

## Trenches and excavations

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An “excavation” means any cut, cavity, trench, or depression in the earth’s surface resulting from rock or soil removal. It is generally applied to a cavity of any length over 1.2 m (4 ft.) deep and over 3.7 m (12 ft.) wide at the bottom.

A “trench” is any excavation less than 3.7 m (12 ft.) wide at the bottom, over 1.2 m (4 ft.) deep, and of any length.

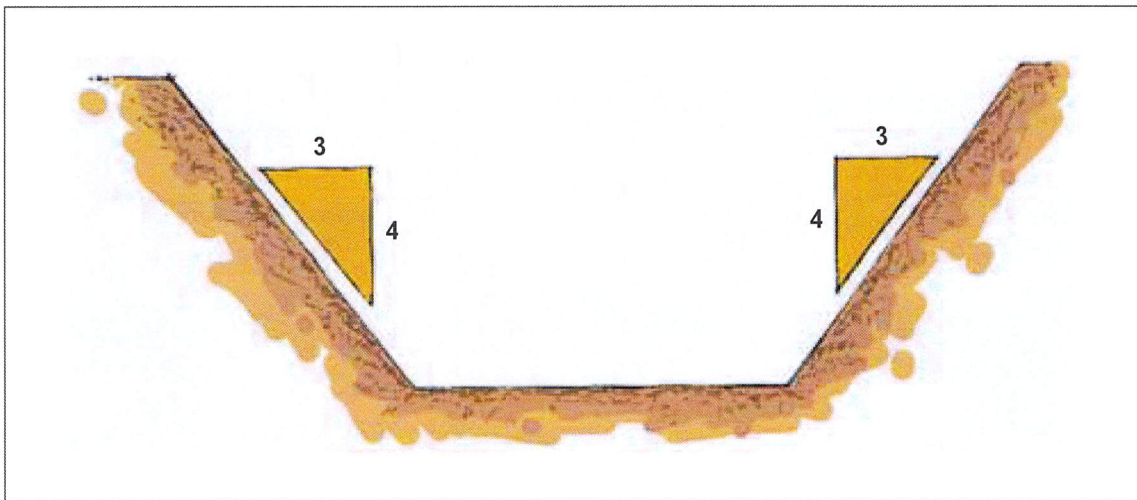
### General requirements

- Before beginning to excavate, locate and identify all utility services, such as electrical, gas, steam, water, and sewer in the area. Any danger to workers from these utility services must be eliminated or controlled.
- Pointed tools cannot be used to probe for underground gas and electrical services.
- If possible, blunt shovels should be used to expose the facility. Caution should be taken, especially if newer, sharper spade shovels are used.
- Trees, utility poles, rocks, or similar objects near the edge of an excavation must be removed or secured to prevent workers from being injured.
- Excavation work must be carried out in accordance with the written instructions of a professional engineer or professional geoscientist, when:
  - The excavation is more than 6 m (20 ft.) deep, or
  - Support structures other than those specified in the regulation are used in the excavation, or

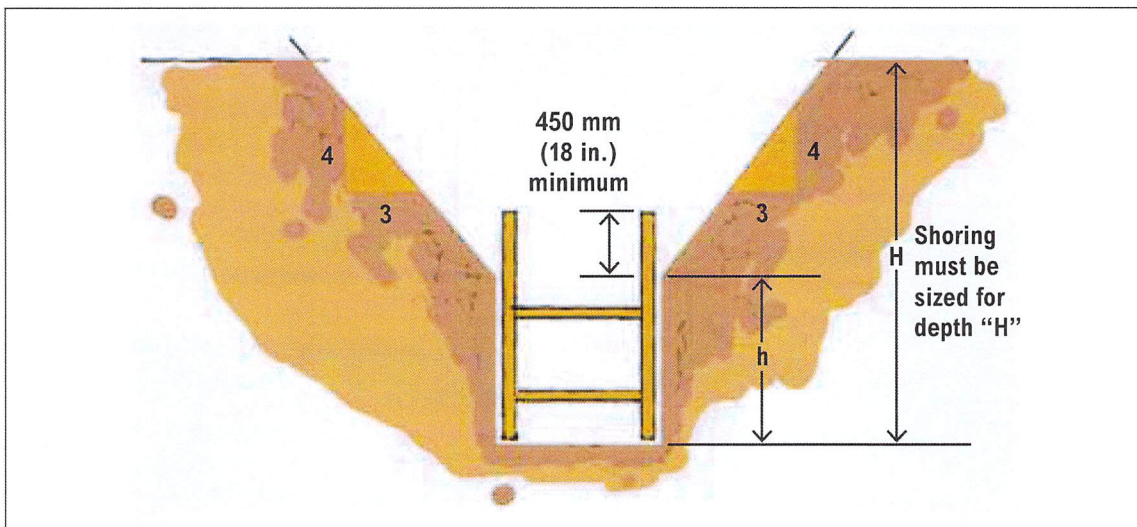
- An improvement or structure is adjacent to the excavation that could endanger workers, or
  - The excavation is subject to vibration or hydrostatic (water) pressure
- A professional engineer’s plan to support or slope the sides of the excavation and written instructions must include information on the subsurface conditions expected to be encountered. A copy of the plan and any written instruction signed and sealed by the engineer must be available at the site.

### Sloping and shoring requirements

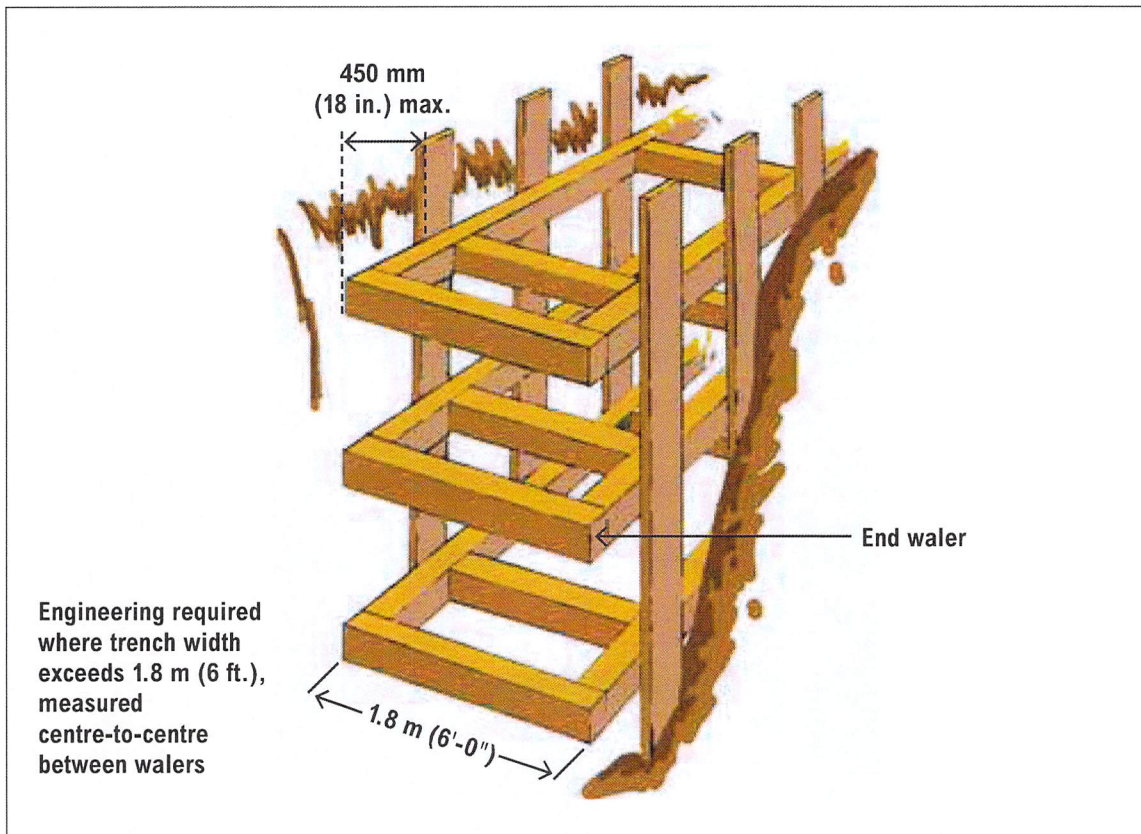
- No worker may enter an excavation over 1.2 m (4 ft.) in depth unless:
  - The sides of the excavation are sloped to a safe angle no steeper than three horizontal to four vertical, or
  - The sides have been supported by use of sheet piling or shoring and bracing, or
  - A combination of both sloping and shoring is used, or
  - The sides of the excavation have been sloped or supported in accordance with the written instruction of a professional engineer



*Unshored trench and excavation walls must be sloped flatter than the angle of repose, but in no case steeper than 3 horizontal to 4 vertical unless otherwise specified in writing by a professional engineer.*



*This is an example of combined sloping and shoring.*



*This is an example of end shoring for hard and solid soils. Uprights for end shoring are not shown for clarity.*

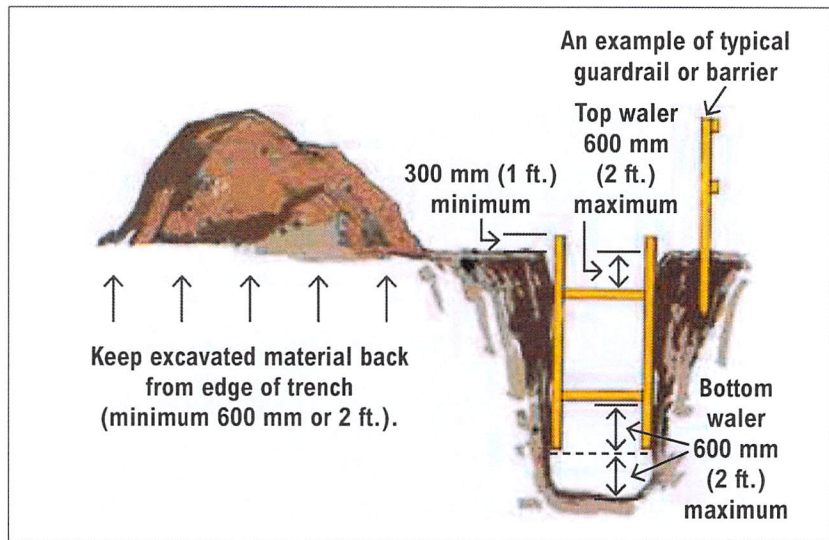
### **Additional excavation requirements**

- Excavation slopes and/or supporting systems must be inspected daily for erosion or deterioration.
- Excavated material must be kept back at least 600 mm (2 ft.) from the edge of any trench excavation and 1.2 m (4 ft.) from any other excavation.
- When necessary, excavations must be covered, or substantial guardrails or barriers must be erected around excavations to prevent workers or other persons from falling into them.
- A ladder must be provided when workers are required to enter excavations over 1.2 m (4 ft.) in depth. The ladder must extend from the bottom of the excavation to at least 1 m (3 ft.) above ground level and be placed so that it is protected by the shoring.

Vertical supports must extend above the ground level a minimum of 300 mm (1 ft.) and must be no more than 600 mm (2 ft.) up from the bottom of the trench.

Top waler must be set at 600 mm (2 ft.) down from the ground level.

Bottom waler must be set at 600 mm (2 ft.) up from the bottom of the vertical support.



An example of ladder use in an excavation over 1.2 m (4 ft.) deep.

