OSHA
DEPARTMENT OF LABOR & INDUSTRY

SAFETY HAZARD ALERT

Loading/unloading systems at concrete products plants

Initiative

The Minnesota Occupational Safety and Health Division (MNOSHA) has recently identified a specific hazard involving the loading and unloading systems in concrete block production plants. The racks used with some of these systems have failed, resulting in some near misses and at least one accident witnessed by a MNOSHA investigator. In each case, these racks, which are designed to transport thousands of pounds of product, collapsed, sending blocks and fragments onto unsuspecting workers.

The purpose of this MNOSHA Safety Hazard Alert is to heighten public awareness of hazards created when these systems are used incorrectly.

Description of the hazard

The automated loader/unloader system places concrete products onto and off of racks for firing in the kiln. The machine has two separate stackers, each equipped with a spade loader. The loader, or stacker, receives pallets of green concrete masonry units from the front delivery conveyor of the concrete products machine. The spade loader moves in and elevates to pick up a load. When the spade loader is full, the spade deposits the pallets of green concrete masonry units onto a rack. The spade then returns to the stacker to pick up another load.

Simultaneously, the spade unloader retrieves pallets of cured concrete masonry units from the kiln and deposits the pallets into the unloader stacker. The stacker sets the pallets one at a time onto the unloading conveyor and returns to the rack to pick up another load.

The rack conveyor indexes to the next bay or to the next rack after the spade loader and unloader have filled or emptied their respective bays.

During this process, the block rack system may collapse due to poor placement onto the conveyor by a forklift driver or a spade loader/unloader failure or even a shift in the block rack or blocks during travel along the conveyor.

A full block rack may weigh up to 4,000 pounds and will cause serious injury should it fall onto a passerby. These systems are very top heavy (meaning the weight is shifted upward and has no stable weight base) as they travel along the conveyor system.

Eliminating the hazard

MNOSHA investigators will routinely look for these items to determine whether the hazard is controlled.

- Load and unload the blocks at all times according to the manufacturer's recommendations. This usually, but not always, means the blocks should be added from the bottom to the top of the spade loader and removed from the top to the bottom of the spade unloader to increase stability.

- Do not load the equipment beyond its design limits.
- Establish the common routes of travel away from the conveyor system.
- Install and maintain appropriate guarding wherever feasible to ensure that if the material falls, the guards will contain the collapse. (The guarding system should be removable to allow access to the equipment and may or may not extend through the entire loading/unloading area.)
- Place a rack positioning guide behind the conveyor when forklifts are used to load the conveyor. The forklift operator can then use the guide to ensure all of the rack feet are completely aligned on the conveyor pads before lowering the rack.
- Train employees about the hazards of material collapse and not to walk or work beneath the loader/unloader and conveyor.

Some existing chain conveyor systems can be retrofitted with rollers, eliminating the pads and the conveyor, but this retrofit may be expensive and is not always feasible.

For more information
Employers and employees with questions or concerns can consult the federal OSHA website at www.osha.gov or call MNOSHA Compliance at (651) 284-5050 or toll-free at 1-877-470-6742. For more information about requirements and recommendations, refer to Minnesota Statutes 182.653, subdivision 8; 29 CFR 1910.176(b); 29 CFR 1910.178(m)(2); and 29 CFR 1910.212(a).

Acknowledgements
The principal contributor to this MNOSHA Safety Hazard Alert was Brian L. Alexander, an industrial hygienist with the MNOSHA St. Paul Area Office.