Other lines or utilities that will impede excavation	None or non-hazardous	Hazardous or fiber optic		
Bends or fittings (stopples, tees, TORs, etc.)	None or location known	Known to exist but location unknown		
Pipe integrity (weld quality, ductility, etc.)	Good	Suspect/poor		
Line operation	Not operating & blocked	Operating		
Aboveground obstructions (within swing area)	None	Structures or overhead utilities		
Risk Factor	Risk Level			
	Low	Moderate	High	Very High
Railroads (within 220 yds of excavation)	None or no trains scheduled during excavation	Train(s) scheduled during excavation or schedule unknown		
Total Indicated in Each Risk Level				

**Note: Blasting is a special case of excavation**

Review level required:	
ALL RISK FACTORS LOW. COMPETENT, TRAINED EMPLOYEE OR AUTHORIZED REPRESENTATIVE	
ONE OR MORE RISK FACTORS "MODERATE": MAJOR MAINT SUPT., AREA or TERMINAL SUPERVISOR OR DESIGNATED REPRESENTATIVE 4 or more risk factors*	
ONE OR MORE RISK FACTORS "HIGH": DIVISION MANAGER OR DESIGNATED REPRESENTATIVE*	
ONE OR MORE RISK FACTORS "VERY HIGH": DIRECTOR OF HEALTH AND SAFETY AND ASSET INTEGRITY MANAGER OR DESIGNATED REPRESENTATIVES*	
	(*) denotes requirement for written excavation plan

	(**) denotes requirement for Division Manager approval. Written excavation plan is not required if this is the only HIGH/VERY HIGH-risk factor.
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Approved By: \_\_\_\_\_  
Signature Title

Distribution: Distribute per Required Review Level