

# OSHA Excavation & Trenching Safety Pack

**FORBES SAFETY SOLUTIONS**

Complete bundle — 7 templates included

Editable Word/Excel/PowerPoint versions available at [forbessafety.com/downloads/](https://forbessafety.com/downloads/)

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# FORBES SAFETY SOLUTIONS

## EXCAVATION / TRENCH DAILY INSPECTION CHECKLIST

29 CFR 1926 Subpart P | 29 CFR 1926.651 | 29 CFR 1926.652

### PROJECT INFORMATION

Company Name: \_\_\_\_\_ Project Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Competent Person Name: \_\_\_\_\_  
Job Location: \_\_\_\_\_ Depth: \_\_\_\_\_  
Width: \_\_\_\_\_ Soil Classification: \_\_\_\_\_

**⚠ This inspection must be completed by a Competent Person before each shift and after any rain, vibration, or other hazard-increasing event.**

| #  | Inspection Item                                                                               | Yes / No / N/A | Notes / Corrective Action |
|----|-----------------------------------------------------------------------------------------------|----------------|---------------------------|
| 1  | Utility locates verified (811 completed, marks visible)                                       |                |                           |
| 2  | Protective system in place (sloping / benching / shoring / shielding — specify type in Notes) |                |                           |
| 3  | Protective system adequate for soil type and depth                                            |                |                           |
| 4  | Spoil pile set back minimum 2 feet from trench edge                                           |                |                           |
| 5  | Means of egress within 25 feet of travel (ladder / ramp / stairs)                             |                |                           |
| 6  | Water accumulation controlled (dewatering in place if needed)                                 |                |                           |
| 7  | No undermining of adjacent structures (buildings, walls, utilities)                           |                |                           |
| 8  | Surface encumbrances removed or adequately supported                                          |                |                           |
| 9  | Atmosphere tested (if >4 feet deep with potential hazardous atmosphere)                       |                |                           |
| 10 | Heavy equipment set back from trench edge                                                     |                |                           |
| 11 | Pedestrian and vehicle barriers / barricades in place                                         |                |                           |
| 12 | Fall protection for workers near edge (above 6 feet)                                          |                |                           |
| 13 | Adequate lighting for work area                                                               |                |                           |
| 14 | Emergency rescue equipment available and accessible                                           |                |                           |

### DEFICIENCIES & CORRECTIVE ACTIONS

| # | Deficiency Description | Corrective Action Taken | Completion Time |
|---|------------------------|-------------------------|-----------------|
|---|------------------------|-------------------------|-----------------|

|   |  |  |  |
|---|--|--|--|
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

COMPETENT PERSON CERTIFICATION

I certify that I have inspected this excavation/trench and all conditions are safe for entry, or all deficiencies have been corrected as noted above.

Print Name): \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

RE-INSPECTION AFTER EVENT (Rain / Vibration / Other): \_\_\_\_\_ Time: \_\_\_\_\_ Initials: \_\_\_\_\_

## JOB HAZARD ANALYSIS

### Directional Drilling / Boring

Regulatory References: 29 CFR 1926.651, CGA Best Practices, 811 Call Before You Dig

#### PROJECT INFORMATION

|                 |                               |                  |                                                          |
|-----------------|-------------------------------|------------------|----------------------------------------------------------|
| Project Name:   |                               | Date:            |                                                          |
| Location:       |                               | JHA Number:      | JHA-032                                                  |
| Supervisor:     |                               | Reviewed By:     |                                                          |
| Trade/Activity: | Directional Drilling / Boring | Permit Required: | <input type="checkbox"/> Yes <input type="checkbox"/> No |

#### JOB HAZARD ANALYSIS

| Task Step                             | Hazard                                                                                           | Risk Level       | Control Measures                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------|--------------------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Utility Locate Verification</b> | Striking unmarked utilities<br>Inaccurate locate markings<br>Incomplete records                  | H<br>H<br>M      | Verify 811 ticket is current and all utilities have responded<br>Pothole/vacuum excavate to physically expose utilities within 5 ft of bore path<br>Compare field marks against utility maps and as-built drawings<br>Mark all exposed utilities with flags/stakes and record depths<br>If discrepancies found, stop work and re-request locates<br>Use ground-penetrating radar (GPR) for added verification in congested areas         |
| <b>2. Drill Rig Setup</b>             | Heavy equipment tip-over<br>Caught-in/between<br>Noise exposure<br>Traffic hazards               | H<br>M<br>M<br>H | Position rig on firm, level ground; use crane mats if needed<br>Establish traffic control plan with signs, cones, flaggers per MUTCD<br>Set exclusion zone around rig — minimum 10 ft from rotating components<br>Inspect all rig safety guards, E-stops, and shutdown devices<br>Verify pipe rack is secure and pipe handling area is clear<br>Conduct safety briefing with all crew before startup                                     |
| <b>3. Pilot Bore</b>                  | Striking existing utilities<br>Drilling fluid release (frac-out)<br>Entanglement in drill string | H<br>H<br>H      | Use electronic locating/sonde to track bore head position and depth continuously<br>Monitor drilling fluid pressure — do NOT exceed formation fracture pressure<br>Maintain 2 ft minimum separation from known utilities<br>Station spotter at bore path to watch for surface heaving or fluid emergence<br>Never reach into rotating drill string; use wrenches designed for breakout<br>Wear hearing protection; rig produces 85-95 dB |
| <b>4. Back-Ream</b>                   | Entanglement<br>Fluid spill<br>High torque / sudden release                                      | H<br>M<br>M      | Ensure reamer guards are installed and rotating parts are shielded<br>Maintain safe distance from reamer and drill string during rotation                                                                                                                                                                                                                                                                                                |

## FORBES SAFETY SOLUTIONS

| Task Step                   | Hazard                                                                                                  | Risk Level                          | Control Measures                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | Noise                                                                                                   | M                                   | <p>Monitor mud returns — loss of returns indicates potential frac-out</p> <p>Use proper pipe handling tools (no hands near threads under torque)</p> <p>Keep mud containment pits/tanks maintained and not overflowing</p> <p>Have vacuum truck on standby for fluid management</p>                                                                                                                                                |
| 5. Product Pullback         | <p>Pipe whip/snap</p> <p>Heavy load handling</p> <p>Trench collapse at exit pit</p> <p>Entanglement</p> | <p>H</p> <p>M</p> <p>H</p> <p>H</p> | <p>Inspect swivel, pulling head, and product pipe connections before pullback</p> <p>Keep personnel clear of pipe under tension — establish exclusion zone</p> <p>Shore or slope exit pit per 29 CFR 1926.652</p> <p>Use tag lines on suspended pipe — never guide by hand near rotating joints</p> <p>Monitor pull force — stop if resistance exceeds design parameters</p> <p>Spotter at exit pit to guide product emergence</p> |
| 6. Cleanup & Demobilization | <p>Slips/trips on drilling mud</p> <p>Heavy equipment movement</p> <p>Environmental contamination</p>   | <p>M</p> <p>M</p> <p>M</p>          | <p>Pump out and properly dispose of all drilling fluid per local regulations</p> <p>Backfill entry/exit pits and compact to original grade</p> <p>Clean up all spilled drilling fluid from surrounding areas</p> <p>Restore ground surface, seed/sod as required by permit</p> <p>Secure all equipment for transport; check load securement</p> <p>Complete as-built documentation with bore depth and alignment records</p>       |

**Additional Notes:** All utility locates must be verified and valid (within 10-14 business days depending on jurisdiction).  
Pothole/vacuum excavate to expose all utilities within 5 ft of bore path. Maintain bore logs with depth and fluid pressure records.

# FORBES SAFETY SOLUTIONS

## PERSONAL PROTECTIVE EQUIPMENT (PPE)

| Required PPE                                                         |                                                                   |
|----------------------------------------------------------------------|-------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Hard Hat (ANSI Z89.1)            | <input checked="" type="checkbox"/> Safety Glasses (ANSI Z87.1)   |
| <input checked="" type="checkbox"/> High-Visibility Vest (Class 2/3) | <input checked="" type="checkbox"/> Steel/Composite Toe Boots     |
| <input checked="" type="checkbox"/> Hearing Protection (NRR 25+)     | <input checked="" type="checkbox"/> Cut-Resistant Gloves          |
| <input checked="" type="checkbox"/> Face Shield (during fluid ops)   | <input checked="" type="checkbox"/> Rubber Boots (wet conditions) |

## EMERGENCY PROCEDURES

- Utility strike (gas): Evacuate area immediately. Do NOT operate switches/ignition. Call 911 and gas utility emergency line.
- Utility strike (electric): Stay clear of equipment. Assume all ground in area is energized. Call 911 and utility provider.
- Utility strike (water/sewer): Shut down drill. Notify utility. Contain flow to prevent environmental damage.
- Drilling fluid release (frac-out): Stop drilling immediately. Contain fluid with berms/vacuum truck. Notify environmental coordinator.
- Entanglement injury: Activate E-stop on drill rig immediately. Do NOT attempt to reverse rotation. Call 911.
- Report all incidents, near-misses, and utility contacts to supervisor and 811 immediately.

# FORBES SAFETY SOLUTIONS

## WORKER SIGN-OFF

By signing below, I acknowledge that I have reviewed and understand this Job Hazard Analysis, the associated hazards, and the required control measures for the work to be performed.

| #  | Print Name | Signature | Company | Date | Time |
|----|------------|-----------|---------|------|------|
| 1  |            |           |         |      |      |
| 2  |            |           |         |      |      |
| 3  |            |           |         |      |      |
| 4  |            |           |         |      |      |
| 5  |            |           |         |      |      |
| 6  |            |           |         |      |      |
| 7  |            |           |         |      |      |
| 8  |            |           |         |      |      |
| 9  |            |           |         |      |      |
| 10 |            |           |         |      |      |

## REVIEW & APPROVAL

| Role            | Name / Signature | Title | Date |
|-----------------|------------------|-------|------|
| Prepared By     |                  |       |      |
| Reviewed By     |                  |       |      |
| Approved By     |                  |       |      |
| Site Supervisor |                  |       |      |

## REVISION HISTORY

| Rev. | Date | Description     | Author |
|------|------|-----------------|--------|
| 0    |      | Initial Release |        |
| 1    |      |                 |        |

# JOB HAZARD ANALYSIS

## Excavation & Trenching Operations

**Applicable Standards:** 29 CFR 1926 Subpart P (1926.650–1926.652); OSHA Excavation Standard; 29 CFR 1926.651(c) — Utility Locates

|                            |                          |
|----------------------------|--------------------------|
| <b>Project Name:</b> _____ | <b>Date:</b> _____       |
| <b>Location:</b> _____     | <b>Supervisor:</b> _____ |
| <b>Crew Members:</b> _____ |                          |

| Step # | Job Steps                                                                                     | Potential Hazards                                                                                           | Hazard Controls                                                                                                                                                                                                                     | Responsible Person |
|--------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1      | Conduct pre-excavation site survey and review utility locate markings (811 call confirmation) | Utility strikes (gas, electric, water, fiber); unmarked underground hazards                                 | Verify 811 utility locate completed (min. 48 hrs prior). Review as-built drawings. Hand-dig within 18" of marked utilities. Use ground-penetrating radar for unknown areas.                                                         |                    |
| 2      | Establish excavation perimeter barricades and traffic control                                 | Struck-by from vehicles or mobile equipment; unauthorized entry into excavation zone                        | Install high-visibility barricades and warning signs per MUTCD standards. Assign flaggers for active roadways. Maintain 6-ft setback for spoil piles from trench edge.                                                              |                    |
| 3      | Perform soil classification by competent person (visual and manual tests)                     | Incorrect soil classification leading to inadequate protective systems; cave-in risk                        | Competent person conducts thumb penetration, plasticity, and dry strength tests per 29 CFR 1926.652 Appendix A. Document soil type (A, B, or C) in writing. Reassess after rain events.                                             |                    |
| 4      | Excavate trench using hydraulic excavator                                                     | Equipment tip-over; struck-by from bucket swing; overhead power line contact                                | Ensure operator is trained/certified. Maintain 10-ft clearance from power lines (20-ft for >350kV). No workers in swing radius. Ground guide with radio communication required. Spotters for blind spots.                           |                    |
| 5      | Install protective system — shoring, shielding, or sloping per soil classification            | Cave-in / trench collapse; engulfment; crushing injuries                                                    | Install system before any worker enters trench >5 ft deep (OSHA 1926.652). Use tabulated data for shoring specs. Hydraulic shores installed from top down. Trench boxes rated for soil type and depth.                              |                    |
| 6      | Place access/egress ladders within 25 ft of lateral travel for all workers                    | Inability to escape during emergency; falls from ladder; ladder displacement                                | Position ladders per 1926.651(c)(2) — max 25 ft travel distance. Ladders extend 3 ft above trench edge. Secure at top to prevent displacement. Inspect daily before use.                                                            |                    |
| 7      | Monitor atmospheric conditions in trench (>4 ft deep)                                         | Oxygen deficiency; toxic gases (H <sub>2</sub> S, CO, methane); hazardous atmosphere from nearby operations | Continuous atmospheric monitoring with 4-gas meter (O <sub>2</sub> , LEL, CO, H <sub>2</sub> S). Calibrate instrument daily. Ventilate with mechanical blowers if readings are abnormal. Rescue plan and retrieval system in place. |                    |
| 8      | Perform work activities within the trench (pipe installation, utility repair, etc.)           | Struck-by from falling materials/tools; manual handling injuries; water accumulation                        | Keep materials/tools 2 ft back from trench edge. Use buckets or tool lanyards to lower items. Pump standing water continuously. No workers under suspended loads. Competent person inspects trench daily and after weather events.  |                    |
| 9      | Backfill operations and compaction                                                            | Workers caught between equipment and trench wall; uncontrolled soil movement; vibration exposure            | Clear all personnel from trench before backfilling. Remove shoring bottom-up. Backfill in lifts and compact per engineer specs. Operator maintains visual contact with spotter. Anti-vibration gloves for compaction equipment.     |                    |
| 10     | Demobilize equipment and restore site                                                         | Struck-by during equipment movement; unguarded open                                                         | Barricade any open excavations left overnight with steel plates or fencing. Restore traffic                                                                                                                                         |                    |

| Step # | Job Steps | Potential Hazards         | Hazard Controls                                                                              | Responsible Person |
|--------|-----------|---------------------------|----------------------------------------------------------------------------------------------|--------------------|
|        |           | excavations; trip hazards | control. Final inspection by competent person.<br>Document JHA completion and any incidents. |                    |

 **This JHA must be reviewed and signed by all crew members before work begins.** Conditions on the jobsite may change — reassess hazards throughout the shift and update this JHA as necessary.

REVIEW & APPROVAL

Reviewed By (Print Name)

Signature

Date

# FORBES SAFETY SOLUTIONS

## JOB HAZARD ANALYSIS

### Pipeline / Underground Utility Installation

**Applicable Standards:** 29 CFR 1926 Subpart P (Excavations) • 29 CFR 1926.651 (General Requirements) • 29 CFR 1926.652 (Protective Systems) • CGA Best Practices (Common Ground Alliance 811) • MUTCD (Traffic Control) • 29 CFR 1926.353 (Ventilation for Welding) • 29 CFR 1910.146 (Permit-Required Confined Spaces)

### PROJECT INFORMATION

|                   |  |                |  |
|-------------------|--|----------------|--|
| Company Name:     |  | Date:          |  |
| Project/Site:     |  | JHA Number:    |  |
| Supervisor:       |  | Work Activity: |  |
| Location/Address: |  | Permit #:      |  |

### JOB HAZARD ANALYSIS — TASK BREAKDOWN

| TASK STEP                                                   | HAZARD                                                                                                                                                                                                                                                                             | RISK (H/M/L) | CONTROL MEASURES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Utility Locate &amp; Potholing (811 Verification)</b> | <ul style="list-style-type: none"> <li>Struck-by existing utilities (gas, electric, fiber, water)</li> <li>Electrocution from unmarked power lines</li> <li>Damage to pressurized gas line</li> <li>Inadequate locate markings</li> </ul>                                          | H            | <ul style="list-style-type: none"> <li>Call 811 minimum 48–72 hours before excavation — verify ticket is active and valid</li> <li>Obtain utility locate maps and cross-reference with as-built drawings</li> <li>Pothole (soft-dig) with vacuum excavation or hand tools within 24" of marked utilities</li> <li>Competent person verifies all locates before mechanical excavation</li> <li>Mark tolerance zones with white paint per CGA Best Practices</li> <li>Photograph all markings before work begins for documentation</li> </ul>                                                                                                                                                                                                              |
| <b>2. Excavation &amp; Trench Setup</b>                     | <ul style="list-style-type: none"> <li>Cave-in / trench collapse</li> <li>Engulfment</li> <li>Falls into excavation</li> <li>Hazardous atmosphere (methane, CO, H<sub>2</sub>S, low O<sub>2</sub>)</li> <li>Contact with groundwater</li> <li>Heavy equipment struck-by</li> </ul> | H            | <ul style="list-style-type: none"> <li>Competent person performs soil classification per 29 CFR 1926.651</li> <li>Install trench protective system: sloping, benching, shoring, or trench shield per soil type</li> <li>Excavations &gt;4 ft. deep require protective system; &gt;20 ft. requires PE-stamped design</li> <li>Atmospheric monitoring before entry and continuously in deep trenches (&gt;4 ft.)</li> <li>Install barricades, guardrails, and warning signs around excavation perimeter</li> <li>Ladders within 25 ft. of all workers for emergency egress</li> <li>Spotter required for all heavy equipment near trench edge</li> <li>Daily trench inspection by competent person; re-inspect after rain or changed conditions</li> </ul> |
| <b>3. Pipe Laying / Welding</b>                             | <ul style="list-style-type: none"> <li>Struck-by pipe or materials during lifting</li> <li>Caught-between during pipe placement</li> <li>Welding burns and UV radiation</li> <li>Fire/explosion from hot work near gas utilities</li> </ul>                                        | H            | <ul style="list-style-type: none"> <li>Rigging inspection before each lift — competent rigger directs crane/excavator</li> <li>Tag lines on all suspended loads; no workers under suspended pipe</li> <li>Hot work permit required for all welding/cutting operations</li> <li>Welding screens/curtains to protect nearby workers from UV/sparks</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                              |

| TASK STEP                                       | HAZARD                                                                                                                                                                                                                                                           | RISK (H/M/L) | CONTROL MEASURES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 | <ul style="list-style-type: none"> <li>Ergonomic strain (heavy lifting)</li> <li>Fume inhalation</li> </ul>                                                                                                                                                      |              | <ul style="list-style-type: none"> <li>Fire watch with extinguisher during and 30 min. after hot work</li> <li>Welding fume extraction or natural ventilation for trench welding</li> <li>Proper lifting techniques; mechanical assists for pipe &gt;50 lbs.</li> <li>Gas detection monitor in continuous operation near gas utilities</li> </ul>                                                                                                                                                                                                                                                                           |
| <b>4. Backfill &amp; Compaction</b>             | <ul style="list-style-type: none"> <li>Struck-by heavy equipment</li> <li>Crushing/caught-between compaction equipment and trench walls</li> <li>Damaged pipe from improper backfill</li> <li>Noise exposure &gt;85 dBA</li> <li>Whole-body vibration</li> </ul> | M            | <ul style="list-style-type: none"> <li>Spotter for all heavy equipment operations near trench</li> <li>Verify no workers in trench during machine backfill operations</li> <li>Follow engineered backfill specifications (lift thickness, material type)</li> <li>Compaction testing per project specifications</li> <li>Hearing protection required near compaction equipment</li> <li>Anti-vibration gloves and equipment operator rest intervals</li> <li>Maintain minimum safe distance from trench edge for equipment (per soil type)</li> </ul>                                                                       |
| <b>5. Pressure Testing</b>                      | <ul style="list-style-type: none"> <li>High-pressure line failure / rupture</li> <li>Projectile hazard from fitting failure</li> <li>Exposure to test medium (water, air, or inert gas)</li> <li>Noise from pressurized release</li> </ul>                       | H            | <ul style="list-style-type: none"> <li>Written pressure test procedure approved by engineer</li> <li>Establish exclusion zone — no personnel within blast radius during pressurization</li> <li>Inspect all fittings, joints, and connections before test initiation</li> <li>Gradual pressurization in stages with hold periods per specification</li> <li>Calibrated pressure gauges — minimum two independent gauges</li> <li>Bleed pressure safely before disconnecting any fittings</li> <li>Hearing protection during controlled pressure release</li> <li>Emergency shutoff valve accessible at all times</li> </ul> |
| <b>6. Site Restoration &amp; Demobilization</b> | <ul style="list-style-type: none"> <li>Traffic exposure on roadways</li> <li>Uneven ground / trip hazards</li> <li>Remaining excavation openings</li> <li>Improper waste disposal</li> </ul>                                                                     | M            | <ul style="list-style-type: none"> <li>Traffic control plan (TTC) per MUTCD — flaggers, cones, signs, arrow boards</li> <li>High-visibility Class 3 vests for all workers near traffic</li> <li>Verify all excavations backfilled and compacted to grade</li> <li>Install permanent surface restoration (asphalt, concrete, sod) per permit requirements</li> <li>Remove all construction debris and dispose per environmental regulations</li> <li>Conduct final site walk-through with supervisor — document with photos</li> <li>Update as-built drawings with actual utility locations</li> </ul>                       |

## FORBES SAFETY SOLUTIONS

### PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS

| PPE ITEM                  | SPECIFICATION / STANDARD                                                      | WHEN REQUIRED                                                  |
|---------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------|
| Hard Hat                  | ANSI/ISEA Z89.1, Type I, Class E (electrical rated)                           | All times within excavation work zone                          |
| High-Visibility Vest      | ANSI/ISEA 107, Class 3 (for roadway/traffic exposure)                         | All workers on site; Class 3 required near traffic             |
| Steel/Composite Toe Boots | ASTM F2413 — puncture-resistant, metatarsal guard recommended                 | All times on site; waterproof if groundwater present           |
| Safety Glasses            | ANSI Z87.1 — impact-rated, anti-fog                                           | All times; goggles for grinding, cutting, or dusty conditions  |
| Hearing Protection        | ANSI S3.19 — NRR 25+ dB (plugs or muffs)                                      | Near heavy equipment, compaction, or pneumatic tools (>85 dBA) |
| Cut-Resistant Gloves      | ANSI/ISEA 105, Cut Level A4 minimum                                           | Pipe handling, material moving, general excavation tasks       |
| Welding Hood / Shield     | ANSI Z87.1, Shade 10-12 for arc welding                                       | All welding and cutting operations                             |
| Welding Gloves            | ANSI/ISEA 105 — heat and flame resistant                                      | All welding and hot work operations                            |
| Respiratory Protection    | NIOSH-approved P100 or supplied air as required                               | Trench atmospheres with contaminants; welding fume exposure    |
| Fall Protection Harness   | ANSI Z359.11 — full body harness with lanyard                                 | Work adjacent to excavations >6 ft. deep without guardrails    |
| Gas Detection Monitor     | 4-gas monitor: O <sub>2</sub> , LEL, CO, H <sub>2</sub> S — bump tested daily | All personnel entering excavations >4 ft. deep                 |

### EMERGENCY PROCEDURES

| EMERGENCY PROCEDURES                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trench Rescue: If a cave-in occurs, call 911 immediately. Do NOT enter the trench to rescue — this is a confined space rescue requiring trained technical rescue teams. Protect remaining trench walls from further collapse. |
| Struck Utility — Gas: Evacuate upwind immediately. Establish 300 ft. exclusion zone. Call gas company emergency line. Do NOT attempt to cap or repair. Eliminate ignition sources.                                            |
| Struck Utility — Electric: Assume all conductors are energized. Do NOT touch the line or equipment in contact with it. Call utility emergency number. Establish exclusion zone equal to wire span length.                     |
| Hazardous Atmosphere: Remove worker from trench immediately if gas monitor alarms. Ventilate with mechanical blower. Do not re-enter until atmosphere is confirmed safe by competent person with calibrated monitor.          |
| Medical Emergency: Administer first aid. Call 911 and provide exact location and nature of injury. Designate someone to guide emergency vehicles to site. First aid kit and AED on site at all times.                         |
| Emergency Contacts: Competent Person: _____   811 Ticket #: _____   Local EMS: 911   Gas Co. Emergency: _____   Electric Co. Emergency: _____                                                                                 |

## FORBES SAFETY SOLUTIONS

### WORKER ACKNOWLEDGMENT & SIGN-OFF

By signing below, I acknowledge that I have reviewed this JHA, understand the identified hazards and control measures, and agree to follow all safety procedures outlined herein. I have been trained on the use of required PPE and emergency procedures for this work activity.

| #  | PRINTED NAME | SIGNATURE | DATE |
|----|--------------|-----------|------|
| 1  |              |           |      |
| 2  |              |           |      |
| 3  |              |           |      |
| 4  |              |           |      |
| 5  |              |           |      |
| 6  |              |           |      |
| 7  |              |           |      |
| 8  |              |           |      |
| 9  |              |           |      |
| 10 |              |           |      |

### JHA REVIEW & APPROVAL

This JHA must be reviewed and approved before work commences. Review is required whenever scope, conditions, personnel, or site conditions change. The competent person must re-assess the trench and protective systems at the start of each shift.

| ROLE                              | NAME | SIGNATURE | DATE |
|-----------------------------------|------|-----------|------|
| Prepared By (Safety Professional) |      |           |      |
| Reviewed By (Competent Person)    |      |           |      |
| Approved By (Project Manager)     |      |           |      |
| Approved By (HSE Manager)         |      |           |      |

### REVISION HISTORY

| REV # | DATE | DESCRIPTION | REVISED BY |
|-------|------|-------------|------------|
|       |      |             |            |
|       |      |             |            |
|       |      |             |            |

**DISCLAIMER:** *This JHA template is provided as a guide for safety planning and does not replace site-specific hazard assessments. Employers are responsible for ensuring compliance with all applicable OSHA standards, state and local regulations, utility owner requirements, and company-specific safety programs. The competent person must adapt this document to reflect actual site conditions, soil classification, protective systems, and personnel qualifications.*

## FORBES SAFETY SOLUTIONS

### EXCAVATION PERMIT

Reference: 29 CFR 1926 Subpart P

#### PROJECT INFORMATION

|              |  |                   |
|--------------|--|-------------------|
| Company:     |  | Project Name:     |
| Location:    |  | Permit #:         |
| Date Issued: |  | Competent Person: |

#### EXCAVATION DETAILS

|                      |                    |
|----------------------|--------------------|
| Excavation Purpose:  |                    |
| Depth (ft):          | Length (ft):       |
| Soil Classification: | Protective System: |

#### PRE-EXCAVATION CHECKLIST

| #  | Checklist Item                                            | Yes |
|----|-----------------------------------------------------------|-----|
| 1  | 811/One-Call utility locate request complete?             |     |
| 2  | Locate marks valid (less than 30 days old)?               |     |
| 3  | Underground utility map reviewed?                         |     |
| 4  | Competent person designated and on-site?                  |     |
| 5  | Protective system designed for soil conditions?           |     |
| 6  | Means of egress provided (ladder within 25 ft of travel)? |     |
| 7  | Traffic control plan in place?                            |     |
| 8  | Adjacent structures assessed for stability?               |     |
| 9  | Spoil pile placed minimum 2 ft from edge?                 |     |
| 10 | Surface water controls / dewatering plan in place?        |     |
| 11 | Warning system for mobile equipment established?          |     |
| 12 | Personal protective equipment available?                  |     |

#### ATMOSPHERIC MONITORING (Required if depth > 4 ft with potential hazardous atmosphere)

| Parameter                           | Action Level  | Reading 1 | Time |
|-------------------------------------|---------------|-----------|------|
| Oxygen (O <sub>2</sub> )            | 19.5% - 23.5% |           |      |
| LEL (Combustible Gas)               | < 10% LEL     |           |      |
| Carbon Monoxide (CO)                | < 35 ppm      |           |      |
| Hydrogen Sulfide (H <sub>2</sub> S) | < 10 ppm      |           |      |
| Monitoring Instrument:              |               |           |      |

#### PERMIT VALIDITY

|             |  |           |
|-------------|--|-----------|
| Valid From: |  | Valid To: |
|-------------|--|-----------|

*This permit must be renewed if conditions change (weather, soil, adjacent work, etc.)*

#### AUTHORIZATION SIGNATURES

|                     |             |  |
|---------------------|-------------|--|
| Competent Person:   | Print Name: |  |
| Project Supervisor: | Print Name: |  |
| Safety Manager:     | Print Name: |  |

Reference: 29 CFR 1926 Subpart P - Excavations

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UTIONS

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part P

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|             |  |  |  |
| Width (ft): |  |  |  |
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| No | N/A | Comments |
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| Reading 2         | Time | Reading 3 | Time |
|-------------------|------|-----------|------|
|                   |      |           |      |
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|                   |      |           |      |
| Calibration Date: |      |           |      |

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| Signature: |  | Date: |  |
|------------|--|-------|--|
| Signature: |  | Date: |  |
| Signature: |  | Date: |  |

# EXCAVATION & TRENCHING SAFETY PROGRAM

Written Safety Program

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**[COMPANY NAME]**

[Company Address]

[City, State ZIP]

[Phone Number]

Revision Date: [MM/DD/YYYY]

Revision Number: [1.0]

*Prepared by Forbes Safety Solutions*

## Document Control

This document is the property of [COMPANY NAME]. It must be reviewed and updated at least annually or when conditions change.

| Revision # | Date   | Description of Change | Approved By  |
|------------|--------|-----------------------|--------------|
| 1.0        | [Date] | Initial Release       | [Name/Title] |
|            |        |                       |              |
|            |        |                       |              |

# Table of Contents

*Note: Right-click and select "Update Field" to refresh the Table of Contents after editing.*

# 1. Purpose and Scope

## 1.1 Purpose

The purpose of this Excavation and Trenching Safety Program is to establish the procedures, practices, and responsibilities necessary to protect employees from the hazards associated with excavation and trenching operations. Excavation cave-ins are among the most deadly construction hazards — the weight of soil that collapses can easily exceed thousands of pounds and can bury a worker in seconds.

This written program establishes minimum requirements for excavation and trenching activities performed by or on behalf of [COMPANY NAME] and complies with the requirements of 29 CFR 1926, Subpart P — Excavations.

## 1.2 Scope

This program applies to all [COMPANY NAME] employees, subcontractors, and temporary workers involved in excavation and trenching operations, including but not limited to:

- Foundation excavations
- Utility trenching (water, sewer, gas, electric, communications)
- Pipe installation and repair
- Basement excavations
- Roadway and infrastructure construction
- Grading operations where workers enter the excavation
- Any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal

This program does NOT apply to excavations made entirely in stable rock or excavations less than 5 feet in depth where examination of the ground by the competent person provides no indication of a potential cave-in (per 29 CFR 1926.652(a)(1)).

## 1.3 Regulatory References

- 29 CFR 1926.650 – Scope, Application, and Definitions
- 29 CFR 1926.651 – Specific Excavation Requirements
- 29 CFR 1926.652 – Requirements for Protective Systems
- 29 CFR 1926 Subpart P, Appendix A – Soil Classification
- 29 CFR 1926 Subpart P, Appendix B – Sloping and Benching
- 29 CFR 1926 Subpart P, Appendix C – Timber Shoring for Trenches
- 29 CFR 1926 Subpart P, Appendix D – Aluminum Hydraulic Shoring for Trenches
- 29 CFR 1926 Subpart P, Appendix E – Alternatives to Timber Shoring
- 29 CFR 1926 Subpart P, Appendix F – Selection of Protective Systems
- OSHA Publication 2226 – Excavation: Hazard Recognition in Trenching and Shoring



## 2. Definitions

**Benching (Benching System):** 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 a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

**Competent Person:** One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. For excavation, the competent person must be trained in soil analysis and protective system selection.

**Excavation:** Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

**Hazardous Atmosphere:** An atmosphere that by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

**Protective System:** A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching, shield systems, and other systems that provide the necessary protection.

**Registered Professional Engineer:** A person who is registered as a professional engineer in the state where the work is to be performed.

**Shield (Shield System):** A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Also known as a trench box or trench shield.

**Shoring (Shoring System):** A structure such as a metal, hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

**Sloping (Sloping System):** 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 such factors as soil type, environmental conditions of exposure, and application of surcharge loads.

**Stable Rock:** Natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed.

**Trench:** A narrow excavation (in relation to its length) made below the surface of the ground, generally with a depth greater than its width, but with a width not exceeding 15 feet.

**Type A Soil:** Cohesive soils with an unconfined compressive strength of 1.5 tsf (tons per square foot) or greater. Examples: clay, silty clay, sandy clay, clay loam. Excludes fissured soil, soil subject to vibration, previously disturbed soil, and soil part of a layered system.

**Type B Soil:** Cohesive soil with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf. Examples: angular gravel, silt, silt loam, sandy loam, previously disturbed soils except those classified as Type C, fissured cohesive soils, dry rock that is not stable.

**Type C Soil:** Cohesive soil with an unconfined compressive strength of 0.5 tsf or less. Examples: granular soils (gravel, sand, loamy sand), submerged soil, soil from which water is freely seeping, submerged rock that is not stable.

## 3. Roles and Responsibilities

### 3.1 Employer / Management

- Establish, implement, and maintain this Excavation and Trenching Safety Program
- Designate a competent person for each excavation project who has training and experience in soil classification and protective system selection
- Provide all necessary excavation safety equipment (protective systems, monitoring instruments, access/egress equipment) at no cost to employees
- Ensure utility locating services (811) are contacted before any excavation begins
- Ensure all employees involved in excavation operations receive appropriate training
- Investigate all excavation-related incidents and near misses
- Maintain documentation of inspections, soil classifications, and training records
- Conduct annual program reviews and update as necessary

### 3.2 Competent Person

- Conduct daily inspections of excavations, adjacent areas, and protective systems before each shift, after every rainstorm, and after any event that could increase the hazard (e.g., vibration from nearby construction, heavy equipment movement)
- Classify soils at each excavation site using at least one visual test and one manual test
- Select and design protective systems appropriate for the soil type, depth, and site conditions
- Monitor excavation operations for changing conditions that could affect employee safety
- Determine the need for atmospheric testing in excavations deeper than 4 feet or where hazardous atmospheres may exist
- Authority to immediately remove employees from the excavation when a hazardous condition is detected
- Ensure that means of egress (ladders, ramps, stairs) are provided within 25 feet of lateral travel for all employees in trenches 4 feet or more in depth
- Evaluate adjacent structures, utility locations, and surface conditions before excavation begins
- Document all inspections, soil classifications, and corrective actions

### 3.3 Supervisors

- Ensure the competent person has inspected the excavation before allowing employees to enter
- Verify that protective systems are installed and functioning properly
- Enforce compliance with this program and all excavation safety requirements
- Ensure employees use proper access/egress routes
- Conduct daily pre-work briefings covering excavation hazards

- Report all incidents, near misses, and changed conditions to the competent person and management
- Ensure spoil piles are placed at least 2 feet from the edge of the excavation
- Keep heavy equipment and surcharge loads away from the excavation edge

### **3.4 Employees**

- Comply with all excavation safety requirements in this program
- Never enter an excavation that has not been inspected by the competent person
- Use only designated access/egress routes (ladders, ramps, stairs)
- Report any signs of cave-in potential, water accumulation, or changing conditions to the competent person or supervisor immediately
- Wear required personal protective equipment at all times in and around excavations
- Keep materials, equipment, and spoil piles at least 2 feet from the edge of the excavation
- Never work under raised loads or operate heavy equipment near the excavation edge without authorization
- Attend and participate in all required excavation safety training
- Immediately evacuate the excavation when ordered to do so

## 4. Excavation and Trenching Procedures

### 4.1 Pre-Excavation Planning

Before any excavation begins, the following pre-excavation planning steps shall be completed:

#### 4.1.1 Utility Location

- Contact 811 (the national "Call Before You Dig" service) at least 48 to 72 hours (per state requirements) before any excavation begins
- All known utilities shall be marked by the utility owners before excavation starts
- The exact location of underground installations shall be determined by safe and acceptable means (hand digging, vacuum excavation, or other non-destructive methods) when working within the tolerance zone of marked utilities
- Utility owners/operators shall be contacted for specific guidance when working near high-pressure gas lines, electrical cables, or other critical infrastructure
- If utilities cannot be located with certainty, hand dig or use vacuum excavation methods
- Maintain at least 18 inches clearance from any confirmed underground utility during mechanical excavation
- Document all utility locate requests, locate ticket numbers, and utility markings on the Daily Trench Inspection Form (Appendix A)

#### 4.1.2 Adjacent Structure Assessment

The competent person shall evaluate the stability of adjacent structures (buildings, walls, sidewalks, roadways, and other structures) that may be affected by excavation operations:

- Determine if shoring, bracing, or underpinning is necessary to ensure the stability of adjacent structures
- Monitor adjacent structures for signs of movement, settlement, or cracking throughout excavation operations
- Maintain a safe distance from structures that could be undermined by excavation activities
- Install support systems as necessary to protect adjacent structures from damage or collapse
- Contact a registered professional engineer if there is any doubt about the structural integrity of adjacent features

#### 4.1.3 Surface Water and Drainage

Adequate measures shall be taken to prevent surface water from entering the excavation:

- Divert surface water drainage away from the excavation using berms, ditches, or other effective means
- Install dewatering pumps if water accumulation occurs within the excavation

- Employees shall not work in excavations where water has accumulated or is accumulating unless adequate precautions have been taken
- If water removal equipment is used, it shall be monitored by the competent person to ensure proper operation
- Inspect for evidence of a situation that could result in a boiling condition, surface water runoff, or water buildup in the excavation

## 4.2 Soil Classification

The competent person shall classify the soil at each excavation site to determine the appropriate protective system. Soil classification shall be performed using at least one visual test and one manual test.

### 4.2.1 Soil Types

| Soil Type   | Unconfined Compressive Strength | Examples                                                                                                                   | Maximum Slope Angle |
|-------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------|
| Type A      | 1.5 tsf or greater              | Clay, silty clay, sandy clay, clay loam, and hardpan (cemented soils)                                                      | ¾:1 (53°)           |
| Type B      | 0.5 to 1.5 tsf                  | Angular gravel, silt, silt loam, sandy loam, previously disturbed Type A soils, fissured cohesive soils, dry unstable rock | 1:1 (45°)           |
| Type C      | 0.5 tsf or less                 | Gravel, sand, loamy sand, submerged soil, soil from which water is freely seeping, submerged unstable rock                 | 1½:1 (34°)          |
| Stable Rock | N/A                             | Natural solid mineral material that can be excavated with vertical sides and remain intact                                 | Vertical (90°)      |

### 4.2.2 Visual Tests

The competent person shall perform the following visual tests:

- Observe the excavated soil for grain size, particle type (granular vs. cohesive), and signs of moisture
- Examine the excavation walls for cracks, spalling, raveling, or other signs of instability
- Look for layered soil systems where one soil type overlies another
- Check for previously disturbed soil (e.g., previous excavation backfill, utility trenches)
- Observe whether the soil clumps when dug or easily breaks apart
- Assess the presence of water seepage, a high water table, or standing water in the excavation
- Look for evidence of vibration from traffic, construction equipment, or other sources
- Observe the type of soil in the spoil pile (does it hold together or crumble?)

### 4.2.3 Manual Tests

At least one of the following manual tests shall be performed:

- Pocket Penetrometer Test — A direct-reading instrument that measures the unconfined compressive strength of the soil. Type A:  $\geq 1.5$  tsf; Type B: 0.5–1.5 tsf; Type C:  $< 0.5$  tsf.
- Thumb Penetration Test — Press your thumb into the soil sample. If the thumb penetrates no further than the thumbnail, the soil may be Type A. If the thumb penetrates the full length with moderate effort, the soil may be Type B. If the thumb penetrates easily, the soil is Type C.
- Dry Strength Test — Dry a sample until completely dry. If it crumbles on its own or with moderate pressure, it is granular (Type C). If it breaks into clumps that can only be broken with difficulty, it may be clay combined with other soils (Type A or B).
- Plasticity (Ribbon) Test — Mold a moist sample into a ball and roll it into a thread. If a 2-inch thread can be held on one end without tearing, the soil is cohesive (Type A or B). If it fails, it is granular (Type C).
- Shear Vane Test — A direct-reading device that measures the shear strength of soil, which can be correlated to unconfined compressive strength.

Document all soil classification results on the Soil Classification Worksheet (Appendix B). When in doubt, classify the soil as the weaker type.

## 4.3 Protective Systems

Employees shall NOT enter excavations 5 feet or more in depth unless a protective system is in place (unless the excavation is made entirely in stable rock). For excavations less than 5 feet, a protective system is required if the competent person identifies a potential for cave-in.

### 4.3.1 Sloping

Sloping involves cutting the sides of the excavation at an angle away from the excavation to prevent cave-ins. Maximum allowable slopes:

- Type A Soil:  $\frac{3}{4}$ :1 (horizontal to vertical) — 53 degrees from horizontal
- Type B Soil: 1:1 — 45 degrees from horizontal
- Type C Soil:  $1\frac{1}{2}$ :1 — 34 degrees from horizontal
- Stable Rock: Vertical (90 degrees)
- For excavations 20 feet or deeper, sloping and benching designs must be approved by a registered professional engineer
- Short-term exposure (24 hours or less) in Type A soil: Maximum slope of  $\frac{1}{2}$ :1 (63 degrees) is permitted for excavations 12 feet or less in depth

### 4.3.2 Benching

Benching creates a series of horizontal steps in the excavation wall. Benching is NOT permitted in Type C soil.

- Type A Soil: Maximum bench height of 4 feet. Simple or multiple bench configuration permitted.
- Type B Soil: Maximum bench height of 4 feet. Steps must be below the maximum slope angle (1:1).
- Type C Soil: Benching is NOT allowed due to soil instability.
- The first bench must begin at the excavation floor level.
- Benching designs for excavations over 20 feet must be prepared by a registered professional engineer.

#### 4.3.3 Shoring

Shoring systems support the excavation walls and prevent cave-in. Common shoring systems include:

- Timber Shoring — Installed per OSHA Subpart P, Appendix C. Includes wales, cross braces, and uprights.
- Aluminum Hydraulic Shoring — Lightweight, adjustable systems installed per OSHA Subpart P, Appendix D. Must be installed per manufacturer's tabulated data.
- Screw Jack Shoring — Adjustable metal systems that can be used with timber or metal sheeting.
- All shoring must be installed from the top down and removed from the bottom up.
- Shoring must be designed for the specific soil conditions and depth of excavation.
- Employees shall not be permitted in the excavation while shoring is being installed or removed unless protected by another system.
- Manufacturer's tabulated data must be on-site for all manufactured shoring systems.

#### 4.3.4 Shielding (Trench Boxes)

Trench shields (trench boxes) are portable structures placed inside the excavation to protect workers from cave-ins:

- Trench shields shall be certified by the manufacturer for the specific depth and soil type
- Manufacturer's tabulated data (maximum depth, soil type, dimensions) must be available on-site
- Shields shall extend at least 18 inches above the surrounding surface or the excavation shall be sloped back from the top of the shield at an angle not steeper than 1½:1
- Workers shall not remain in the shield during installation, removal, or vertical movement of the shield
- Backfill shall be placed evenly on both sides to prevent the shield from tipping
- Shields shall be inspected before each use for damage, deformation, and proper operation of spreader bars or hydraulic cylinders
- Multiple shields may be stacked for deeper excavations if designed for that purpose by the manufacturer
- Lateral movement of shields is permitted if the support provided is continuous

## 4.4 Access and Egress

Safe means of access and egress shall be provided for all excavations 4 feet or more in depth:

- Structural ramps used as access/egress must be designed by a competent person qualified in structural design, or by a registered professional engineer if used by vehicles
- Ladders, stairways, or ramps shall be located within 25 feet of lateral travel for all employees in the excavation
- Ladders shall extend at least 3 feet above the edge of the excavation and be secured to prevent displacement
- Ramps and runways shall be constructed of non-slip materials or treated surfaces
- Employees shall not use heavy equipment (bucket, boom, etc.) as a means of access or egress
- Access/egress points shall be kept clear of materials, equipment, and debris at all times
- The competent person shall evaluate and approve all access/egress routes before employees enter the excavation

## 4.5 Atmospheric Testing

Atmospheric testing shall be performed in excavations where hazardous atmospheres may exist or may reasonably be expected to develop:

- Excavations deeper than 4 feet where the possibility of an oxygen deficiency or a hazardous atmosphere exists shall be tested before employees enter
- Excavations in areas where hazardous substances have been stored, where landfill operations have occurred, or near petroleum facilities, gas lines, or chemical plants require atmospheric testing regardless of depth
- Testing shall include oxygen content (19.5%–23.5%), combustible gases (<10% LEL), and toxic gases ( $H_2S$  <10 ppm, CO <25 ppm) as appropriate
- If a hazardous atmosphere is detected, emergency rescue equipment (SCBA) shall be readily available
- Ventilation shall be provided as necessary to maintain safe atmospheric conditions
- Continuous monitoring is required when atmospheric conditions may change due to work activities or environmental factors
- Employees shall be removed from the excavation immediately if atmospheric testing reveals hazardous conditions

## 4.6 Hazard Prevention

### 4.6.1 Spoil Pile Management

- All excavated material (spoil) shall be placed at least 2 feet from the edge of the excavation, measured from the nearest edge of the spoil pile to the edge of the excavation

- Spoil piles shall be contained or retained as necessary to prevent materials from falling into the excavation
- Spoil shall not be stored on the downhill side of the excavation where it could wash into the trench
- Rock, soil, or other materials shall be effectively retained or restrained to prevent them from falling or rolling into the excavation

#### **4.6.2 Mobile Equipment**

- When mobile equipment is operated adjacent to an excavation, a warning system shall be utilized (barricades, hand/mechanical signals, stop logs, or grade-level berms)
- Equipment shall not be permitted to operate closer to the edge of an excavation than the depth of the excavation, unless the excavation is supported or shored
- Employees shall not work under loads being handled by lifting or digging equipment
- Employees shall stand away from vehicles being loaded or unloaded to avoid being struck by any spillage or falling materials

#### **4.6.3 Water Accumulation Hazards**

- Employees shall not work in excavations where water has accumulated or is accumulating unless adequate precautions have been taken to protect employees (water removal, safety harnesses and lifelines, or other means)
- The competent person shall monitor water removal equipment and the operations throughout the work shift
- If water is controlled or prevented from accumulating by the use of water removal equipment, the operation shall be monitored by the competent person
- Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation

#### **4.6.4 Falling Load Protection**

- No employee shall be permitted underneath loads handled by lifting or digging equipment
- Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by spillage or falling materials
- When overhead operations or falling hazards exist, employees working in the excavation shall wear hard hats
- Barricades, barriers, or physical separation shall be used to protect workers in excavations from vehicular traffic

## 5. Inspection Requirements

### 5.1 Daily Inspections

The competent person shall inspect the excavation, adjacent areas, and protective systems at the following intervals:

- Before the start of each work shift
- After every rainstorm or other hazard-increasing occurrence (flooding, vibration from nearby blasting or heavy equipment, etc.)
- As conditions change throughout the work shift
- When fissures, seepage, undermining, bulging at the bottom, or other signs of instability occur

If the competent person identifies evidence of a situation that could result in a cave-in, exposure to a hazardous atmosphere, or other hazardous condition, all exposed employees shall be removed from the hazardous area until the necessary precautions have been taken.

### 5.2 Inspection Checklist Items

The following items shall be evaluated during each inspection (use the Daily Trench Inspection Form — Appendix A):

- Condition of excavation walls (cracks, spalling, bulging, sloughing, raveling)
- Condition and adequacy of protective systems (shoring tight, shields level, slopes correct)
- Water accumulation or seepage
- Condition of spoil piles (placement, retention, distance from edge)
- Access/egress availability and condition (ladder within 25 feet, extending 3 feet above edge)
- Underground utility exposure or proximity
- Adjacent structure stability
- Surface conditions and drainage adequacy
- Equipment placement relative to the excavation edge
- Employee compliance with safety requirements
- Atmospheric conditions (if applicable)
- Barricades and warning systems for pedestrian and vehicular traffic

## 6. Training Requirements

### 6.1 Competent Person Training

Competent persons shall receive comprehensive training in:

- OSHA Subpart P — Excavations (29 CFR 1926.650–652) and all Appendices
- Soil classification methods (visual and manual testing)
- Protective system selection and design (sloping, benching, shoring, shielding)
- Excavation hazard recognition and abatement
- Atmospheric testing procedures and equipment operation
- Emergency response and rescue procedures
- Utility damage prevention and 811 procedures
- Inspection documentation requirements

### 6.2 Employee Training

All employees who work in or around excavations shall receive training in:

- Recognition and avoidance of excavation hazards (cave-in, falling materials, hazardous atmospheres, water accumulation, utilities)
- Understanding of protective systems and their limitations
- Proper use of access/egress equipment (ladders, ramps, stairs)
- Safe work practices in and around excavations
- Spoil pile placement and material handling near excavations
- Emergency procedures and evacuation routes
- Personal protective equipment requirements (hard hats, high-visibility vests, etc.)
- Authority and duty to refuse to enter an unsafe excavation
- Incident and near-miss reporting procedures

### 6.3 Retraining

Retraining shall be provided when:

- Changes in site conditions or excavation methods require new knowledge or skills
- An employee demonstrates inadequate knowledge of excavation safety procedures
- After any excavation-related incident or near miss
- When new equipment or protective systems are introduced
- At minimum, annual refresher training shall be provided

## 6.4 Training Documentation

Training records shall include: employee name and signature, date(s) of training, trainer name and qualifications, topics covered, and duration. Records shall be maintained for the duration of employment plus three years. Use the Training Sign-Off Sheet (Appendix D) to document each session.

## 7. Documentation and Recordkeeping

[COMPANY NAME] shall maintain the following records:

| Record Type                                     | Retention Period                 | Responsible Party |
|-------------------------------------------------|----------------------------------|-------------------|
| Daily Trench Inspection Forms                   | Duration of project + 3 years    | Competent Person  |
| Soil Classification Worksheets                  | Duration of project + 3 years    | Competent Person  |
| Utility Locate Tickets/Records                  | Duration of project + 1 year     | Project Manager   |
| Competent Person Designation Records            | Duration of assignment + 1 year  | Management        |
| Training Records                                | Duration of employment + 3 years | Safety Manager    |
| Incident/Near Miss Reports                      | 5 years minimum                  | Safety Manager    |
| Program Audit Reports                           | 5 years minimum                  | Management        |
| Manufacturer's Tabulated Data (Shoring/Shields) | Duration of equipment use        | Competent Person  |
| PE-Designed Protective Systems (if applicable)  | Duration of project + 3 years    | Project Manager   |

All records shall be readily accessible for review by OSHA compliance officers, employees, and their designated representatives.

## Appendix A: Daily Trench Inspection Form

| Field                | Information                                                                                                                                                                  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Name/Number: | [ ]                                                                                                                                                                          |
| Location/Address:    | [ ]                                                                                                                                                                          |
| Date:                | [ ] Weather Conditions: [ ]                                                                                                                                                  |
| Competent Person:    | [ ]                                                                                                                                                                          |
| Excavation Depth:    | [ ] ft Length: [ ] ft Width: [ ] ft                                                                                                                                          |
| Soil Classification: | <input type="checkbox"/> Type A <input type="checkbox"/> Type B <input type="checkbox"/> Type C <input type="checkbox"/> Stable Rock <input type="checkbox"/> Layered        |
| Protective System:   | <input type="checkbox"/> Sloping <input type="checkbox"/> Benching <input type="checkbox"/> Shoring <input type="checkbox"/> Shielding <input type="checkbox"/> Other: _____ |

### Inspection Checklist

| #  | Inspection Item                                             | Yes | No | N/A | Comments |
|----|-------------------------------------------------------------|-----|----|-----|----------|
| 1  | 811 utility locates completed and documented?               |     |    |     |          |
| 2  | All utilities identified, marked, and protected?            |     |    |     |          |
| 3  | Excavation walls stable — no cracks, bulging, or sloughing? |     |    |     |          |
| 4  | Protective system installed and in good condition?          |     |    |     |          |
| 5  | Spoil pile at least 2 feet from excavation edge?            |     |    |     |          |
| 6  | Ladder/ramp within 25 feet of lateral travel?               |     |    |     |          |
| 7  | Ladder extends 3 feet above the excavation edge?            |     |    |     |          |
| 8  | No water accumulation in excavation?                        |     |    |     |          |
| 9  | Surface water diverted from excavation?                     |     |    |     |          |
| 10 | Adjacent structures stable and not undermined?              |     |    |     |          |
| 11 | Equipment positioned at safe distance from edge?            |     |    |     |          |
| 12 | Barricades/warning systems in place for traffic?            |     |    |     |          |
| 13 | Atmospheric testing performed (if required)?                |     |    |     |          |
| 14 | Atmospheric readings within acceptable limits?              |     |    |     |          |
| 15 | Hard hats and PPE being worn by all workers?                |     |    |     |          |
| 16 | Workers using designated access/egress routes?              |     |    |     |          |
| 17 | No loads being raised/lowered over workers?                 |     |    |     |          |
| 18 | Manufacturer's tabulated data on-site (if applicable)?      |     |    |     |          |

Deficiencies Noted / Corrective Actions Taken

| Description of Deficiency | Corrective Action Taken | Completed By | Time |
|---------------------------|-------------------------|--------------|------|
|                           |                         |              |      |
|                           |                         |              |      |
|                           |                         |              |      |
|                           |                         |              |      |
|                           |                         |              |      |

Atmospheric Test Results (if applicable)

| Time | O <sub>2</sub> (%) | LEL (%) | H <sub>2</sub> S (ppm) | CO (ppm) | Tester Initials |
|------|--------------------|---------|------------------------|----------|-----------------|
|      |                    |         |                        |          |                 |
|      |                    |         |                        |          |                 |
|      |                    |         |                        |          |                 |
|      |                    |         |                        |          |                 |

Competent Person Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed By (Supervisor): \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix B: Soil Classification Worksheet

| Field                  | Information |
|------------------------|-------------|
| Project Name/Number:   | [ ]         |
| Location:              | [ ]         |
| Date:                  | [ ]         |
| Competent Person:      | [ ]         |
| Excavation Depth:      | [ ]         |
| Sample Location/Depth: | [ ]         |

### Visual Tests Performed

| Visual Test                                         | Observations | Result |
|-----------------------------------------------------|--------------|--------|
| Soil particle size and type (granular vs. cohesive) |              |        |
| Presence of fissures or cracks in walls             |              |        |
| Layered soil systems                                |              |        |
| Previously disturbed soil                           |              |        |
| Water seepage or standing water                     |              |        |
| Evidence of vibration effects                       |              |        |
| Soil clumping behavior in spoil pile                |              |        |
| Spalling, raveling, or sloughing of walls           |              |        |

### Manual Tests Performed

| Manual Test              | Method/Reading                       | Result      |
|--------------------------|--------------------------------------|-------------|
| Pocket Penetrometer      | Reading: _____ tsf                   | Type: _____ |
| Thumb Penetration Test   | Depth of penetration: _____          | Type: _____ |
| Dry Strength Test        | Crumbles / Breaks with difficulty    | Type: _____ |
| Plasticity (Ribbon) Test | Thread length before breaking: _____ | Type: _____ |
| Shear Vane Test          | Reading: _____ tsf                   | Type: _____ |

### Classification Determination

| Field                               | Information                                                                                                                                                                                                             |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Final Soil Classification:          | <input type="checkbox"/> Type A <input type="checkbox"/> Type B <input type="checkbox"/> Type C <input type="checkbox"/> Stable Rock                                                                                    |
| Layered System:                     | <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: [                      ]                                                                                                                     |
| Classification Basis:               | [                      ]                                                                                                                                                                                                |
| Factors Downgrading Classification: | <input type="checkbox"/> Fissured <input type="checkbox"/> Vibration <input type="checkbox"/> Previously Disturbed <input type="checkbox"/> Submerged <input type="checkbox"/> Seepage <input type="checkbox"/> Layered |

## Protective System Selected

| Field               | Information                                                                                                                                                   |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Selected System:    | <input type="checkbox"/> Sloping (Angle: _____) <input type="checkbox"/> Benching <input type="checkbox"/> Shoring <input type="checkbox"/> Shield/Trench Box |
| System Details:     | [                      ]                                                                                                                                      |
| PE Design Required: | <input type="checkbox"/> Yes <input type="checkbox"/> No PE Name: [                      ]                                                                    |

Competent Person Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix C: Competent Person Designation Form

[COMPANY NAME] hereby designates the following individual as a Competent Person for excavation and trenching operations in accordance with 29 CFR 1926.650–652:

| Field                      | Information |
|----------------------------|-------------|
| Employee Name:             | [ ]         |
| Employee Title:            | [ ]         |
| Employee ID/SSN Last 4:    | [ ]         |
| Date of Designation:       | [ ]         |
| Designation Valid Through: | [ ]         |

### Qualifications and Training

| Training/Qualification               | Provider | Date Completed | Certification # |
|--------------------------------------|----------|----------------|-----------------|
| OSHA Excavation Safety (Subpart P)   |          |                |                 |
| Soil Classification Training         |          |                |                 |
| OSHA 30-Hour Construction            |          |                |                 |
| Competent Person Course — Excavation |          |                |                 |
| First Aid / CPR                      |          |                |                 |
|                                      |          |                |                 |
|                                      |          |                |                 |

### Experience

| Description of Relevant Experience | Duration | Employer/Project |
|------------------------------------|----------|------------------|
|                                    |          |                  |
|                                    |          |                  |
|                                    |          |                  |
|                                    |          |                  |

## Authorization

As a designated Competent Person, the individual named above has the training, knowledge, and authority to:

- Classify soil types using visual and manual testing methods
- Select, design, and inspect protective systems for excavations
- Conduct daily inspections of excavations, protective systems, and adjacent areas
- Identify existing and predictable excavation hazards
- Authorize employees to enter excavations
- Order immediate evacuation of excavations when hazardous conditions exist
- Take prompt corrective measures to eliminate identified hazards

Designated By (Management): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Employee Acknowledgment: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix D: Training Sign-Off Sheet

| Field                   | Information                           |
|-------------------------|---------------------------------------|
| Training Topic:         | Excavation & Trenching Safety Program |
| Training Date:          | [ ]                                   |
| Training Location:      | [ ]                                   |
| Trainer Name:           | [ ]                                   |
| Trainer Qualifications: | [ ]                                   |
| Training Duration:      | [ ]                                   |

### Topics Covered

- ☐ Excavation hazard recognition (cave-in, utilities, water, atmosphere)
- ☐ Soil classification methods and types (A, B, C, Stable Rock)
- ☐ Protective systems (sloping, benching, shoring, shielding)
- ☐ Access and egress requirements (ladders within 25 feet)
- ☐ Utility locating procedures and 811 requirements
- ☐ Spoil pile placement (minimum 2 feet from edge)
- ☐ Water accumulation hazards and controls
- ☐ Atmospheric testing requirements (excavations >4 feet depth)
- ☐ Daily inspection requirements and competent person duties
- ☐ Emergency procedures and evacuation
- ☐ Applicable OSHA standards (29 CFR 1926.650–652)

### Employee Acknowledgment

By signing below, I acknowledge that I have received training in the above topics, understand the material presented, had the opportunity to ask questions, and agree to comply with the excavation and trenching safety requirements of [COMPANY NAME].

| # | Employee Name (Print) | Employee Signature | Date | Company/Trade |
|---|-----------------------|--------------------|------|---------------|
|   |                       |                    |      |               |
|   |                       |                    |      |               |
|   |                       |                    |      |               |
|   |                       |                    |      |               |
|   |                       |                    |      |               |

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|  |  |  |  |  |

Trainer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# TRENCHING & EXCAVATION SAFETY

29 CFR 1926.650-652

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Presenter: \_\_\_\_\_

Date: \_\_\_\_\_

# WHY THIS MATTERS

- Trench collapses killed 39 workers in 2022 — the worst year in a decade. Numbers dropped to 15 in 2023 and 12 in 2024 after OSHA's zero-tolerance enforcement push.
- One cubic yard of soil weighs as much as a car — roughly 3,000 lbs. A partial collapse can pin you in seconds and crush your chest so you can't breathe.
- 85% of all trenching fatalities from 2011-2021 occurred in the construction industry (CPWR/BLS data).
- OSHA has a zero-tolerance policy for unprotected trenches: immediate inspections, willful citations, and criminal prosecution referrals.
- The average rescue time for a buried worker is 6+ minutes. The survival window for full burial is about 4 minutes. You have to get it right before anyone goes in.

Source: [OSHA Trench Safety Data](#)

**FORBES SAFETY SOLUTIONS**

# COMPETENT PERSON & SOIL CLASSIFICATION

- A Competent Person must be on site at all times when workers are in the trench. This person has the authority to shut down work immediately — no foreman override.
- The Competent Person classifies soil before any worker enters: Type A (most stable, e.g. clay), Type B (medium, e.g. crusite gravel), Type C (least stable, e.g. wet sand). When in doubt, assume Type C.
- Soil classification determines your protective system: Type A can use 3/4:1 slopes, Type B needs 1:1, Type C needs 1.5:1 — or use shoring/shielding.
- Previously disturbed soil is NEVER Type A, regardless of what it looks like. If a trench was backfilled and re-dug, default to Type B at best.
- Daily inspections are required before each shift, after rain, and after any event that could change conditions. Document everything.

# PROTECTIVE SYSTEMS & ACCESS/EGRESS

- Three protective system options: SLOPING (cutting walls back at safe angles), SHORING (hydraulic or timber supports), or SHIELDING (trench boxes). Choose based on soil type, depth, and site conditions.
- Any trench 5 feet or deeper requires a protective system unless the Competent Person determines the excavation is in stable rock. No exceptions.
- Trenches 4 feet or deeper require a ladder, ramp, or stairway within 25 feet of every worker. You should never have to walk more than 25 feet to get out.
- Never stack spoil piles, equipment, or materials within 2 feet of the trench edge. That weight can trigger a collapse.
- Water accumulation is a collapse trigger. Pump standing water before entry and monitor continuously. Rain overnight? Re-inspect before anyone goes in.

# DISCUSSION QUESTIONS

*Take 5 minutes to discuss with your crew:*

1. Who is the Competent Person on this site today? Does every crew member know who that is?
2. What soil type are we working in right now — and how was that classification made?
3. How far is the nearest exit point from where workers are in the trench? Is it within 25 feet?
4. If a wall started to crack or bulge right now, what's your immediate response?

# ATTENDANCE SIGN-OFF

Date: \_\_\_\_\_ Topic: Trenching & Excavation Safety Presenter: \_\_\_\_\_

| #  | PRINT NAME | COMPANY | SIGNATURE |
|----|------------|---------|-----------|
| 1  |            |         |           |
| 2  |            |         |           |
| 3  |            |         |           |
| 4  |            |         |           |
| 5  |            |         |           |
| 6  |            |         |           |
| 7  |            |         |           |
| 8  |            |         |           |
| 9  |            |         |           |
| 10 |            |         |           |