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AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

Fall Protection for Leading Edge Work: Ask the Experts

MAY 1, 2025

Welcome & Introduction: **Brian A. Rizzo,** Director, Office of Construction Services, OSHA

Moderator: **Thomas Kramer, PE, CSP,** Fall Protection Subject Matter Expert at LJB Inc.

Panelists:

Dan Henn, Chairman, ANSI/ASSP Z359 Committee; Safety Operations Manager – Products, LJB, Inc.

Don Hurley, CSP, Safety Directory, Zachry Industrial, Inc.

Michael Overholt, CSP, Vice President, Safety & Quality, American Contractors Insurance Group (ACIG)

Housekeeping

- Today's webinar will be recorded and automatically shared via follow-up email.
- The recording and slides will also be posted on cpwr.com/webinars.
- Attendees are automatically muted! Please submit panelist questions via the Q&A box.
- Spanish audio is available via simultaneous interpretation

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Fall Protection for Leading Edge Work: Ask the Experts

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- TKramer@LJBinc.com
- Session Moderator

Dan Henn

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- Current Chair, Z359 Full Committee

Don Hurley

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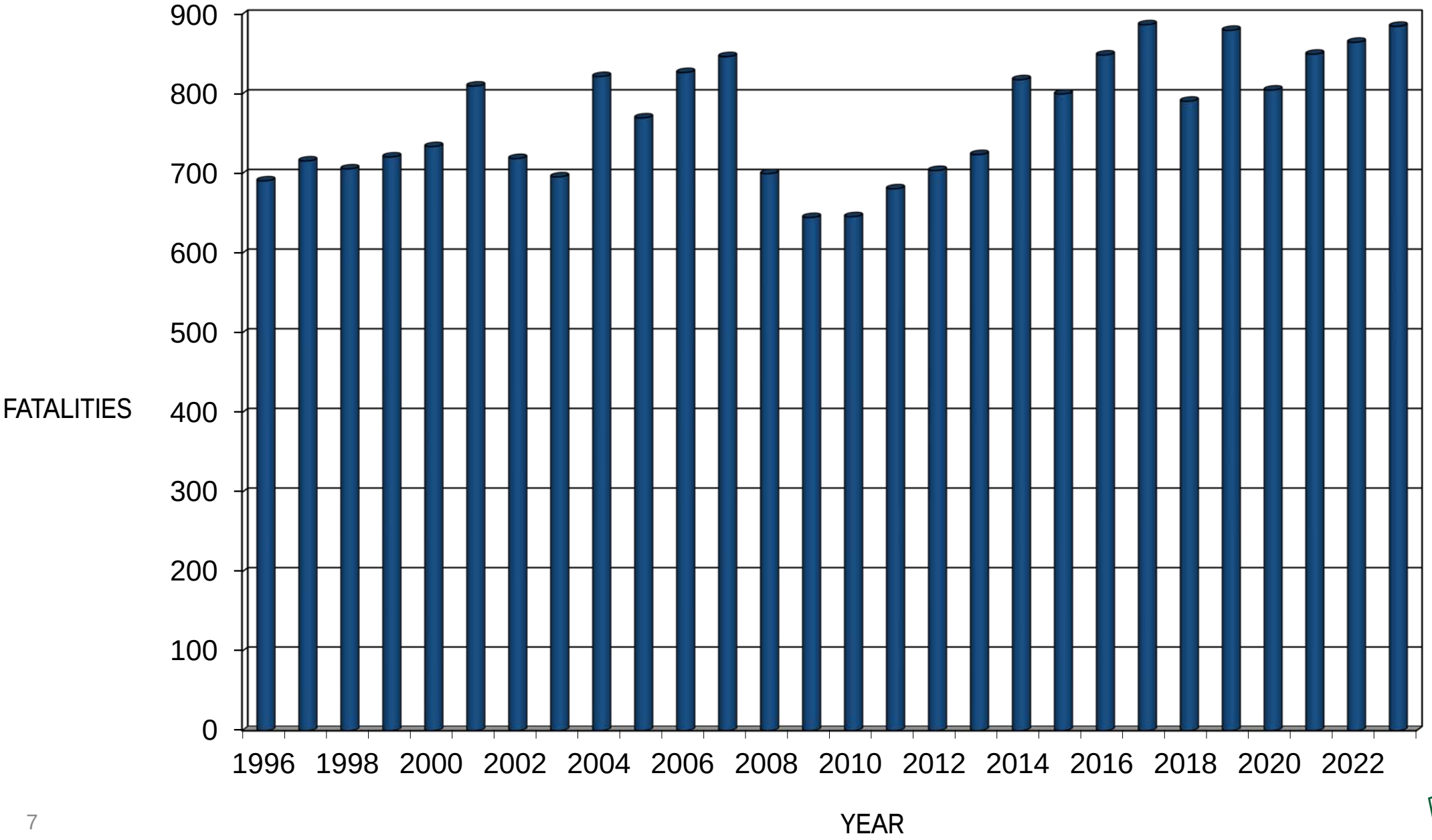
- Z359 Full Committee Member

Agenda

- Why are we here?
- Industry updates & news
- Open Q&A
- Closing

Why are we here?

- Fall fatalities are not decreasing.
- Much has and will be changing in the industry.
- What can each of us do to better protect workers at height?



Source: BLS Census of Fatal Occupational Injuries

OSHA National Emphasis Program

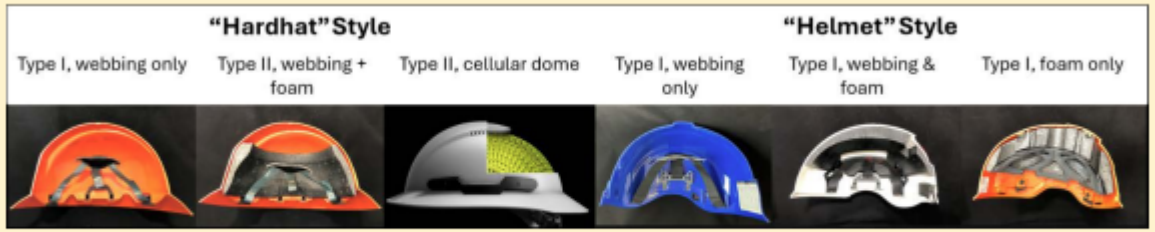
- OSHA National Emphasis Program (NEP) to Prevent Falls
- Launched May 1, 2023

OSHA NEP

- What’s a National Emphasis Program (NEP)?
- Why is this needed to prevent falls?
- How does it work?
- What do organizations need to do to prepare for this program?

Selecting Head Protection

- 50,000+ traumatic brain injuries (TBI's) are treated annually in the US
- 2,297 fatal intracranial injuries from 2015-2022
- Wearing proper headgear is essential to reducing the risk of a TBI
  - Hardhat vs Helmet
  - Type I vs Type II



Images courtesy of Dr. Michael Bottlang. Photos show examples of suspension and padding types only and do not make up a comprehensive list or guide.

2021-2024 STANDARDS

1. Z359.11: Full body harnesses (Effective in 2022)
2. Z359.14: Self-retracting devices (Effective in 2023)
3. Z459.1: Rope access(Effective in 2022)
4. Z359.9: Descenders(Effective in 2022)
5. Z359.4 Rescue (reaffirmed in 2023)
6. Z359.13 Energy absorbing lanyards (reaffirmed in 2023)
7. Z359.2 (Effective in 2024)
8. Z359.15 (Effective in 2025)
9. Z359.1 (Effective in 2025)

Future ANSI/ASSP Ballots

1. Z359.21 – Hoist and Rope Haul Systems (Pending)
2. Z359.19 – Rigid Rail Fall Arrest Systems (Pending)
3. Z359.17 – Flexible Horizontal Lifelines (Pending)

Q&A from Panel

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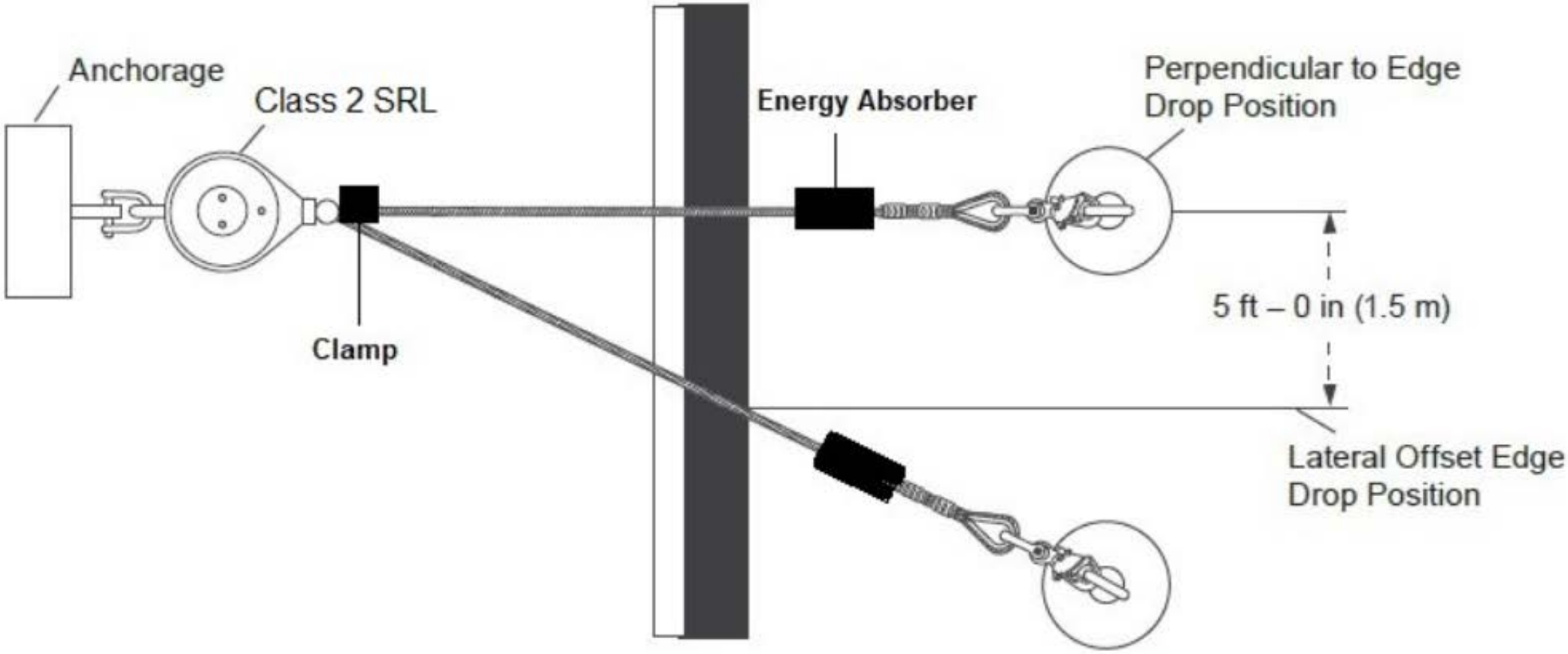


Figure 12: Dynamic Performance testing of SRDs – Class 2

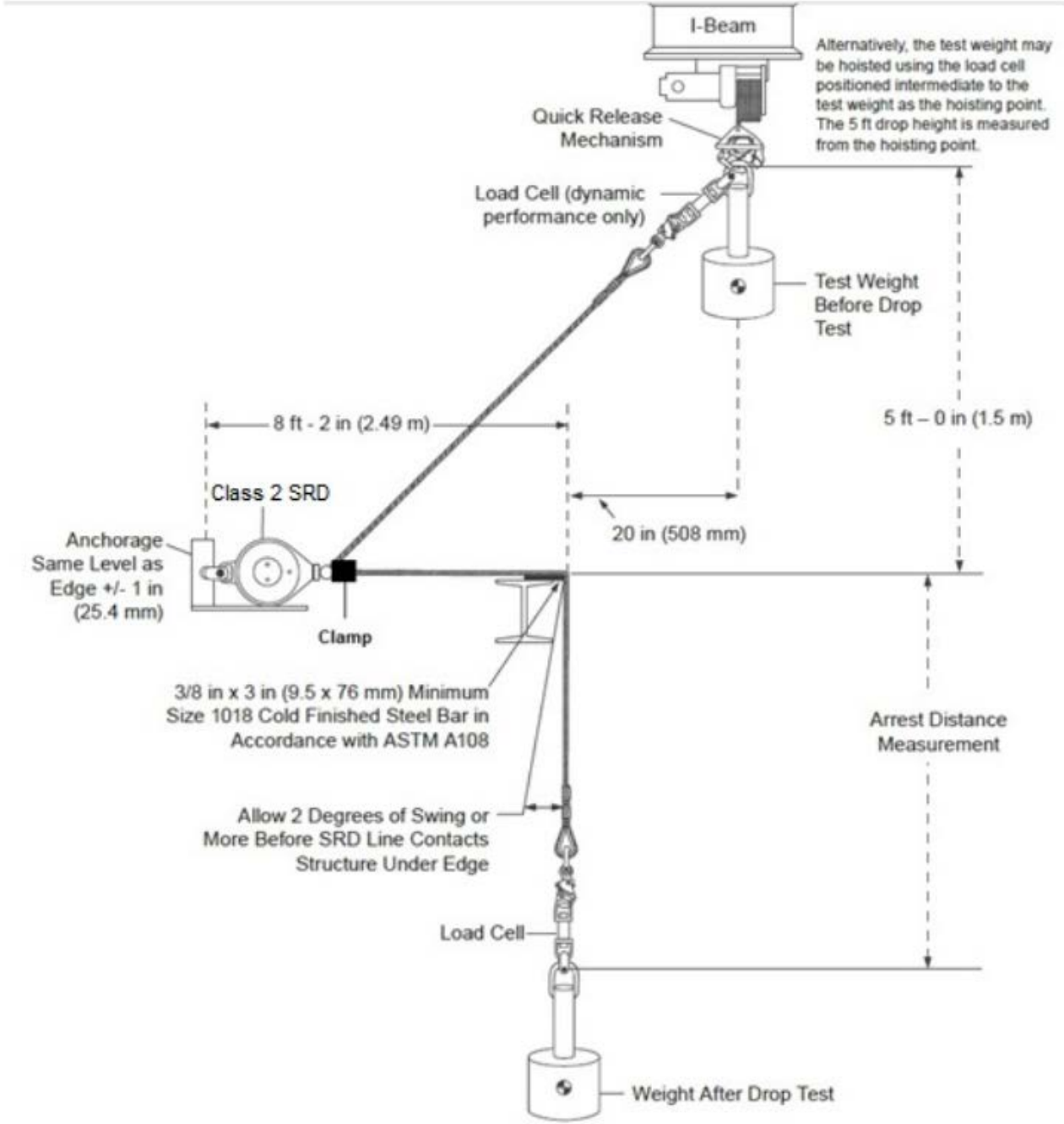


Figure 5a: Class 2 SRD Test Structure

Testing Outside of Standard Requirements

Reduce opportunities for failure by managing your SRDs

Our workers deserve our best.

Leading Edge Conditions

Types:

- Bent Plate/Pour Stop
- Various Concrete Edges
- Cross Laminated Timber (CLT)
- Varying Sharp Steel Edges
- Metal Decking

Constituent Lines

- Wire Rope vs. Webbing
- A small increase in cable diameter = an increase in strength

Various Manufacturers Were Tested

Compendium of Results

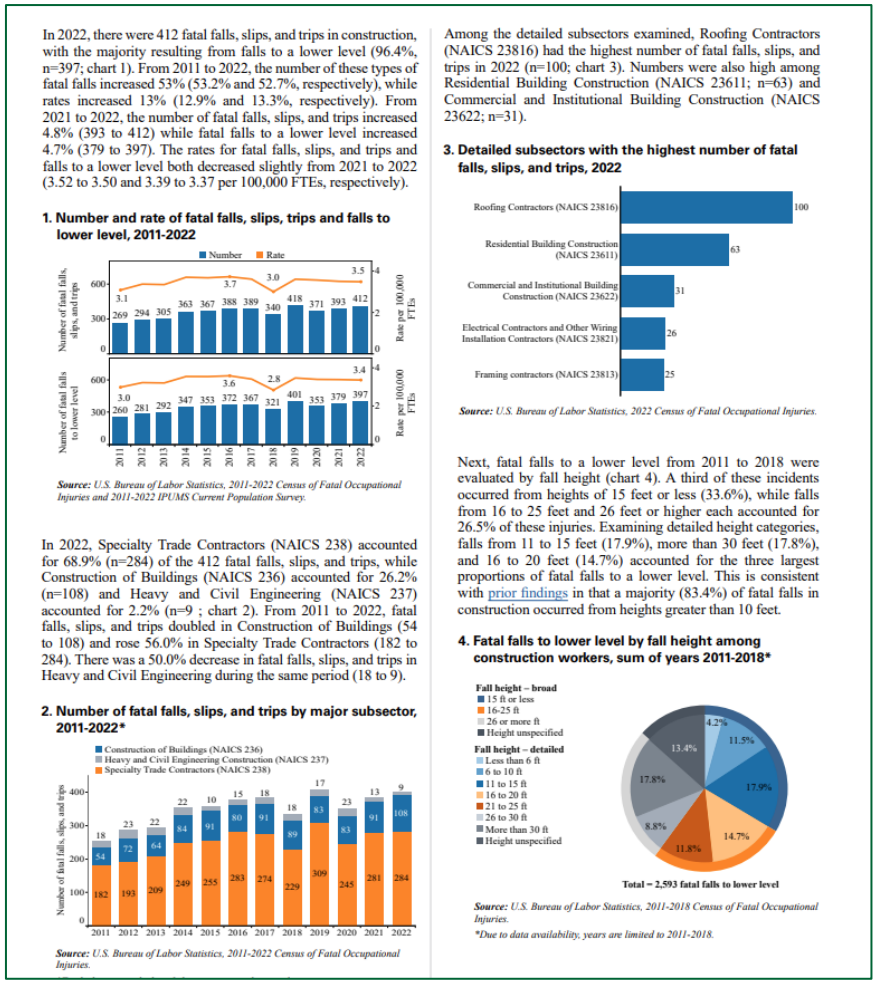
Thought Leadership

- Elevate your overhead anchorages
- In general terms, wire rope outperformed webbing
- Issued safety alerts to contractors
- Procurement
  - Create specification
  - Consistent purchasing parameters
  - Match products to the application
    - No “one size fits all” solution

Just because you’re tied off doesn’t mean you’re protected.

Fatal and Nonfatal Falls in US Construction (2021-2022)

- CPWR Data Bulletin
  - Nearly half of work-related fatal falls, slips, and trips in 2021 happened to construction workers



In 2022, there were 412 fatal falls, slips, and trips in construction, with the majority resulting from falls to a lower level (96.4%, n=397; chart 1). From 2011 to 2022, the number of these types of fatal falls increased 53% (53.2% and 52.7%, respectively), while rates increased 13% (12.9% and 13.3%, respectively). From 2021 to 2022, the number of fatal falls, slips, and trips increased 4.8% (393 to 412) while fatal falls to a lower level increased 4.7% (379 to 397). The rates for fatal falls, slips, and trips and falls to a lower level both decreased slightly from 2021 to 2022 (3.52 to 3.50 and 3.39 to 3.37 per 100,000 FTEs, respectively).

1. Number and rate of fatal falls, slips, trips and falls to lower level, 2011-2022

Source: U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries and 2011-2022 IPUMS Current Population Survey.

In 2022, Specialty Trade Contractors (NAICS 238) accounted for 68.9% (n=284) of the 412 fatal falls, slips, and trips, while Construction of Buildings (NAICS 236) accounted for 26.2% (n=108) and Heavy and Civil Engineering (NAICS 237) accounted for 2.2% (n=9 ; chart 2). From 2011 to 2022, fatal falls, slips, and trips doubled in Construction of Buildings (54 to 108) and rose 56.0% in Specialty Trade Contractors (182 to 284). There was a 50.0% decrease in fatal falls, slips, and trips in Heavy and Civil Engineering during the same period (18 to 9).

2. Number of fatal falls, slips, and trips by major subsector, 2011-2022*

Source: U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries.

Among the detailed subsectors examined, Roofing Contractors (NAICS 23816) had the highest number of fatal falls, slips, and trips in 2022 (n=100; chart 3). Numbers were also high among Residential Building Construction (NAICS 23611; n=63) and Commercial and Institutional Building Construction (NAICS 23622; n=31).

3. Detailed subsectors with the highest number of fatal falls, slips, and trips, 2022

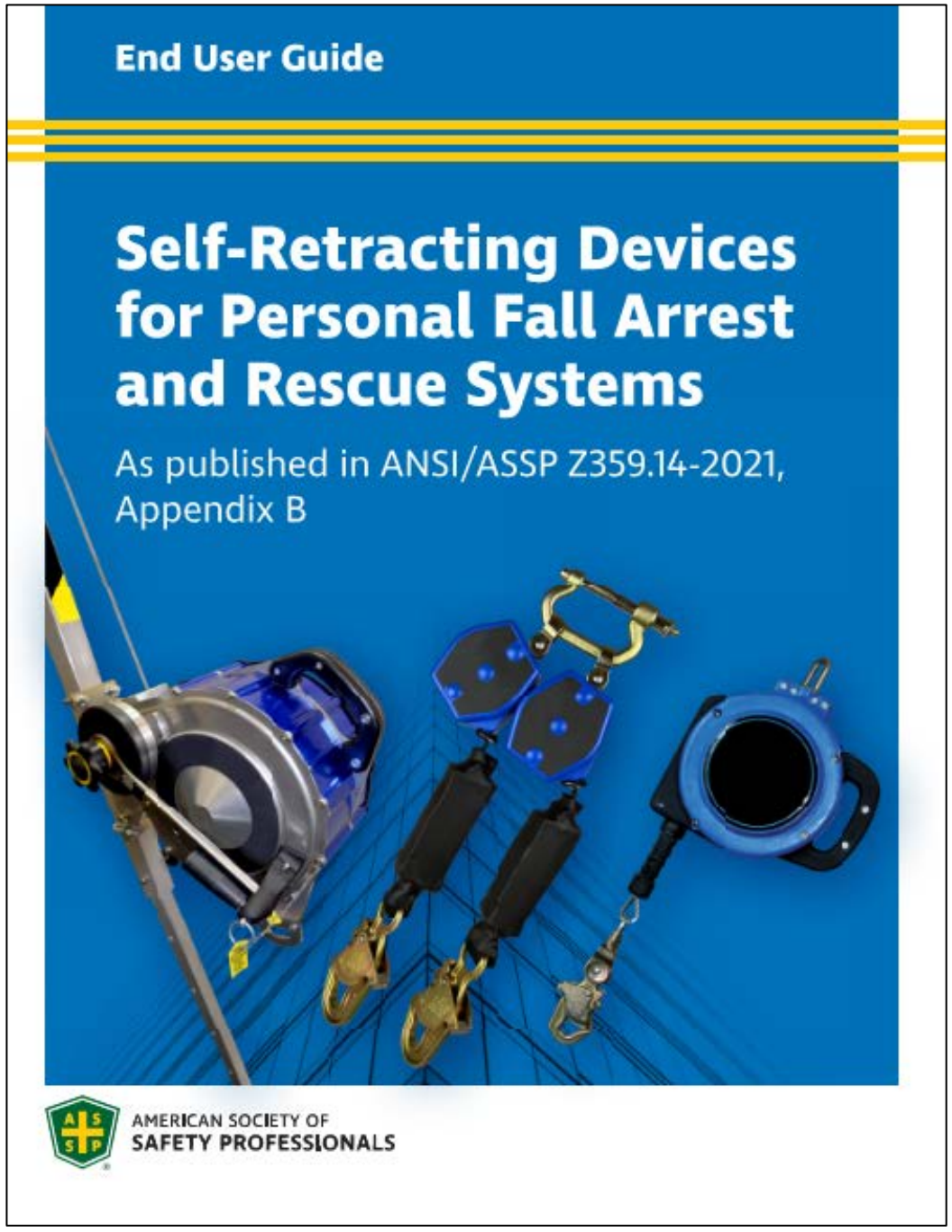
Source: U.S. Bureau of Labor Statistics, 2022 Census of Fatal Occupational Injuries.

Next, fatal falls to a lower level from 2011 to 2018 were evaluated by fall height (chart 4). A third of these incidents occurred from heights of 15 feet or less (33.6%), while falls from 16 to 25 feet and 26 feet or higher each accounted for 26.5% of these injuries. Examining detailed height categories, falls from 11 to 15 feet (17.9%), more than 30 feet (17.8%), and 16 to 20 feet (14.7%) accounted for the three largest proportions of fatal falls to a lower level. This is consistent with prior findings in that a majority (83.4%) of fatal falls in construction occurred from heights greater than 10 feet.

4. Fatal falls to lower level by fall height among construction workers, sum of years 2011-2018*

Source: U.S. Bureau of Labor Statistics, 2011-2018 Census of Fatal Occupational Injuries.

**Due to data availability, years are limited to 2011-2018.*



End User Guide

Available in Spanish

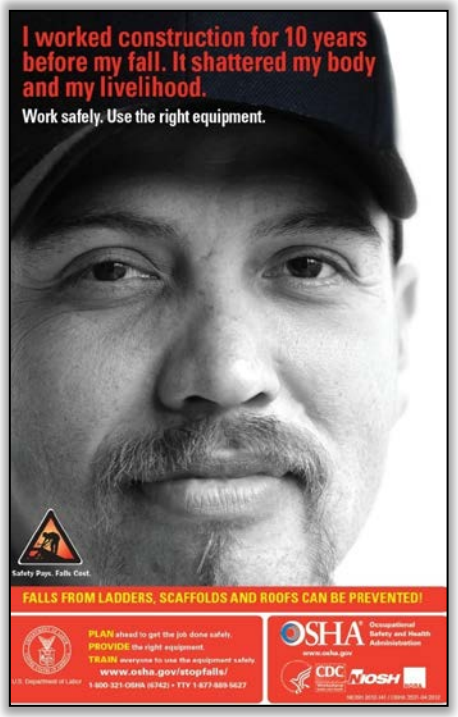
Free fall protection program assessment sheet

ANSI Z359.2-2023

- Effective date: June 10, 2024

Campaign to Prevent Falls in Construction

- **Leadership:** Led by the National Occupational Research Agenda (NORA) Construction Sector Council. Campaign leaders are NIOSH, OSHA, and CPWR – The Center for Construction Research and Training
- **60+ partners** – government, unions, businesses, associations
- **Tagline:** Plan. Provide. Train.
- **Campaign Name:** Safety Pays, Falls Cost
- **Campaign brand:** testimony approach; factual and serious tone



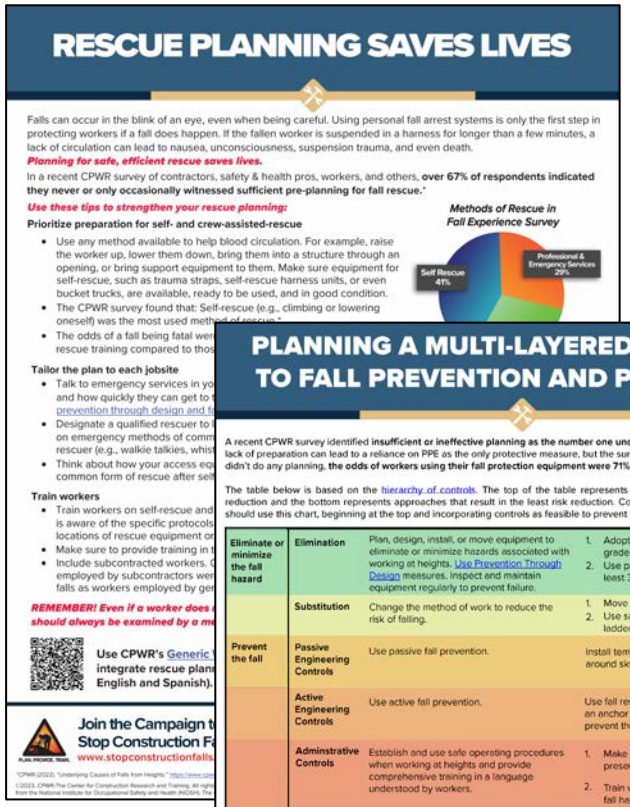
National Safety Stand-Down to Prevent Falls in Construction: Launched 2014, celebrated 11th anniversary this year

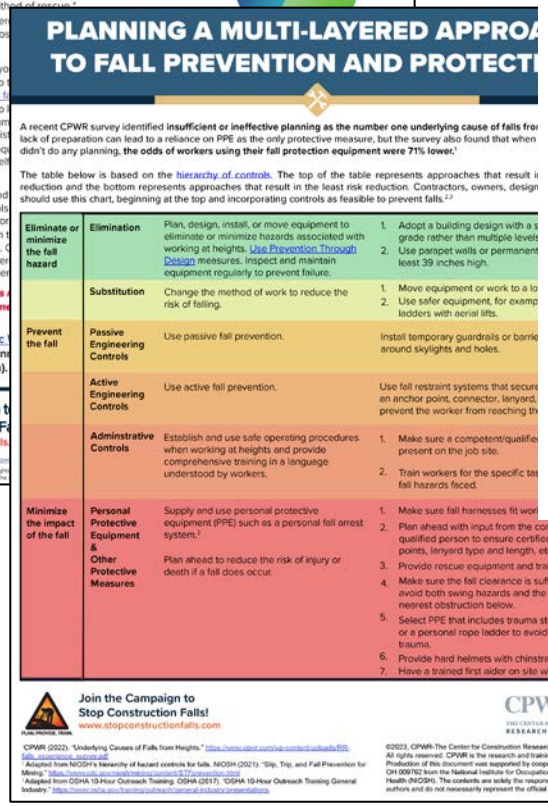
Training & Implementation Resources

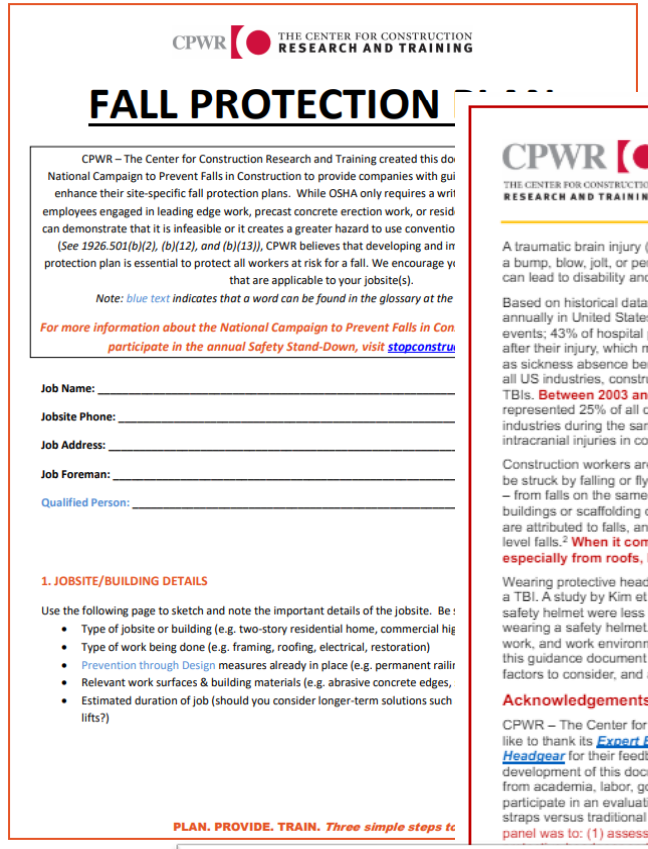
- Infographics, factsheets, flyers, posters, and data bulletins
- Toolbox talks, hazard alert cards
- Spot the Hazard sheets
- Hard-hat Stickers
- Op ed release, press releases, media
- How-to guide, planning tools
- Videos & webinars
- Social media resources
- Science blogs, Webinars, Podcasts

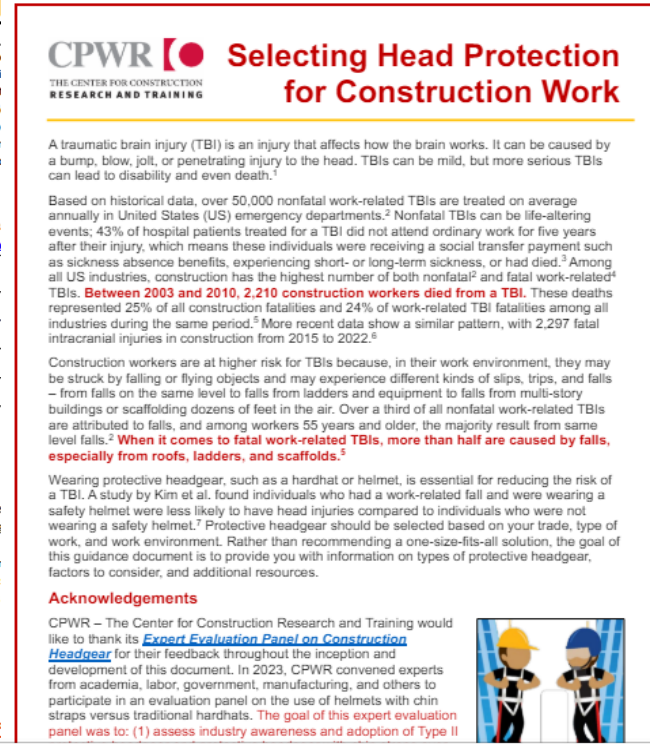
Stop Construction Falls Website

Planning Resources









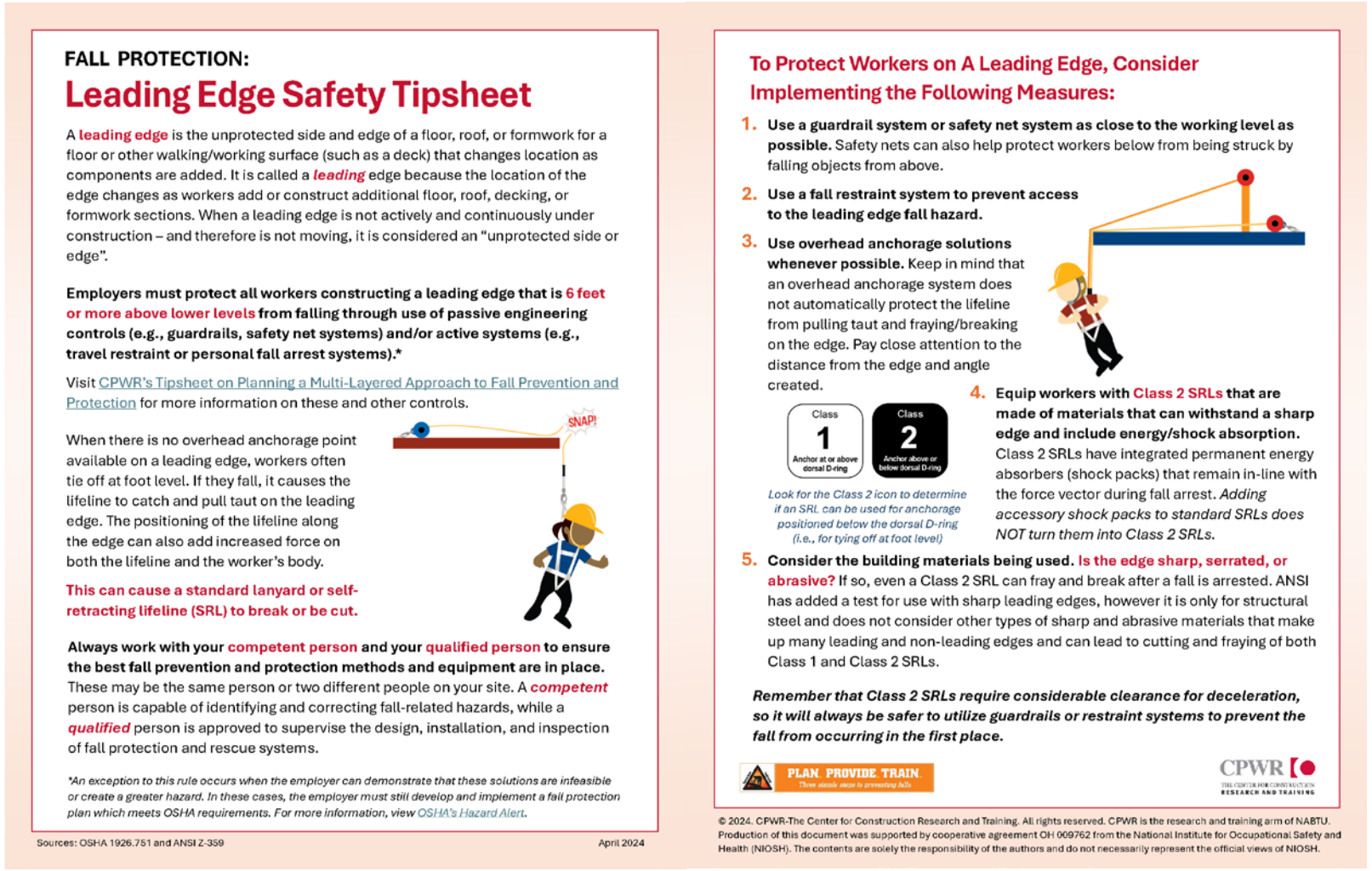
Preventing Falls through Improved Design

Moderator: Chris Trahan Cain, CIH, Executive Director, *CPWR*

Panelists:

- **G. Scott Earnest, PhD, PE, CSP,** Associate Director for Construction, Office of Construction Safety and Health, *NIOSH*
- **Bill Wright**, Communications Director, *CPWR*
- **Bob Moser, PE, CSP, RA,** Manager of Health & Safety by Design, *Jacobs*
- **Ralph Bierschwale**, Architectural Design Manager and Architecture SME, *Jacobs*
- **TJ Lyons, CSP,** Safety Director, *Gilbane*
- **Jose Herrera,** Safety & Occupational Health Specialist, Directorate of Construction, *OSHA*

NEW Leading Edge Tipsheet



FALL PROTECTION:

Leading Edge Safety Tipsheet

A **leading edge** is the unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as a deck) that changes location as components are added. It is called a ***leading*** edge because the location of the edge changes as workers add or construct additional floor, roof, decking, or formwork sections. When a leading edge is not actively and continuously under construction – and therefore is not moving, it is considered an "unprotected side or edge".

Employers must protect all workers constructing a leading edge that is 6 feet or more above lower levels from falling through use of passive engineering controls (e.g., guardrails, safety net systems) and/or active systems (e.g., travel restraint or personal fall arrest systems).*

Visit CPWR's Tipsheet on Planning a Multi-Layered Approach to Fall Prevention and Protection for more information on these and other controls.

When there is no overhead anchorage point available on a leading edge, workers often tie off at foot level. If they fall, it causes the lifeline to catch and pull taut on the leading edge. The positioning of the lifeline along the edge can also add increased force on both the lifeline and the worker's body.

This can cause a standard lanyard or self-retracting lifeline (SRL) to break or be cut.

Always work with your competent person and your qualified person to ensure the best fall prevention and protection methods and equipment are in place. These may be the same person or two different people on your site. A ***competent*** person is capable of identifying and correcting fall-related hazards, while a ***qualified*** person is approved to supervise the design, installation, and inspection of fall protection and rescue systems.

**An exception to this rule occurs when the employer can demonstrate that these solutions are infeasible or create a greater hazard. In these cases, the employer must still develop and implement a fall protection plan which meets OSHA requirements. For more information, view OSHA's Hazard Alert.*

Sources: OSHA 1926.751 and ANSI Z-359

April 2024

To Protect Workers on A Leading Edge, Consider Implementing the Following Measures:

1. **Use a guardrail system or safety net system as close to the working level as possible.** Safety nets can also help protect workers below from being struck by falling objects from above.
2. **Use a fall restraint system to prevent access to the leading edge fall hazard.**
3. **Use overhead anchorage solutions whenever possible.** Keep in mind that an overhead anchorage system does not automatically protect the lifeline from pulling taut and fraying/breaking on the edge. Pay close attention to the distance from the edge and angle created.

Look for the Class 2 icon to determine if an SRL can be used for anchorage positioned below the dorsal D-ring (i.e., for tying off at foot level)

4. **Equip workers with Class 2 SRLs that are made of materials that can withstand a sharp edge and include energy/shock absorption.** Class 2 SRLs have integrated permanent energy absorbers (shock packs) that remain in-line with the force vector during fall arrest. *Adding accessory shock packs to standard SRLs does NOT turn them into Class 2 SRLs.*
5. **Consider the building materials being used. Is the edge sharp, serrated, or abrasive?** If so, even a Class 2 SRL can fray and break after a fall is arrested. ANSI has added a test for use with sharp leading edges, however it is only for structural steel and does not consider other types of sharp and abrasive materials that make up many leading and non-leading edges and can lead to cutting and fraying of both Class 1 and Class 2 SRLs.

Remember that Class 2 SRLs require considerable clearance for deceleration, so it will always be safer to utilize guardrails or restraint systems to prevent the fall from occurring in the first place.

PLAN. PROVIDE. TRAIN.
Three simple steps to preventing falls.

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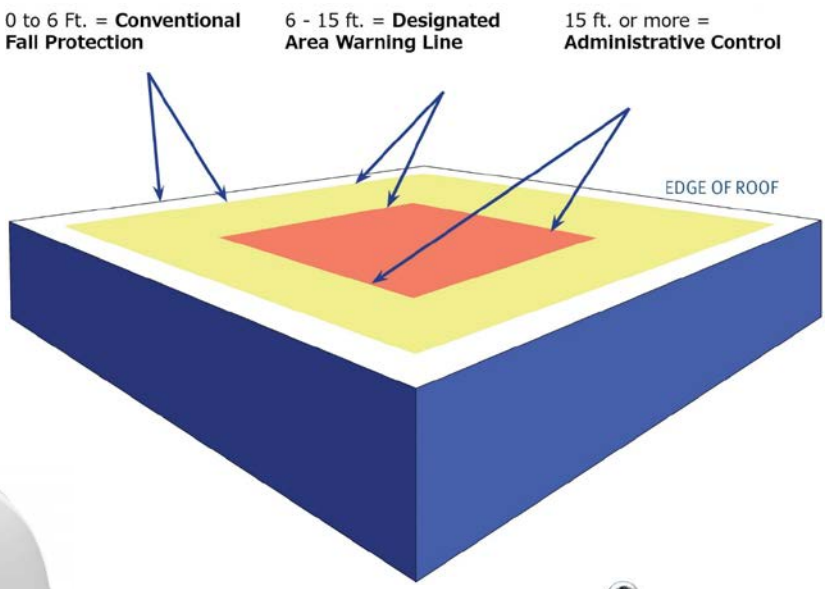
Production of this document was supported by cooperative agreement OH 009762 from the National Institute for Occupational Safety and Health (NIOSH). The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH.

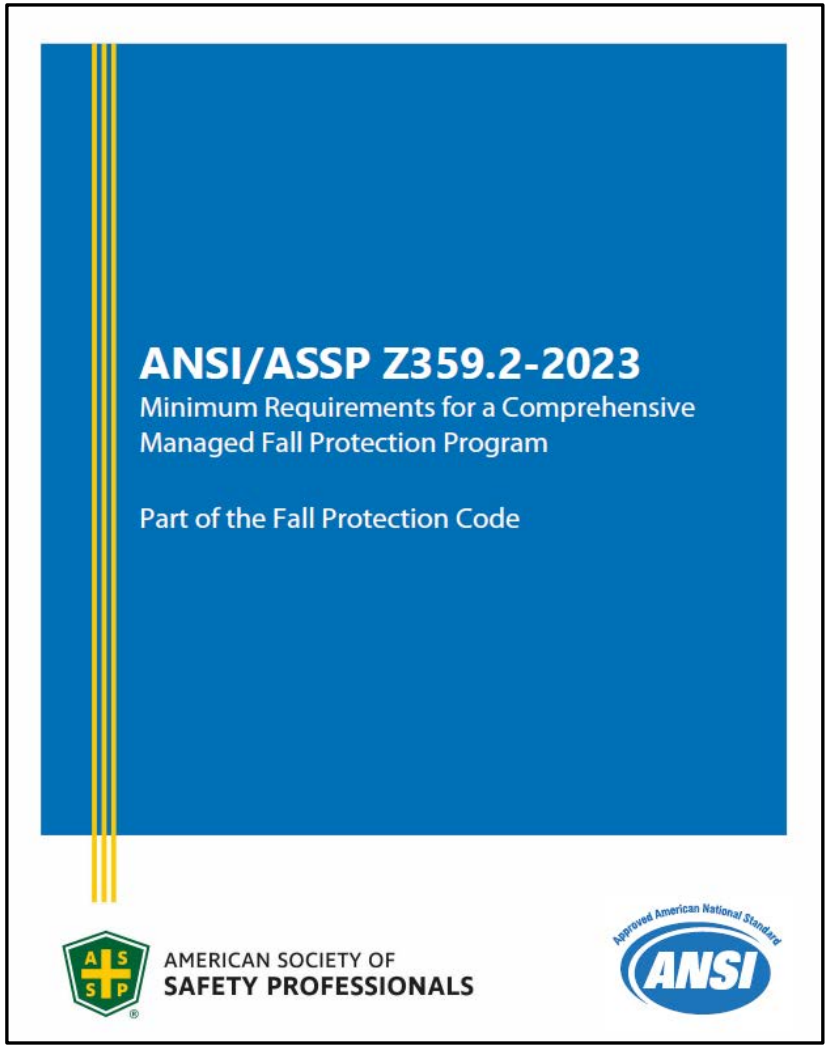
ENGLISH: https://www.cpwr.com/wp-content/uploads/IG-Leading_Edge_Tipsheet.pdf
SPANISH: https://www.cpwr.com/wp-content/uploads/IG-Leading_Edge_Tipsheet-SP.pdf

RECOMMENDED ACTIONS

- Use controls other the PPE
- Ensure proper harness fitting
- Elevate anchorages
- Visualize outcomes



OPERATIONAL IMPROVEMENTS



CLOSING EXERCISE: IMAGINE!

Imagine every year on May 22nd at precisely 10:15 am, all your workers simultaneously “tested” their fall protection systems.

What would happen?

Are you good, or just lucky?

Questions