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**Course Name**

# Sloping, Benching, Embankments and Bundwalls

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**Sector Name**

Civil Engineering

**Document Type**

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## Sloping, Benching, Embankments and Bundwalls

### Course Introduction

This course provides comprehensive insights into the principles, techniques, and safety considerations associated with soil excavation, stabilization, and earthwork practices. Sloping, benching, embankments, and bundwalls are critical elements of construction projects that involve earthmoving and soil manipulation.

Participants will gain the knowledge and skills to evaluate soil types, select appropriate excavation and backfilling methods, implement protective systems, and ensure compliance with structural and environmental requirements. The course emphasizes practical applications and the latest standards for safe and efficient earthwork operations.

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## Sloping, Benching, Embankments and Bundwalls

### Target Audience

- ✓ Civil engineers.
- ✓ Experienced Civil Engineers Seeking Professional Development
- ✓ Architects and Urban Planners
- ✓ Entrepreneurs in the Construction Industry
- ✓ Project Managers in the Construction Industry

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## Sloping, Benching, Embankments and Bundwalls

### Learning Objectives

- ✓ Identifying soil excavation/backfilling equipment in accordance with soil type and different excavation/backfilling purposes.
- ✓ Estimating soil excavation production rates.
- ✓ Learning how to select appropriate excavation protective systems.
- ✓ Matching fill and compaction requirements.
- ✓ Identifying compaction equipment/test in accordance with soil type and excavation/backfilling purposes.
- ✓ Identifying the compaction degree required for structural /non-structural areas.
- ✓ Identifying Factors affecting compaction/compaction degree.
- ✓ Identifying appropriate protective systems (shoring of excavation sides), shoring/shielding techniques, sloping/benching, and maximum allowable slopes.
- ✓ Identifying the requirements of soil stabilization and the different types of material applied to side slopes.
- ✓ Identifying soil improvement required in accordance with soil types and the technique adopted.

## Sloping, Benching, Embankments and Bundwalls

### Course Outline

#### ✓ DAY 01

##### **Fundamentals of Soil Excavation and Earthwork**

- ✓ Introduction to Soil Types and Properties:
- ✓ Soil classification systems
- ✓ Soil behavior under load and excavation

##### **Excavation Equipment and Methods:**

- ✓ Matching equipment to soil type and excavation purpose
- ✓ Estimating soil excavation production rates

##### **Protective Systems for Excavation:**

- ✓ Overview of shoring, shielding, sloping, and benching
- ✓ Introduction to maximum allowable slopes and safety regulations
- ✓ Practical Session: Soil type evaluation and excavation planning

## Sloping, Benching, Embankments and Bundwalls

### Course Outline

#### ✓ Day 02

##### **Compaction and Backfilling Techniques**

- ✓ Compaction Principles:
- ✓ Factors affecting compaction and compaction degree
- ✓ Structural vs. non-structural compaction requirements

##### **Compaction Equipment and Testing:**

- ✓ Selecting equipment based on soil type
- ✓ Common compaction tests (e.g., Proctor, CBR, field density tests)

##### **Backfilling Methods:**

- ✓ Matching fill materials to project requirements
- ✓ Layering and compaction techniques
- ✓ Practical Session: Hands-on compaction and testing exercises

## Sloping, Benching, Embankments and Bundwalls

### Course Outline

#### ✓ Day 03

##### **Sloping and Benching in Excavation**

- ✓ Principles of Sloping and Benching:
- ✓ Design and implementation of stable slopes and benches
- ✓ Slope stability analysis methods

##### **Protective Systems for Slope Stability:**

- ✓ Shoring and shielding techniques for excavation sides
- ✓ Introduction to soil stabilization methods for side slopes
- ✓ Case Studies: Successful sloping and benching techniques in projects
- ✓ Practical Session: Designing slopes and benches for specific soil types

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## Sloping, Benching, Embankments and Bundwalls

### Course Outline

#### ✓ Day 04

##### **Embankments and Bundwalls**

- ✓ Design and Construction of Embankments:
- ✓ Embankment materials and stability considerations
- ✓ Factors affecting settlement and slope stability

##### **Bundwalls Design and Applications:**

- ✓ Role of bundwalls in flood control and containment
- ✓ Materials and construction methods for bundwalls

##### **Soil Improvement and Stabilization:**

- ✓ Techniques for soil stabilization (e.g., lime, cement, geosynthetics)
- ✓ Importance of drainage in embankments and bund walls
- ✓ Practical Session: Embankment and bundwall design exercises

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## Sloping, Benching, Embankments and Bundwalls

### Course Outline

#### ✓ Day 05

##### **Safety, Sustainability, and Project Applications**

- ✓ Safety Standards in Earthwork Operations:
- ✓ Regulatory requirements and risk management
- ✓ Common hazards and safety measures

##### **Environmental Considerations:**

- ✓ Minimizing environmental impact during excavation and earthworks
- ✓ Erosion control and sediment management

##### **Performance Monitoring and Maintenance:**

- ✓ Long-term monitoring of embankments and slopes
- ✓ Rehabilitation techniques for failed slopes and embankments

##### **Course Review and Final Case Study:**

- ✓ Participants will develop a comprehensive plan for a real-world excavation, embankment, or bundwall project.

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## Sloping, Benching, Embankments and Bundwalls

### Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Sept. 14, 2026	Sept. 18, 2026	5 days	4250.00 \$	UAE , Dubai
Dec. 21, 2026	Dec. 25, 2026	5 days	4250.00 \$	UAE , Dubai
Jan. 24, 2027	Jan. 28, 2027	5 days	4250.00 \$	KSA , Jeddah
April 19, 2027	April 23, 2027	5 days	4950.00 \$	Spain , Madrid

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