

Sample Lesson Plan
Construction Industry Training Program
Concrete and Masonry Construction

Introduction

The standard for concrete and masonry construction sets forth requirements with which construction employers must comply to protect construction workers from accidents and injuries resulting from the premature removal of formwork, the failure to brace masonry walls, the failure to support precast panels, the inadvertent operation of equipment, and the failure to guard reinforcing steel. Subpart Q prescribes performance-oriented requirements designed to help protect all construction workers from the hazards associated with concrete and masonry construction operations at construction, demolition, alteration, or repair worksites.

Instructor's Activities

- PowerPoint presentation
- Discuss 29 CFR 1926 Subpart Q
- Participant feedback

Learning Objectives and Outcomes

General Requirements

I. Construction Loads

Employers must not place construction loads on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the intended loads.

II. Reinforcing Steel

All protruding reinforcing steel, onto and into which employees could fall, must be guarded to eliminate the hazard of impalement.

III. Post-Tensioning Operations

Employees (except those essential to the post-tensioning operations) must not be permitted to be behind the jack during tensioning operations.

IV. Concrete Buckets

Employees must not be permitted to ride concrete buckets.

IV. Working Under Loads

Employees must not be permitted to work under concrete buckets while the buckets are being elevated or lowered into position. To the extent practicable, elevated concrete buckets must be routed so that no employee or the fewest employees possible are exposed to the hazards associated with falling concrete buckets.

V. Personal Protective Equipment

Employees must not be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless they are wearing protective head and face equipment.

VI. Equipment and Tools

The standard also includes requirements for the following equipment and operations: bulk cement storage, concrete mixers, power concrete trowels, concrete buggies, concrete pumping systems, concrete buckets, tremies, bull floats, masonry saws, and lockout/tagout procedures.

Requirements for Cast-in-Place Concrete

I. Formwork

Formwork must be designed, fabricated, erected, supported, braced, and maintained so that it will be capable of supporting without failure all vertical and lateral loads that might be applied to the formwork.

II. Drawings or Plans

Drawings and plans, including all revisions for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, must be available at the jobsite.

III. Shoring and Reshoring

Erected shoring equipment must be inspected immediately prior to, during, and immediately after concrete placement. The sills for shoring must be sound, rigid, and capable of carrying the maximum intended load. All base plates, shore heads, extension devices, and adjustment screws must be in firm contact and secured, when necessary, with the foundation and the form. Reshoring must be erected, as the original forms and shores are removed, whenever the concrete is required to support loads in excess of its capacity.

IV. Vertical Slip Forms

Forms must be designed to prevent excessive distortion of the structure during the jacking operation. Jacks and vertical supports must be positioned in such a manner that the loads do not exceed the rated capacity of the jacks. All vertical slip forms must be provided with scaffolds or work platforms where employees are required to work or pass.

V. Reinforcing Steel

Reinforcing steel for walls, piers, columns, and similar vertical structures must be adequately supported to prevent overturning and collapse. Employers must take measures to prevent unrolled wire mesh from recoiling. Such measures may include, but are not limited to, securing each end of the roll or turning over the roll.

VI. Removal of Formwork

Forms and shores (except those that are used for slabs on grade and slip forms) must not be removed until the employer determines that the concrete has gained sufficient strength to support its weight and superimposed loads. Reshoring must not be removed until the concrete being supported has attained adequate strength to support its weight and all loads placed upon it.

VII. Precast Concrete

Precast concrete wall units, structural framing, and tilt-up wall panels must be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed. Only essential employees are permitted under precast concrete that is being lifted or tilted into position.

VIII. Lift-Slab Operations

Lift-slab operations must be designed and planned by a registered professional engineer who has experience in lift-slab construction. Jacking equipment must be marked with the manufacturer's rated capacity and must be capable of supporting at least two and one-half times the load being lifted during jacking operations. Under no circumstances shall any employee who is not essential to the jacking operation be permitted immediately beneath a slab while it is being lifted.

IX. Masonry Construction

Whenever a masonry wall is being constructed, employers must establish a limited access zone prior to the start of construction, equal to the height of the wall to be constructed plus 4 feet (1.2 meters), and shall run the entire length of the wall; restricted to entry only by employees actively engaged in constructing the wall; and kept in place until the wall is adequately supported to prevent overturning and collapse

References

- **OSHA Standard**

- 29 CFR 1926 Subpart Q – Concrete and Masonry Construction**

- http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10777

- **Reference Material**

- <http://www.osha.gov/doc/outreachtraining/htmlfiles/concrete.html>

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