



Tilt-Up Panel Construction Hazard

Safety and Health Information Bulletin

SHIB 10-15-2003

Purpose

The purpose of this Safety and Health Information Bulletin is:

1. To alert tilt-up contractors, constructors, and erectors about the hazards of unsupported panels toppling over and causing severe injury or death to workers.
2. To inform tilt-up contractors, constructors and erectors not to remove braces from panels until all structural connections are complete and properly secured.
3. To identify regulatory requirements for, and provide safety recommendations to employers and workers involved in tilt-up construction.

Background

Federal OSHA's Directorate of Construction received notice of a multiple fatality accident on a construction project located in Greensboro, North Carolina. An inspection of the construction site was conducted by North Carolina Department of Labor Division of Occupational Safety and Health (OSH-NC). During this inspection OSH-NC identified hazardous conditions occurring during a tilt-up panel erection operation at a large retail warehouse.¹

This Safety and Health Information Bulletin is **not** a standard or regulation, and it creates no new legal obligations. The Bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with hazard-specific safety and health standards as issued and enforced by either the Occupational Safety and Health Administration (OSHA), or an OSHA-approved State Plan. In addition, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm under Section 5(a)(1), the General Duty Clause of the Act. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take steps to prevent or abate the hazard. However, failure to implement any guidelines in this bulletin is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.

Accident Investigation

The OSH-NC accident investigation revealed:

1. Three employees working at the construction site took a lunch break in the shade provided by a twenty (20) ton, 23' high by 19'7" wide, inadequately supported, reinforced concrete tilt-up wall panel.
2. The unbraced wall panel collapsed killing all three employees.
3. The tilt-up erection employer failed to install adequate bracing and/or removed temporary braces on approximately fourteen (14) tilt-up wall panels prior to the completion of all permanent connections to the structure.

¹ Tilt-up panel construction a construction technique of casting concrete elements in a horizontal position at the job site and then tilting and lifting the panels to their final position in a structure.

4. Joist welds, grout, and pour back strips, as specified by the contract documents, were not all in place prior to temporary brace removal.
5. A number of “K” series steel joists designed to be attached to the embed plates were not welded or properly secured.
6. Supervisors and employees lacked adequate knowledge about measures necessary to address hazards associated with tilt-up construction.

OSHA Standards and Suggested Safety Tips for Tilt-up Construction

1. Employers shall initiate and maintain such programs as may be necessary to provide for frequent and regular inspections of the job site, materials, and equipment by designated competent persons. **1926.20(b)(1) through (2)**
2. Employers shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazard or other exposure to illness or injury. **1926.21(b)(2)**. For example employers should instruct supervisors and workers not to remove temporary braces until roof structure and/or columns are in place to stabilize the building.
3. Employers shall comply with all of the requirements for precast concrete construction. **1926.704**
4. Employers should ensure that tilt-up panels are properly braced to resist wind and lateral forces.
5. Employers shall use only certified welders when welding steel joists to embeds and inserts on tilt-up wall panels.

Further Information

Further information can be obtained from Occupational Safety and Health Administration, Directorate of Construction internet website www.OSHA.gov.doc or by contacting the Office of Construction Services at 202-693-2020.

Additional information is available from

American National Standards Institute (ANSI)
www.ansi.org

American Society of Testing and Materials (ASTM)
www.astm.org

Tilt-Up Concrete Association (TCA)
www.tilt-up.org