Cementing Safety for Concrete and Masonry Workers: Precast, Lift-Slab, and Masonry Construction



What's at Stake?

The potential for serious injuries and even fatalities is very high when thinking about work involved for concrete and masonry workers. Precast concrete, lift-slab operations, and masonry construction all pose different types of risk, and all have the potential for multiple employees to be hurt or killed if these risks are ignored.

One such example can be found on OSHA's accident report website. During construction of a Walmart in Warner Robins, GA, an unbraced masonry block wall collapsed. The result was the death of one employee and hospitalization of seven others. The employees involved weren't directly working on the wall at the time; some of the employees were cleaning debris at the base of the wall, and some were dismantling a scaffold in the same area of the masonry wall when it collapsed. No limited access zone had been established at the worksite.

What's the Danger?

Concrete walls can weigh upwards of several thousand tons. So, it makes sense that collapse of these walls is a significant hazard to workers. Causes of collapse depend on the method of construction and type of structure being built. In general, removing framework too early, incorrect use of equipment, improper or inadequate shoring, and not guarding reinforcing steel can all pose dangers for construction collapse.

Specifically, for *precast* concrete, collapse is imminent if there is not enough support for the panels during construction, or if lift inserts and hardware do not meet load-bearing limits.

When working on *lift-slab* operations, there is increased risk if working without a fully formed design plan, and if working with inadequate, damaged, or overloaded jacks.

During *masonry* construction, danger is significantly increased when working without a limited access zone – as was missing in the example above.

For all construction types, allowing open access to all areas of construction for essential and nonessential employees increases the dangers involved.

How to Protect Yourself

There are some general things to keep in mind to protect yourself:

- Appropriate use of PPE is essential. Specifically, protective head/ face equipment must be worn when applying cement, sand, and water mixtures using a pneumatic hose. Hardhats, safety glasses, gloves, visible clothing, safety shoes, and any other PPE instructed by your employer is necessary to protect yourself while you work.
- Structural design must be adequate. While this is ultimately the responsibility of your employer, it is up to you to be aware that the structure is supposed to be able to support intended loads. If you are unsure or hesitant, speak up!
- The site is a "need to be" basis. Only essential employees should be permitted to the areas of operations. Signs and barriers must be in place to limit access and increase awareness of construction operations for employees.

Preventing overturning and collapse in precast concrete depends on adequate support of wall units, structural framing, and tilt-up wall panels.

- Lift inserts attached to tilt-up wall panels must be able to support at least TWO TIMES the max intended load.
- Lift inserts for other precast members must be able to support FOUR TIMES the load.
- Lifting hardware must be able to support at least FIVE TIMES the max intended load.

Lift-slab operations must be designed and planned by a registered engineer; these plans should include detailed instructions, sketches, methods, and provisions for ensuring lateral stability. Additionally, care when operating jacks is of utmost importance.

- Jacking equipment must be marked with manufacturer's rated capacity and must be able to support at least TWO AND A HALF TIMES the load being lifted.
- Jacks must be designed and installed so that they will not lift when loaded more than their rated capacity.
- Jacks must have a safety device which will cause the unit to support the load at any position in the event of malfunction or loss of ability to continue to lift.

When doing masonry construction, the most vital part of hazard prevention is ensuring a limited access zone.

- Zones must be set up before construction starts and must be equal to the intended height of the wall plus FOUR FEET and run the entire length of the wall.
- Zones ensure restricted entry – only workers actively engaged in constructing the wall are allowed in the limited access zone.
- Zones must stay in place until the wall is supported so that it prevents overturning and collapse, unless the wall is braced (for walls over 8 ft high), in which case the bracing must remain in place until permanent support of the structure is in place.

Final Word

Preventing collapse of concrete and masonry constructions is the best way to maintain safety for workers. Purposeful and appropriate planning and use of equipment based on the specific needs of the construction will ensure a secure worksite.