



Ohio Administrative Code Rule 4123:1-5-26 Trenches and excavations.

Effective: September 1, 2023

(A) General specifications.

(1) Utility companies and municipally owned utilities will be contacted and advised of proposed work prior to the start of actual excavation. Prior to opening an excavation, effort will be made to determine whether underground installations, i.e., sewer, telephone, water, fuel, electric lines, etc., will be encountered and, if so, where such underground installations are located.

(2) An employee will not be required to use mechanical digging or trenching equipment within three feet of an energized underground electrical conductor whose location is known, unless the conductors are protected by concrete ducts or equivalent protection.

(3) Where trenches or excavations are made in locations adjacent to backfilled trenches or excavations or where trenches or excavations are subjected to vibrations from any source, such as railroad or highway traffic or the operation of machinery, additional precautions by way of shoring and bracing will be taken to prevent slides or cave-ins.

(4) Undercutting of the exposed faces of trenches or excavations is not permitted unless the exposed faces of such undercutting are supported by one or more of the methods prescribed for the support of exposed faces of trenches.

(5) Material placement.

(a) Excavated material or other material will be retained a minimum of twenty-four inches from the top edge of the trench or excavation.

(b) As an alternative to the clearance prescribed in paragraph (A)(5)(a) of this rule, the employer will use effective barriers or other effective retaining devices in lieu thereof in order to prevent excavated or other materials from falling into the trench or excavation.



(6) Wells, pits, shafts etc.

(a) All wells, pits, shafts, etc., will be barricaded or covered.

(b) Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., will be backfilled.

(B) Trenches.

(1) The exposed faces of all trenches more than five feet high will be shored, laid back to a stable slope, or some other equivalent means of protection will be provided where employees may be exposed to moving ground or cave-ins. (See table 26-1 to this rule.)

(2) Sides of trenches in unstable or soft material, five feet or more in depth, will be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength to protect the employees working within them. (See table 26-1 and table 26-2 to this rule.)

(3) Sides of trenches in hard compact soil, including embankments, will be shored or otherwise supported when the trench is more than five feet in depth and eight feet or more in length. In lieu of shoring, the sides of the trench above the five-foot level may be sloped to preclude collapse, but will not be steeper than a one-foot rise to each one-half-foot horizontal.

(4) Materials used for sheeting and sheet piling, bracing, shoring, and underpinning, will be in good serviceable condition, and timbers used will be sound and free from large or loose knots, and will be designed and installed so as to be effective to the bottom of the trench.

(5) Minimum specifications - trench shoring.

(a) Minimum specifications for trench bracing and shoring will be in accordance with table 26-2 to this rule. The vertical planks in the bracing system will extend at least to the top of the trench face.

(b) Braces and diagonal shores in a wood shoring system will not be subjected to compressive stress



in excess of values given by the following formula:

$$S = 1300 - 20L \div D$$

Maximum ratio: $L \div D = 50$

Where: L = length, unsupported, in inches.

D = least side of the timber in inches.

S = allowable stress in pounds per square inch of cross section.

(6) When employees are working in trenches four feet deep or more, an adequate means of exit, such as a ladder or steps, will be provided and located so as to require no more than twenty-five feet of lateral travel.

(7) When bracing or shoring of trenches is needed, such bracing and shoring will be carried along with the excavation.

(8) Cross braces or trench jacks will be placed in true horizontal position, be spaced vertically, and be secured to prevent sliding, falling, or kickouts.

(9) Portable trench boxes, safety cages or sliding trench shields may be used for the protection of employees in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they will be designed, constructed, and maintained in a manner which will provide protection equal to or greater than the sheeting or shoring needed for the trench and will extend at least to the top of the trench face.

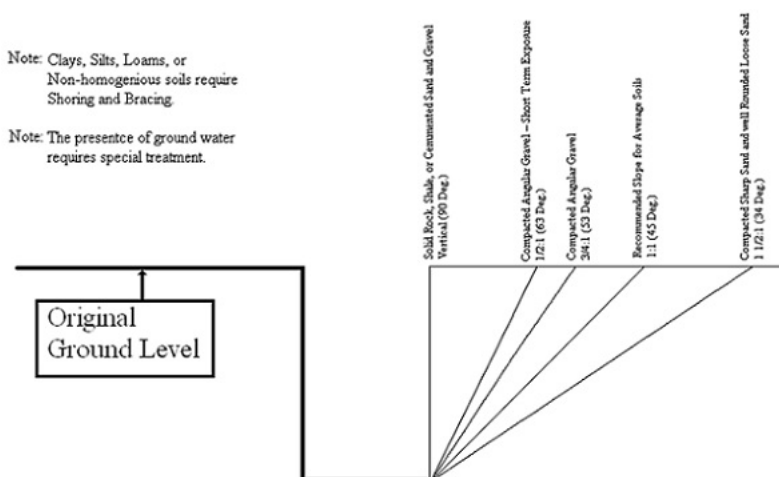
(10) Backfilling and removal of trench supports will progress together from the bottom of the trench. Jacks or braces will be released slowly, and, in unstable soil, employees will clear the trench before pulling out the jacks or braces with ropes.

(C) Excavations.



(1) The walls and faces of all excavations in which employees are exposed to danger from moving ground will be guarded by a shoring system, sloping of the ground, or some other equivalent means. (See table 26-1 and table 26-2 to this rule.)

Table 26-1.



Note: Clays, Silts, Loams, or Non-homogenous soils require Shoring and Bracing.
Note: The presence of ground water requires special treatment.

Table 26-2.
TRENCH SHORING—MINIMUM REQUIREMENTS

Depth of trench Feet	Kind or condition of earth	Size and spacing of members										
		Uprights		Stringers		Cross braces ^a				Maximum spacing		
		Minimum dimension Inches	Maximum spacing Feet	Minimum dimension Inches	Maximum spacing Feet	Width of trench		Vertical		Horizontal		
				Up to 3 feet	3 to 6 feet	6 to 9 feet	9 to 12 feet	12 to 15 feet	Vertical Feet	Horizontal Feet		
5 to 10	Hard, compact	3x4 or 2x6	6	2x6	4x4	4x6	6x6	6x8	4	6		
	Likely to crack	3x4 or 2x6	3	4x6	4	2x6	4x4	4x6	6x6	6x8	4	6
10 to 15	Soft, sandy, or filled	3x4 or 2x6	Close sheeting	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Hydratatic pressure	3x4 or 2x6	Close sheeting	6x8	4	4x4	4x6	6x6	6x8	8x8	4	6
	Hard	3x4 or 2x6	4	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
	Likely to crack	3x4 or 2x6	2	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6
15 to 20	Soft, sandy, or filled	3x4 or 2x6	Close sheeting	4x6	4	4x6	6x6	6x8	8x8	8x10	4	6
	Hydratatic pressure	3x6	Close sheeting	8x10	4	4x6	6x6	6x8	8x8	8x10	4	6
Over 20	All kinds or conditions	3x6	Close sheeting	4x12	4	4x12	6x8	8x8	8x10	10x10	4	6
	All kinds or conditions	3x6	Close sheeting	4x8	4	4x12	6x8	8x10	10x10	10x12	4	6

^a Trench jacks may be used in lieu of, or in combination with, cross braces. Shoring is not required in solid rock, hard shale, or hard slag. Where desirable, steel sheet piling and bracing of equal strength may be substituted for wood.

(2) Supporting systems, i.e., piling, cribbing, shoring etc., shall be designed by a qualified person and shall meet accepted engineering specifications.

(3) Excavations sloped to the angle of repose will be flattened when an excavation has water



conditions, silty materials, loose boulders, and areas where erosion, deep frost action, and slide planes appear.

(4) Sides, slopes, and faces of all excavations will meet accepted engineering specifications by scaling, benching, barricading, rock bolting, wire meshing, or equally effective means.

(5) Materials used for sheeting, sheet piling, cribbing, bracing, shoring, and underpinning will be in good serviceable condition, and timbers will be sound, free from large or loose knots, and of proper dimensions. (See table 26-2 to this rule for proper dimensions.)

(6) Excavations below the level of the base of the footing of any foundation or retaining wall are not permitted, except in hard rock, unless the wall is underpinned and appropriate precautions are taken to ensure the stability of adjacent walls.

(7) If it is necessary to place or operate power shovels, derricks, trucks, materials, or other heavy objects on a level above and near an excavation, the side of the excavation will be sheet-piled, shored, braced or sloped as necessary to resist the extra pressure due to such super-imposed loads.

(8) When mobile equipment is utilized or allowed adjacent to excavations, substantial stop logs or barricades will be installed.

(9) Where employees or equipment cross over excavations, walkways or bridges with standard guardrails will be provided.