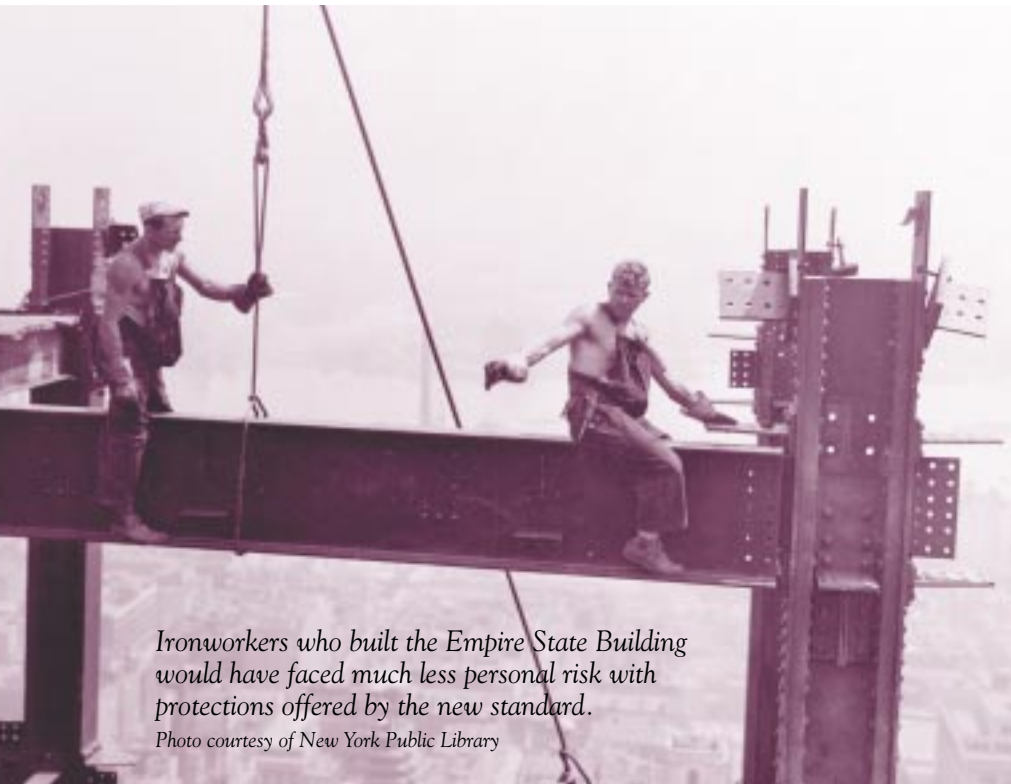


Protecting Ironworkers

OSHA's new steel erection standard is expected to go a long way toward saving lives and preventing injuries.

by Frank Meilinger



Ironworkers who built the Empire State Building would have faced much less personal risk with protections offered by the new standard.

Photo courtesy of New York Public Library

Remember those startling pictures of workers casually walking along beams or unguardedly connecting giant steel girders hundreds of feet above the ground as they erected the world-famous Empire State Building? What many of us do not know is that five men perished during construction of the 102-story landmark.

Although we certainly have come a long way in worker safety since this architectural and engineering treasure was completed 70 years ago, the nation's 57,000 ironworkers continue to face risks of serious injury or death. Every year an average of 35 ironworkers die during steel erection activities and 2,300 more suffer lost-work-day injuries.

OSHA's new steel erection standard, which becomes effective January 18, 2002, will help make America's ironworkers safer than ever. The new standard is expected to prevent 30 fatalities and 1,142 injuries annually and, as a result, save employers nearly \$40 million a year.

The rule is one of the first OSHA standards developed under the *Negotiated Rulemaking Act of 1990* and the Department of Labor's negotiated rulemaking policy. With negotiated rulemaking, a committee composed of representatives from interested parties potentially affected by the rule develops a proposed standard. OSHA then publishes the proposal, holds public hearings, and receives written information from the public. After reviewing all available evidence, OSHA issues a final standard.

Members of the Steel Erection Negotiated Rulemaking Advisory Committee (SENAC) developed the steel erection rule. The committee, established in May 1994, included representatives from organized labor, industry, public interests, and government. The parties worked out contrasting positions and sought common ground through face-to-face discussions. By airing disputed issues early in the rulemaking process, the committee helped to develop a better rule that employers are more likely to comply with—reducing the need for enforcement and litigation activities.

The new standard protects all workers engaged in steel erection activities. It does not, however, cover workers on electric transmission towers, communications towers, broadcast towers, water towers, or tanks.

The revised standard is part of OSHA's ongoing commitment to keep workplace regulations current



OSHA's new steel erection standard will help protect 57,000 U.S. ironworkers, preventing some 30 fatalities and 1,142 injuries a year.

Photo by Michael Carpenter

with evolving work practices and ensure that all workers are protected from the hazards posed by newer working conditions and technologies. OSHA's new requirements close gaps in current coverage, strengthen many existing specifications, and promote compliance by clarifying and consolidating current requirements.

The steel erection standard places special emphasis on the most serious hazards workers encounter during the steel erection process. These include hazards associated with working under loads; hoisting, landing, and placing decking; column stability; double connections; landing and placing steel joints; and falls to lower levels.

The standard's focus on these significant hazards will prevent

many of the unnecessary injuries and fatalities that occur in the industry each year. For instance, a worker died in 1999 when he stepped into a 3-foot-square skylight hole and fell to the ground below. OSHA's new requirements for covering roof and floor openings might have prevented this accident. Covers for roof and floor openings must meet the following requirements:

- be capable of supporting twice the weight of the employees, equipment, and material;
- be secured when installed to prevent accidental displacement; and
- be painted with high-visibility paint or marked with the word "HOLE" or "COVER."

In another fatal incident, a worker fell more than 23 feet while walking on a steel rafter. He had finished bolting-up a steel purlin to the rafter and was walking back to get another purlin when he fell. Compliance with the new fall protection requirements could have prevented this accident. The final rule requires that, with some exceptions, employers provide fall protection equipment to workers engaged in steel erection on surfaces more than 15 feet above a lower level. This includes workers engaged in bolt-up activities.

According to Noah Connell, director of OSHA's Office of Construction Standards and Compliance Assistance, special provisions in the new standard concentrate on ensuring structural integrity.

"These buildings are strong once they're completed but are very precarious while they are being erected," explains Connell. "A number of these provisions are specifically designed to improve the structural stability during the construction process to prevent the buildings from collapsing or falling."

New structural stability provisions include requirements for installing four instead of two anchor bolts to prevent "hinging down;" mandatory testing of concrete for curing before steel columns can go up; installing "seats" or other devices for double connections; and informing ironworkers of modifications and repairs to anchor bolts.

In July, OSHA announced that the final steel erection standard will go into effect January 18, 2002, exactly 6 months later than the original effective date. The delay is designed to give the industry additional time to become familiar with the new requirements and provide training to employees in the construction industry. OSHA also is preparing material to assist the industry in the training process.

The 6-month delay also allows employers time to make the necessary changes to avoid costly refabrication of already-made components and avoid long delays to projects that would affect all trades involved in the construction process. Components are typically fabricated 2 or 3 months before erection.

OSHA will not apply the component requirements of the new standard to the following two situations:

- components used in steel erection projects where the building permit was obtained before January 18, 2001, when the *Federal Register* published the final rule; and
- components used in steel erection projects in which the steel

erection work began before September 16, 2001.

OSHA estimates that the final rule will save employers in the steel erection industry nearly \$40 million a year in costs associated with lost-workday injuries, such as lost

productivity, medical expenses, and insurance costs. Additional cost savings associated with avoided third-party liability claims and other legal remedies that offer relief from economic and personal loss are expected to be substantial.

To learn more about the steel erection standard, visit OSHA's website at www.osha.gov. [JSHQ](#)

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Key Provisions of the Standard

Site Layout and Construction Sequence

- Requires certification of proper curing of concrete in footings, piers, and walls or the mortar in masonry piers and walls for steel columns.
- Requires the controlling contractor to provide the erector with a safe site layout, including preplanned routes for hoisting loads.

Site-Specific Erection Plan

- Requires preplanning of key erection elements, including, in certain circumstances, coordination with the controlling contractor before erection begins.

Hoisting and Rigging

- Provides additional crane safety for steel erection.
- Minimizes employee exposure to overhead loads through preplanning and work practice requirements.
- Prescribes proper procedure for multiple lifts, often referred to as "christmas-treeing."

Structural Steel Assembly

- Provides safer walking/working surfaces by eliminating tripping hazards and minimizes slips through new slip-resistance requirements.
- Provides specific work practices regarding safely landing deck bundles and promoting the prompt protection from fall hazards in interior openings.

Column Anchorage

- Requires four anchor bolts per column along with other column stability requirements.
- Requires procedures to ensure the adequacy of anchor bolts that have been modified in the field.

Beams and Columns

- Eliminates collapse hazards associated with making double connections at columns.

Open-Web Steel Joists

- Minimizes the likelihood of lightweight steel joists collapsing by addressing need for erection bridging and method of attachment.
- Requires bridging terminus anchors with illustrations and drawings in a non-mandatory appendix.
- Establishes new requirements to minimize collapse in placing loads on steel joists.

Systems-Engineered Metal Buildings

- Establishes requirements to minimize collapse in the erection of these specialized structures that account for a major portion of steel erection in this country.

Falling Object Protection

- Institutes performance provisions that address hazards of falling objects in steel erection.

Fall Protection

- Establishes controlled decking zone (CDZ) provisions to prevent decking fatalities.
- Protects deckers and connectors at heights greater than two stories or 30 feet. Connectors between 15 and 30 feet must wear fall arrest or restraint equipment and be able to be tied off or provided another means of fall protection. Deckers between 15 and 30 feet must be protected by fall protection equipment or work in a CDZ.
- Requires fall protection for all others engaged in steel erection at heights greater than 15 feet.

Training

- Requires a qualified person to train exposed workers in fall protection.
- Requires a qualified person to train exposed workers engaged in special, high-risk activities.