

CLIMB HIGHER

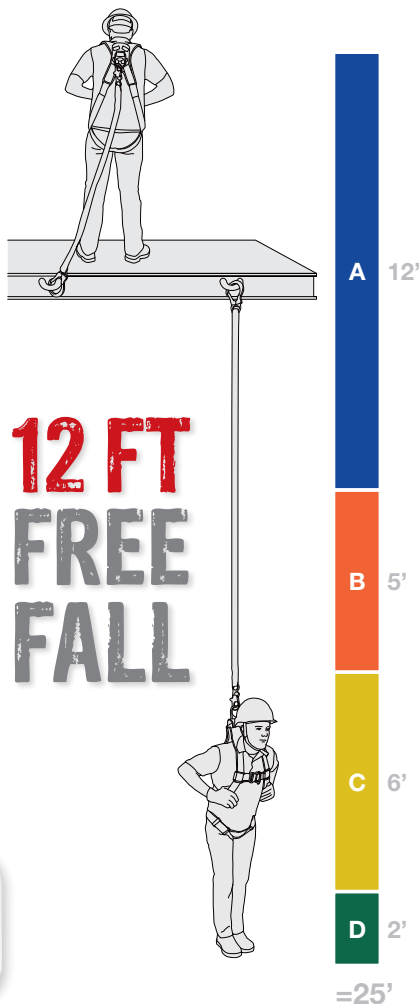
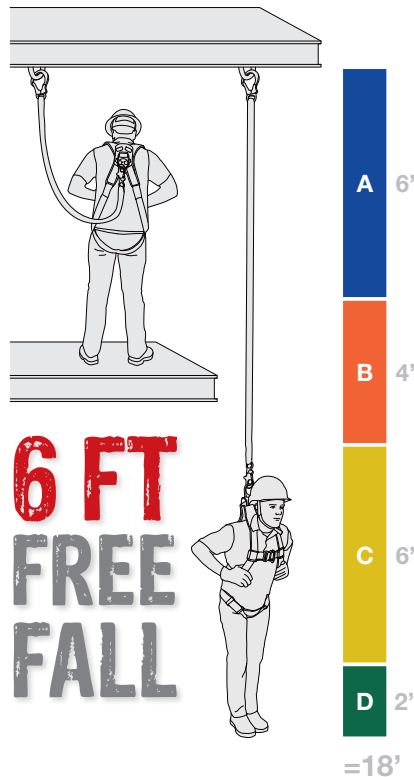


KNOWLEDGE BASE DOCUMENTS



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6 FT vs 12 FT FREE FALL



6 FT
FREE FALL

12 FT
FREE FALL

LOOK FOR THESE
BADGES THROUGHOUT
THE CATALOG.

CALCULATING FREE FALL

$$A + B + C + D =$$

TOTAL FALL CLEARANCE

A. Free fall distance

Original working length before a fall event occurs/before activation of energy absorber.

B. Deceleration distance

Maximum allowable amount of elongation that may payout from the energy absorber upon activation during a fall event.

C. Height of dorsal D-ring

Typical average height of the dorsal D-Ring on a user's full body harness measured from the walking/working surface up.

D. Harness stretch & dorsal D-ring shift + safety factor

Combined amount of harness webbing elongation and dorsal back D-ring up-shift during entire fall event.

Typical twin leg lanyards are designed to arrest the forces associated with a maximum fall distance of 6 feet. Ideally, your anchorage is above you, so a standard 6 foot lanyard that's attached to your dorsal D-ring will limit your free fall to an acceptable distance.

When you don't have an overhead anchorage, your fall distance increases. The lanyard won't begin to stop you until your lower anchorage is now above you. A standard lanyard is not designed to safely stop you while you're falling from that distance. There are specially designed lanyards for these situations.

12 foot free fall lanyards have a maximum deployment distance of 60", so fall clearance needs to be taken into account. Fall clearance is the distance below your anchorage point that you'll fall without hitting the surface, or a structure below you. To calculate for a standard 6 foot free fall from an overhead anchor, take the length of the lanyard, 6 feet, plus the shock pack deployment, 48 inches, or 4 feet. Then, add your overall height, let's say 6 feet. So far we're at 16 feet of clearance. Finally, add a safety factor, 2 feet, to account for things like harness stretch and shifting. For this scenario, you'd need at least 18 feet of fall clearance before the nearest

obstruction to safely work. A foot level anchor requires more distance for the lanyard to begin stopping the fall, even though both lanyards are still 6 feet in length.

There are also some lanyards available which can be used in both 6 foot and 12 foot free fall scenarios. Check the badges and descriptions to find the right lanyard for you. If you have more questions, give one of our Gear Experts® a call.





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ABCDs OF FALL PROTECTION

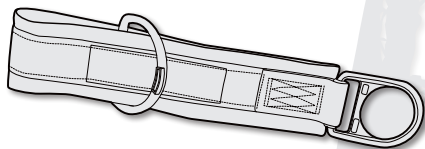
A typical fall arrest system has four main components, often described as the ABCD's of fall protection.

Anchorage. Body Support. Connectors. Descent & Rescue.

When used properly together, they provide the maximum degree of safety for a worker at height. But don't forget, a rescue plan is an equally important factor when it comes to fall protection. The proper gear for descent and rescue should always be a part of a complete fall protection plan, too.

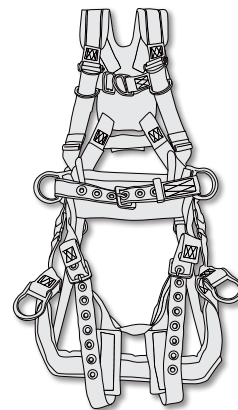
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VIDEO



ANCHORAGE

Anchors provide secure attachment points for workers. There are many different ways to properly anchor depending on the industry, job, and structure. If you're on a tower, an anchorage point could be a tie-off sling, or perhaps an I-Beam anchor could be used in a horizontal system. Look for anchorage points rated for at least 5,000 pounds or even an engineered solution designed for your specific application.



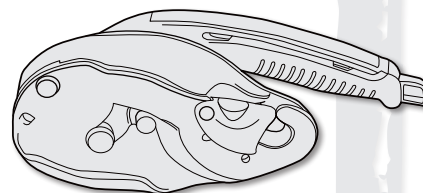
BODY SUPPORT

Now we're talking harnesses. There's no safe and natural way to attach one's body to a structure. Luckily, harnesses are designed to distribute the forces that occur in a fall to limit injuries, or worse, death. There are many varieties of harnesses available for different industries and jobs.



CONNECTORS

Once you've chosen a comfortable harness and your anchor point is secure, you just need one last thing before you're ready to climb. Here's where a shock absorbing lanyard or SRL comes in. Twin-leg lanyards provide 100% tie-off. SRL's can limit your fall distance to a few inches. Again, there are a variety of connectors to choose from, made by many different manufacturers.



DESCENT & RESCUE

What's your plan? Every job site needs to have proper rescue equipment and a proper rescue plan in place before anyone starts working. From rope access to confined space, there is specific gear needed to get to a fallen worker and get them to safety. A haul system helps raise them up, and a descent device will lower them down. Or maybe you could add trauma straps to your harness, so if you're the one dangling you can relieve some of the pressure that gravity is placing on your parts. Lucky for you, our Gear Experts® have put together some rescue kits that can get you started on your rescue solution.



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ASME B30 COMPLIANCE

ASME B30 STANDARD FOR LIFTING & RIGGING

Chapter 26-5 of the ASME B30 Standard covers rigging blocks, like those that you'd use with a capstan hoist. Here's what you need to know about the standard*. Have more questions? Give our Gear Experts® a call!

MATERIALS

The block should be able to permanently deform before losing the ability to support the load. This ensures that you should notice the block has been overloaded before it falls.

Side plates should be of metal, wood, or a synthetic material. You'll almost always see steel or aluminum blocks in the tower industry. The sheaves and load-bearing straps or fittings should be made of metal, as well.

SAFE DESIGN FACTOR

Rigging blocks must have a minimum safety factor of 4.

RATED LOADS

Always keep your total load inside of the recommended limits set by the manufacturer. And

remember that this is the maximum load applied, not a single line load. Meaning if the block is rigged at the top of the tower and you're lifting something that weighs 1,000 pounds, there could be up to 2,000 pounds on the block. Check out competent rigger training courses for more on these concepts.

IDENTIFICATION

Each block has to have markings for manufacturer, rated load, and acceptable rope sizes. The block should also be maintained by the user to insure these markings remain legible through the life of the hardware.

TRAINING

Users must be properly trained to select, inspect, and fully use the blocks. That means not just in proper rigging, but also this very standard.

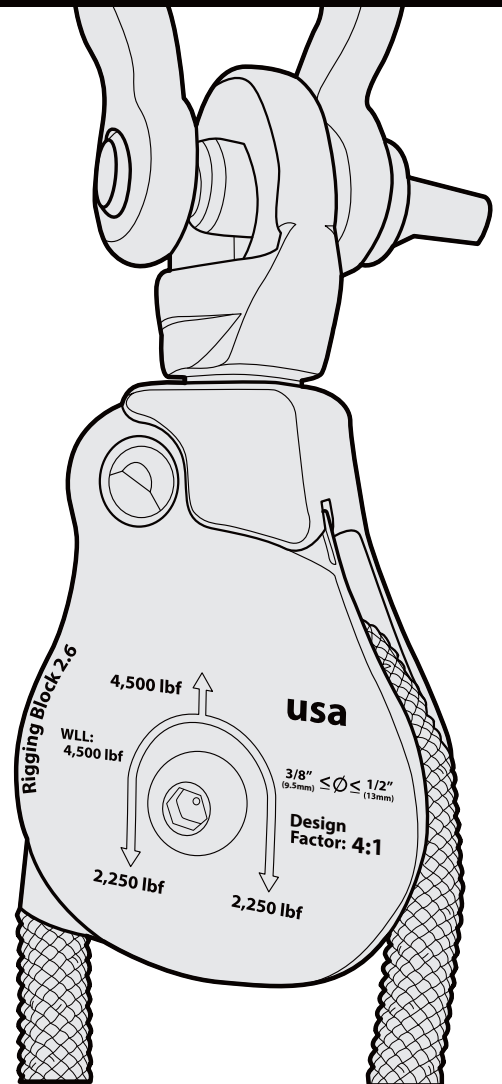
INSPECTION, REPAIR, & REMOVAL FROM SERVICE

A qualified person should designate whether the hardware is suitable for rigging, and remove from service if it's not. Prior to use, all blocks should be inspected to verify compliance with ASME B30. A visual inspection should be performed each time the block is used. Permanently installed rigging hardware should have periodic inspections as well.

Repairs or modifications must be specified by the manufacturer or a qualified person. The replacement parts should meet or exceed the original manufacturer specifications. Unless advised by the manufacturer, modifications are not recommended.

OPERATING PRACTICES

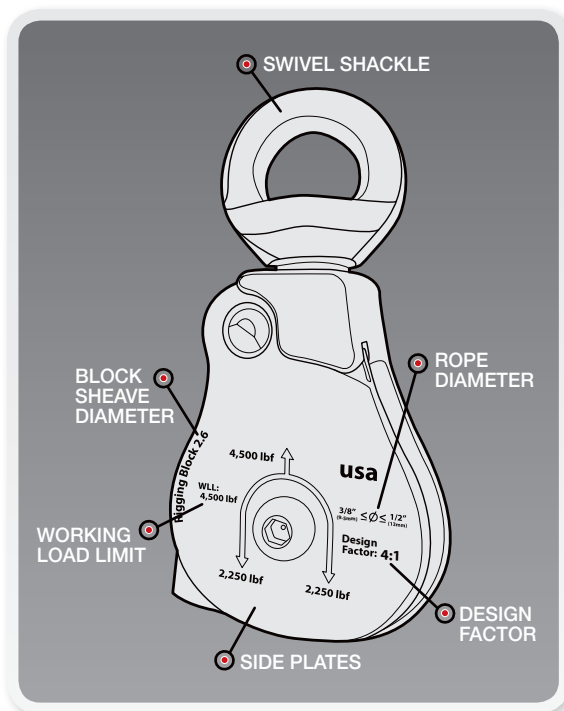
Obviously, load ratings should not be exceeded. Make sure you're keeping clear of the block, its running lines, load, or any other part of the system during lifting. That includes walking or standing under a



suspended load, or lifting line. Also, don't stand next to the rigging when the line is under tension.

The load applied to the block should be in-line with the sheave to prevent side loading. Blocks with swivels help to avoid these problems. Also, make sure your rope is securely in the groove of the sheave. Shock loading should also be avoided.

*This is not a comprehensive training guide.



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ASME
B30
COMPLIANT

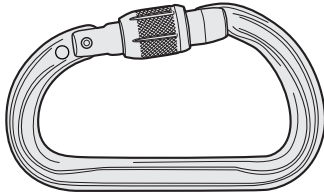
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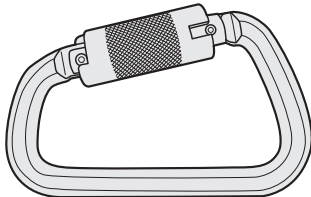
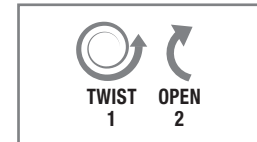
CARABINER GATE MECHANISMS

Carabiner gates come in a few different varieties. For tower climbing, the most common is the twist lock, but some other work may require another variety of gate function.



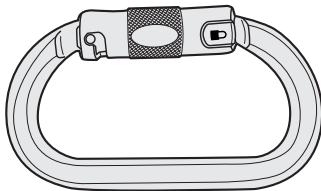
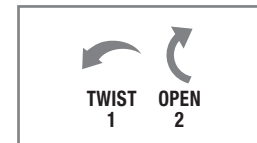
SCREW-LOCK

The screw-lock operates by unscrewing the sleeve down the gate to open. This gate will not auto-lock, as the sleeve has to be manually tightened after the gate snaps shut.



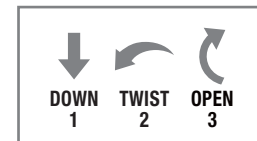
TWIST-LOCK

The twist-lock is a double action gate that quickly opens with a simple twist and pull movement.



AUTO-LOCK

This is a three stage design as it requires 3 different motions to open. First you pull the sleeve down, then twist, then pull back to open. Some carabiners only twist one direction, while others can twist left or right.



ANSI Z87.1

This standard outlines the requirements for eye and face protection to protect workers from impact, non-ionizing radiation, and liquid splash exposures. It has been updated twice since 2003, with revisions in 2010 and 2015. This change focuses on product performance and has more closely aligned the US standard with international standards.

ANSI Z87.1-2015 continues to differentiate eye protection based on specific risks and places additional emphasis on allowing workers to choose the right eyewear based on their environment and potential hazards.

GENERAL REQUIREMENTS

The hazard organizes required protection based on encountered hazards. The most common hazards include:

- Blunt impact
- Radiation
- Splashes and droplets
- Dust
- Small dust particles

Look for markings and packaging which outline what specific hazards each eyewear is designed to protect against. Most common safety glasses are designed to protect against blunt impact.

IMPACT TESTING

There are four different tests for this standard. The lowest level test is a 1 inch steel ball that is dropped on the lens from about 50 inches. This is similar to getting hit in the eye with a golf ball thrown from a few feet away. This provides good protection but does not qualify the glasses for high impact.

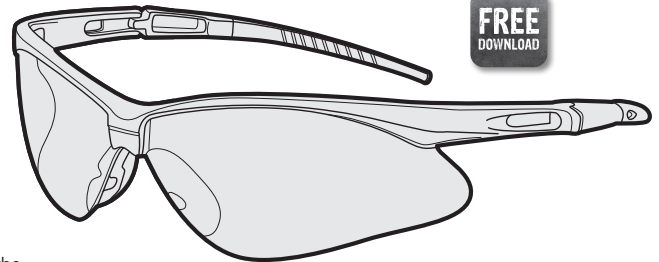
For that type of work, you have to have a lens stamped with a Z87+ marking. To qualify for the plus rating, they must pass the following three tests.

First, a 0.25" steel ball is fired at 6 specific locations on the lens at about 150 feet per second, roughly 100 miles per hour. Essentially getting shot in the eye with a BB gun.

Second is a high mass impact test with a 17.6 ounce steel missile shaped object, weighing just over a pound, or 500 grams. This is also dropped from 50 inches and is equivalent to being hit in the eye with a hammer.

Finally, a penetration test. For this, a sharp needle weighing 1.56 ounces is dropped onto the lens from 50 inches.

If during all of these tests, no part of the eyewear breaks or fragments from the frame, and no part



of the eyewear comes apart, it qualifies for the 87+ stamp.

There is also a military ballistic standard, which has to stop a .15 caliber round fired at 640 feet per second.

MARKINGS

The ANSI standard requires easy-to-understand lens and frame markings. These make selecting and identifying compliant eye protection easy. All markings must be clearly and permanently marked on the frame and lens.

IMPACT: Z87+ indicates high-velocity impact. Z87 alone means basic impact

SPLASH & DROPLET: D3 for splash and droplet

DUST: D4

FINE DUST: D5

WELDING: W plus a shade number

UV: U plus the scale number

INFRARED LIGHT: R plus the scale number

VISIBLE LIGHT FILTER: L plus the scale number

PRESCRIPTION: Z87-2 on the front of the frame and both temples

HEAD SIZE: H indicates products designed for smaller head sizes

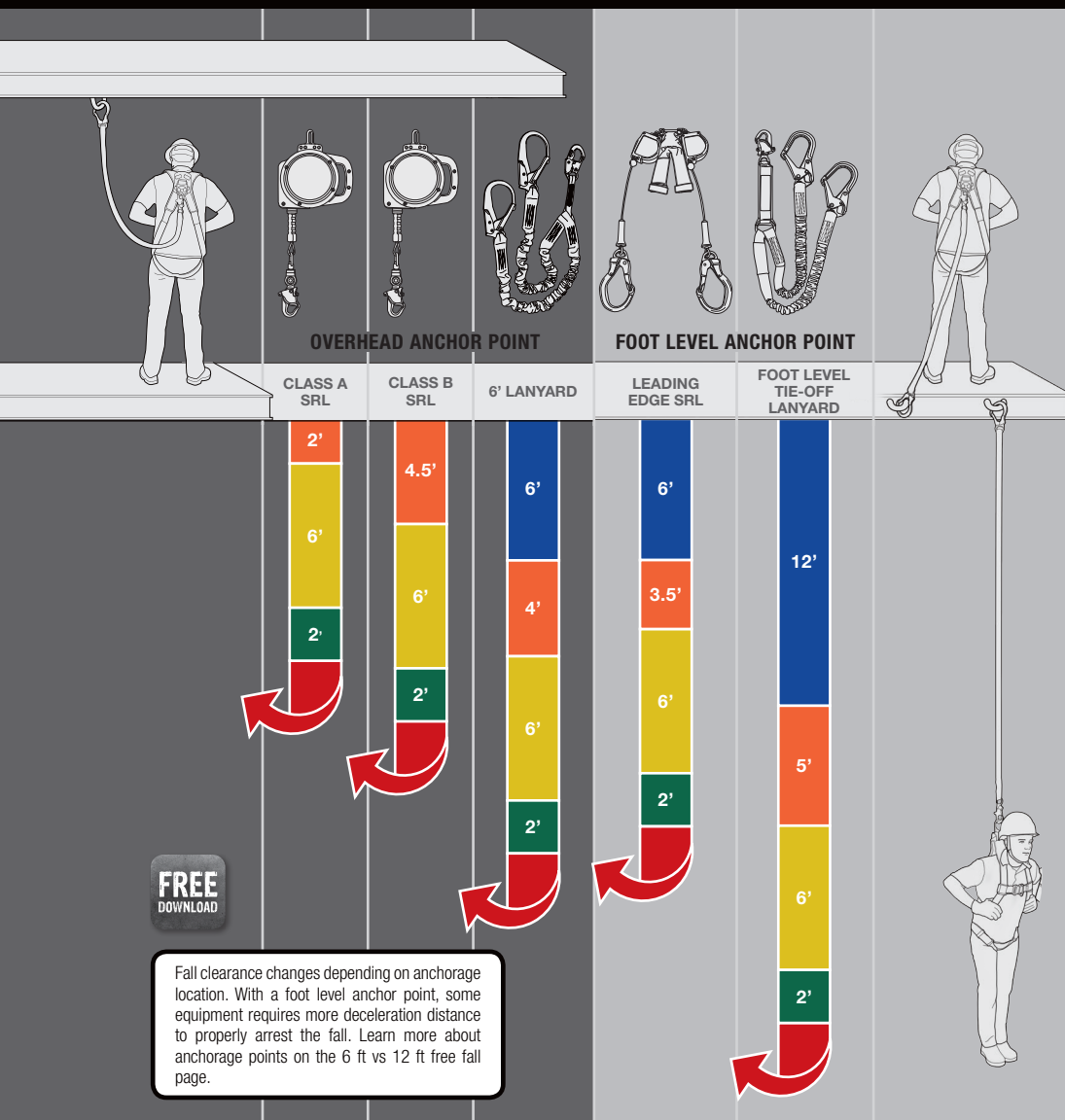
OTHER: V for photochromatic and S for special lens tint





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FALL CLEARANCES 101



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Fall clearance changes depending on anchorage location. With a foot level anchor point, some equipment requires more deceleration distance to properly arrest the fall. Learn more about anchorage points on the 6 ft vs 12 ft free fall page.

REGULATIONS

OSHA 1910.140

1910.140(c)(5)

Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 ft (0.61 m) or less.

1910.140(d)(1)(ii)

Personal fall arrest systems must bring the employee to a complete stop and limit the maximum deceleration distance the employee travels to 3.5 ft (1.1 m).

OSHA 1926.502

1926.502(d)(16)(iv)

Personal fall arrest systems, when stopping a fall, shall bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 ft (1.07 m).

STANDARDS

ANSI Z359.13 - 2013

PERSONAL ENERGY ABSORBERS & ENERGY ABSORBING EQUIPMENT

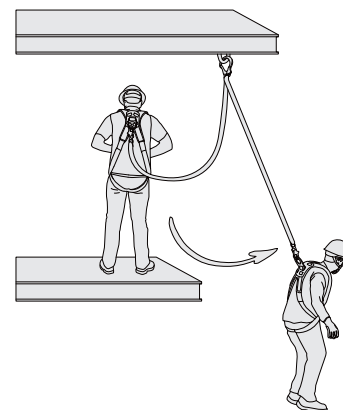
3.1.8.1

6 ft free fall personal energy absorbers shall have a maximum deployment distance of 48 inches.

3.1.8.2

12 ft free fall personal energy absorbers shall have a maximum deployment distance of 60 inches.

Always refer to manufacturer's specifications. Proper fall protection training is required before performing any at-height work.





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FIRST AID 101



ANSI has set standards for minimum requirements for first aid kits and their contents. (ANSI Z308.1) These kits are classified by the assortment and quantity of first aid supplies to treat injuries and illnesses common to workplaces, such as major and minor wounds, minor burns, sprains and strains, and eye injuries.

This standard has been updated many times. For more information, give our Gear Experts® a call!

ANSI KIT CLASSES

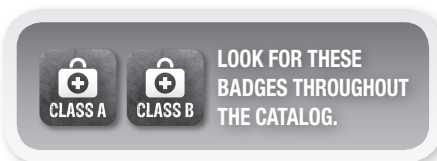
This standard breaks kits into two classes. Class A and Class B. These are described below.

CLASS A KITS

These kits are designed to deal with the most common types of work place injuries.

CLASS B KITS

These kits are designed with a more varied type and quantity of supplies and are intended to deal with injuries in more complex or high-risk environments.



KIT CLASSIFICATIONS

Kit containers are also classified by portability, mounting options, resistance to water, and corrosion and impact resistance.

TYPE 1

Intended for use in stationary, indoor application. Not intended to be portable and should have means to be mounted in a fixed position.

TYPE 2

Intended for portable, indoor applications. Should be equipped with a carrying handle.

TYPE 3

Intended for portable use in mobile indoor and outdoor settings. Should have means to be mounted and have a water resistant seal.

TYPE 4

Intended for portable use in mobile industries or outdoor applications where the potential for damage due to environmental factors and rough handling is present.

The new standard also specifies that the kits contain first aid supplies in uniform-sized, color-coded boxes as follows:



BLUE:
Antiseptic



YELLOW:
Bandages



RED:
Burn Treatment



ORANGE:
Personal Protective Equipment



GREEN:
Miscellaneous

ANSI Z308.1-2015: CLASSES OF FIRST AID KITS & REQUIRED SUPPLIES

First Aid Supply	Minimum Quantity		Minimum Size or Volume	
Item	Class A Kits	Class B Kits	U.S.	Metric
Adhesive bandage	16	50	1 x 3 in	2.5 x 7.5 cm
Adhesive tape	1	2	2.5 yd (total)	2.3 m
Antibiotic application	10	25	1/7 oz	0.5 g
Antiseptic	10	50	1/7 oz	0.5 g
Breathing barrier	1	1	N/A	N/A
Burn dressing (gel soaked)	1	2	4 x 4 in	10 x 10 cm
Burn treatment	10	25	1/32 oz	0.9 g
Cold pack	1	2	4 x 5 in	10 x 12.5 cm
Eye covering (with means of attachment)	2	2	2.9 sq in	19 sq cm
Eye/skin wash	1 fl oz total	N/A	N/A	29.6 mL
	N/A	4 fl oz total	N/A	118.3 mL
First aid guide	1	1	N/A	N/A
Hand sanitizer	6	10	1/32 oz	0.9 g
Medical exam gloves	2 pairs	4 pairs	N/A	N/A
Roller bandage (2 in)	1	2	2 in x 4 yd	5 cm x 3.66 m
Roller bandage (4 in)	0	1	4 in x 4 yd	10 cm x 3.66 m
Scissors	1	1	N/A	N/A
Splint	0	1	4.0 x 24 in	10.2 x 61 cm
Sterile pad	2	4	3 x 3 in	7.5 x 7.5 cm
Tourniquet	0	1	1 in (width)	2.5 cm (width)
Trauma pad	2	4	5 x 9 in	12.7 x 22.9 cm
Triangular bandage	1	2	40 x 40 x 56 in	101 x 101 x 142 cm



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GEAR CHECKLIST

Make ordering easy with these convenient checklists. Use them as a guide to make sure you have everything you need or give them to each person on your crew. To make things even easier, we can turn your list into a custom kit with a part number unique to your company. Call our Gear Experts® at (800) 940-6762 for more info.

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TOWER CLIMBING

QTY	ITEM	PAGE(S)	PART NUMBER
	Climbing Helmet		
	Harness		
	Twin Leg Lanyard		
	Cable Safety Sleeve		
	Rope Grab with 3' Lanyard		
	Snaphook Spreader Bar		
	Positioning Device		
	Anchor Slings		
	Bolt Bags		
	Carabiners		
	Tool Lanyards		
	Gear Bag		

Equipment for: _____

Need by date: _____

GENERAL PPE & SAFETY

QTY	ITEM	PAGE(S)	PART NUMBER
	Hard Hat		
	Safety Glasses		
	Gloves		
	Hearing Protection		
	Work Boots		
	First Aid Kit		
	Hi-Viz Apparel		
	Job Site Signs		

LIFTING & RIGGING

QTY	ITEM	PAGE(S)	PART NUMBER
	Capstan Hoist		
	Mount		
	Generator		
	Handline Block / Snatch Block		
	Slings		
	Shackles		
	Load Rated Carabiners		
	Canvas Buckets		

RESCUE

QTY	ITEM	PAGE(S)	PART NUMBER
	Rope		
	Descent Device		
	Pick-Off System		
	Small Carabiners		
	Anchor Strap		
	Gear Bag		

ROPE

QTY	ITEM	PAGE(S)	PART NUMBER
	Safety Line		
	Load Line		
	Tag Line		
	Pulleys		
	Rope Bag		

TOWER TOOLS

QTY	ITEM	PAGE(S)	PART NUMBER
	RF Monitor		
	Two Way Radios & Accessories		
	Power Tools		
	Grounding Molds		
	Antenna Alignment Tool		



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GLOVE RATINGS 101

Gloves are tested and rated in a few different ways. Next to many gloves you'll see a shield with four numbers. This is the EN388 shield. The EN388 standard is a great measurement of a glove's protection level. Use this guide to determine how your glove of choice stacks up in four important categories.

ABRASION – This is based on the number of cycles required to break down the glove. The protection is rated on a scale of 1 to 4. The higher the number, the better the glove.

CUT RESISTANCE – Based on the number of cycles required to cut through the glove. This scale is rated 1 to 5, with a Cut 5 glove providing the best protection.

TEAR – Rated 1 to 4 with 1 being the easiest to tear, and 4 being the most tear resistant.

PUNCTURE – Based on the amount of force required to pierce the material of the glove. 1 puncture easily, a 4 glove provides the most protection.



The American National Standards Institute (ANSI) has released a new edition of the ANSI / ISEA 105 Standard (2016 ed.) The changes create new classification levels, which includes a new scale to determine cut score, and a revised method for testing gloves to the standard.

The new ANSI standard now features nine cut levels significantly reducing the gaps between each level and better defining protection levels for the cut resistant gloves and sleeves with the highest gram score. The new standard spans from 0 g to 6,000 g of cut protection. It's tested by determining how much weight is required to cut through the glove material by a blade traveling 20 mm across the surface of the material.

Based on the chart below, A1 rated gloves provide the least protection, while A9 provide the greatest. Look for the new ANSI Cut Score badge throughout the catalog.



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UNDERSTANDING THE ANSI STANDARD

The ANSI / ISEA 107-2015 is the new standard for approved High-Visibility gear. These classes are based on hazards on the job site, based on complexity, vehicular traffic, and speed.

All compliant hi-vis safety apparel must be balanced in design, with specific material requirements to meet the standard. No less than 40% of the minimum required reflective and background material has to be present on both the front and back of the garment, ensuring visibility from the front and back.

REQUIRED MARKINGS

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- Manufacturers name
- Item Number
- Size
- ANSI / ISEA Standard including year
- Indication of compliance of flame resistance
- If not flame resistant, must show: "This garment is not flame resistant as defined by ANSI / ISEA 107-2015"
- Pictogram showing garment type, class, and level of reflective performance
- Maximum number of wash processes (i.e.: Max 50.)

PERFORMANCE CLASSES

ANSI 107
01

Class 1 (Type O Only): Provides minimum amount of hi-vis material required to differentiate worker visually from backgrounds around non-complex work environments. These garments are considered "Non-ANSI apparel".

ANSI 107
P2

ANSI 107
R2

Class 2 (Type R & P): These provided additional hi-vis materials and may allow design opportunities to define the human form more effectively. Class 2 garments typically provide longer detection and identification distances, and increased conspicuity performance compared to Class 1. They are required when working near roadways where traffic speeds exceed 25 mph.

ANSI 107
P3

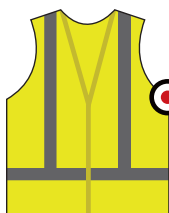
ANSI 107
R3

Class 3 (Type R & P): These offer greater visibility to the wearer in both complex backgrounds through a full range of body movements. Mandatory placement requirements for background, retroreflective and combined-performance materials on sleeves and pant legs. They are required when working near traffic speeds in excess of 50 mph. Sleeveless garments or vests are never considered Class 3.

ANSI 107
E

Class E: Supplemental apparel such as bibs, shorts, and gaiters, which are not compliant when worn alone, though, when combined with Class 2 or Class 3 apparel, the combination satisfies the Class 3 requirements.

GARMENT CATEGORIES



Type O - "Off Road"

Meant for off-road applications. This level of garment provides added visibility to workers who are not working around traffic. This level of Hi-Vis is common for parking lot attendants.



Type R - "Roadway"

These garments provide enhanced visibility for workers exposed to common highway traffic, working in more complex daytime and nighttime environments. This includes working in proximity to highway traffic, roadway temporary traffic control (TTC) zones, or from work vehicles and construction equipment within TTC zones.



Type P - "Public Safety"

This level of garment category is for emergency and incident responders, including law enforcement personnel. The standard requires less fluorescent background material to easily identify and distinguish personnel. It also permits shorter garments to make tactical access easier.

FABRIC & REFLECTIVE REQUIREMENTS BY TYPE & CLASS

GARMENT TYPE DESIGNATION	TYPE O		TYPE R		TYPE P	
PERFORMANCE CLASS	Class 1		Class 2	Class 3	Class 2	Class 3
BACKGROUND MATERIAL AMOUNTS	217 in ²		775 in ²	1,240 in ²	450 in ²	775 in ²
REFLECTIVE MATERIAL AMOUNTS	155 in ²		201 in ²	310 in ²	201 in ²	310 in ²
WIDTH MINIMUMS OF REFLECTIVE MATERIAL	1"		1.38"	2"	2"	2"



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INDUSTRIAL COATINGS 101

COLD GALV

Cold galvanizing compound is a single-component zinc coating used to protect bare steel from rust and corrosion. Although it is applied like paint, it is not. It gives the same protection as hot dip galvanizing. The higher the zinc content, the higher protection against the elements from rust and corrosion. The zinc bonds to the steel to form the protective layer, and the higher the zinc content, the better the coverage and protection.

SURFACE PREP

The surface must be clean, dry steel. Use a steel brush to remove any existing rust on the surface for the entire area that will be covered in cold galvanizing compound. Also, remove any chemicals, dirt, grease, oil, silicon, etc. from the surface before applying cold galv.

APPLICATION

Cold galv can be painted on using traditional brushes, rolled, and even sprayed using a thinner. Aerosol coatings are also available. We recommend a disposable brush like the 3" chip brush. Be sure to review the conditions for your particular brand of cold galv, but most of the compounds can be applied in a wide variety of weather conditions. Humidity can even intensify the cathodic action and acceleration of the protective formation.

SHIPPING

Cold galvanizing compound can only be sent via ground or LTL. It is not allowed in the air system due to its category 3 classification for flammable liquids.

TOWER PAINT

TowerPlex coatings are designed and formulated to be durable, long-lasting protection for galvanized towers and other metal surfaces. They're 100% acrylic and meet all federal standards for aviation safe colors.

The alkalinity of the paint etches into the zinc in galvanized surfaces unlike other ordinary enamel paints, so it actually forms a chemical bond to the tower.

PRIMER

The paint works best with its matching primer. You'll want to prime any rusted areas. If you plan to spray on the paint, a full coat of primer is recommended.

APPLICATION

Before applying prep the surface in a similar fashion to cold galv. The paint can be applied between 50° and 110° Fahrenheit. Coverage is different for every situation, but theoretical coverage is 588 sq/feet per gallon at 1 mil dry.

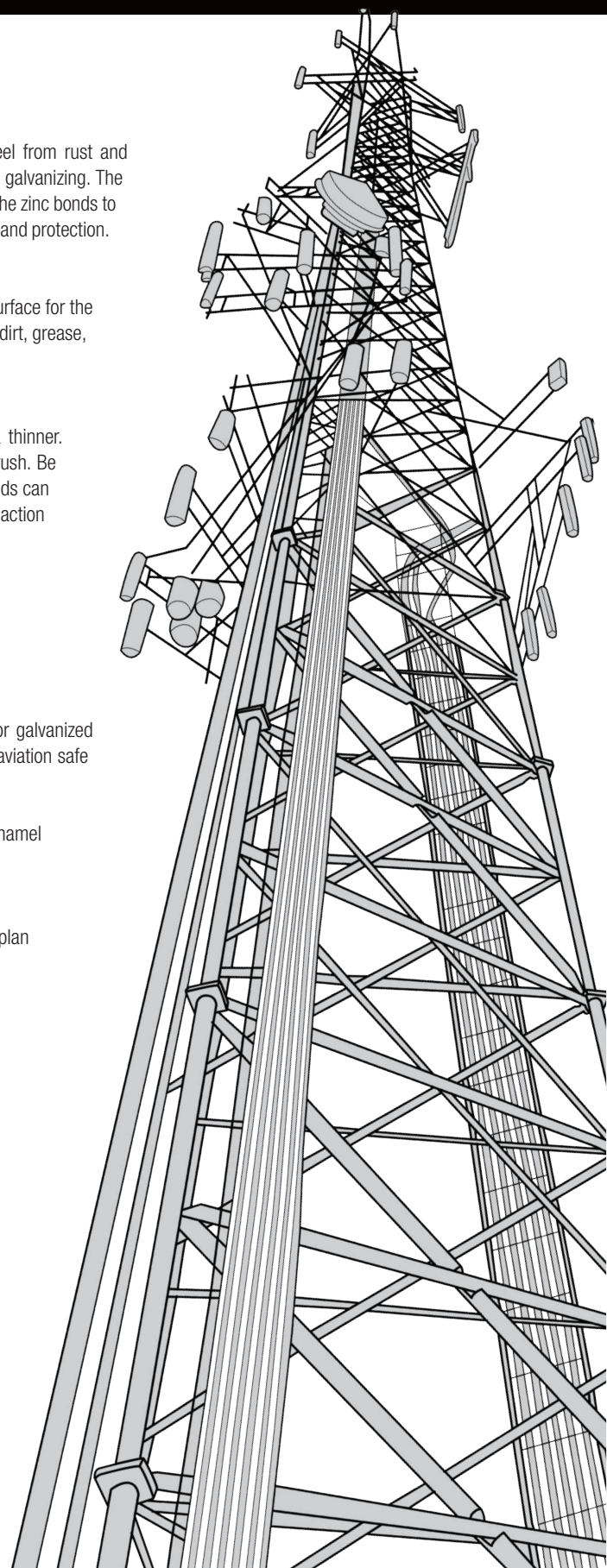
It can be applied using a brush, mitt, or spray. Ideally a full wet coat is applied overlapping 50% each pass to avoid dusting. The paint should dry overnight, and avoid painting if a freeze or rain is possible in the next 24 hours.

COMPLIANCE

Use a color chart to test whether your tower needs to be painted. They are specially designed charts calibrated with color swatches which meet the FAA guidelines for aviation safe colors.



WATCH THE VIDEO ON OUR
YOUTUBE CHANNEL





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RESPIRATOR 101

When working in hazardous environments or with hazardous materials, taking every precaution to protect your lungs is essential. Respirators are designed to filter out specific particles, chemicals, or vapors, to prevent them from causing injury, illness, or worse.

WHAT ARE THE HAZARDS?

Determining hazards present in a particular job is the first step to selecting a respirator. Each type of respirator has features designed to mitigate the risk associated with various airborne irritants.

SOME COMMON HAZARDS ARE:

Particulates - silica, hazardous dust and fibers
Weld fume - stainless and galvanized steel
Lead
Asbestos/Mold
Bleach/Ammonia - General cleaning products
Pesticides/Insecticides
Solvents - Water based latex
Chemicals - Sulfur dioxide, chlorine, ammonia

While this is not a complete guide for every hazard you might encounter, it cannot be stressed enough the importance of matching the respirator and filter with the hazards present.

ASSESS THE SITUATION

Next, the jobsite should be assessed for overall employee exposure. Do all workers on the site need respiratory protection or just those in the immediate area of the hazard?

Air quality is typically measured in parts per million (ppm) or milligrams per cubic meter of air (mg/m³). Specific guidelines are outlined in OSHA's Respiratory Protection Standard 29 CFR 1910.134.

LEVEL OF PROTECTION

Depending on the type of hazard, and level of exposure, you may need a specific style of respirator.

THERE ARE THREE MAIN TYPES:

Disposable, Half Mask, and Full Face.

Disposable respirators are the most basic form and provide short-term protection. They may not be suitable for all types of hazards.

Half mask and full face respirators are usually reusable and provide more protection. They also add the convenience of having replaceable filters to swap out for different protection needs.

For even more hazardous environments, there are also supplied air systems which completely supplement the air in the work environment for clean, safe air.

FILTERS

The filter of the respirator allows air to flow through, but blocks the hazards. Disposable respirators come with a built in filter, where half and full face respirators have removable filters which can be changed based on the hazard, or replaced when they become worn out.



FILTERS CAN HAVE 1 OF 3 LETTER CLASS RATINGS:

Class N - Not oil resistant
Class R - Resistant to oil
Class P - Oil proof

They also use a 3 number rating system, based on how well they filter particles measuring 0.3 microns or larger in diameter.

95 - Filters 95% of all particles
99 - Filters 99% of all particles
100 - Filters 100% of all particles.

These two filter classes are typically noted in this form: N95, P100, etc.



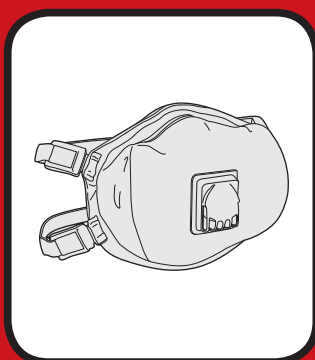
FIT

When wearing a respirator, it is essential that it fit correctly. A user should be fit to ensure that they have selected the proper size and style of respirator. This test should be administered by a trained person, and repeated regularly.

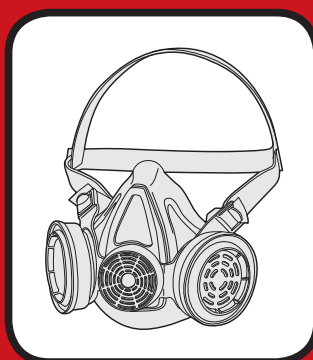
A seal check should be performed each time the respirator is donned, to check for gaps that allow air to pass between the face and the face seal.

STANDARDS

OSHA only allows respirators approved by the National Institute for Occupational Safety and Health (NIOSH) for workplace use.

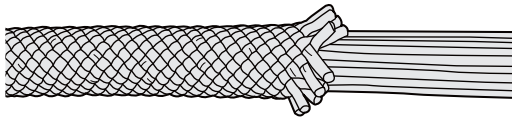


DISPOSABLE

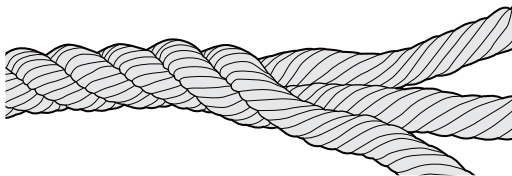


HALF MASK

ROPE CONSTRUCTION



Kernmantle - Kernmantle rope consists of twisted parallel fibers (the kern) surrounded by a tightly braided sheath (the mantle). The core fibers provide the majority (about 70%) of the rope's strength. The sheath is tightly braided providing significantly higher abrasion resistance. There are two distinct types of kernmantle: dynamic and static. Dynamic is used for recreational climbing due to its high shock absorption capabilities. Static kernmantle has very low stretch and works well for industrial applications. Due to its construction, it remains round through descent devices and allows minimal twist on the rope. The properties of static kernmantle make it ideal for use as a life line or descent line.



3-Strand - 3-Strand ropes are an inexpensive rope option. They tend to have a lower breaking strength than double braid or kernmantle, so a larger diameter must be used to achieve the same strength. Due to their construction, 3-Strand ropes have a tendency to rotate under load and provide less abrasion resistance. These characteristics make it a poor load line. With regard to safety and working at height, 3-Strand is most commonly used as a lifeline due to compliance with OSHA requirements and compatibility with 5/8" rope grabs.



Double Braid - Double braided rope is, as the name implies, a braided core surrounded by a braided sheath. The inner and outer braids are generally designed to share the load equally with very low elongation. Double braid rope remains round under tension, imparts no rotational force when loaded and has a soft hand. These characteristics make it ideal for use as a load rope.

DIAMETER

As ropes get thicker, they get stronger. But there's a misconception that to be as safe as possible you should get the thickest rope available. In reality, your rigging is only as strong as your weakest component. The capstan, shackles, slings, blocks, and rope all must be considered. If you're using a 1,000 pound capstan hoist, most 1/2" Double Braids have an MBS high enough to safely handle the maximum load for the hoist; even with the safety factor, and any loss of strength due to knots, termination plates, or sewn eyes. While a 5/8" rope has a higher breaking strength, it would not matter since the hoist is only capable of lifting 1,000 pounds. Another thing to consider is the sheave diameter of the blocks being used. There are many options which can handle 1/2" synthetic rope, but few exist that are strong enough to justify 5/8" rope.

INSPECTION

Each time you use your rope, you should perform a visual inspection to ensure it's safe to use. Check for cuts, nicks, burns, excess fraying, flat or uneven spots, burns, harness, glossing, discoloration from sun exposure or chemicals, or inconsistencies in the rope. Refer to the manufacturers recommendations for complete inspection and usage instructions. Use a rope log, like the one available on www.gmesupply.com/knowledge-base to keep a complete record of inspections.

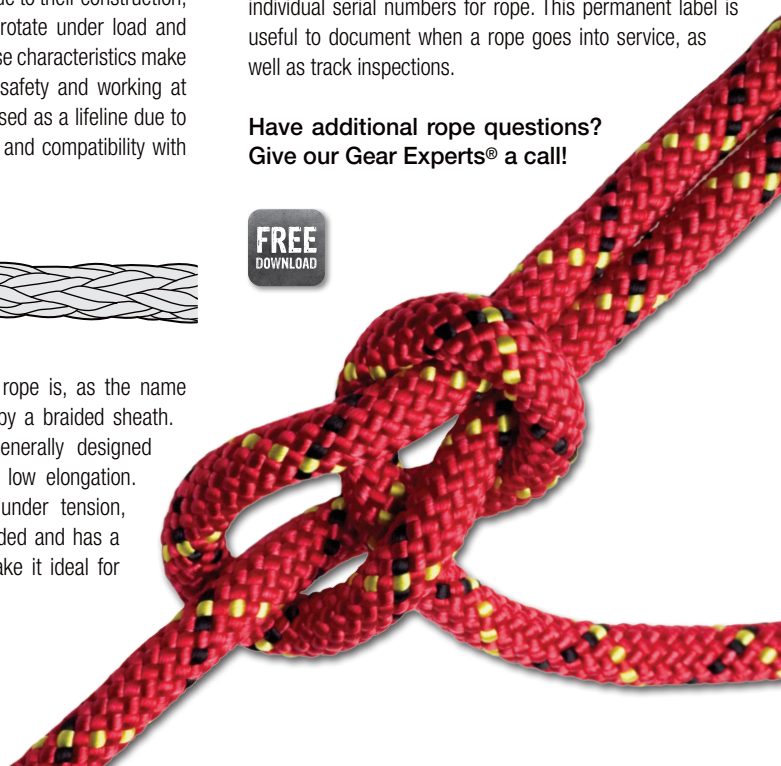
Another practice which is becoming more common is individual serial numbers for rope. This permanent label is useful to document when a rope goes into service, as well as track inspections.

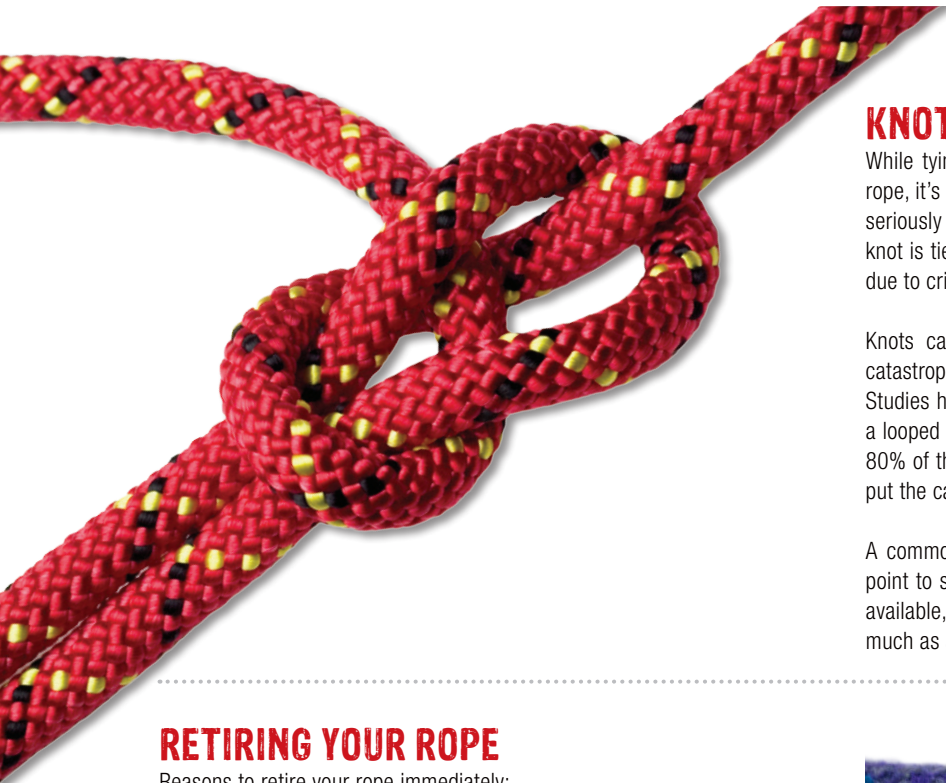
**Have additional rope questions?
Give our Gear Experts® a call!**



ROPE DIAMETERS

6 mm	
7 mm	
8 mm	5/16"
9 mm	
10 mm	3/8"
11 mm	7/16"
12 mm	
13 mm	1/2"
14 mm	
15 mm	
16 mm	5/8"
17 mm	
18 mm	
19 mm	3/4"





KNOTS

While tying knots is a very important skill to have when working with rope, it's equally important to recognize the effects they have. Knots can seriously decrease the overall strength of the rope, not only while the knot is tied in the rope, but even after the knot has been untied. This is due to crimping and twisting that is often irreversible.

Knots can decrease rope strength by up to 50%, which could be catastrophic in a life safety or overhead lifting and rigging scenario. Studies have shown that a figure 8 knot, one commonly used to create a looped termination at the end of a rope, causes ropes to break at 75-80% of their typical strength. This decrease in MBS could be enough to put the capacity below required safety factors.

A common reason knots are tied in ropes is to create an attachment point to secure a rope to a structure or object. There are other options available, which do not decrease the strength of the rope by nearly as much as a knot.

RETIRING YOUR ROPE

Reasons to retire your rope immediately:

- Rope whose strength may have been compromised during use
- Rope which is subjected to uncontrolled or excessive loading
- Rope which is greater than 10 years old, regardless of history & usage
- Rope whose history and past usage you are uncertain about
- Rope that has been exposed to heat, direct flame, or excessive abrasion

Cut retired rope into short lengths to discourage future use - or discard it entirely. A retired rope should not be stored, kept, or maintained in such a way that it could inadvertently be used.



Pictures above showcase damaged rope cores and frayed/abraded sheath



TERMINATION OPTIONS

Termination Plates - A piece of hardware, typically made from milled aluminum, which has multiple holes. Rope is fed through these holes in a specific pattern, leaving the main hole at the end of the plate as an attachment point.

Factory Sewn or Spliced Eyes - Many rope manufacturers offer sewn eyes for kernmantle and double braid ropes, or hand spliced terminations for three strand ropes. These terminations are designed to drastically reduce the stress put on the rope to minimize strength loss. They also typically include a protective thimble or abrasion resistant sleeve to further protect the rope at the stress points.

Factory Installed Connectors - Rope manufacturers can also include hardware connection options. Snaphooks with swivels are included on many lifelines to make attachment even easier.



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ROPE BAGS



ITEM	PART #	10 MM OR 3/8"	11 MM OR 7/16"	12.5 MM OR 1/2"	16 MM OR 5/8"
Sterling Rope Bag - S	MDBAGROPES09	60 m or 200'	45 m or 150'	35 m or 115'	28 m or 94'
Sterling Rope Bag - M	MDBAGROPEM07	105 m or 347'	79 m or 260'	60 m or 200'	50 m or 163'
PMI Standard Rope Bag - S	RB44015	120 m or 393'	100 m or 328'	75 m or 246'	61 m or 200'
PMI Deluxe Rope Bag - L	RB4400_	160 m or 524'	120 m or 393'	92 m or 301'	75 m or 246'
PMI Rope Bag - L	RB44021	160 m or 524'	120 m or 393'	92 m or 301'	75 m or 246'
Sterling Rope Bag - L	MDBAGROPEL08	212 m or 696'	159 m or 522'	121 m or 400'	100 m or 326'
DBI Sala Rope Bag - L	8700223	250 m or 820'	200 m or 656'	100 m or 328'	80 m or 262'
PMI Rope Bag - XL	RB44024	250 m or 820'	200 m or 656'	100 m or 328'	80 m or 262'
GME Supply Premium Rope Bag - L	56_ _RB	250 m or 820'	200 m or 656'	100 m or 328'	80 m or 262'
Elk River Eze-Man Rope Bag - S	84302	259 m or 850'	212 m or 700'	106 m or 350'	85 m or 279'
Petzl Rope Bag - S	S41A_ 025	280 m or 918'	220 m or 721'	185 m or 606'	148 m or 485'
PMI Rope Bag - 2XL	RB44056	285 m or 935'	230 m or 754'	200 m or 656'	160 m or 524'
Elk River Eze-Man Rope Bag - M	84303	342 m or 1,125'	274 m or 900'	137 m or 450'	110 m or 360'
Petzl Rope Bag - L	S41A_ 035	400 m or 1,312'	310 m or 1,017'	260 m or 853'	208 m or 682'
Elk River Eze-Man Rope Bag - L	84304	419 m or 1,375'	335 m or 1,100'	167 m or 550'	133 m or 436'

OSHA states that a safety helmet must be worn "when working in areas where there is potential for injury to the head from falling objects." Hard hats must also be worn in areas where there's a risk of exposure to electrical conductors that can potentially contact the head. In these situations, specially designed helmets must be used.

HARD HAT TYPES



TYPE I: Type I hard hats are intended to reduce forces of impact from a blow to the top of the head. These are the most common helmet on the jobsite. Type 1 helmets would protect a worker from a dropped hammer or tape measure.

TYPE II: Type II hard hats are intended to reduce forces from lateral impact coming from an off-center, side, or top of the head strike. This impact could be from a sharp corner of an I-Beam or swinging structural element of a tower. The sides of these helmets are typically lined with a high-density foam or suspension.

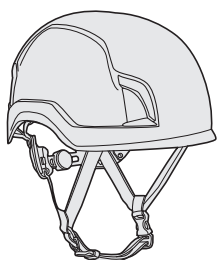
ELECTRICAL CLASSES



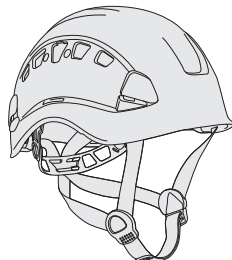
CLASS E: Class E hard hats are designed to reduce exposure to high voltage conductors and offer protection up to 20,000 volts. These helmets cannot be vented. Formerly associated with the "Class B" rating, Class E hard hats can also be considered a General, "Class G" hard hat.

CLASS G: Class G hard hats are designed to reduce exposure to low voltage conductors. They offer protection up to 2,200 volts. Like Class E helmets, this protection is only for the head. Class G was formerly categorized as "Class A".

CLASS C: Class C hard hats are considered conductive, and they do not provide any electrical protection. These helmets are typically vented, and only protect workers from impacts but do provide workers increased breathability.



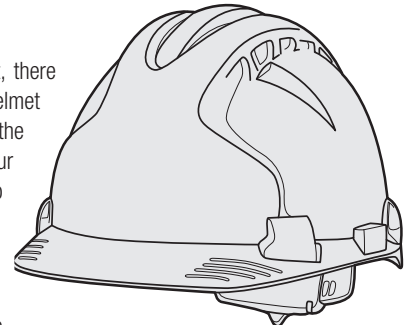
NON-VENTED



VENTED

LABELING

To qualify as an ANSI certified helmet, there must be a legible label inside the helmet which identifies the standards that the hard hat was designed to meet. If your helmet is missing this label or it's no longer legible, it should be replaced.



SERVICE LIFE

Hard hats service life starts from the time it was put into service. While there is a date code stamped into the helmet, that is only the date of manufacturing. When a helmet is put into service, it should be documented on the label in the shell of the hard hat.

The helmet suspension should be replaced after no more than every 12 months, and the helmet should be replaced after no more than 5 years. These dates are the maximum, and the helmet should be inspected regularly to ensure that it is still safe.

If the hard hat has sustained an impact it must be removed from service. Even if there is not visible damage, the materials could have weakened and may no longer provide the safe level of protection required.

BEST PRACTICES

Suspensions should always be designed by the manufacturer to work with the specific hard hat and should not be modified. Only use the specific suspension when replacing a worn out suspension and install it to the manufacturer's instructions. This includes installing it backwards so the brim of a helmet can be worn in the back. Although, some manufacturers do offer swing-style suspensions which allow the helmet to be reversed.

Do not paint your helmet. Chemicals in the paint can alter and damage the structure of the hard hat and reduce the protection provided. If you're painting on the jobsite, always clean your helmet according to the manufacturer's recommendations to remove any chemicals or paint residue that may be present.

Pressure sensitive, non-metallic stickers or self-adhesive tape are typically acceptable on most of today's hard hats. However, you must refer to the manufacturer's recommendation to verify if they're allowed on your particular hard hat and for placement guidelines.

STANDARDS

ANSI/ISEA Z89.1-2014

This standard provides performance and testing requirements for industrial helmets, commonly known as hard hats. It establishes the types and classes of protective helmets, depending on the type of hazard encountered.

OSHA 29 CFR 1910.135

Head Protection Requirements and Classifications of Hard Hats and Safety Helmets for general industry workers.

OSHA 29 CFR 1926.100

Head Protection Requirements and Classifications for head protection for construction, demolition, and renovation workers.



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SRL, SRD, PFL 101

WHAT IS A SELF-RETRACTING LIFELINE?

A Self-Retracting Lifeline, or SRL, is a device that contains a spring loaded retracting web or cable lanyard wound around an internal drum. It automatically locks and arrests the fall of a worker.

CLASS A vs CLASS B

ANSI Z359.14-2012 classifies Self-Retracting Lifelines and Personal Fall Limiters into two classes. The main differentiators between the two are stopping distance and arresting forces.

Class A

- Maximum arresting distance not to exceed 24".
- Average arresting force not to exceed 1,350 pounds or 6 kN or have a maximum peak of 1,800 pounds or 8 kN.
- After environmental conditioning (hot, cold, wet), average arresting force not to exceed 1,575 pounds or 7 kN or a maximum peak of 1,800 pounds or 8 kN.

Class B

- Maximum arresting distance not to exceed 54".
- Average arresting force not to exceed 900 pounds or 4 kN or have a maximum peak of 1,800 pounds or 8 kN.
- After environmental conditioning (hot, cold, wet), average arresting force not to exceed 1,125 pounds or 5 kN or a maximum peak of 1,800 pounds or 8 kN.

CLASS
A

CLASS
B

LOOK FOR THESE
BADGES THROUGHOUT
THE CATALOG.

SWING FALL

SRLs are great because they allow you to work much farther away from an anchorage point, sometimes over 100 ft. The downside to this is swing falls become much more of a danger.

A swing fall occurs when an anchorage point is not directly overhead of a worker. The device will stop them in the required distance, but the worker may still swing a great distance. This potentially puts other obstacles, walls, or objects in the path for the worker to collide with.

To avoid swing falls, always stay in the safe zone, which is within 30 degrees of your anchor point. Swing falls can be avoided by using mobile anchorage points which will travel with the worker.

BODY WORN vs MOUNTED

Larger SRLs are mounted above the worker, and the lanyard runs down to connect to the user's dorsal D-ring on their harness. These come in lengths ranging from 8 ft to over 100 ft. The other option is body worn. These are compact devices which connect directly to the users harness and are much shorter, generally 6 or 8 ft. To tie-off the user connects the tether to an anchorage point. These can also be had in twin-leg configuration for 100% tie-off.

LEADING EDGE + FOOT LEVEL

Most SRLs are designed only to be mounted above the user. For cases where this is not possible, specially designed Foot Level or Leading Edge SRLs are required. ANSI classifies these as SRL-LE devices. These incorporate factors to absorb the extra energy associated with foot-level tie off, as

well as more robust cables to resist breaking when run against a leading edge.

LE

LOOK FOR THIS BADGE
THROUGHOUT THE CATALOG.

REPLACEMENT & RECERTIFICATION

Recertification can be done on some SRLs by the manufacturer to prolong the life of the unit. This can be done after the device is involved in a fall, or after the unit has been in the field for a specific period of time. Check with the manufacturer for specifications on recertification.

Other devices cannot be recertified and must be destroyed and replaced if they are involved in a fall or after a time period specified by the manufacturer.

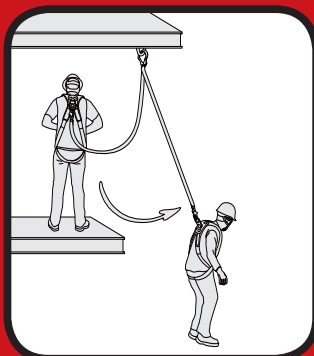
OTHER VARIATIONS

Other potential options for SRL variations include:

- Sealed design for harsh work environments with grease, dust, and moisture.
- Rescue Devices, referred to as SRL-R by ANSI, for auto retrieval. These are common on confined space systems.
- Tie-Back for when connectors cannot secure to anchorage points.
- Arc Flash rated for working in electrical environments.

More questions?
Give our Gear Experts® a call.

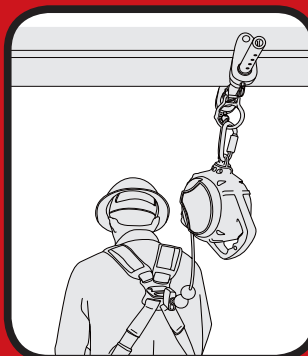
FREE
DOWNLOAD



SWING FALL



BODY WORN



MOUNTED



LEADING EDGE



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STANDARDS INDEX

FREE
DOWNLOAD

Nearly every piece of safety equipment is regulated, as are the safety practices on the job. The information below is simply a guide for what is referenced in each standard and chapter. The full standard provides very specific detail for all aspects of the standard. For more information, give our Gear Experts® a call!

ANSI 10.48 STANDARD (BEST PRACTICES AND USE)

The Criteria for Safety Practices for the Construction, Demolition, Modification and Maintenance of Communications structures in the USA.

- General considerations
- References
- Definitions
- Pre-job planning
- Job site conditions
- Fall protection
- Radio frequency/electromagnetic energy
- Base mounted hoist used for material lifting and personnel lifting
- Personnel lifting accessories and processes
- Rigging
- Gin poles and other lifting devices
- Climbing facilities and access
- Structural construction loading considerations
- Training program requirements
- Capstan hoist operation

THE Z359 FALL PROTECTION CODE

ANSI/ASSE Z359.0-2012

Definitions and Nomenclature Used for Fall Protection and Fall Arrest

ANSI/ASSE Z359.1-2007

Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ANSI/ASSE Z359.2-2007

Minimum Requirements for a Comprehensive Managed Fall Protection Program

ANSI/ASSE Z359.3-2007

Safety Requirements for Positioning and Travel Restraint Systems

ANSI/ASSE Z359.4-2013

Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components

ANSI/ASSE Z359.6-2009

Specifications and Design Requirements for Active Fall Protection Systems

ANSI/ASSE Z359.7-2011

Qualification and Verification Testing of Fall Protection Products

ANSI/ASSE Z359.11-2014

Safety Requirements for Full Body Harnesses

ANSI/ASSE Z359.12-2009

Connecting Components for Personal Fall Arrest System

ANSI/ASSE Z359.13-2013

Personal Energy Absorbers and Energy Absorbing Lanyards

ANSI/ASSE Z359.14-2014

Safety Requirements for Self-Retracting Devices For Personal Fall Arrest and Rescue Systems

ANSI/ASSE Z359.15-2014

Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest and Rescue Systems

ANSI/ISEA 121-2018 DROPPED OBJECTS STANDARD

This standard consists of design, testing, performance, and labeling requirements for tool tethering systems and containers used to transport and secure tools and equipment while working at heights.

CSA S37-13 ANTENNAS, TOWERS, & ANTENNA SUPPORTING STRUCTURES

1. Scope
2. Reference publications
3. Definitions and symbols

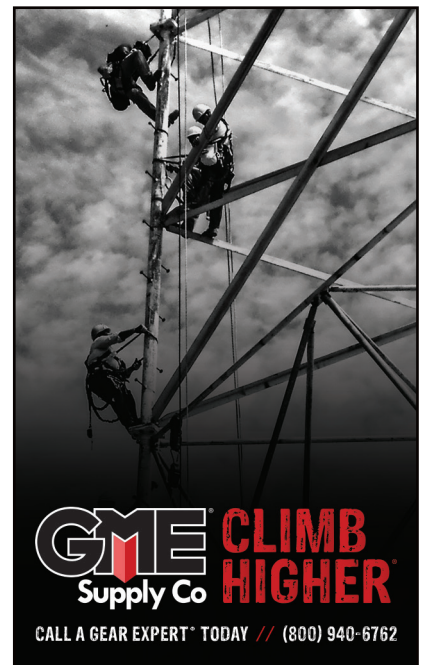
4. Design requirements
5. Loads
6. Analysis
7. Structural steel
8. Corrosion protection
9. Other structural materials
10. Guy assemblies
11. Foundations and anchorages
12. Tower and pole structure installation
13. Obstruction lighting
14. Bonding and grounding
15. Insulator and insulation
16. Ladders, safety devices, platforms and cages

TIA-222-G (ENGINEERING STANDARD)

This Standard provides the requirements for the structural design and fabrication of new and the modification of existing structural antennas, antenna-supporting structures, mounts, structural components, guy assemblies, insulators and foundations.

ANSI/TIA-322 (ENGINEERING STANDARD)

Loading Criteria, Analysis, and Design Related to the Installation, Alteration and Maintenance of Communication Structures



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WALKING WORKING SURFACES

1910 SUBPART D

From 2006 to 2012, there were an average of 261 fatal falls to a lower level annually in general industry, not including falls in the construction industry, resulting in over 48,379 lost-workday injuries reported. Slips, trips, and falls on the same level were reported in more than 125,000 injuries a year.

This new standard overhaul allows employers more flexibility in creating their fall protection solution for what will work best in their situation like guardrails and handrails, personal fall protection, designated areas, and safety net systems. It also incorporates technical information and guidelines from the construction industry that were previously not included in the general industry standards, such as fall protection systems, rope descent systems, and training on fall hazards and fall protection.

Below is a section by section breakdown of the standard. For a full understanding, reference the OSHA website.

STANDARDS BREAKDOWN

1910.21 - SCOPE & DEFINITIONS

OSHA is consistent with terminology used in other general industry, construction, and maritime standards to make the new requirements easier to understand.

1910.22 - GENERAL REQUIREMENTS

Employers must now regularly inspect all walking-working surfaces for unsafe conditions and correct or repair any problems quickly. If the repair cannot be handled immediately the hazard must be guarded to prevent access.

1910.23 - LADDERS

Existing requirements on portable and fixed ladders have been combined. This section requires that when ascending or descending a ladder, employees must maintain 3 points of contact by facing the ladder, using at least one hand at all times, and not carrying any object or load that could cause them to lose balance and fall.

While the provision will allow them as a temporary solution, OSHA is ultimately phasing out cages and wells on fixed ladders. Any existing ladders with cages or wells will need to be modified with ladder safety systems or a personal fall arrest system to meet the new standard within the next 20 years.

1910.25 - STAIRWAYS

The term stairways now applies to all permanently installed stairs regardless of step count. Spiral, ship, and alternating tread-type stairs are only permitted where standard stairs would not be practical.

1910.26 - DOCKBOARDS

Dockboards, or bridge plates must have edging or curbing to prevent equipment from running off the edge. This protects employees that may be working below from dropped objects. Any transport vehicles must also be prevented from moving on dockboards.

1910.27 - SCAFFOLDS & ROPE DESCENT SYSTEMS

Employers must now comply with the construction industry standards for scaffolding. There is also new language for rope descent systems, which were not previously regulated by OSHA.

1910.28 - FALL PROTECTION

A brand new section which allows employers to choose from several fall protection options in addition to guardrails. Safety net systems, personal fall protection systems (travel restraint systems, fall arrest systems, positioning systems, etc.) and designated areas. Fall protection must be provided at four feet for general industry.

1910.29 - FALL PROTECTION SYSTEMS

Fall protection systems should be permanently installed when possible so that they are available whenever potential exposure to fall hazards exist. Personal protective equipment, including fall protection, must be provided by the employer at no cost to the employee.

1910.30 - TRAINING

Employees who use any type of fall protection system or equipment must have proper training and retraining that is developed and taught by a qualified person. This is a completely new requirement under Subpart D. Employees must be able to recognize fall hazards, know what to do about the hazards, and understand how to properly use all equipment to do their job.

SUBPART 1 - 1910.140 - PERSONAL PROTECTIVE EQUIPMENT

This new section to Subpart 1, which covers PPE, covers criteria for fall protection equipment. Specifically, it outlines selection, use, testing, inspection, maintenance, and training.



COMPLIANCE DATES

The majority of the new requirements went into effect January 17, 2017. But OSHA extended some dates to give employers time to properly train, evaluate their programs, and purchase any new equipment required for compliance.

1910 SUBPART D TIME LINE

Compliance Date: May 17, 2017

1910.30(a) and (b): Deadline by which employers must train employees on fall protection equipment hazards.

Compliance Date: November 20, 2017

1910.27(b)(1): Certification of anchorages.

Compliance Date: November 19, 2018

1910.28(b)(9)(i)(A): Deadline by which employers must equip existing fixed ladders with a cage, well, ladder safety system, or personal fall arrest system.

Compliance Date: November 19, 2018

1910.28(b)(9)(i)(B): Deadline by which employers must begin equipping new fixed ladders with a ladder safety system or personal fall arrest system.

Compliance Date: November 18, 2036

1910.28(b)(9)(i)(D): Deadline by which all fixed ladders must be equipped with a ladder safety system or personal fall arrest system.





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OSHA WARNING LINE SYSTEMS



The warning line must be erected around all sides of the roofing work area.

Determine if mechanical equipment will be used for the work. If so, the warning line must be erected no less than 6 feet from the roof edge parallel to the direction of the mechanical equipment's operation and no less than 10 feet from the roof edge perpendicular to the direction of the mechanical equipment's operation.

If mechanical equipment is not being used, the warning line must be erected no less than 6 feet from the roof edge.

Points of access, material-handling areas, storage areas, and hoisting must be connected to the work area by an access path formed by two warning lines. When these areas are not in use, a warning line must be placed across the path at the point where the path intersects the warning line erected around the work area, or the path must be offset in a manner that a person cannot walk directly into the work area.

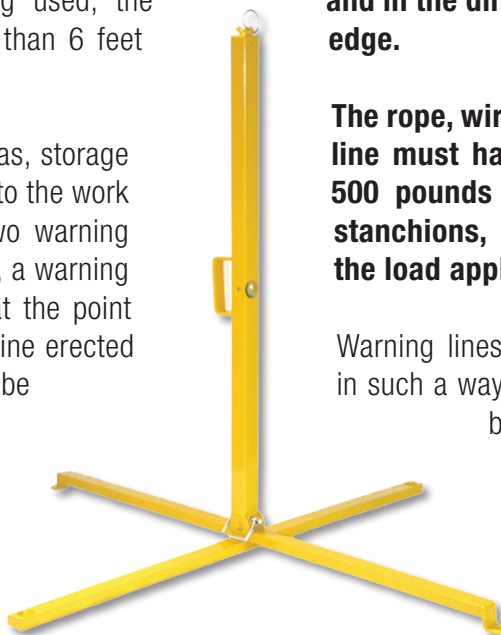
All warning lines must be flagged with high-visibility material at no more than 6 feet intervals.

Warning lines must be rigged and supported so the lowest point (including sag) is no less than 34 inches from the walking/working surface and the highest point is no more than 39 inches from the walking/working surface.

After being rigged with warning lines, stanchions shall be capable of resisting (without tipping over) a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface perpendicular to the warning line and in the direction of the floor, roof, or platform edge.

The rope, wires, or chain serving as the warning line must have a minimum tensile strength of 500 pounds and, after being attached to the stanchions, must support (without breaking) the load applied to the stanchions.

Warning lines must be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before a stanchion tips over.



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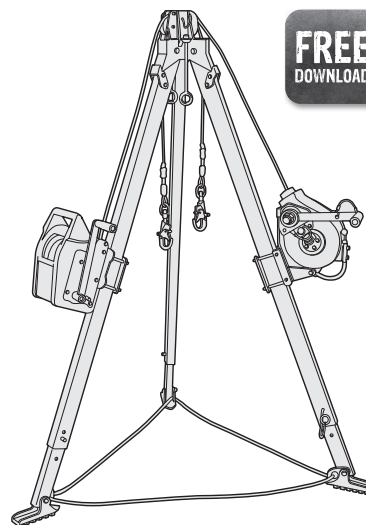
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CONFINED SPACES

Confined spaces vary in size, shape, location, and environment. There's not a standard or typical application, so your confined space safety equipment must be flexible as well. Consistent anchorage is rarely found from one job to the next. Some confined spaces like a manhole on a street will require vertical equipment, but others like a tank would have a side-entry or horizontal requirement.

Choosing the right confined space entry and rescue equipment can be difficult. Temporary jobs require lightweight and easy-to-use portable confined space systems. For areas that are accessed frequently a davit system with a permanently mounted base would be more ideal.

Lifeline type and length are another variable to consider. In some situations, a back-up system may be required. Typical mechanical devices include man-rated winches and 3-way retracting lifelines with both fall protection and emergency rescue functions.



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SAFETY CAN COLOR CODING

Proper safety storage is key in maintaining a safe work environment while storing hazardous materials, including hazardous waste. Your company is most likely storing a number of hazardous materials like cleaning supplies, paint, paint thinner, gasoline, oil, etc. In compliance with OSHA, all hazardous materials and waste require specifically engineered storage containers.

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GASOLINE



DIESEL



KEROSENE

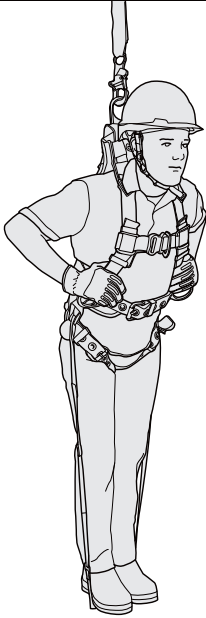


OIL



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SUSPENSION TRAUMA 101



Prompt rescue is critical in the event of fall. In just minutes, suspension trauma can set in and cause serious, potentially fatal damage. It's caused when blood pools in your legs. Your heart is still pumping blood to your legs, and when you cannot use your skeletal muscles to help "pump" that blood back, gravity causes it to pool in your feet and legs. Your harness putting pressure on important veins and arteries also makes circulation difficult. This pooling deprives the brain, kidneys, and other vital organs of oxygen. Suspension trauma straps are a simple accessory to help relieve pressure off of the harness leg straps.

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INSPECTION SHEETS



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ANCHORAGE CONNECTOR INSPECTION

ANCHOR PART NUMBER: _____

SERIAL NUMBER: _____

DATE OF FIRST USE: _____

DATE OF MANUFACTURER: _____

OWNER / COMPANY: _____

NAME OF INSPECTOR: _____

SIGNATURE: _____

DATE OF INSPECTION: _____

ANCHOR MATERIAL:

- ☐ GALVANIZED STEEL ☐ ZINC-PLATED STEEL
☐ STAINLESS STEEL ☐ ALUMINUM
☐ WEB

OTHER: _____

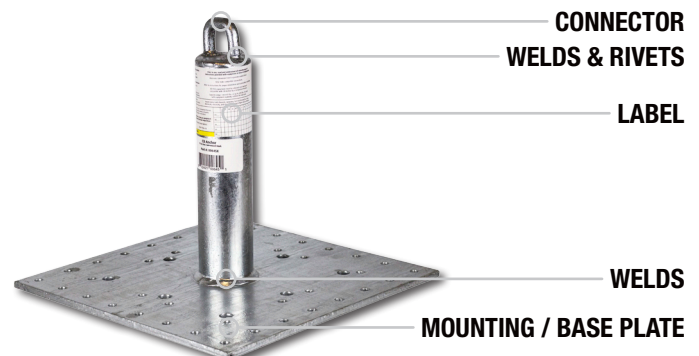
LABELS & MARKINGS	PASS	FAIL	NOTE
LABEL (INTACT & LEGIBLE)	☐	☐	☐
APPROPRIATE ANSI / OSHA / CSA MARKINGS	☐	☐	☐
INSPECTIONS ARE CURRENT / UP-TO-DATE	☐	☐	☐
DATE OF FIRST USE	☐	☐	☐

HARDWARE (IF APPLICABLE)	PASS	FAIL	NOTE
SIGNS OF DEFORMITY	☐	☐	☐
D-RING / CONNECTION POINTS	☐	☐	☐
HOOK GATE / RIVETS (IF APPLICABLE)	☐	☐	☐
CORROSION / PITTING / NICKS	☐	☐	☐

ANCHORAGE CONNECTOR	PASS	FAIL	NOTE
TERMINATION (STITCH, SPLICE, OR SWAGE)	☐	☐	☐
DETERIORATION / CORROSION	☐	☐	☐
CUTS / BURNS / HOLES	☐	☐	☐
INTEGRITY OF WELDS / RIVETS	☐	☐	☐
PAINT CONTAMINATION	☐	☐	☐
STITCHING / WIRE CONDITION	☐	☐	☐
HEAT CORROSION / UV DAMAGE	☐	☐	☐
SEPARATION / BIRD CAGING	☐	☐	☐

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HARNESS INSPECTION

HARNESS PART NUMBER: _____

SERIAL NUMBER: _____

DATE OF FIRST USE: _____

DATE OF MANUFACTURER: _____

OWNER / COMPANY: _____

NAME OF INSPECTOR: _____

SIGNATURE: _____

DATE OF INSPECTION: _____

HARNESS CONFIGURATION:

CHEST STRAP: ☐ PT ☐ TB ☐ QC

LEG STRAPS: ☐ PT ☐ TB ☐ QC

WAIST BELT: ☐ YES ☐ NO

PT: PASS-THROUGH | TB: TONGUE BUCKLE | QC: QUICK-CONNECT

LABELS & MARKINGS	PASS	FAIL	NOTE
LABEL (INTACT & LEGIBLE)	☐	☐	☐
APPROPRIATE ANSI / OSHA / CSA MARKINGS	☐	☐	☐
INSPECTIONS ARE CURRENT / UP-TO-DATE	☐	☐	☐
DATE OF FIRST USE	☐	☐	☐
IMPACT INDICATOR (SIGNS OF DEPLOYMENT)	☐	☐	☐

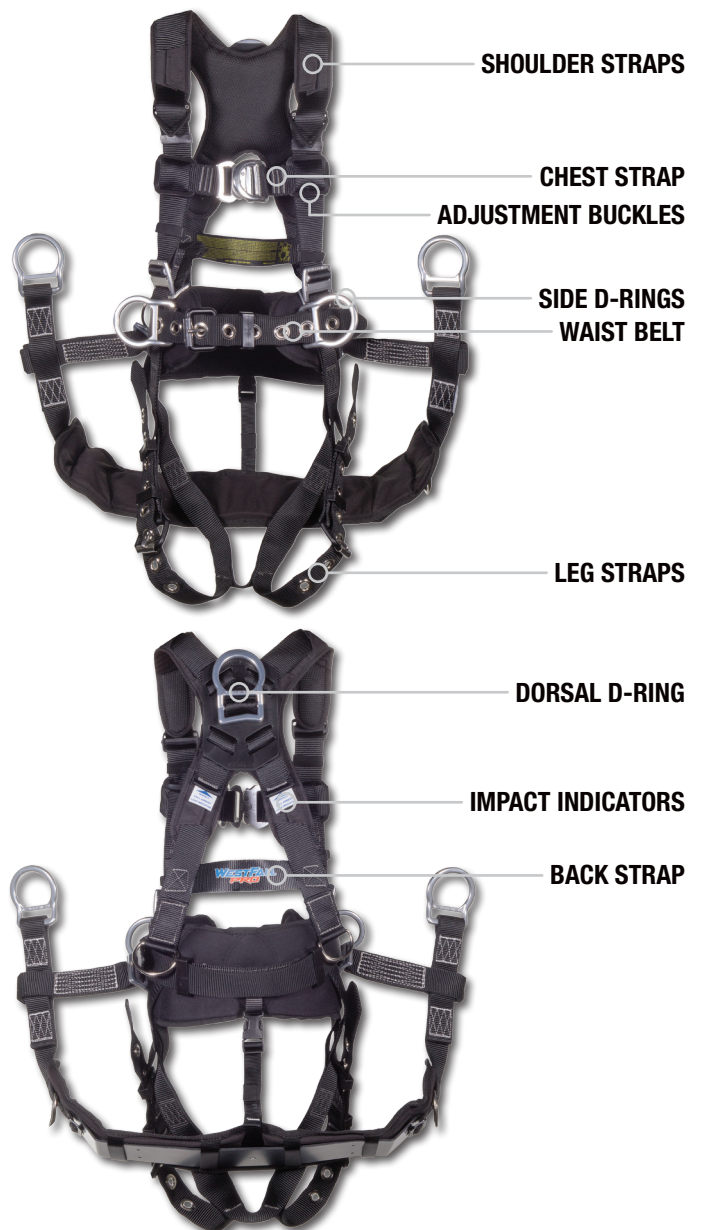
HARDWARE (BUCKLES & D-RINGS)	PASS	FAIL	NOTE
SHOULDER ADJUSTMENT BUCKLES	☐	☐	☐
LEG & WAIST BUCKLES / OTHER HARDWARE	☐	☐	☐
D-RINGS (DORSAL, SIDE, SHOULDER, OR STERNAL)	☐	☐	☐
CORROSION / PITTING / NICKS	☐	☐	☐

WEBBING	PASS	FAIL	NOTE
SHOULDER / CHEST / LEG / BACK STRAPS	☐	☐	☐
CUTS / BURNS / HOLES	☐	☐	☐
PAINT CONTAMINATION	☐	☐	☐
EXCESSIVE WEAR	☐	☐	☐
HEAT CORROSION / UV DAMAGE	☐	☐	☐

STITCHING	PASS	FAIL	NOTE
SHOULDER / CHEST / LEG / BACK STRAPS	☐	☐	☐

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HORIZONTAL LIFELINE INSPECTION

LIFELINE PART NUMBER: _____

SERIAL NUMBER: _____

DATE OF FIRST USE: _____

DATE OF MANUFACTURER: _____

OWNER / COMPANY: _____

NAME OF INSPECTOR: _____

SIGNATURE: _____

DATE OF INSPECTION: _____

LIFELINE MATERIALS:

- ☐ POLYESTER LIFELINE
☐ CABLE LIFELINE
☐ KERNMANTLE LIFELINE

LENGTH: _____

DIAMETER: _____

LABELS & MARKINGS	PASS	FAIL	NOTE
LABEL (INTACT & LEGIBLE)	☐	☐	☐
APPROPRIATE ANSI / OSHA / CSA MARKINGS	☐	☐	☐
INSPECTIONS ARE CURRENT / UP-TO-DATE	☐	☐	☐
DATE OF FIRST USE	☐	☐	☐

HARDWARE (IF APPLICABLE)	PASS	FAIL	NOTE
CONNECTOR (SELF-CLOSING & LOCKING)	☐	☐	☐
HOOK GATE / TENSIONER / RIVETS	☐	☐	☐
CORROSION	☐	☐	☐
PITTING / NICKS	☐	☐	☐

MATERIAL	PASS	FAIL	NOTE
BROKEN / MISSING / LOOSE STITCHING	☐	☐	☐
TERMINATION (STITCH, SPLICE, OR SWAGE)	☐	☐	☐
EXCESSIVE WEAR (FRAYING OR BROKEN STRANDS)	☐	☐	☐
CUTS / BURNS / HOLES	☐	☐	☐
KINKS	☐	☐	☐
SEPARATION / BIRD CAGING	☐	☐	☐

SHOCK PACK (IF PRESENT)	PASS	FAIL	NOTE
COVER / SHRINK TUBE (DON'T CUT OR REMOVE)	☐	☐	☐
DAMAGE / FRAYING / BROKEN STITCHING	☐	☐	☐
IMPACT INDICATOR (SIGNS OF DEPLOYMENT)	☐	☐	☐

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LANYARD INSPECTION

LANYARD PART NUMBER: _____

SERIAL NUMBER: _____

DATE OF FIRST USE: _____

DATE OF MANUFACTURER: _____

OWNER / COMPANY: _____

NAME OF INSPECTOR: _____

SIGNATURE: _____

DATE OF INSPECTION: _____

LANYARD CONFIGURATION:

- ☐ SINGLE LEG LANYARD
- ☐ DOUBLE LEG LANYARD
- ☐ INTERNAL SHOCK ABSORBER
- ☐ EXTERNAL SHOCK ABSORBER
- ☐ CABLE
- ☐ WEB

LABELS & MARKINGS	PASS	FAIL	NOTE
LABEL (INTACT & LEGIBLE)	☐	☐	☐
APPROPRIATE ANSI / OSHA / CSA MARKINGS	☐	☐	☐
INSPECTIONS ARE CURRENT / UP-TO-DATE	☐	☐	☐
DATE OF FIRST USE	☐	☐	☐

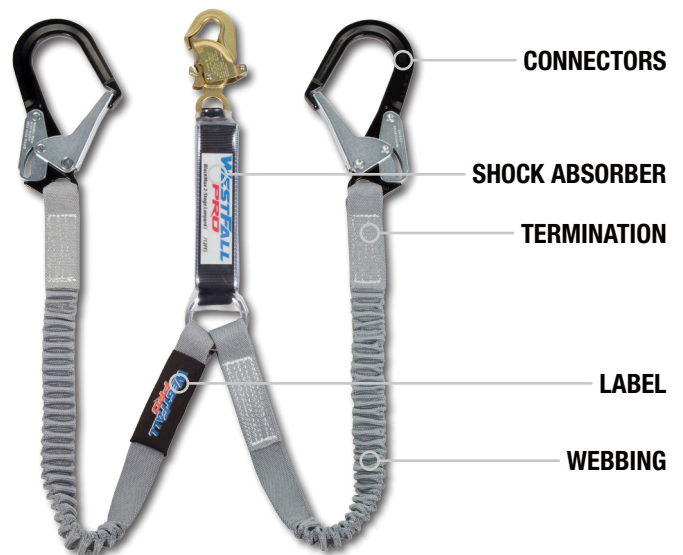
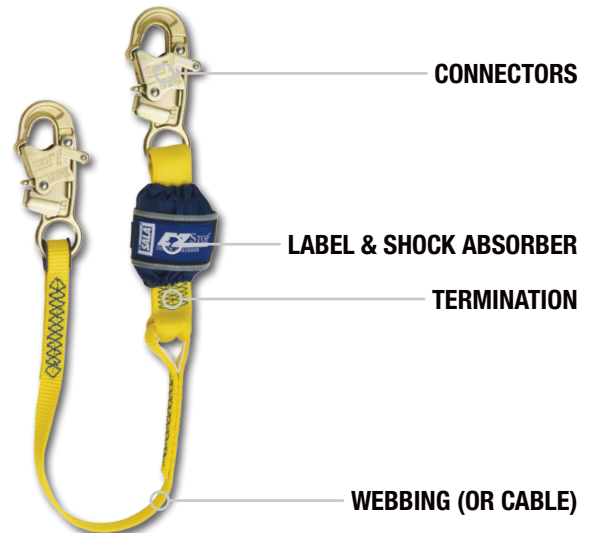
CONNECTORS	PASS	FAIL	NOTE
CONNECTOR (SELF-CLOSING & LOCKING)	☐	☐	☐
HOOK GATE / RIVETS	☐	☐	☐
CORROSION	☐	☐	☐
PITTING / NICKS	☐	☐	☐

MATERIAL (WEB OR CABLE)	PASS	FAIL	NOTE
BROKEN / MISSING / LOOSE STITCHING	☐	☐	☐
TERMINATION (STITCH, SPLICE, OR SWAGE)	☐	☐	☐
WEBBING LENGTH	☐	☐	☐
CUTS / BURNS / HOLES	☐	☐	☐
PAINT DAMAGE	☐	☐	☐
CABLE SEPARATING / BIRD CAGING	☐	☐	☐

SHOCK PACK (IF PRESENT)	PASS	FAIL	NOTE
COVER / SHRINK TUBE (DON'T CUT OR REMOVE)	☐	☐	☐
DAMAGE / FRAYING / BROKEN STITCHING	☐	☐	☐
IMPACT INDICATOR (SIGNS OF DEPLOYMENT)	☐	☐	☐

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RESCUE KIT INSPECTION

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TRUCK NUMBER: _____

NAME / DEPT: _____

DESCRIPTION: _____

DIVISION: _____

PURCHASE DATE: _____

UNIT: _____

SERVICE DATE: _____

PASSES INSPECTION Y/N
HARDWARE Y/N
PROPER ANCHORAGE Y/N
PICKOFF DEVICE Y/N
DESCENT DIAMETER Y/N
UNIFORM GLAZING Y/N
SHEATH FRAYING Y/N
ABRASION/FRAYING Y/N

RETURN TO
SERVICE
Y/N/DATEINSPECTED
BY[illegible]

COMMENTS

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EXPOSED CORE FIBER Y/N
 LOSS OF FAITH Y/N
 USE/AGE Y/N
 DISCOLORATION Y/N
 FLEXIBILITY Y/N
 UNIFORM DIAMETER Y/N
 SHEATH GLAZING Y/N
 ABRASION/FRAYING Y/N
 RETURN TO SERVICE Y/N/DATE
 INSPECTED BY

[illegible]

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SRL INSPECTION

SRL PART NUMBER: _____

SERIAL NUMBER: _____

DATE OF FIRST USE: _____

DATE OF MANUFACTURER: _____

OWNER / COMPANY: _____

NAME OF INSPECTOR: _____

SIGNATURE: _____

DATE OF INSPECTION: _____

LIFELINE CONFIGURATION:

☐ WEB ☐ STAINLESS CABLE ☐ GALVANIZED CABLE

LENGTH: _____

LABELS & MARKINGS	PASS	FAIL	NOTE
LABEL (INTACT & LEGIBLE)	☐	☐	☐
APPROPRIATE ANSI / OSHA / CSA MARKINGS	☐	☐	☐
INSPECTIONS ARE CURRENT / UP-TO-DATE	☐	☐	☐
DATE OF FIRST USE	☐	☐	☐

SHOCK PACK (IF PRESENT)	PASS	FAIL	NOTE
COVER / SHRINK TUBE (DON'T CUT OR REMOVE)	☐	☐	☐
DAMAGE / FRAYING / BROKEN STITCHING	☐	☐	☐
IMPACT INDICATOR (SIGNS OF DEPLOYMENT)	☐	☐	☐

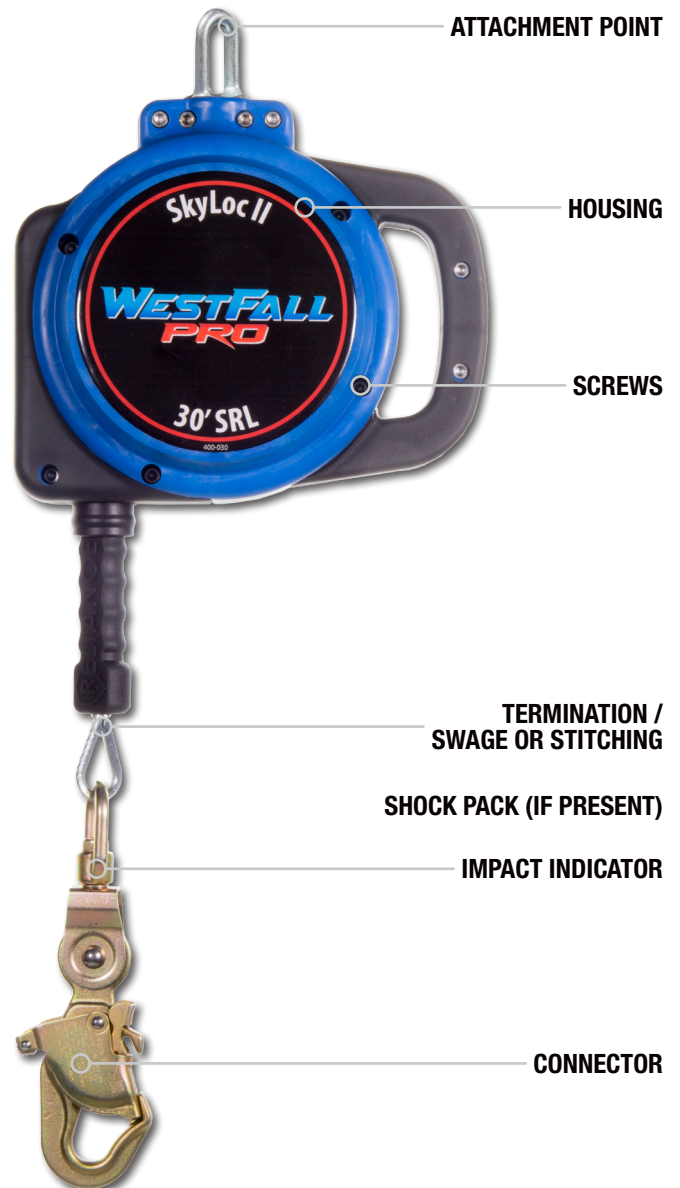
HOUSING	PASS	FAIL	NOTE
ATTACHMENT POINT	☐	☐	☐
NUTS / BOLTS / RIVETS / SCREWS	☐	☐	☐
EVIDENCE OF DAMAGE (DENTS / CRACKS / RUST)	☐	☐	☐

LIFELINE (WEB OR CABLE)	PASS	FAIL	NOTE
TERMINATION (STITCH, SPLICE, OR SWAGE)	☐	☐	☐
CUTS / FRAYING / BROKEN STITCHING	☐	☐	☐
EXCESSIVE WEAR	☐	☐	☐
CABLE SEPARATING / BIRD CAGING	☐	☐	☐
ENTIRE LENGTH RETRACTS SMOOTHLY	☐	☐	☐
TEST BRAKING / LOCKING FUNCTION	☐	☐	☐

CONNECTORS	PASS	FAIL	NOTE
CONNECTOR (SELF-CLOSING & LOCKING)	☐	☐	☐
IMPACT INDICATOR	☐	☐	☐
HOOK BODY / RIVETS	☐	☐	☐
CORROSION	☐	☐	☐
PITTING / NICKS	☐	☐	☐

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VERTICAL LIFELINE INSPECTION

LIFELINE PART NUMBER: _____

SERIAL NUMBER: _____

DATE OF FIRST USE: _____

DATE OF MANUFACTURER: _____

OWNER / COMPANY: _____

NAME OF INSPECTOR: _____

SIGNATURE: _____

DATE OF INSPECTION: _____

LIFELINE MATERIALS:

- ☐ CABLE ☐ WHITE POLYDAC ROPE
☐ BLUE POLY STEEL ROPE ☐ KERNMANTLE ROPE

LENGTH: _____

DIAMETER: _____

LABELS & MARKINGS	PASS	FAIL	NOTE
LABEL (INTACT & LEGIBLE)	☐	☐	☐
APPROPRIATE ANSI / OSHA / CSA MARKINGS	☐	☐	☐
INSPECTIONS ARE CURRENT / UP-TO-DATE	☐	☐	☐
DATE OF FIRST USE	☐	☐	☐

HARDWARE	PASS	FAIL	NOTE
CONNECTOR (SELF-CLOSING & LOCKING)	☐	☐	☐
HOOK GATE / RIVETS	☐	☐	☐
CORROSION	☐	☐	☐
PITTING / NICKS	☐	☐	☐

MATERIAL (ROPE OR CABLE)	PASS	FAIL	NOTE
BROKEN / MISSING / LOOSE STITCHING	☐	☐	☐
TERMINATION (STITCH, SPLICE, OR SWAGE)	☐	☐	☐
EXCESSIVE WEAR (FRAYING OR BROKEN STRANDS)	☐	☐	☐
CUTS / BURNS / HOLES	☐	☐	☐
KINKS	☐	☐	☐
SEPARATION / BIRD CAGING	☐	☐	☐

SHOCK PACK (IF PRESENT)	PASS	FAIL	NOTE
COVER / SHRINK TUBE (DON'T CUT OR REMOVE)	☐	☐	☐
DAMAGE / FRAYING / BROKEN STITCHING	☐	☐	☐
IMPACT INDICATOR (SIGNS OF DEPLOYMENT)	☐	☐	☐

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LIFELINE

LABEL &
TERMINATION

CONNECTOR



LABEL & SHOCK ABSORBER

TERMINATION

LIFELINE

ROPE GRAB DEVICE

EXTENSION LANYARD

CONNECTOR

