



MICHIGAN STATE UNIVERSITY: Prevention of work-related injuries & illnesses through research & investigation

Hazard Alert Granite Slabs 10/24/19

FALLING STONE SLABS CAN KILL

In September 2019, two Michigan workers, one in their 30's and the other in their 50's, were killed while using an overhead crane to move five granite slabs from a metal A-frame rack to another location in the building. The building had multiple A-frames that were aligned in rows less than two feet apart. The two workers bundled the slabs on one side of the A-frame with synthetic web slings that were hooked to a leveling bar on the overhead crane. After the slab bundle was lifted from the A-frame and while being moved, the "empty" side of the A-frame buckled due to the weight of the slabs on the other side of the A-frame. When the A-frame buckled, it knocked over two adjacent A-frames. The workers were positioned in the fall path of the adjacent A-frames and were crushed by the weight of the falling slabs; 15 slabs fell on the older employee, and 12 slabs on the younger employee. First responders did not have the equipment to lift the slabs to reach the victims and sought the assistance of neighboring businesses with the proper equipment to lift the slabs. The A-frames, including the one that buckled, did not have a weight rating label nor were they bolted to the floor.



Granite slabs used for residential and commercial furnishing can vary in weight from several hundred to several thousand pounds. These slabs of stone are often flat and relatively thin and look deceptively light. Due to the weight and shape of these materials, transportation, storage, and loading/unloading tasks pose serious risk of injury and death. Safely handling these massive stone slabs requires proper equipment, employee training, and attention.

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PREVENTING WORK-RELATED FATALITIES FROM FALLING STONE SLABS

- **Before beginning a task**, identify the hazards, safe work practices, and equipment that will be needed to perform the work.
- **Overhead crane operators should have a permit** to operate the crane. Training should include the inspection of crane components and the safe operation of the crane, including *not* operating the crane in excess of its safe lifting capacity. Lifting a load should not occur until the weight of the load has been determined.
- **Ensure** employees moving stone slabs understand the stone's physical properties: size, weight, and center of gravity, as well as any weaknesses, fissures and inherent flaws to ensure an appropriate method to move the stone is selected.

- **Ensure A-frame racking system methods:**
 - Are designed by a professional engineer
 - Have documentation of load capacity on the A-frame
 - Have been inspected to ensure structural integrity
 - Cracked welds;
 - Cracked structural members;
 - Deformed or bent structural members;
 - Splits in wooden supports;
 - Areas that show the storage system has been damaged or overloaded
 - Are anchored (fixed) to the floor
 - Are spaced so that removal of slabs can be accomplished without hitting other A-frames and meet fire code requirements of at least two feet between frames.
- **Develop and implement procedures** for the placement and removal of slabs from the racking systems.
 - Never overload an A-frame or storage rack.
 - Store slabs evenly on an A-frame. Remove them evenly to maintain a balanced weight across the A-frame.
 - Follow industry standards for bracing/strapping/securing materials on A-frames and other storage racks.
- **Do not allow** employees to use a damaged storage racking system (A-frame, storage rack).
- When transporting stone slabs, **always have an escape route.** Examine the transport path and note any obstacles, tight spaces that limit movement, uneven surfaces to drive across, wet/slippery walkways, etc. to determine safe slab and employee movement and potential worker evacuation routes.
- **Work with your local first responders** to develop an emergency response action plan to be able to move the slabs if a slab falls.

DID YOU KNOW?

- Stones such as marble, granite, limestone, and others are usually cut into slices that are 5 feet by 10 feet and 1-3/16 inches thick.
- Slabs typically weigh somewhere between 770 to 880 pounds but can exceed 1,000 pounds. They are often grouped into bundles of five or six slabs which can weigh 4,850 pounds or more.
- Approximately 5 people are crushed at work by stone slabs and die each year in the United States.

Resources

- [“Hazards of Transporting, Unloading, Storing and Handling Granite, Marble and Stone Slabs.”](#) OSHA. Occupational Safety and Health Administration, United States Department of Labor, 12 Aug. 2008. Web. 18 May 2017.
- Natural Stone Institute: Safety Resources and Courses. <https://www.naturalstoneinstitute.org/safety/>
- Stone Forensics: Stone Slab Handling Safety: <https://stoneforensics.com/articles/f/stone-slab-handling-safety>
- Massachusetts Case Report 05-MA-059 Worker Killed When Crushed By Multiple Granite Slabs – Massachusetts <https://www.cdc.gov/niosh/face/sateface/ma/05ma059.html>