



Department-Approved Course Requirements: 1-Hour Excavations

Course Required for: Worker Training

Purpose: This course is a specialized elective course that can help fulfill the requirement for an individual applying for a Site Safety Training Card. **THIS IS AN AWARENESS-LEVEL TRAINING ONLY and does not provide any other qualification or authorization outside of the Site Safety Training Card.**

Duration: 1 Hour of instructional time, excluding breaks

Class Size: 1-40 Trainees

NYC Requirement: In order to continue to operate in the City of New York, the designated construction worker is required to complete a minimum number of hours of approved site safety training and to carry site safety identification cards as proof of completion of the training (As per New York City Local Law 196 of 2017 also known as 'LL196' or 'Local Law'). This course provides one hour towards the satisfaction of that requirement.

Facility Requirements: The Training Facility used by the Course Provider must:

- Have sufficient room to accommodate all expected attendees and the equipment needed to perform hands-on exercises where required as part of the course.
- Make provisions for the presentation of training material in all media types (computer, projectors, video/DVD players, etc.); and
- Comply with all applicable laws, rules and regulations relating to occupancy, zoning, egress, fire detection, fire suppression, light, ventilation, cleanliness, sanitary facilities, emergency notification and evacuation procedures.

Training may be held at construction sites, provided the above requirements are met.

Instructor Requirement: To deliver this course the instructor(s) must demonstrate that he or she is credentialed or trained in instructional methods and learning processes. The instructor(s) must also successfully demonstrate his or her ability to solve or resolve problems relating to the subject matter by possession of a recognized degree, certificate, licensure or professional standing, or by extensive knowledge, training, and experience, in the subject matter being taught. To the extent that the course instructor(s) holds, or has held, a trade license issued by the Department, it must be in good standing and not be surrendered to, suspended by or revoked by the Department.

The instructor(s) must also be authorized by the Occupational Safety and Health Administration ('OSHA') as a trainer(s) for its Construction and Outreach Program.

Curriculum Requirement: All **topics** listed under **Course Content Outline** must be covered using the listed **Instructional Delivery Method**. The time dedicated to each outline topic should be appropriate for the course content and can vary depending on the trade or job performed by the trainee. The **Instructional Delivery Materials** used in this course must contain all current applicable NYC Construction Code references, current rules, policies and bulletins.

Course Curriculum Proposal Package Review: A comprehensive review will be performed by the **Department of Buildings** to determine compliance with these Course Curriculum Requirements.

Instruction Delivery Method

Media: Lecture/Discussion, Slide Presentation, case study

Handouts: Slides, references and handbook

Guided Learning: Instructor will guide trainees through various situations where over excavation may occur

Course Content Outline

1. Introduction
 - a. Instructor introduces topic and describes their qualifications and relevant experience for training this module.
 - b. Establish that all trainees can hear and fully understand you i.e. 'raise your hand if you fully understand me' or 'clap your hands if you fully understand me'
 - c. State basic classroom rules, bearings and decorum
 - i. Inform trainees of duration or training and breaks (if any)
 - ii. Remind trainees about limiting distractions (phone use, texting, sidebar conversations)
 - iii. Emergency procedures (location and means of egress, exits or other contingencies)
 - iv. Location of restrooms
 - d. Training Objectives and Expectations:
 - i. Trainees will become familiar with terms associated with excavations and underpinning activities
 - ii. Trainees will become generally familiar with recognizing, avoiding and preventing safety issues concerning soil failures, undermining and structural collapse.
 - iii. Trainees will learn the responsibilities of permit holder to project adjoining structures
 - iv. Trainees will learn the role of Competent Persons in excavations
2. Lessons Learned Case Study : Investigation of fatal excavation underpinning failure
3. Define with illustrations and relevant Code specifications various terms and components related to excavations and underpinning activities.
 - a. Support of Excavation Plan
 - b. Types of Protective systems
 - i. Sheet shoring
 - ii. Timber shoring
 - iii. Lagging
 - iv. Trench boxes
 - v. Benching and Sloping
 - c. Definition of Excavation and Trench
 - d. Undermining
 - e. Underpinning Operations
 - f. Spoil, Superimposed loads, surcharge
 - g. Overburden

- h. Maximum Allowable Slope (formerly Angle of Repose)
 - i. Soil Classifications and Evaluating Soil Type
 - j. Failure Plane of Soils
 - k. Stress path of adjoining structures (footings and foundations)
 - l. Utilities mark-outs and One Call
 - m. Heaving and Boiling
 - n. Surface Encumbrances
 - o. Types of soil failures
 - i. Slides
 - ii. Fissures
 - iii. Topples
 - iv. Subsidence
 - v. Bulging
 - p. Confined Spaces
4. Describe Typical Sequential Underpinning Process
5. Describe the people involved in rigging and hoisting activities
- a. Qualified Persons
 - b. Geotechnical Professional Engineer
 - c. Structural Professional Engineer
 - d. Competent Persons
 - i. Inspections
6. Describe Conditions and or Actions that can expedite soil failure and structural collapse.
- a. Not properly following underpinning plans or sequences
 - b. Over Excavation (removal of overburden)
 - c. Infiltration of water
 - d. Surcharges, Spoils and Superimposed Loads
 - e. Unstable and or unassessed adjoin structures
 - f. Vibrations
 - g. Type of Soils
 - h. Too steep angle of repose
 - i. Settling
 - j. Weather (freeze/thaw cycle)
 - k. Tectonic action
 - l. Depth and shape of excavation cuts
7. Explain hazards related to excavations and atmospheric hazards
- a. Oxygen
 - b. Flammables
 - c. Toxic
8. Excavation contact with and working around and support of utilities
9. Excavation disruption and areas of influence to:

- a. Subways
 - b. Tunnels (fuel, utility water)
 - c. Port Authority of New York and New Jersey PATH train tunnel
10. Fall Protection
11. Plating and Vehicular Street Protections
12. Create, explain and illustrate an excavation checklist to control for excavation hazards.
13. Resources:
- a. Applicable OSHA Standards Subpart P Title 29 CFR 1926.650
 - b. ANSI/ASME Regulations and Standards
 - c. Worker's Rights (See OSHA: <https://www.osha.gov/Publications/OSHA3146.pdf>)
 - d. OSHA Regional Map: <https://www.osha.gov/html/RAmap.html>
14. Debriefing (Informal evaluation)
- a. Guided by instructor, trainees, in a class discussion talk about the course's content and means of delivery and provide verbal feedback to the instructor.
 - b. Instructor takes notes (either committing them to writing during discussion or ascribing them later into noted-comments).
 - c. Instructor applies lessons learned from debriefing to future trainings.
15. Written (Multiple Choice) Assessment