



Science.
Applied to Life.™

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September Valley Coastal Chapter Technical Meeting

Fall protection at the next level





Jason Giefer

I joined the Tech Service team as an Application Engineer on 3/1/17. Before this I was a Territory Sales Manager traveling to work sites selling fall protection equipment.
Previous to being a TSM I sold a full line of PPE equipment as a distributor rep in the late 1990's and early 2000's.

My wife Jill, son Harris (6), and I reside in Cottage Grove, MN.

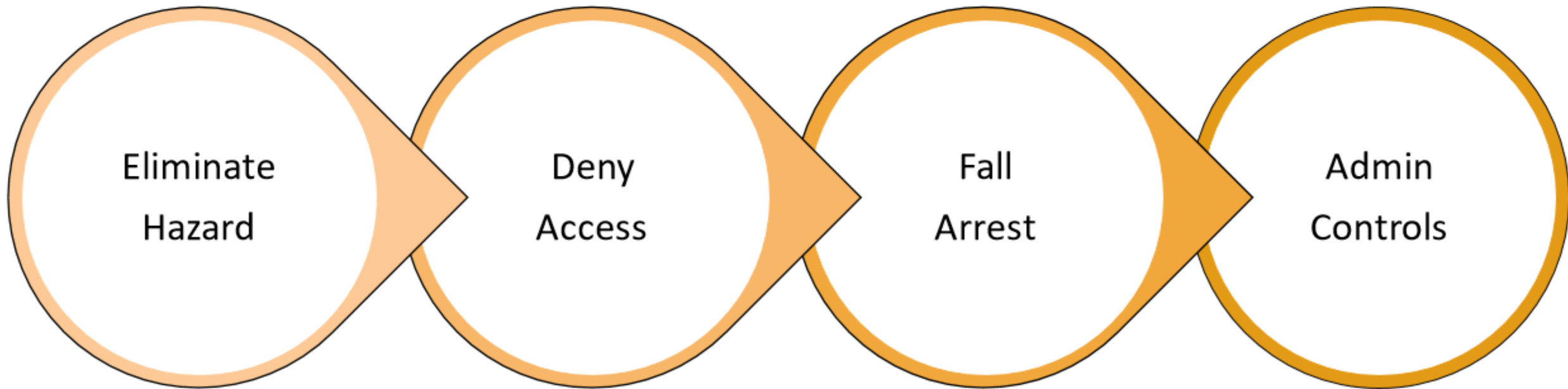
Why Fall Protection?

“The leading causes of private sector worker deaths in the construction industry were falls” - OSHA (2017)

Falls – **381 out of 971** total deaths in construction (2017)

Most frequently cited standards by Federal OSHA: Fall protection
(2018)

Hierarchy of Fall Protection



ABCDs of Active Fall Protection

A = Anchorage System

B = Body Support (Harness)

C = Connecting Devices

D = Descent/Rescue/Escape

E = Education (training)


- User always inspect equipment before each use.
- A documented 3rd party inspection must be performed at least annually.





Equipment Inspection



Record keeping for inspection





Fall Protection

Appendix
Release 2, October 2017

Inspection Checklist/Logs

Full Body Harnesses

Harness Model: _____ Manufacture Date: _____

Serial Number: _____ Lot Number: _____ Purchase Date: _____

Comments: _____

GENERAL FACTORS	ACCEPTED/ REJECTED	SUPPORTIVE DETAILS OR COMMENTS
1. Hardware: (Includes D-rings, buckles, keepers, and back pads) Inspect for damage, distortion, sharp edges, burrs, cracks and corrosion.	<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	
2. Webbing: Inspect for cuts, burns, tears, abrasion, frays, excessive soiling and discoloration.	<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	
3. Stitching: Inspect for pulled or cut stitches.	<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	
4. Labels: Inspect, make certain all labels are securely held in place and legible.	<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	
	<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	
	<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	
	<input type="checkbox"/> ACCEPTED <input type="checkbox"/> REJECTED	

Overall Disposition	<input type="checkbox"/> ACCEPTED	INSPECTED BY: _____
	<input type="checkbox"/> REJECTED	DATE INSPECTED: _____

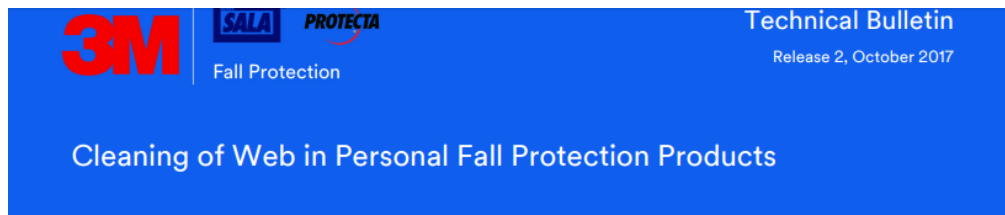
Connected Safety- Radio Frequency Identification (RFID)





Cleaning of FP Equipment

Follow product instructions or tech bulletins for specific cleaning instructions.



Description

Personal Fall Protection products manufactured from webbing can and are recommended to be cleaned periodically to help extend the life expectancy of the product and maintain product performance. Because of the wide variety of cleaning processes available and the potential effects on performance, 3M Fall Protection recommends the following guidelines should be observed.

Scope

The cleaning processes and procedures specified in this bulletin apply to 3M DBI-SALA and Protecta nylon and polyester webbing products used in Personal Fall Arrest Systems (PFAS). Synthetic rope products, such as lifelines or lanyards, can be cleaned using similar processes. Although, rope type lanyards are typically more economical to purchase than most other fall protection products, therefore, the justification to clean these items may not be beneficial. The potential damage (i.e., wear, cuts, etc.) to rope lanyards in many applications also makes cleaning difficult to justify. Specialized web materials (Kevlar® fiber, elastic types, and reflective elements) and hardware materials/coating must be analyzed prior to cleaning to determine effectiveness and potential damage from the cleaning process.

Frequency

General laundering itself is not known to significantly contribute to strength loss, although it has been observed that commercial washing may cause abrasion between metal hardware elements and webbing straps, as well as cause degradation of product markings. Laundered products must be inspected prior to use and after laundering, to determine if the product is acceptable for use. The specific length of time between laundering is solely dependent on the cleanliness of the product. Some applications may require weekly cleaning; other applications may require the product to be cleaned on an annual basis.

Test Samples

Laundering is generally effective on typical dirt and grease exposures found in many industrial settings. Most paints, tar, and industrial contaminants cannot be completely removed from webbing. It is recommended that test samples be laundered and inspected before a large quantity is processed to determine the effectiveness of laundering. Post laundering sample destructive testing may be appropriate if concerns exist regarding the product's ability to perform as designed.

Laundering Procedure

Various procedures can be effective in cleaning web products. High-pressure power type washers and steam cleaners should not be used when cleaning web products due to potential damage to the web fibers. Two acceptable procedures are detailed below.

Hand Scrubbing

This procedure is generally effective for low volumes of equipment. The product can be presoaked in a warm water/cleaner solution prior to hand-scrubbing. The water temperature, when laundering, should not exceed 130° F (54.4° C). A mild detergent (bleach free) such as one used for the laundering of personal clothing articles is recommended. The hand scrubbing action will help break down the dirt, grease, or other material on the webbing. Once cleaned, the product should be rinsed in clean water and hung to air dry in a well-ventilated area out of direct sunlight. Never exceed 130° F (54.4° C) when drying.

Machine Wash

A top or side loading agitating style washing machine (commercial or consumer type) is acceptable for cleaning web products. The product should be placed in a mesh laundry bag to prevent entanglement. A full wash and rinse cycle should be performed using a mild detergent (bleach free) such as one used for the laundering of personal clothing articles. The water temperature, when laundering, should not exceed 130° F (54.4° C). Once cleaned, the product should be hung up to air dry in a well-ventilated area, out of direct sunlight. Never exceed 130° F (54.4° C) when drying.

Cleaning Agents

A mild detergent (bleach free) such as one used for laundering clothing is acceptable. For added cleaning power, a commercial/industrial strength cleaning agent can be used.

Commercial Laundry Detergent		For Scrubbing by Hand	
By Pas 1500 Series	By Pas International Corp. P.O. Box 14 Hudsonville, MI 49426 Phone: (616) 772-5100 http://www.bypasclean.com/?s=1520	Citra-Scrub	Share Corporation P.O. Box 245013 Milwaukee, WI 53224 Phone: (414)355-4000 http://www.sharecorp.com/sites/default/files/044001_013117%20Share%20Corporation%20Citra-Scrub_SDS.pdf
Flo-Class	U.N.X. Incorporated 707 Arlington Blvd. Greenville, NC 27858 Phone: (252) 756-8616 http://www.unxinc.com/85349727/513.pdf		
Innovator Plus	EcoLab Attn: Textile Care Division 370 N. Wabasha St. Paul, MN 55102 Phone: (800) 553-8683		

The cleaning agent supplier you select should be asked to recommend the amount of cleaning agent to use (and disposal instructions) based on your procedure and the degree of cleaning required. Also, if a consumer type washing machine is to be used, consult cleaning agent supplier for compatibility. The cleaning agents listed have been reviewed and approved for use. 3M recommends cleaning agents not listed be reviewed by 3M for approval prior to cleaning.

Cleaning Agent Specifications

The pH level (acidity or alkalinity) of the cleaning solution should be no higher than 12. A pH level higher than 12 may harm the webbing and effect the performance of the products.



IMPORTANT NOTE

Refer to the 3M *User Instructions* provided with your product for additional information.

Disinfecting Fall Protection Equipment - COVID-19 Concerns

Description

In mid-March 2020, 3M Fall Protection published a frequently asked questions document <https://multimedia.3m.com/mws/media/1815211O/3m-faq-for-disinfecting-fall-protection-equipment.pdf> providing guidance on COVID-19 disinfection concerns of 3M fall protection personal protective equipment.

Since publication, 3M has identified consumer resources and competitive communications that advise and instruct users of fall protection PPE to disinfect their equipment with specific chemicals and cleaning agents. During review of these recommended agents, 3M has identified in the disinfectant instructions for use of many of these agent's state that the agent should not be used on porous materials. Many webbing and stitching elements are extremely porous and when exposed to chemicals found in many disinfectants may degrade and ultimately affect the product's original design and strength requirements.

At 3M, we fully understand users are seeking quick methods of disinfection solutions such as spray or wipe-on types of disinfectants for their PPE. However, 3M is unaware of any disinfectant that has been scientifically proven to both safely disinfect and not degrade the porous synthetic materials often used to manufacture safety harness web straps and shock absorbing lanyards.

In these times of uncertainty, we urge you to seek the support of your PPE manufacturers and suppliers. This should include reading and fully understanding their published product PPE documentation, user instructions and warnings including those warnings associated with their recommended disinfecting and cleaning agents.

3M continues to recommend you follow our guidelines for cleaning your 3M personal fall protection equipment. You may reference our cleaning technical bulletin by visiting <https://multimedia.3m.com/mws/media/1301570O/cleaning-of-web-personalfall-protection-products-technical-bulletin.pdf> and the specific product user instruction manual for references.

The CDC also provides guidance on cleaning and disinfection practices in the workplace by visiting <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/cleaning-disinfection.html>

Additional information is provided by the Centers for Disease Control (CDC). General information is available at <https://www.cdc.gov/coronavirus/2019-ncov/> and <https://www.cdc.gov/coronavirus/2019-ncov/prepare/transmission.html>

If you have any additional questions or concerns, please contact 3M Fall Protection Technical Services at 800-328-6146 or email at 3Mfallprotectiontech@mmm.com

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Leading Edges & Foot level tie-off

• What is a Leading Edge (LE) as it relates to Fall Protection?

- Leading Edge - unprotected border, perimeter or opening where a fall hazard exist.
- Sharp Edge – many leading edges also present sharp edge hazards
- Leading Edge / Sharp Edge often found together



What is Foot level?

-Generally any anchorage below the waist. (but, not below the feet)

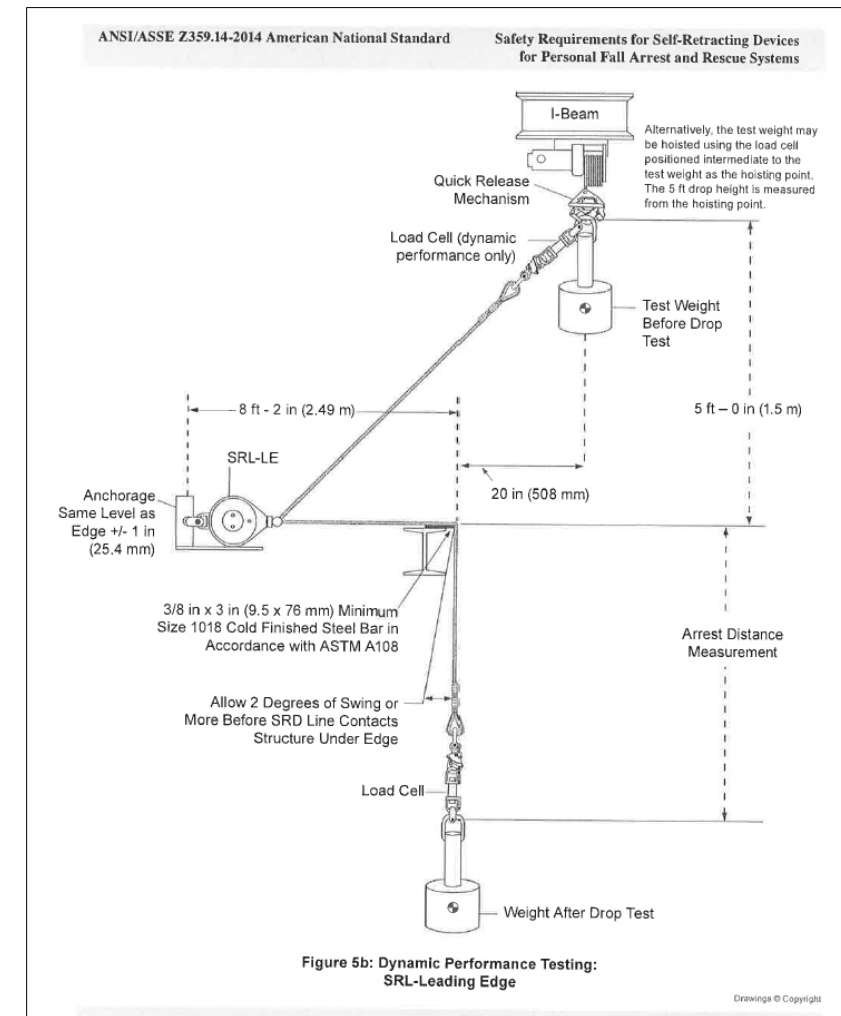
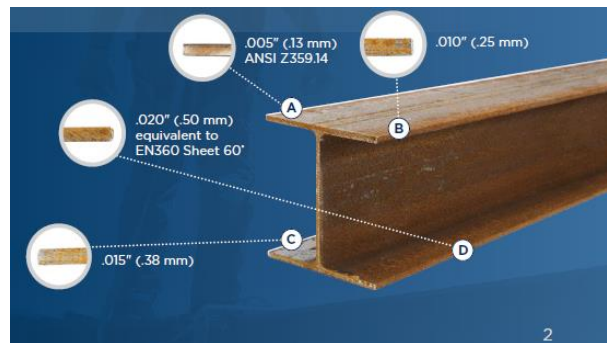
Anchor used on I-beams

- Is it foot level tie-off?



Leading Edge Fall Protection

- ANSI Z359.14 standard for SRL's has specific test criteria.
 - Testing simulates added free fall distance
 - Testing performed over sharp steel edge (.005 inch radius)
 - Testing for swing fall over steel edge as well as straight down



Leading Edge Fall Protection

- **What is the difference between “non-LE” and “LE” rated fall protection equipment?**

- Lifeline material typically larger, stronger, more cut resistant
- Non-LE fall protection equipment is typically rated for full body arrest
- Typically has external energy absorber

- SRL-LE can be used in non-LE applications.
 - No added clearance is needed.
 - Performance is similar

Traditional webbing lifeline (with energy absorber) failure



Traditional cable lifeline (with energy absorber) failure



NANO-LOK[®] edge



fall and limited edge contact



Leading Edge Fall Protection



- What is the difference between “non-LE” and “LE” rated fall protection equipment?

- **Lifeline material typically larger, stronger, more cut resistant**

- Non-LE fall protection equipment is typically rated for 6 ft. free fall and limited edge contact.

- Typically has external energy absorber

- SRL-LE can be used in non-LE applications.

- No added clearance is needed.

- Performance is similar

Traditional webbing lifeline (with energy absorber) failure



Traditional cable lifeline (with energy absorber) failure



NANO-LOK[®] edge



Leading Edge Fall Protection



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NANO-LOK[®] edge



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NANO-LOK[®] edge



Leading Edge Fall Protection



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Traditional cable lifeline (with energy absorber) failure



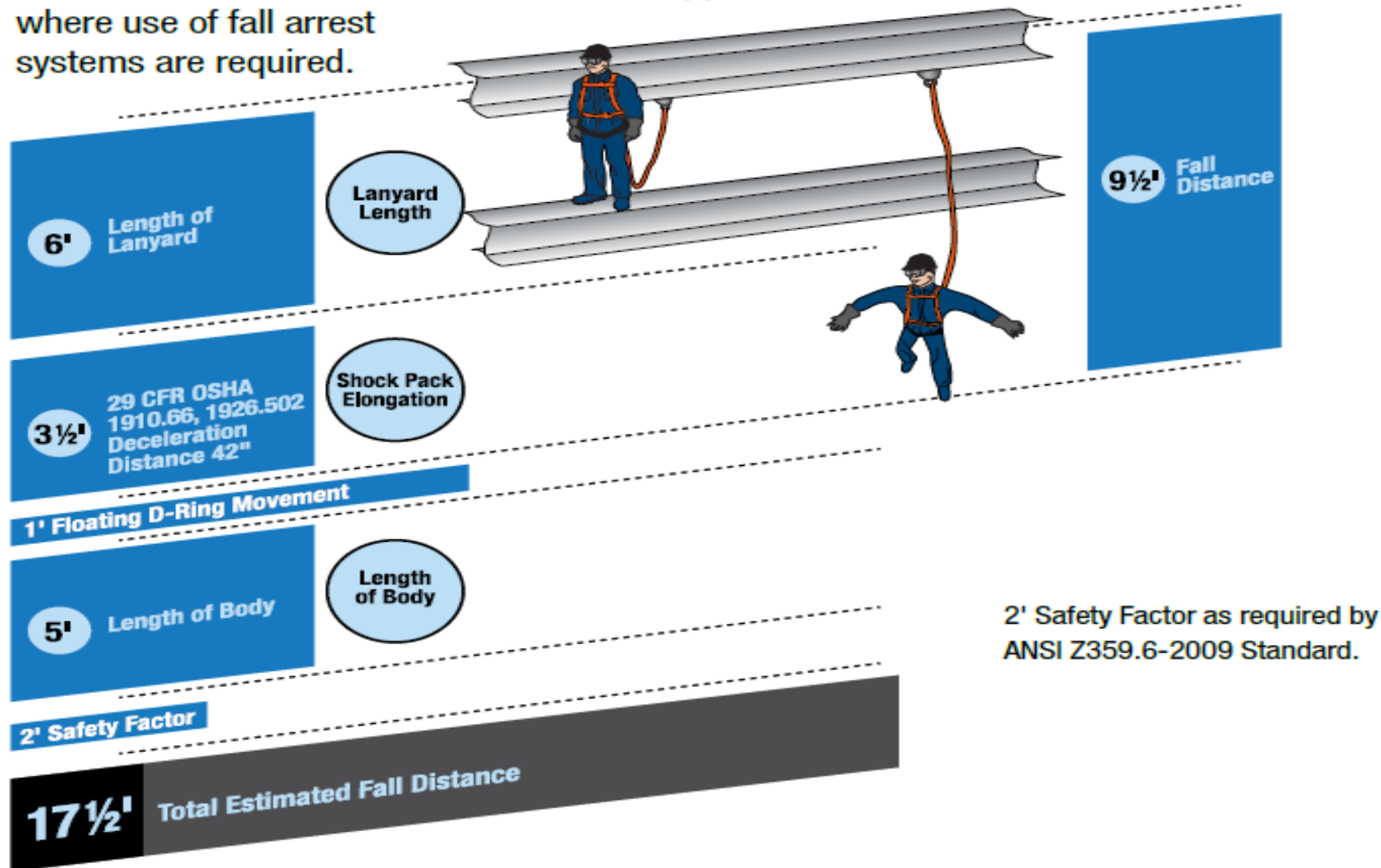
NANO-LOK[®] edge



Identifying fall clearance

How to Calculate Fall Distance

Fall distance must be calculated for each application where use of fall arrest systems are required.

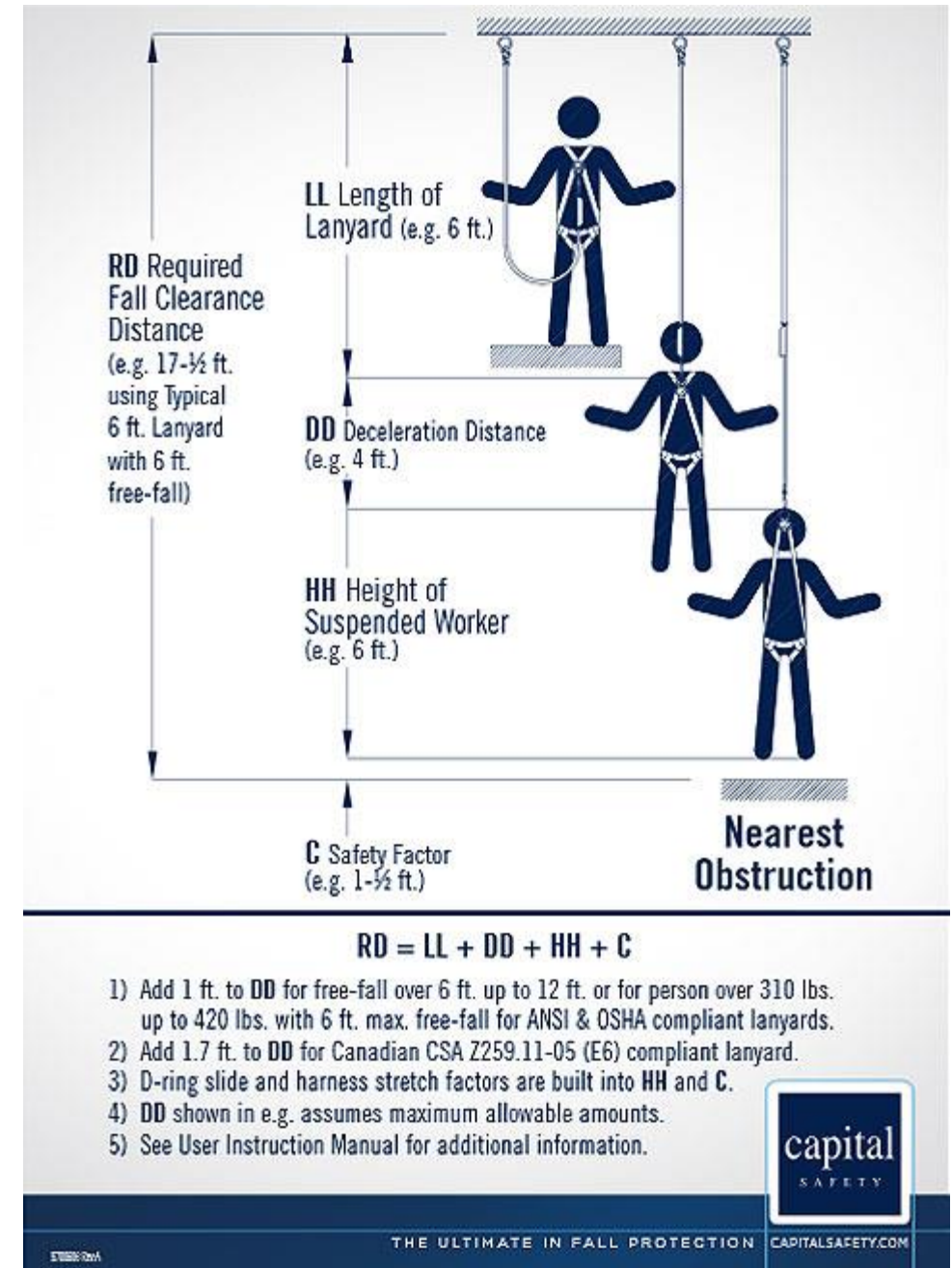


Most lanyards require 17.5 ft. of clearance as measured from the anchorage downward.

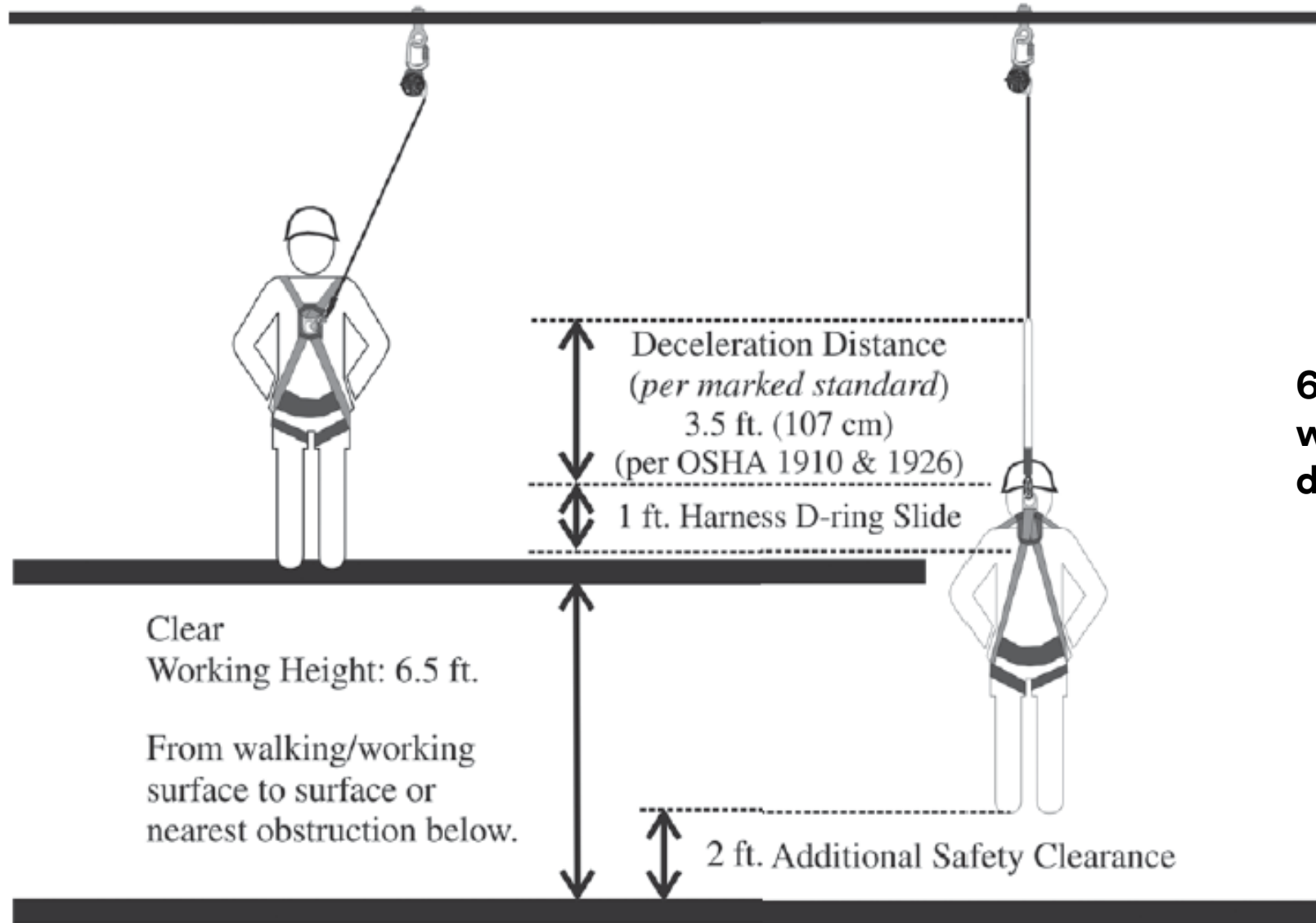
Shock absorbing lanyards

Important points to remember: Calculating clearance

1. RD – required clearance distance (17.5')
2. LL – lanyard length
3. DD – deceleration distance
4. HH – user height
6. C – safety factor



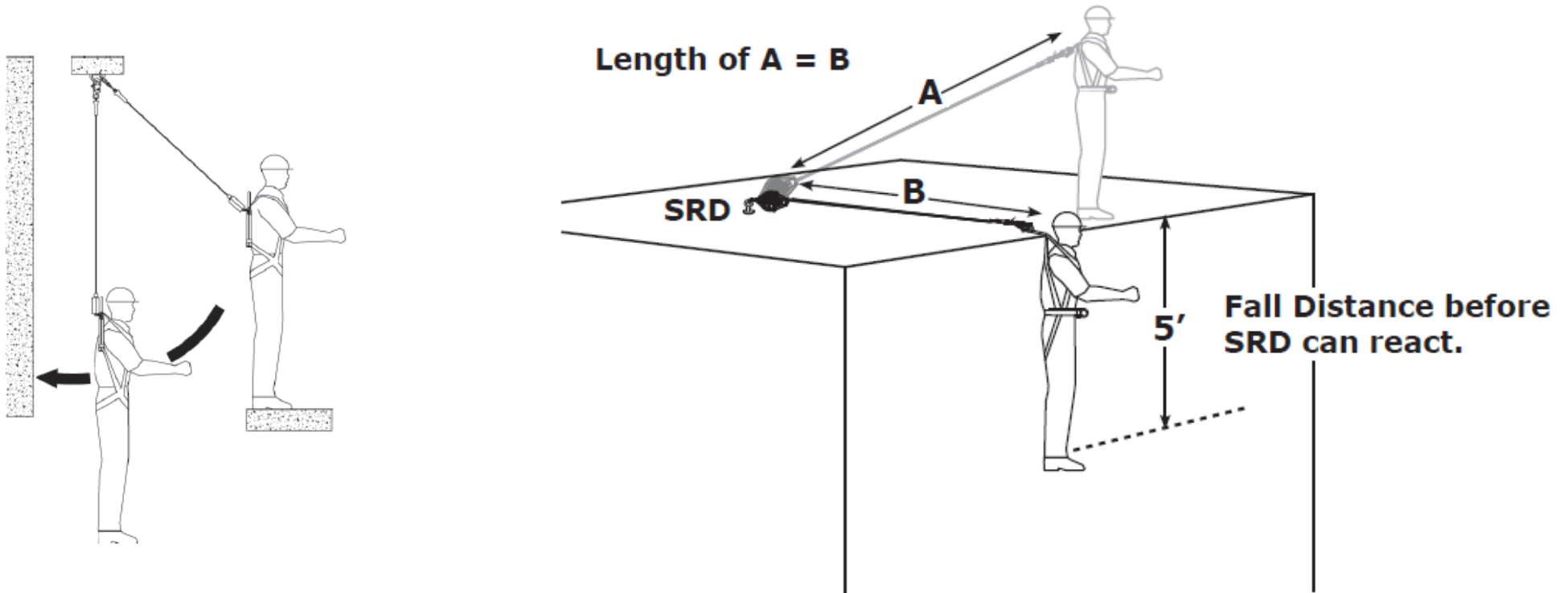
Self-retracting Lanyards (SRL's)



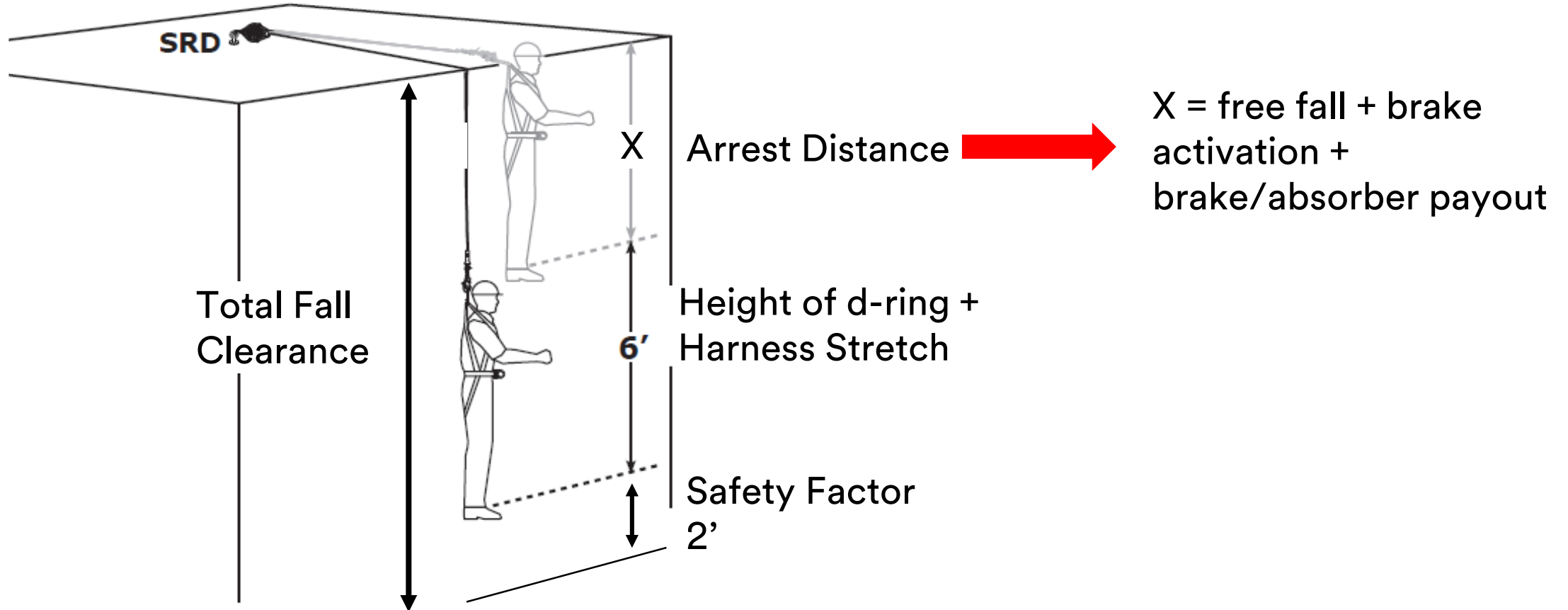
6.5 ft. clearance required from the work surface if user is standing and directly below SRL

Leading Edge / Sharp Edge

- What goes into determining the clearance requirements?



Leading Edge / Sharp Edge



X is a measured value based on test data and calculations

Safe HLL use

& Qualified person role in HLL use

A solid yellow triangle is located in the bottom right corner of the slide, pointing towards the top right.

Who is Responsible for HLL?

For **general industry**:

OSHA 1910.140(c)(11) “The employer must ensure that each horizontal lifeline: Is designed, **installed, and used** under the supervision of a qualified person;...”

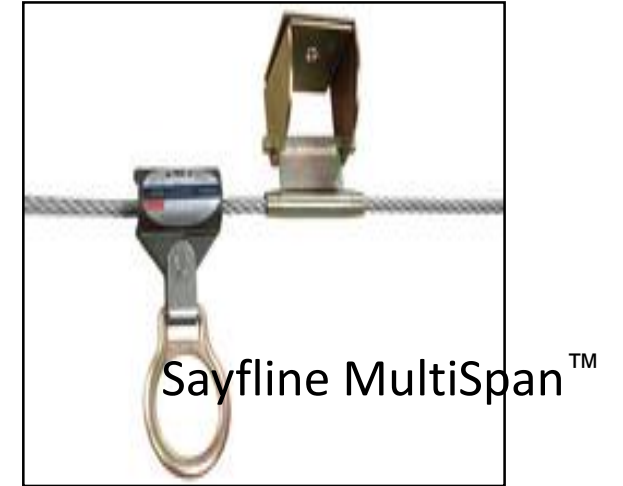
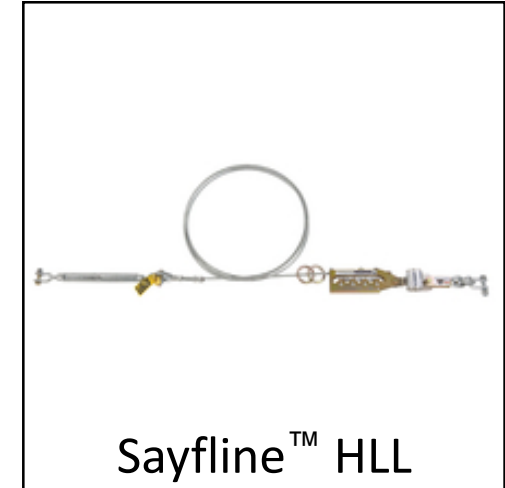
For **construction**:

OSHA 1926.502(d)(8) “Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person...”

OSHA clearly states that it is the employer’s responsibility to determine who the Qualified Person is based on their knowledge, training, and experience.

<https://multimedia.3m.com/mws/media/15107000/3m-pre-engineered-horizontal-lifeline-systems-and-the-qualified-person-involvement-bulletin.pdf>

Horizontal Lifeline Systems - Temporary



HLL installation should be overseen by qualified person

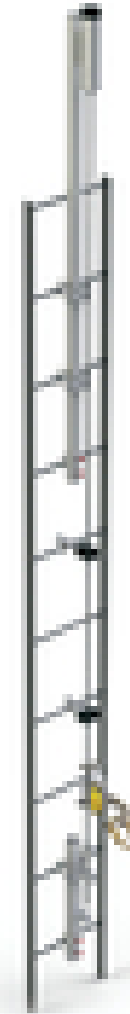
Horizontal Lifelines examples



Fixed Ladder Safety

Vertical Systems - Ladder Safety System

- Free requirements are provincially assigned
- Ladder cages are the most common
 - They cause injuries in the event of a fall
 - Direct your fall to the cage base
- Ladder systems are:
 - Safer than cages in the event of a fall
 - Easier and less costly to install and maintain
 - Arrest falls quicker and more positively



Harnesses Accessories

- D-Ring Extenders
- Suspension Trauma Straps
(buy time waiting for rescue)



Suspension Trauma

- Suspension Trauma Safety Straps
 - Helps offset the onset of Orthostatic Intolerance
 - Allows user to move the legs and prevent blood pooling
 - Unique pouches attach to harness and adjust easily
 - User can reduce weight on femoral veins aiding circulation

Deploy



Adjust



Stand up



Dropped object prevention

A.K.A. Fall Protection For Tools

#1: Dropped Object Plan

Company: _____
Prepared by 3M Fall Protection | 800-328-6146 | 3MFallProtection@mmm.com

Sample Dropped object Prevention Plan



3M.com/FallProtection 800-328-6146

43

#2: Solutions for 90% of tools (143 SKU's)



#3: Competent Person Training



Dropped Object Prevention Competent Person Training

Course description:

Objects dropped from height can result in severe personal injuries, equipment damage and tool loss, yet these hazards are often overlooked in planning for workplace safety. In this hands-on interactive course, participants will learn how to implement drop prevention solutions by applying the ABC's of Fall Protection for People to Fall Protection for Tools.

Duration:

0.5 days (up to 4 hours)

Recommended attendance:

This course is for supervisors of authorized users who implement and monitor a managed fall protection program. Attendees will develop the necessary skills and knowledge base to be deemed a Dropped Objects Competent Person.

Learn more:

To learn more about our training and consultative services, call 800-328-6146, option 8 or visit [3M.com/FallProtection](https://www.3m.com/FallProtection)

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Form 9701389 Rev A

Topics discussed:

- Common dropped object hazards
- Hierarchy of drop prevention
- ABC's of fall protection for people vs. for tools
- Passive systems (canopies, guardrails with toe boards and mesh, screens, covers)
- Tool restraint and tool arrest systems (e.g. 3M® DBI-SALA® Fall Protection for Tools product line)

Thank you

Jason Giefer

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(651) 900-9975

Below are links to support information for the presentation to Valley Coastal Chapter ASSP September 16th.

Qualified person and qualified person involvement in HLL's:

<https://multimedia.3m.com/mws/media/15107000/3m-pre-engineered-horizontal-lifeline-systems-and-the-qualified-person-involvement-bulletin.pdf>

Fall Protection regulatory references:

https://www.3m.com/3M/en_US/worker-health-safety-us/safety-resources-training-news/ppe-regulations/#fallprotectionreferences

Dropped object/Fall protection for tools: <https://multimedia.3m.com/mws/media/15375960/dropped-objects-standard-isea-121-3m-update.pdf> Protection for tools ANSI/ISEA 121-2018

Cleaning web in personal fall arrest:

<https://multimedia.3m.com/mws/media/13015700/cleaning-of-web-in-personal-fall-protection-products-technical-bulletin.pdf>

Covid disinfecting:

<https://multimedia.3m.com/mws/media/18257090/3m-faq-update-for-disinfecting-fall-protection-equipment-covid19-concerns.pdf>

Fall clearance chart:

<https://multimedia.3m.com/mws/media/13892560/3m-fall-protection-lanyard-fall-clearance-chart.pdf>

3M Fall protection training classes offered:

https://www.3m.com/3M/en_US/fall-protection-us/support/training/

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