



Best Practices to Prevent Structural Failures

Structural integrity can be taken for granted, but failures can be sudden and unforgiving. Train miners and supervisors on these simple measures to help prevent these potentially catastrophic incidents.

Good Housekeeping

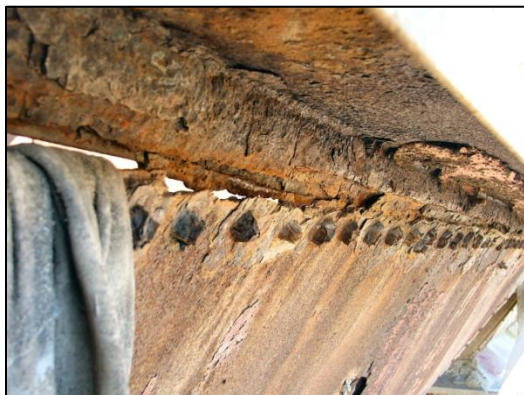
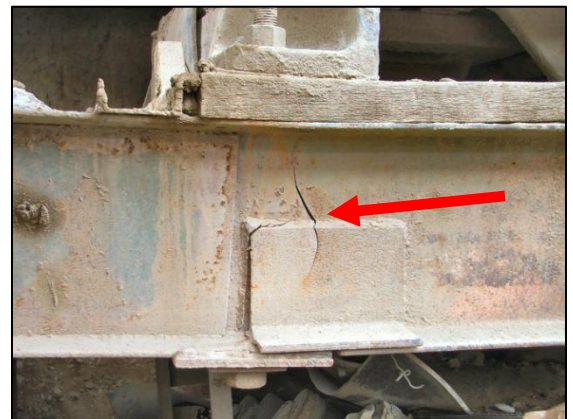
Structural damage can go undetected due to poor housekeeping; accumulations of wet material can cause corrosion. Remove spillage from around the base of structures, columns and off the flanges of horizontal beams. Prevent further spillage and damage by front-end and skid-steer loaders and forklifts.

Inspections

Safety and supervisory personnel should inspect structures during audits, and miners should be trained to notice and report potential structural problems. Periodically, a structural engineer should perform a formal assessment of structural integrity. Examine steel, concrete, wood, masonry, aluminum and fiber-reinforced polymer. Take all appropriate personal safety precautions while performing inspections, such as using fall protection at height and following safe confined space entry procedures.

What to look for (signs of damage that can be spotted and reported by anyone):

- Cracked, corroded, delaminated or flaked metal
- Holes, thinned or missing sections of beams or columns
- Bent, buckled or crushed beams or columns; missing or damaged struts or braces
- Damage from equipment impact
- Missing, loose or corroded bolts
- Cracked, broken or inadequate welds
- Bulging or deformed bin sides or tops; gapped joints
- Damaged building siding
- Cracked, broken, spalled or undermined concrete
- Delaminated plywood or water-weakened wooden structures



Report and Repair

Miners should be empowered to and feel comfortable about reporting suspected damage. Mine operators should take all reports seriously, determine the validity of each concern and take appropriate action. A qualified engineer should be consulted when there is any doubt. Barricade and post warning signs at affected areas and prevent entry pending repairs or rehabilitation.

New or Modified Construction

A registered professional engineer should design or review new or modified structures and equipment. New construction, and modifications to or demolition of existing facilities, should be performed by competent persons using accepted safe procedures and equipment and tools appropriate for the work.

