

Soil Classification & Excavation Safety

Guy's Construction
123 Main Street, Anytown, CA 90210

29 CFR 1926.650-652 (Subpart P) / Appendix A-D

Effective Date: June 08, 2026

SAMPLE DOCUMENT - NOT FOR COMPLIANCE USE

JURISDICTION AND REGULATORY FRAMEWORK

This document is a company safety program. It is NOT a substitute for any required OSHA or state excavation permit. Obtain all required permits BEFORE excavation begins.

A cubic yard of soil weighs approximately 3,000 pounds. Workers buried under even a few feet face suffocation within minutes. OSHA reports ~40 trench fatalities per year.

- competent person to classify soil using at least one visual and one manual test per Appendix A

29 CFR 1926.652 Appendix A

- soil classification

29 CFR 1926.652(b)(2), Appendix A

- trained in soil classification, protective system selection, atmospheric testing, and daily inspection of excavations and adjacent areas

29 CFR 1926.650-652

- competent person for daily excavation inspections, adjacent areas, protective systems, soil classification

29 CFR 1926.651(k)

STATE-SPECIFIC: California has additional excavation requirements:

- shield system or trench box able to withstand cave-in forces
- cave-in that could entrap, bury, or immobilize a worker
- cave-in leading to engulfment
- cave-in when exceeding maximum allowable horizontal and vertical spacing of hydraulic cylinders and wales
- cave-in or wall collapse
- combustible material, unless alternative precautions necessary to provide protection from fire or other products of combustion are approved in the ventilation plan
- design, construction, maintenance and operation to maintain volume and velocity sufficient to gather and convey contaminants to safe disposal
- compliance with 29 CFR 1926.1101
- when a pressure reduction exceeds 365 days
- as a diagnostic aid
- properly sized and installed aluminum hydraulic shoring meeting table requirements
- inadequate protection against cave-in
- trench collapse and worker engulfment
- trench wall collapse and worker engulfment
- the authority to commit the resources needed to carry out the contingency plan
- 10 parts per million above the ambient level
- the maximum phase-to-phase voltage of the circuit
- that a control device achieves the performance requirements of paragraph (c)(1)
- safeguard personnel
- submerged soil or soil from which water is freely seeping
- the soil is fissured

- Type C soil
- fissured soil
- previously disturbed soil
- a principal bedrock aquifer, the recharge or potential recharge area of a principal bedrock aquifer, or an unconsolidated alluvium or terrace deposit, according to the Oklahoma Geological Survey "Maps Showing Principal Groundwater Resources and...
- oil which has been produced within the State from any well or wells in violation of any rule, regulation or order of the Commission
- load capacity of the lowest rated component of the sling
- such as hooks or links formed from bolts, rods, or other parts
- legible identification information attached including manufacturer name or trademark, grade, nominal chain size, number of legs, rated loads for vertical and bridle hitch and angle, length (reach), individual sling identification, and repairing...
- alternative to timber shoring for trench protection
- alternative to timber shoring for trench protection
- Section 1541.1(c)
- alternative to timber shoring for protective systems in trenches
- 14.0
- an overhead shield or canopy that protects the driver from falling material when loaded by cranes, power shovels, loaders etc.
- maintain one clear for access between levels at all times
- other visible damage that causes doubt about the safety of continued use
- permanently removed from service
- operational requirements for articulating boom cranes
- 29 CFR 1926.650 Scope, application, and definitions applicable to this subdivision
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- an operable 360-degree intermittent warning light or beacon mounted on the outside of the vehicle
- response time of 30 minutes or less
- each valve from unauthorized operation and from vandalism
- each phase of the drill response to validate total response time including rupture identification and valve shut-off ≤ 30 minutes
- uncertainties in any reported results (including tool tolerance) as part of that analysis
- drainage systems such as small streams and other smaller waterways that could serve as a conduit to a high consequence area
- the use of reclaimed water in oil and gas operations
- atmospheric testing, ventilation, and rescue procedures
- any additional permits such as for hot work that have been issued to authorize work in the permit space
- Confined Space Entry Permit under §5157 - permit required for excavation depth alone regardless of atmospheric hazards
- testing in accordance with Appendix B satisfies the requirements of (d)(5)

- atmospheric testing conducted in accordance with Appendix B
- RMV or alternative equivalent technology
- excavation and in situ direct examination by means of visual examination, direct measurement, and recorded non-destructive examination results and data needed to assess all threats
- multiple GWUT shots and double-ended inspections that are overlaid to show the minimum 2 to 1 S/N ratio is met in the middle
- semi-monthly
- maximum of 5% CSA

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1.0 PROGRAM OVERVIEW

Guy's Construction performs excavation and trenching work. This program establishes soil classification procedures and excavation safety requirements per 29 CFR 1926 Subpart P.

2.0 WHEN PROTECTIVE SYSTEMS ARE REQUIRED

Depth	Requirement
Less than 5 ft	Protective system not required UNLESS competent person identifies cave-in hazard. If hazard exists, protection required at any depth.
5 ft to 20 ft	Protective system REQUIRED: sloping, benching, shoring, or shielding per Appendix A/B/C/D or PE design.
Greater than 20 ft	Protective system must be designed by a registered Professional Engineer (PE). Tabulated data cannot be used.

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3.0 SOIL CLASSIFICATION SYSTEM

OSHA Appendix A defines three soil types. Competent person must classify using at least one visual AND one manual test.

Property	Type A	Type B	Type C
Compressive str	1.5 tsf or greater	0.5 to 1.5 tsf	Less than 0.5 tsf
Examples	Clay, silty clay, sandy clay, cemented soils	Silt, sandy loam, silt loam, medium clay, previously disturbed Type A	Gravel, sand, loamy sand, submerged soil, freely seeping
Max slope angle	53 deg (3/4H : 1V)	45 deg (1H : 1V)	34 deg (1-1/2H : 1V)
Shoring duty	Lightest	Medium	Heaviest
How common	RARE (see Sec 6.0)	Common	Very common (default)

Stable Rock: natural solid mineral, vertical sides intact. Extremely rare. When in doubt, classify as Type C.

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4.0 VISUAL TESTS

At least one visual test required for every classification:

- Observe soil as excavated: clumps (cohesive) or breaks apart (granular)?
- Examine excavation walls: cracks, fissures, layers?
- Water seepage: flowing into excavation? Soil saturated?
- Previously disturbed soil (backfill, utility trenches)? Cannot be Type A.
- Vibration sources nearby (traffic, equipment, pile driving)? Disqualifies Type A.
- Spoil pile: holds shape or slumps?
- Layered systems: classify by weakest layer.

5.0 MANUAL TESTS

5.1 Thumb Penetration Test

Press thumb into fresh sample. Thumbnail depth with great effort = Type A. Full thumbnail with moderate effort = Type B. Penetrates easily = Type C. Most commonly used field test.

5.2 Pocket Penetrometer

Spring-loaded device measuring unconfined compressive strength in tsf. >1.5 tsf = Type A, $0.5-1.5$ = Type B, <0.5 = Type C. Take multiple readings, use lowest consistent.

5.3 Ribbon Test

Roll moist sample into 1/8 inch thread. Holds = cohesive (A/B). Crumbles = granular (C). Squeeze into ribbon: 6-8 inches before breaking = high plasticity (Type A characteristics).

5.4 Dry Strength Test

Dry sample completely. Cannot break by finger pressure = strong cohesion (A/B). Crumbles = granular (C).

6.0 FACTORS THAT DOWNGRADE CLASSIFICATION

Type A is rare in practice. The following common conditions automatically disqualify Type A:

Previously disturbed soil: Any excavated, backfilled, or disturbed soil. Eliminates Type A on most sites.

Vibration: Traffic, equipment, pile driving within influence zone.

Water seepage: Any water flowing into excavation. Submerged soil is always Type C.

Fissured soil: Visible cracks, even if otherwise cohesive.

Layered systems: Classify by weakest layer.

Sloping layers: Layers dipping into excavation increase sliding risk.

When in doubt, classify as Type C. No penalty for over-protecting. Severe penalties (including criminal prosecution) for under-classifying.

7.0 PROTECTIVE SYSTEM SELECTION

Soil Type	Sloping	Benching	Shoring	Shielding
Type A	53 deg (3/4:1)	Allowed (4 ft max step)	Light duty per App C/D	Allowed
Type B	45 deg (1:1)	Allowed (4 ft max step)	Medium duty per App C/D	Allowed
Type C	34 deg (1-1/2:1)	NOT ALLOWED	Heavy duty per App C/D	Allowed

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8.0 COMPETENT PERSON REQUIREMENTS

- Must be on site whenever employees are in excavations
- Trained in soil classification, protective systems, and hazard recognition
- Authority to remove employees from excavation and stop work
- Performs soil classification using visual AND manual tests
- Conducts daily inspections (Section 9.0)

29 CFR 1926.650(b) / 1926.651(k)

9.0 DAILY INSPECTION

Competent person inspects before each shift and after any event (rain, vibration, freezing):

- Excavation walls: cracking, bulging, sloughing, water seepage
- Protective systems: shoring tight, shields plumb, slope angle maintained
- Surface conditions: surcharge loads, traffic, equipment near edge
- Atmosphere: test for hazardous atmosphere in excavations >4 ft deep if potential exists
- Access/egress: ladder within 25 feet of travel in trenches >4 ft deep

10.0 UTILITY LOCATION (811)

- Contact 811 at least 48-72 hours before excavation (varies by state)
- Verify all utilities are marked before digging
- Hand dig within tolerance zone of marked utilities
- Document the 811 ticket number, locate date, and mark verification

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11.0 TRAINING

- Competent person: soil classification methods, protective system selection, OSHA Subpart P
- All excavation workers: hazard recognition, protective system use, emergency procedures
- Equipment operators: safe excavation practices, spoil pile placement, clearance from edges

12.0 RECORDKEEPING

- Soil classification field records (Appendix A): project duration + 3 years
- Daily inspection checklists (Appendix B): project duration + 3 years
- 811 locate documentation (Appendix C): project duration + 3 years
- PE-designed protective system drawings: project duration + 5 years
- Training records: duration of employment

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California STATE-SPECIFIC REQUIREMENTS

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APPENDIX A: SOIL CLASSIFICATION FIELD RECORD

Date:	_____	Project:	_____
Location:	_____	Depth:	_____
Competent Person:	_____	Weather:	_____

Visual Tests Performed:

- Soil observed during excavation: Cohesive (clumps) Granular (breaks apart)
- Excavation walls examined: Intact Cracks Fissures Layers
- Water seepage: None Slight Moderate Freely seeping
- Previously disturbed: Yes (disqualifies Type A) No
- Vibration sources: Present (disqualifies Type A) None

Manual Tests Performed:

- Thumb penetration: Hard (Type A) Moderate (Type B) Easy (Type C)
- Pocket penetrometer: Reading ___ tsf >1.5 (A) 0.5-1.5 (B) <0.5 (C)
- Ribbon test: Ribbon length ___ inches
- Dry strength: Cannot break (A/B) Crumbles (C)

Disqualifying Factors Present:

- Previously disturbed (disqualifies A)
- Vibration sources (disqualifies A)
- Water seepage (disqualifies A)
- Fissured (disqualifies A)

CLASSIFICATION: Type A Type B Type C Stable Rock

Protective System Selected: Sloping at ___ degrees Benching Shoring Shield/Trench Box PE Design

Competent Person: _____ Date: _____

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APPENDIX B: DAILY EXCAVATION INSPECTION CHECKLIST

Date: _____

Project: _____

Inspector: _____

Excavation Location: _____

Item	Notes	OK	N/A
Soil classification completed and documented			
Protective system in place and adequate for soil type			
Excavation walls: no cracking, bulging, or sloughing			
No water accumulation (or controlled by dewatering)			
Spoil pile min 2 ft from edge			
No surcharge loads near edge (equipment, materials)			
Access/egress: ladder within 25 ft of travel (>4 ft deep)			
Utilities marked and protected			
Atmospheric testing completed (if required)			
Adjacent structures stable			
No vehicular traffic near edge (or barricaded)			
Employees trained on excavation hazards			

Overall: Safe to enter Corrections needed (list): _____

Competent Person: _____

Date: _____

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APPENDIX C: 811 UTILITY LOCATE DOCUMENTATION

Date Called:

Project:

Ticket #:

Locate Requested For:

Utilities Marked:

- Electric (RED) Gas (YELLOW) Water (BLUE) Sewer (GREEN)
- Telecom (ORANGE) Cable TV (ORANGE) Other: _____

Marks Verified on Site: Yes No Date Verified: _____

Hand Dig Required Within Tolerance Zone: Yes Tolerance: ____ inches

No Utilities Found in Work Area: Confirmed

Verified By: _____

Date: _____

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