

Preventing Foundation Failure: Soils, Concrete, Reinforcement and Layout

Course # BLTI206



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Course Description

Quality construction begins with a strong foundation. Soil conditions, proper foundation layout and design, along with high performance concrete and concrete reinforcement will have a large effect on the productivity and profitability of the project. This three hour course is useful for anyone involved in foundation design and construction decisions, including contractors, architects, and engineers. The steps involved in foundation preparation and design are outlined through text, integrated videos, diagrams and slides.

After completing this course participants will be able to:

- Differentiate between soil types and determine load bearing capacity of a foundation based on soil classifications.
 - List and describe specific admixtures that are used to create a desired effect to improve setting time, workability and strength of concrete.
 - Identify the different types of forms, and the advantages of one over another depending on the specifics of the job.
 - Summarize the advantages of post-tensioned pre-stressed concrete, and describe common applications in the construction industry.
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COURSE OUTLINE

Chapter 1 - Soil Testing

***Learning Objectives:** 1) Describe the methods by which soil and rock deposits are classified and analyzed. 2) Be able to identify and conduct basic soil compaction and density tests. 3) Determine load bearing capacity of a foundation based on soil classification.

- A. Soil Types and Classification
- B. Tests
- C. Soil Compaction
- D. Soil Density
- E. Dewatering

Chapter 2 - Concrete and Concrete Reinforcement

***Learning Objectives:** 1) Explain the difference between chemical and mineral admixtures, and describe the several different types used. 2) Explain the process of, and importance of compressive strength testing. 3) Discuss how to construct proper concrete joints. 4) Describe and define 5 types of problems that typically occur with concrete.

- A. Admixtures
- B. Compressive Strength Testing: 7 Day Test
- C. Joints: Isolation, Expansion and Construction
- D. Reinforcement: Placement, Ties
- E. Post Tensioned Prestressed Concrete
- F. Problems: Scaling, Curling, Spalling

Chapter 3 - Footings and Foundations

***Learning Objectives:** 1) Identify and understand the components and methods to footing and foundation construction. 2) Understand the purpose of steel reinforcement in walls. 3) Recognize the importance of protecting foundation walls from water infiltration.

- A. Layout Process
- B. Foundation Types: Basement, Crawl, Slab-on-Grade and others
- C. Displacement and reinforcement: Steel reinforcement, Columns and Pilasters
- D. Concrete Formwork
- E. Dampproofing and Waterproofing

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