

# TerranearPMC Safety Share

Robert Brounstein

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Storing or stacking materials improperly can be dangerous. This was powerfully exemplified during the tragic event that occurred on November 18, 1999 when Texas A&M built their traditional bonfire for the big football game against the University of Texas. The structure consisted of three layers of 18-foot logs that were wired together and placed perpendicular to the ground so as to resemble a large wedding cake. It stood 59-feet tall and unexpectedly, the bottom layer shifted causing the entire stack (over one million pounds of timber) to collapse, killing 12 students and injuring another 27. The bonfire was a tradition at the University since 1907 and in those 90-plus years, there was never any indication that such a tragedy could happen. As it turns out, this structure was never built with any design or size/weight specifications. Since this unfortunate event, the design now has to be built per strict specifications and approved by a structural engineer.

With a doubt, the Texas A&M Bonfire incident was an extreme case of what can happen when materials are not properly stacked. And while, this incident was not considered to be a workplace violation, an exhaustive investigation (which are mandatory for workplace environments) was conducted and concluded that if proper design features and materials storage techniques were properly employed, this unfortunate incident would have been prevented.

For workplace environments, OSHA has promulgated a number of standards that are designed to protect workers from similar disasters; that is, material piles falling and causing serious injuries. OSHA states that stored materials must not create a hazard for employees. And while this may be considered a blanket catch-all phrase, similar to the OSH Act's *General Duty Clause* (stating the workplace shall be free of recognized hazards), OSHA does go beyond the rhetoric by specifying how employers should make workers aware of such factors, including material storage height and weight, how accessible the stored materials are to the user, as well as noting the condition of the containers where the materials are being stored when stacking and piling materials.

OSHA insists that storage of material shall not create a hazard. Bags, containers, bundles, etc., stored in tiers shall be stacked, blocked, interlocked and limited in height so that they are stable and secure against sliding or collapse. And of course, housekeeping is an important aspect to ensure effective materials storage.

According to the OSHA General Industry Standard (29 CFR 1910.176), whenever mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, loading docks, doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstruction across or in aisles that could create a hazard. Permanent aisles and passageways shall be appropriately marked.

In OSHA's construction standard (29 CFR 1926, Subpart H) it is specified that materials stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the



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material stored. Further, OSHA states that bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high. For piling bricks, stacks shall not be more than 7 feet in height. And, when a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level. For masonry blocks, when a stack reaches 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.

When it comes to stacking lumber, it is required that all nails shall be removed prior to stacking, while the lumber shall be loaded on level and solidly supported sills and shall be so stacked as to be stable and self-supporting. Lumber piles shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high. The interpretation for this is based on a 16-foot height when lumber is handled manually and 20-feet if using a forklift (for stacking).

For structural steel, poles, pipe, bar stock, and other cylindrical materials, unless rack system is used, shall be stacked and blocked so as to prevent spreading or tilting. And, as is always the case, housekeeping is an important issue. As such, storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation growth will be controlled when necessary.

The OSHA Excavation standard, 29 CFR 1926, Subpart P, also has requirements for proper storing of materials. Under this regulation, employees shall be protected from materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both.

And when workers need to physically handle materials, when applicable, handles or holders should be attached to loads to reduce the chances of getting fingers pinched or smashed. And PPE? For loads with sharp or rough edges, wear gloves or other hand and forearm protection. In addition, to avoid injuries to the eyes, use eye protection. When the loads are heavy or bulky, safety boots/shoes should be worn to protect feet as an injury can easily happen should a load accidentally drop.

While it may seem to be common sense to ensure plies of equipment and materials are secured so that they do not present a hazard to workers, the rules and regulations provided by OSHA (as well as other organizations) are only minimum requirements. Therefore by placing materials 2 feet away from an excavation does not guarantee materials will not fall into the excavation and cause a workplace injury. It is up to all of us to examine our work areas with a critical eye and thereby determine if our processes and practices effectively control workplace hazards.

**The poetry of the earth is never dead.** ~John Keats

