Ohio Administrative Code

Rule 4123:1-3-13 Trenches and excavations.

Effective: June 30, 2025

(A) Reserved.

(B) Definitions.

(1) "Accepted engineering requirements " means those requirements or practices which are compatible with standards required by a registered architect, a registered professional engineer, or other duly licensed or recognized authority.

(2) "Angle of repose" means the greatest angle above the horizontal plane at which material will lie without sliding.

(3) "Braces" means the horizontal members of the shoring system with ends bearing against the uprights or stringers.

(4) "Excavation" means any manmade cavity or depression in the earth's surface, including the manmade cavity's sides, walls, or faces, formed by earth removal and producing unsupported earth conditions by reasons of the excavation. If installed forms or similar structures reduce the depth-to-width relationship, an excavation may become a trench.

(5) "Hard compact soil" means all earth materials not classified as unstable.

(6) "Kickouts" means accidental release or failure of a shore or brace.

(7) "Shaft" means an excavation made from the surface of the ground the longer axis of which forms an angle with the vertical of no more than forty-five degrees.

(8) "Sheet piling" means the act of making a pile, or sheeting, that may form one of a continuous interlocking line, or a row of timber, concrete, or steel piles, driven in close contact to provide a tight

wall to resist the lateral pressure of water, adjacent earth, or other materials.

(9) "Sides", "walls," or "faces" means the vertical or inclined earth surfaces formed as a result of trenching or excavation work.

(10) "Stringers" or "wales" means the horizontal members of a shoring system with sides bearing against the uprights or earth.

(11) "Trench," when used as a noun, means a narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench at the bottom is no greater than fifteen feet (4.6 meters).

(12) "Trench boxes," "safety cages," or "trench shields" means a shoring system capable of supporting the walls of a trench from the ground level to the trench bottom and which can be moved along as work progresses.

(13) "Trench jack" means screw or hydraulic type jacks used as cross bracing in a trench shoring system.

(14) "Unstable soil" means earth material that, because of its nature or the influence of related conditions, cannot be depended upon to remain in place without extra support, such as would be furnished by a system of shoring.

(15) "Uprights" means the vertical members of a shoring system.

(C) General requirements.

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

(2) Additional precautions by way of shoring and bracing shall be taken to prevent slides or cave-ins

where trenches or excavations are made in locations adjacent to backfilled trenches or excavations, or where trenches or excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or any other source.

(3) Undercutting of the exposed faces of trenches or excavations is prohibited, 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.

(4) Material placement.

(a) Excavated material or other material shall be placed a minimum of twenty-four inches (sixty-one centimeters) from the top edge of the trench or excavation.

(b) As an alternative to the clearance prescribed in paragraph (C)(4)(a) of this rule, the employer may 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.

(5) Wells, pits, and shafts.

(a) All wells, pits, and shafts shall be barricaded or covered.

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

(D) Trenches.

(1) The exposed faces of all trenches more than five feet (1.5 meters) high shall be shored, laid back to a stable slope, or some other equivalent means of protection shall be provided where employees may be exposed to moving ground or cave-ins. See "Table 13-1" of the appendix to this rule.

(2) Sides of trenches in unstable or soft material, five feet (1.5 meters) or more in depth, shall be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength to protect the employees working within them. See "Table 13-1" and "Table 13-2" of the appendix to this rule.

(3) Sides of trenches in hard compact soil, including embankments, shall be shored, or otherwise supported, when the trench is more than five feet (1.5 meters) in depth and eight feet (2.4 meters) or more in length. In lieu of shoring, the sides of the trench above the five-foot (1.5 meters) level may be sloped to preclude collapse but shall not be steeper than a one-foot (30.5 centimeters) rise to each one-half-foot (15.2 centimeters) horizontal.

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

(5) Minimum requirements, trench shoring.

(a) Minimum requirements for trench bracing and shoring shall be in accordance with "Table 13-2" of the appendix to this rule

(b) Braces and diagonal shores in a wood shoring system shall not be subjected to compressive stress in excess of value given by the following formula:

S = 1300 - (20 x L/D)

Maximum ratio L/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 required to be in trenches four feet (1.2 meters) deep or more, an adequate means of exit, such as a ladder or steps, shall be provided and located so as to require no more than twenty-five feet (7.6 meters) of lateral travel.

(7) When bracing or shoring of trenches is required, the bracing and shoring shall be carried along with the excavation.

(8) Cross braces or trench jacks shall be placed in true horizontal position, spaced vertically, and 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 shoring system or sloping. Where used, the trench boxes, safety cages, or sliding trench shields shall be designed, constructed, and maintained in a manner which will provide protection equal to or greater than the sheeting or shoring required for the trench. When a trench box is used in combination with other protective systems, such as sloping or benching, the trench box must extend at least eighteen inches (45.7 centimeters) above the vertical face to prevent dirt, rocks, and other debris from rolling into the trench. If the top of the trench box is at ground level, the trench box does not need to extend above grade.

(10) Backfilling and removal of trench supports shall progress together from the bottom of the trench. Jacks or braces shall be released slowly, and in unstable soil, ropes shall be used to pull out the jacks or braces from above after employees have cleared the trench.

(E) Excavations.

(1) The walls and faces of all excavations in which employees are exposed to danger from moving ground shall be guarded by a shoring system, sloping of the ground, or some other equivalent means. See "Table 13-1" and "Table 13-2" of the appendix to this rule.

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

(3) Excavations sloped to the angle of repose shall 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 shall meet accepted engineering requirements by

scaling, benching, barricading, rock bolting, wire meshing, or other equally effective means.

(5) Materials used for sheeting, sheet piling, cribbing, bracing, shoring, and underpinning shall be in good serviceable condition, and timbers shall be sound, free from large or loose knots, and of proper dimensions, in accordance with "Table 13-2" of the appendix to this rule.

(6) Excavations below the level of the base of the footing of any foundation or retaining wall is prohibited, except in hard rock, unless the wall is underpinned, and appropriate precautions taken, to ensure the stability of adjacent walls.

(7) If deemed 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 shall be sheet-piled, shored, braced, or sloped as necessary to resist the extra pressure due to such superimposed loads.

(8) When mobile equipment is utilized or allowed adjacent to excavations, substantial stop logs or barricades shall be installed. If possible, the grade should be away from the excavation.

(9) Walkways shall be provided where employees or equipment are required to cross over excavations, and standard guardrails shall be provided where the walkways are six feet (1.8 meters) or more above lower levels.