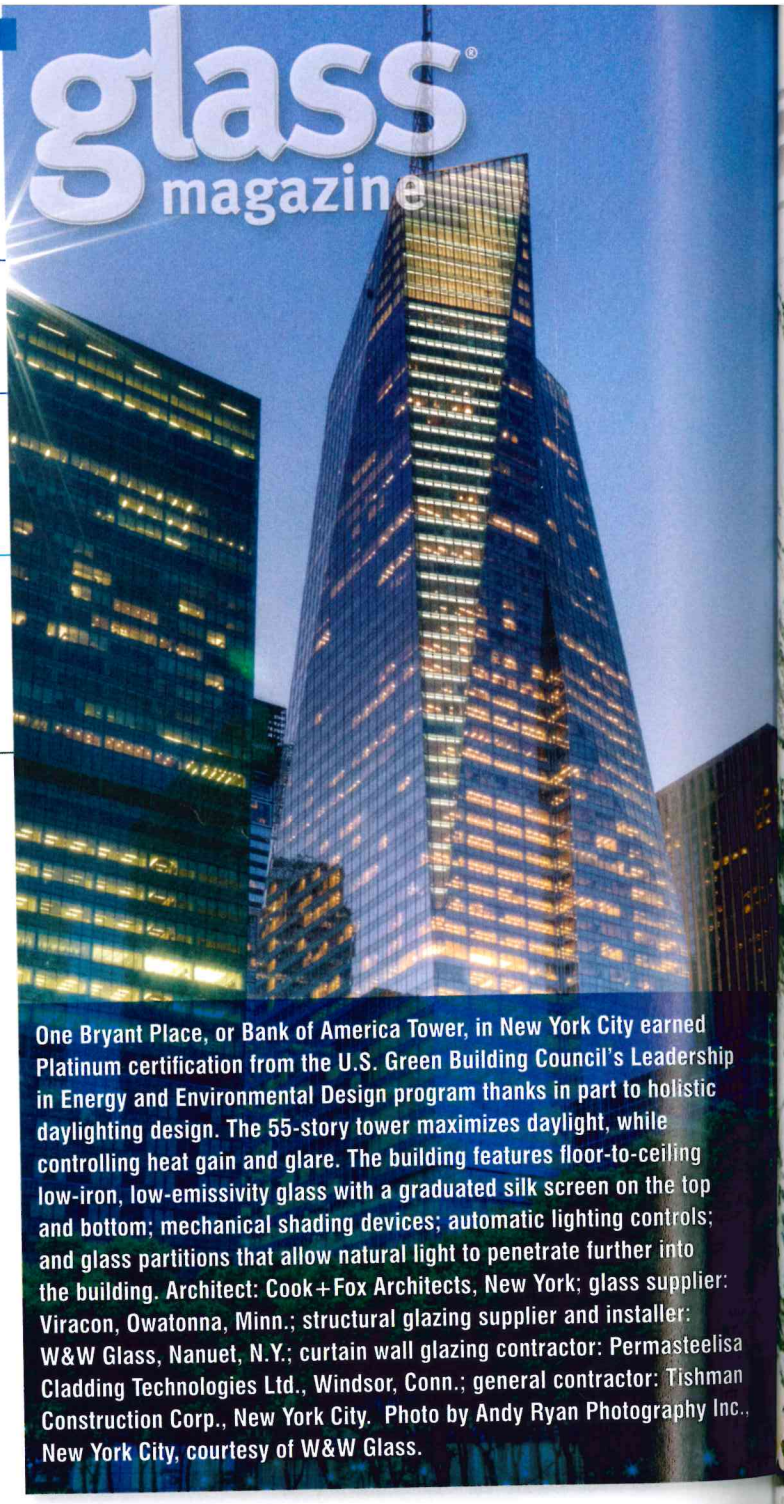
features



One Bryant Place, or Bank of America Tower, in New York City earned Platinum certification from the U.S. Green Building Council's Leadership in Energy and Environmental Design program thanks in part to holistic daylighting design. The 55-story tower maximizes daylight, while controlling heat gain and glare. The building features floor-to-ceiling low-iron, low-emissivity glass with a graduated silk screen on the top and bottom; mechanical shading devices; automatic lighting controls; and glass partitions that allow natural light to penetrate further into the building. Architect: Cook+Fox Architects, New York; glass supplier: Viracon, Owatonna, Minn.; structural glazing supplier and installer: W&W Glass, Nanuet, N.Y.; curtain wall glazing contractor: Permasteelisa Cladding Technologies Ltd., Windsor, Conn.; general contractor: Tishman Construction Corp., New York City. Photo by Andy Ryan Photography Inc., New York City, courtesy of W&W Glass.

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"L" rack user alert

Following a fatal incident, the Washington State FACE Program issues new recommendations for safe glass handling

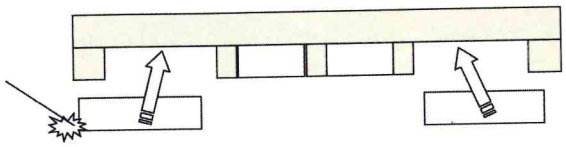
In September 2008, a 35-year-old skilled assembler and fabricator of custom mirror products died when he was struck by a metal "L" rack loaded with a 3,000-pound crate of mirrors in the custom glass and mirror manufacturing facility in Washington, where he worked. The victim and two co-workers were in the process of moving the large "L" rack of mirrors closer to a glass cutting table, using two pallet jacks. The "L" rack was designed with forklift pockets at the bottom, with the intention that it be moved using a forklift only. As the employees moved and repositioned the rack using the two pallet jacks, it fell rearward and struck the victim.

To prevent similar occurrences, Washington State Fatality Assessment and Control Evaluation Program officials recommend that businesses engaged in handling, shipping or receiving flat glass or similar products:

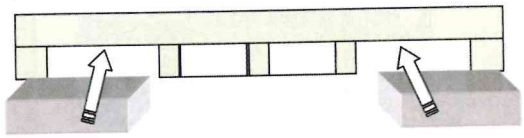
- Develop a safer method of glass transportation and handling that eliminates use of the "L" glass rack.
- Modify "L" glass racks permanently or temporarily while at the business location to prohibit the use of pallet jacks.
- Design and organize the work environment to eliminate hazard potential.
- Institute and enforce strict material-handling policies that prohibit unsafe and improper materials handling.
- Require written hazard assessments and plans specific to material-handling tasks.
- Provide safety training materials in an appropriate language for employees.

Fig. 1

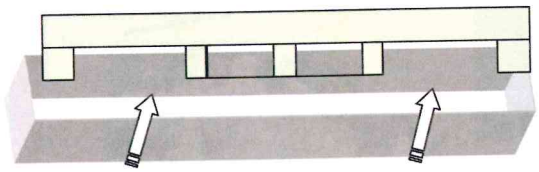
A. Weld plates to permanently cover openings to prohibit use of pallet jacks



B. Fabricate physical blockers that can be secured to rack to temporarily fill spaces



C. Fasten a tight fitting semi-rigid belt to prohibit unplanned and unauthorized movement of "L" racks. Belt can be removed to allow movement with forklift.



1. Develop a safer method of glass transportation and handling that eliminates the use of "L" racks.

The FACE program recommends that companies that use similar "L" racks investigate options for safer transportation and handling of large glass lites, mirrors, granite or concrete slabs, and similar size and weight materials. Alternate options include stacking materials horizontally or vertically in a crate, with spacers between each lite for protection and access for handling. A vacuum handling system with crane and forklift-mounted vacuum units for the handling and movement of individual lites would complement the crate transportation method. Handlers of glass mirrors and similar flat, heavy materials should refrain from using wheeled carts and dollies, which also pose significant hazards.

2. Modify "L" racks permanently or temporarily while at the business location to prohibit the use of pallet jacks.

The design of the "L" rack involved in this incident made it possible for employees to use pallet jacks to move the rack and mirror crates. The bottoms of the racks should be modified to prevent the use of pallet jacks (see Fig. 1). Companies should develop a method to permanently block the spaces on any racks that will remain at the facility and a method that will not allow access by pallet jack while racks are at the facility. One method to permanently prevent the use of pallet jacks involves welding plates over the lower front and back spaces. To temporarily prohibit access, install plates that cover the bottom open spaces, connected front-to-back and tightened using a threaded rod and nut or clamping system. Other options include fabricating a solid object to fill the spaces under the rack with clamps that connect it to the base of the rack,

"L" rack with manual pallet jack positioned in open space beside forklift pocket. In this incident, two pallet jacks were used: one on each side. Arrows indicate direction the "L" rack toppled.

What went wrong

In this incident, the metal "L" rack had pockets at the bottom to allow for access and movement with forklifts. However, the remainder of the bottom area of this specific rack was not blocked or designed to prevent the use of manual pallet jacks.

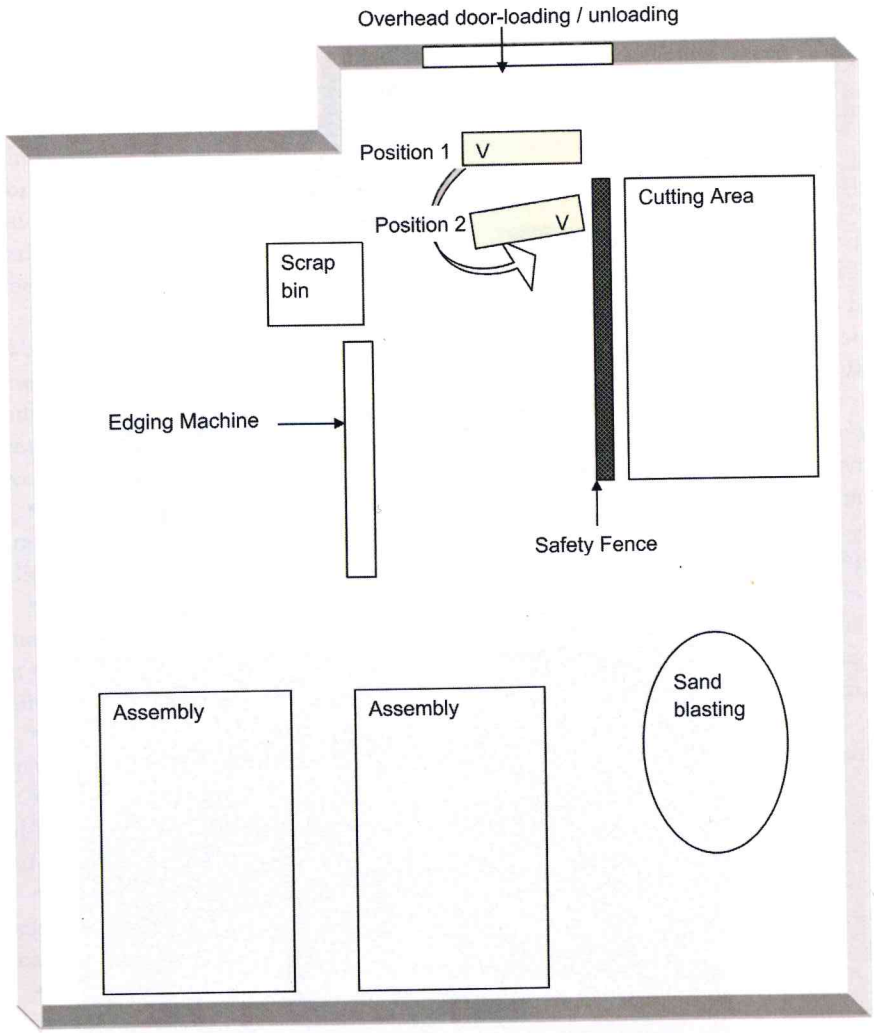
Glass mirrors in wood crates are loaded on the racks and positioned at a slight rearward angle on rack braces in order to stabilize the glass lites and prevent them from toppling forward off the rack. The incident company now uses straps and braces to stabilize crates of glass on racks, and uses straps to fasten racks to the backstop of forklifts. When positioned on the floor or on a forklift with a backstop and strapped for support, the loaded racks are stable and generally not susceptible to toppling. However, when a loaded rack is lifted with a manual pallet jack at each end, the center of gravity of the rack and the load dynamics change dramatically, making racks more unstable and thus susceptible to toppling. The rack instability is greatly increased when using two pallet jacks at maximum height. This creates unbalanced load centers and an uncontrolled rack, as was the case in this incident.

or fastening a temporary belt around the bottom perimeter of the rack.

3. Design and organize the work environment to eliminate hazards.

Companies should design and organize work areas so there is sufficient space to move and manipulate large racks of materials. In this case, the plant manager suggested that the employees were moving this tall "L" rack with pallet jacks because a scrap bin blocked the path of the forklift (See Fig. 2). During the investigation, FACE personnel, along with the company safety manager, noted there was insufficient space between the safety fence and the scrap bin to use a forklift to maneuver the "L" rack. As a hazard prevention practice, companies should organize the workspace to provide sufficient space for handling and movement of large and heavy materials. In this case, the scrap bin could have been easily moved and placed out of the way by a forklift. Another option is to segregate the workspace into zones where specific activities or equipment are either allowed or prohibited. In this case, it might have been beneficial to prohibit the use of pallet jacks in the area where large "L" racks were regularly moved.

Fig. 2



V = Victim location
Note: Not to scale

4. Institute and enforce strict material-handling policies that prohibit unsafe and improper materials handling.

Institute strict safety and hazard prevention rules with a "three strikes and out" or stepped disciplinary action for offenders. In this case, a strict written and verbal policy against moving "L" racks with pallet jacks might have resulted in one of the three employees objecting or cautioning the other two against the maneuver.

5. Require written hazard assessments and plans specific to material-handling tasks.

A specific, written hazard assessment and step-by-step plan should be required for material-handling tasks. This is especially important for non-routine tasks. The hazard assessment should include a specific listing of the individual tasks, who will be involved and how the hazards associated with each component will be managed. The assessment and plan should be developed jointly by all involved in the task, reviewed by the company safety manager and strictly followed.

6. Provide safety training and materials in appropriate language for employees.

Companies should provide safety training and materials in languages appropriate to all employees to ensure they understand potential hazards and their consequences. This extends to verbal training and written materials. A possible option is to designate an employee as safety representative and liaison for each language.

This article was developed by the Washington State Fatality Assessment and Control Evaluation Program. The FACE Program is supported in part by a grant from the National Institute for Occupational Safety and Health (NIOSH). For more information, contact the Safety and Health Assessment and Research for Prevention (SHARP) Program at 888/667-4277. The full report can be accessed at: http://www.lni.wa.gov/Safety/Research/Face/ReptNarr/Investigations/Default.asp.