Excavation Width Quick Guide

WSI
North Dakota Workforce Safety & Insurance

According to OSHA excavation and trenching are among the most hazardous construction operations. OSHA defines an excavation as any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. A trench is defined as a narrow underground excavation that is deeper than it is wide, and is no wider than 15 feet (4.5 meters).

How wide should excavation be? WSI created this guide to assist you in determining the safe width of an excavation based on depth and soil type.

Type A Soil

- ¾:1 Slope
- All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of ¾:1.
- Top width = 1.5 x depth + bottom width

Example: if bottom width is 4 ft then an 8 ft deep trench should be 16 ft across the top (1.5 x 8') + 4' = 16'

Type B Soil

- 1:1 Slope
- All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.
- Top width = 2 x depth + bottom width

Example: if bottom width is 4 ft, then an 8 ft deep trench should be 20 ft across the top (2 x 8') + 4' = 20'

Type C Soil

- 1½: 1 Slope
- All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.
- Top width = 3 x depth + bottom width

Example: if bottom width is 4 ft, then an 8 ft deep trench should be 28 ft across the top (3 x 8') + 4' = 28'

Note: Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Additional Resources:

OSHA Hazards and Solutions – Trenching and Excavation