Concrete and Masonry for Construction: Overview

5-Minute Talk

OSHA's standard for concrete and masonry construction is located in 29 CFR 1926, Subpart Q — Concrete and masonry construction. The Subpart addresses requirements construction employers must comply with to protect employees from accidents and injuries resulting from the:

- Premature removal of formwork.
- Failure to brace masonry walls
- Failure to support precast panel.
- Inadvertent operation of equipment.
- Failure to guard reinforcing steel.

The regulation is divided into seven major groups. They are:

Scope, application and definitions — Prescribes performance-oriented requirements to help protect all construction employees from hazards associated with concrete and masonry construction operations at construction, demolition, alteration, or repair jobsites.

General requirements — Discusses general work practice requirements related to construction loads, reinforcing steel, concrete buckets, working under loads, and personal protective equipment. Some of the requirements are:

- All protruding reinforcing steel, onto and into which employees could fall, must be guarded to eliminate an impalement hazard.
- Employees (except those essential to the post-tensioning operations) must not be permitted to be behind the jack during tensioning operations.
- Employees must not be permitted to ride concrete buckets.
- Employees must not be permitted to work under concrete buckets while the buckets are being elevated or lowered into position.

Requirements for equipment and tools — Addresses the hazards associated with equipment and tools used in concrete and masonry construction. Some examples are:

- Powered and rotating type concrete troweling machines that are manually guided must have a control switch that automatically shuts off the power whenever the operator's hands are removed from the handles.

- Masonry saws must be guarded with a semicircular enclosure over the blade.
- When using bull float handles where they might contact energized electrical conductors, must be constructed of nonconductive material or insulated with a nonconductive sheath.

Requirements for cast-in-place concrete — Discusses formwork in general, shoring and reshoring, vertical slip forms, reinforcing steel, and removal of formwork. Some requirements are:

- 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 framework.
- Drawings and plans, including all revisions for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, must be available at the jobsite.
- All shoring equipment (including equipment used in reshoring operations) must be inspected prior to erection to determine that the equipment meets the requirements specified in the formwork drawings.
- Damaged shoring equipment must not be used for shoring. Shoring equipment found to be damaged or weakened after erection must be immediately reinforced.
- Reinforcing steel for walls, piers, columns, and similar vertical structures must be adequately supported to prevent overturning and collapse.
- 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.

Requirements for precast concrete — Directs employers to ensure precast concrete wall units, structural framing, and tilt-up wall panels be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed. Some rules are:

- 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.

Lift-slab operations — Contains specific requirements for lift-slab construction operations. Examples of regulations in this section are:

- Lift-slab operations must be designed and planned by a registered professional engineer who has experience in lift-slab construction.

- Lift-slab operation plans and designs must include provisions for ensuring lateral stability of the building/structure during 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 and the equipment must not be overloaded.
- Jacks/lifting units must be designed and installed so that they will neither lift nor continue to lift when loaded in excess of their rated capacity.
- 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.

Masonry construction — Requires employers to establish a limited access zone whenever a masonry wall is being constructed. Rules include:

- Whenever a masonry wall is being constructed, employers must establish a limited access zone prior to the start of construction. The limited access zone must be:
- Equal to the height of the wall to be constructed plus 4 feet, and must run the entire length of the wall.
- On the side of the wall that will be unscaffolded.
- Restricted to entry only by employees actively engaged in constructing the wall.
- Kept in place until the wall is adequately supported to prevent overturning and collapse unless the height of the wall is more than 8 feet and unsupported, in which case it must be braced. The bracing must remain in place until permanent supporting elements of the structure are in place.

There have been a number of tragic accidents over the years involving concrete and masonry construction including one that happened during the time OSHA was preparing the current regulation. In that accident a building in Bridgeport, Connecticut, collapsed, taking the lives of 28 workers. The collapse caused the highest death toll from a workplace accident in the United States since 51 employees were killed in 1978 during construction of a cooling tower at Willow Island, West Virginia. The Bridgeport building that collapsed was being erected using the lift-slab method of construction. OSHA's investigation of the collapse revealed that there had been a failure to comply with the OSHA regulations.

Even after fifteen years of the current regulations being in place, you often hear of or read about a wall collapse at construction sites. Don't let this happen at your jobsites.

OSHA believes that complying with the regulations in Subpart Q will reduce the deaths and injuries that have plagued the workers in concrete and masonry construction.

Employee Training

There are no specific training requirements for Subpart Q. However, the OSHA regulations at 29 CFR 1926.21 require employers to train employees in the recognition and avoidance of unsafe conditions and the regulations applicable to their work environment to control or eliminate any hazards or other exposure to illness or injury.

Training Tips

In this 5-minute training, concentrate on what is going on at your jobsite. Stick to what is relevant to the employee. What will impact him/her today? For example, if you are constructing a masonry wall, you might want to actually measure and mark the limited access zone to show employees where they can and can't be, who can and can't be in the zone, and when the zone can be removed.

Another quick exercise would be to go over what could happen if an employee were using a bull float that did not have an insulated handle and it struck an overhead electrical transmission line.

Where To Go For More Information

29 CFR 1926, Subpart Q — Concrete and masonry construction.