

Technical Bulletin Prohibition of Welding on Bolted or Riveted Fire Escape Connections with Internal Rust

Issued by:**FranCisco Meneses**

Founder – National Fire Escape Association

Fire Escape Expert (50+ years experience)

Endorsed by:**Fire Escape Engineers****Fire Escape Division of Codes, Compliance, Standards****Date:** October 2025**Subject:** Structural Integrity and Code Compliance in Fire Escape Connection Restoration

Background

Fire escapes across the United States—especially pre-1978 installations—were constructed using **mechanical fasteners** (bolts or rivets), **not welds**, for a critical engineering reason: **mechanical connections allow for expansion, contraction, and maintenance**, while welded joints create sealed cavities that trap moisture, accelerate corrosion, and mask internal deterioration.

Recent attempts by unqualified welding contractors to “repair” deteriorated fire escapes by welding directly onto **rusted, painted, or lead-coated steel** have raised serious structural, legal, and safety concerns.

This bulletin establishes that such practices are **not acceptable** under recognized engineering or safety standards and are **explicitly rejected** by both the **National Fire Escape Association (NFEA)** and **Fire Escape Engineers**.

Fire Escape Engineer Position

Francisco Meneses, Founder of the National Fire Escape Association, formally agrees and certifies the following engineering position:

"You cannot weld any bolted or riveted fire escape connection that contains internal rust, corrosion, or moisture. Welding over a compromised joint does not restore structural capacity — it merely conceals active corrosion and sets up premature weld failure within one to three years."

This consensus establishes the current **industry standard for all fire escape restoration work nationwide**. This is in concurrence with **NYC Standard Specifications - January 2010 - 5A.10 FIRE ESCAPES Part E: "No field welding is permitted in the repair of fire escapes. All repairs must be bolted or shop welded."**

Technical Justification

1. Internal Rust Expansion (Rust Jacking)

Rust expands up to **six times** the volume of the original steel. When a weld is placed over a corroded joint, the trapped rust continues expanding inside the sealed cavity. This expansion exerts **tensile stress** on the weld bead from within, leading to **brittle cracking and weld delamination** within a short period (typically 1–3 years).

2. Lack of Surface Preparation

Proper welding procedures (AWS D1.1) require **bare, clean, and sound metal**. Rusted or painted substrates violate the first step of any weld specification. Welding over **lead-based paint** (common in all pre-1978 fire escapes) is a direct **EPA violation**, carrying potential fines of **\$37,500 per occurrence** under the Toxic Substances Control Act (TSCA).

3. Fire Safety and Code Requirements

Any welding operation on an occupied or attached building requires a **Fire Watch** under both **NFPA 51B (Fire Prevention in Welding and Cutting Operations)** and local Fire Code. Failure to maintain a Fire Watch introduces significant life-safety hazards, as sparks can ignite interior combustibles through open windows or façade cavities.

4. False Longevity Claims

Many welding contractors offer so-called "25-year warranties," which are **not based on engineering standards or testing**. Often, these warranties coincide with the contractor's own self-inspection schedule every five years—creating a clear conflict of interest. Since the root cause (internal corrosion) remains unaddressed, weld failure and hidden corrosion persist beneath the surface coating.

5. Proper Restoration Method

The **accepted standard of care**—endorsed by the National Fire Escape Association and practicing engineers nationwide—is:

- Disassemble or mechanically separate corroded components.
- Remove all internal rust via mechanical cleaning.
- Prime all mating surfaces with rust-inhibitive coating.
- Reassemble using **hot-dip galvanized or stainless-steel bolts**.
- Seal exterior seams with caulking to prevent future moisture entry.

Bolted restoration maintains **inspectability, reversibility, and code compliance**, whereas welding destroys all three.

Conclusion

Fire escapes are not bridges, yet the same metallurgical principles apply. No bridge engineer would ever weld a load-bearing riveted connection over rust and moisture — doing so traps decay and ensures future structural failure. Fire escapes demand the same discipline.

Therefore, welding on **rusted or previously bolted fire escape connections** is not only **structurally unsound** but also **in violation of multiple federal and local safety codes**.

This position, developed by **Francisco Meneses (Founder, National Fire Escape Association)**, stands as the **recognized standard** for all fire escape repairs and certifications nationwide.

Accepted Standard Summary

Issue	Engineering Risk	Code / Legal Violation	Proper Solution
Welding over rusted joints	Weld fracture from rust expansion	Violation of AWS D1.1, NFPA 51B	Mechanical bolting after full rust removal
Welding over lead paint	Toxic fume release	EPA TSCA \$37,500 fine	Paint removal by certified abatement contractor
No fire watch	Fire hazard,	NFPA 51B, IFC	Fire Department-supervised

during weld	property loss	3505	fire watch
Sealed corroded joints	Hidden progressive failure	Engineering negligence	Clean, prime, and rebolt

Prepared by:
FranCisco Meneses
Founder – National Fire Escape Association
Fire Escape Expert (50+ years experience)

Endorsed by:
Fire Escape Engineers
Fire Escape Division of Codes, Compliance, Standards