Excavation Support Systems Training Course

Professional Development Training Course Outline

Category	Construction Institute	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Excavation Support Systems Training Course is designed to equip professionals with advanced knowledge of deep excavation safety, temporary works design, earth retention technologies, and risk-based construction practices. With increasing demand for urban infrastructure development, underground construction, metro projects, high-rise foundations, and sustainable construction solutions, this course focuses on modern excavation support techniques, geotechnical engineering principles, OSHA-aligned safety practices, and innovative ground improvement strategies. Participants will gain practical expertise in designing, selecting, installing, monitoring, and managing excavation support systems to minimize failures, protect workers, and improve project efficiency.

The course integrates theoretical concepts, industry best practices, digital construction technologies, real-world case studies, and practical problem-solving approaches to develop competent professionals capable of handling complex excavation challenges. Topics include sheet piling, diaphragm walls, soldier piles and lagging, secant pile walls, braced excavations, soil nailing, ground anchors, monitoring systems, and excavation risk management. Through expert-led training and applied learning, participants will understand how to deliver safer, cost-effective, and environmentally responsible excavation projects aligned with global construction standards.

Programme Curriculum

Excavation Support Systems Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Develop advanced understanding of excavation support systems, temporary works engineering, and geotechnical risk management.
2. Understand modern earth retention technologies and innovative ground stabilization techniques.
3. Learn design principles for deep excavation support structures and underground construction projects.
4. Apply construction safety management strategies for excavation operations.
5. Identify excavation hazards using risk assessment, predictive analytics, and safety engineering methods.
6. Improve decision-making skills for selecting suitable excavation protection systems.
7. Understand soil behavior, groundwater control, and geotechnical investigation techniques.
8. Master installation practices for shoring systems, retaining structures, and support frameworks.
9. Develop knowledge of instrumentation, monitoring systems, and structural performance evaluation.
10. Apply international standards and best practices in excavation safety compliance.
11. Learn cost optimization strategies using value engineering and sustainable construction approaches.
12. Analyze real-world excavation failures through engineering failure investigation case studies.
13. Enhance professional capability in managing complex excavation projects using digital construction technologies.

Target Audience

1. Civil Engineers and Structural Engineers
2. Geotechnical Engineers
3. Construction Project Managers
4. Site Engineers and Supervisors
5. Safety Officers and HSE Professionals
6. Contractors and Construction Consultants
7. Urban Infrastructure and Underground Construction Specialists
8. Architects and Engineering Consultants involved in foundation projects

Course Modules

Module 1: Fundamentals of Excavation Support Systems

- Principles of excavation engineering and temporary works design
- Types of excavation support systems and applications
- Soil mechanics fundamentals for excavation stability
- Excavation failure mechanisms and prevention methods
- Global excavation safety standards and best practices
- **Case Study:** Analysis of a high-rise basement excavation project where proper support selection prevented wall movement and surrounding structure damage.

Module 2: Soil Investigation and Geotechnical Assessment

- Geotechnical site investigation methods
- Soil classification and engineering properties
- Groundwater challenges and dewatering strategies
- Soil pressure calculations and stability analysis
- Interpretation of geotechnical reports for excavation planning
- **Case Study:** Review of an underground metro excavation project requiring advanced soil analysis and groundwater control.

Module 3: Sheet Piling and Retaining Wall Systems

- Applications of steel sheet piles in excavation projects
- Installation techniques and equipment selection
- Advantages and limitations of sheet pile systems
- Corrosion protection and durability considerations
- Performance monitoring of retaining structures
- **Case Study:** Industrial waterfront excavation project using sheet pile walls for temporary earth retention.

Module 4: Diaphragm Walls and Deep Excavation Systems

- Design concepts of diaphragm wall systems
- Construction sequence and quality control
- Reinforcement cage installation techniques
- Slurry management and excavation support
- Applications in deep basements and underground facilities
- **Case Study:** Commercial tower basement construction using diaphragm walls in a congested urban environment.

Module 5: Soldier Piles, Lagging, Soil Nailing, and Anchoring

- Design and installation of soldier pile systems
- Timber and concrete lagging applications
- Soil nailing principles and construction methods
- Ground anchor design and testing procedures
- Hybrid excavation support solutions
- **Case Study:** Highway expansion project using soil nails and anchors to stabilize steep excavation slopes.

Module 6: Braced Excavations and Temporary Works Management

- Internal bracing systems and structural behavior
- Strut and wale design principles

- Temporary works coordination and approvals
- Construction sequence planning
- Managing excavation-induced ground movement
- **Case Study:** Large-scale underground parking excavation using multi-level bracing systems.

Module 7: Excavation Monitoring, Safety, and Risk Management

- Instrumentation and monitoring technologies
- Real-time excavation performance tracking
- Safety management systems for excavation sites
- Emergency response planning
- Digital monitoring and predictive risk assessment
- **Case Study:** Deep excavation project using automated sensors to detect early wall deformation.

Module 8: Advanced Technologies and Sustainable Excavation Practices

- BIM applications in excavation planning
- Digital twins for construction monitoring
- Sustainable excavation methodologies
- Artificial intelligence in construction risk prediction
- Future trends in geotechnical engineering
- **Case Study:** Smart construction project using BIM integration and IoT monitoring for excavation safety optimization.

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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