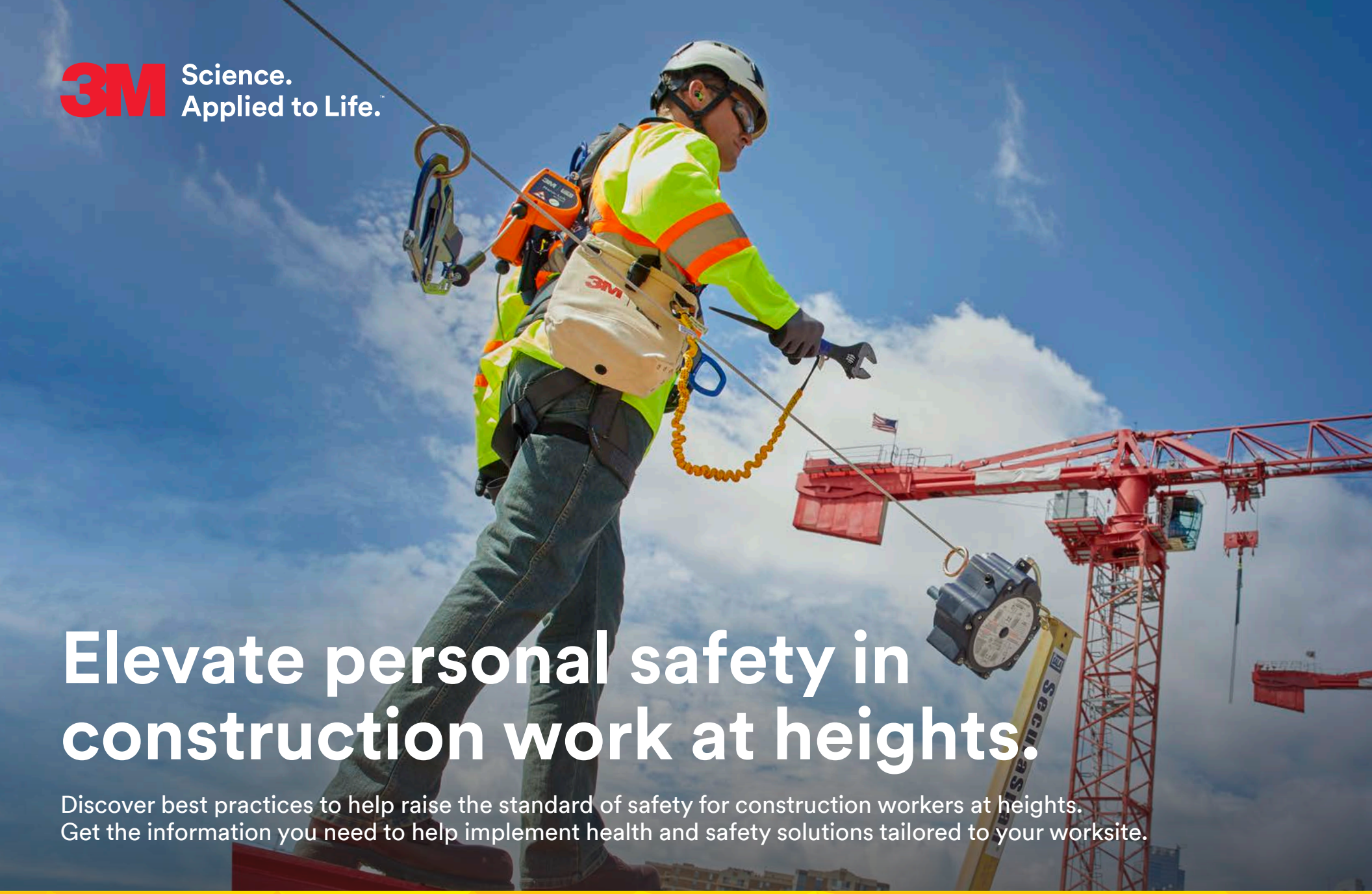


3M Science. Applied to Life.™

# Elevate personal safety in construction work at heights.

Discover best practices to help raise the standard of safety for construction workers at heights.
Get the information you need to help implement health and safety solutions tailored to your worksite.

**Every day, nearly one million workers globally suffer a workplace accident, and close to 6,300 people will die due to an occupational accident or disease—including many in the construction industry.[1] Through collaboration and science, we believe that together we can help change that.**

# Construction Safety. Backed by Science.

Head impact and eye injuries. Hearing and respiratory hazards. Falls from height and dropped objects. Construction workers face all of these and more day in and day out, so they rely on integrated safety and health solutions from 3M to help keep them protected and comfortable.

Our approach goes well beyond providing quality personal protective equipment. With knowledgeable industry experts committed to developing worker-inspired innovations, our team delivers new technology and in-depth training that can make a measurable impact on worker health and safety.

**Technical service/application engineers and regulatory specialists worldwide**

**Countries with local standards professionals**

**3,000+**
**Active patents on safety technologies**

**100+**
**Training professionals & 15 training centers globally[2]**

# Working at Height

As we've established, working in construction can be dangerous if you're not careful and protected. This is especially true when working at height where there's absolutely no room for error.

You are considered to be "working at height" if you are working in any place above another level where a person could fall causing injury. This includes working on a ladder, scaffolding, flat or sloped roofs, near an edge or an opening in a floor or wall and many, many more.

**You are working at height if you are:**

- Above ground/another level
- Could fall from an edge
- Near an opening or fragile surface

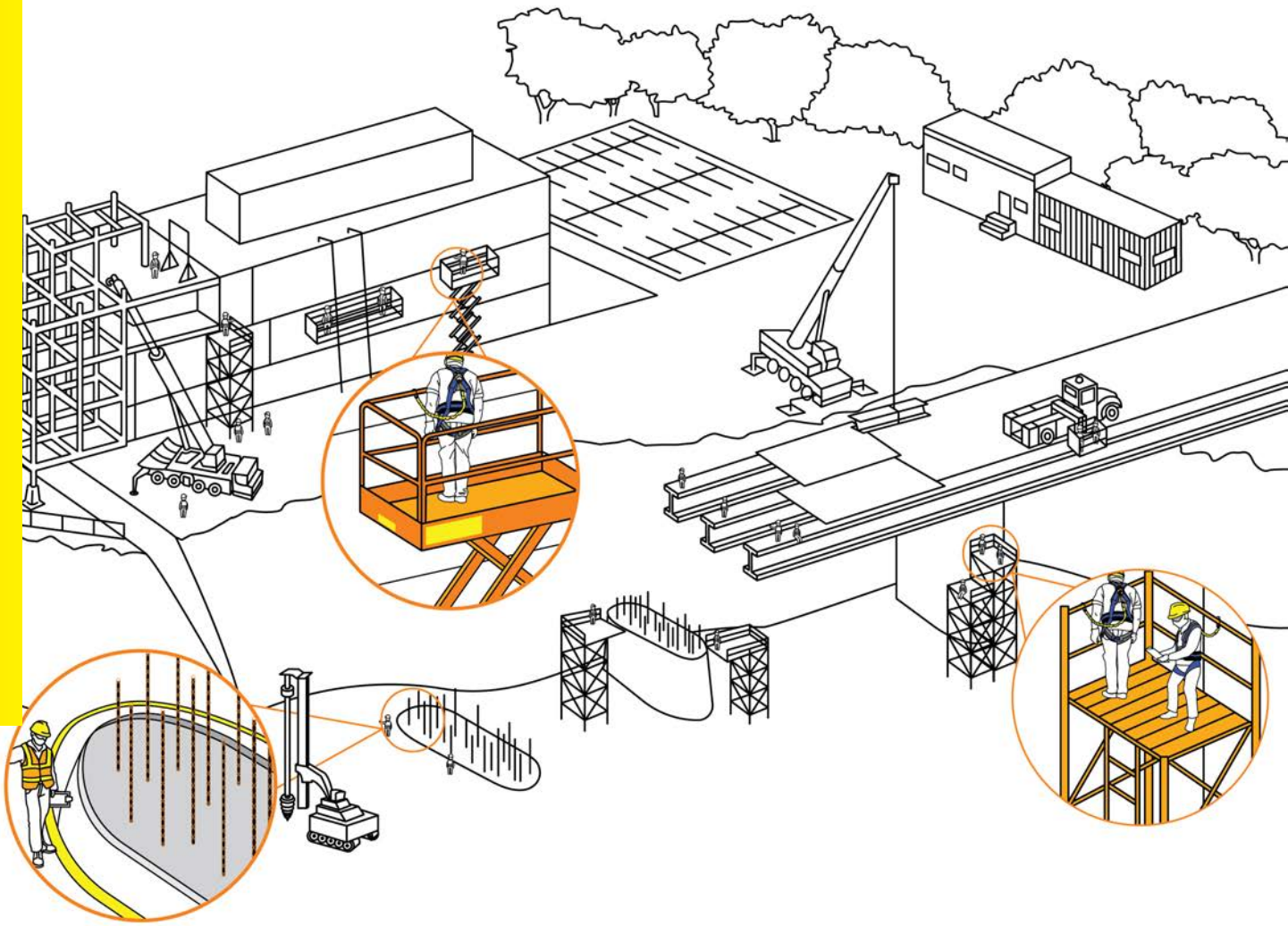
There are key challenges of working at heights: leading edge – sharp edges, fall clearance, and dropped objects. Whether conducting a hazard assessment or developing a comprehensive fall protection plan, thinking about the key challenges before the work begins will help to prevent falls. Help elevate personal safety in construction work at heights by discovering best practices to help raise the standard of safety for construction workers at heights.

This eBook will walk you through the information you need to protect yourself and your crew. We'll cover the hazards workers at height face, best practices and suggest the right PPE for working on reinforced concrete construction applications at heights, mobile elevating work platforms and scaffolding.

# Table of Contents

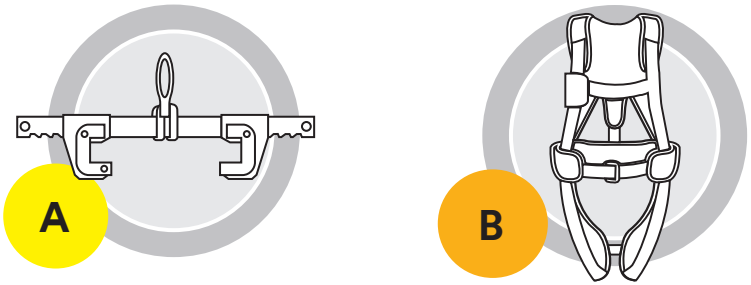
Use the following pages to explore construction hazards, best practices and suggested PPE for each of your employees. It's important to remember that PPE should be considered the last line of defense in construction safety and health, as engineering controls (physical workplace changes) and administrative work practice controls should be established first to protect workers. When safety for employees who work at heights is a priority, everyone on your team stands to benefit.





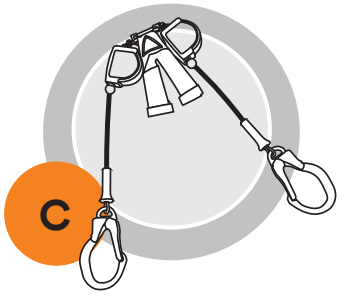
# The ABCs of Fall Protection

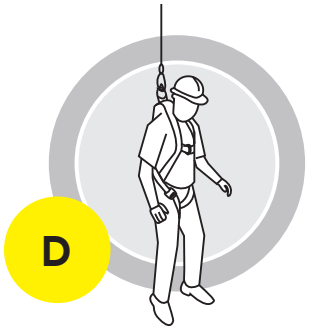
With over 20,000 products designed for the specific needs of many industries with work at-height hazards, we can help find the combination of anchorages, body support and connector solutions to meet the requirements of many applications in the construction industry.

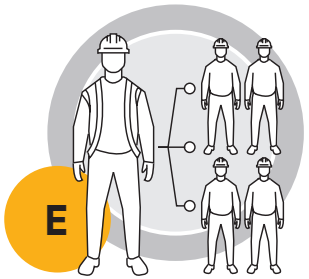


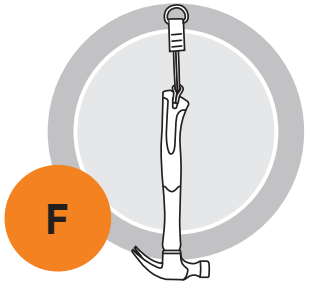







## A Anchorage

This is a secure point of attachment on the structure for a personal fall arrest system (PFAS). Anchorage connectors vary by industry, job, type of installation and structure. They must be able to support the intended loads and provide a sufficient factor of safety for fall arrest. In the US for example, anchorage connectors must provide a secure point of attachment for a complete personal fall arrest system, and must be capable of supporting a load of 5,000 lbs. (22kN) or of meeting the Occupational Safety and Health Administration's (OSHA) criteria of a 2 to 1 safety factor.

## B Body Support

Harnesses distribute fall forces over the upper thighs, pelvis, chest and shoulders. They provide a connection point on the worker for the personal fall arrest system.

## C Connectors

Devices such as self-retracting lifelines or energy-absorbing lanyards connect a worker's harness to the anchorage.

## D Descent and Rescue Devices

These are used to raise or lower a fallen, injured worker to safety or retrieve him from a confined space.

## E Education

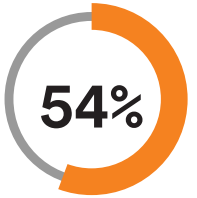
It is essential for employees and employers. We offer a variety of training and consultative services to fit your needs.

## F Fall Protection for Tools

These solutions help make work environments safer and more productive by reducing dropped object incidents.


**of construction industry deaths in the United States involve falls[3]**


**of fatal accidents in the United Kingdom occurred with people working from height[4]**




**of US fall deaths in construction were workers with no fall arrest system[3]**

# Reinforced Concrete Construction Applications at Heights

## Hazards in Steel Tensioning, Rebar, Cage Work and Concrete Formwork

As populations grow, countries are investing in building and maintaining infrastructure. Infrastructure projects include buildings, bridges, tunnels, roads, utilities, and many other civil construction projects. According to OSHA, the construction industry uses reinforced concrete in building many types of commercial, industrial and residential structures.[5] Many types of structural components such as slabs, walls, beams, columns and foundations may be constructed in this manner. Reinforced concrete is a type of concrete that requires reinforcing steel bars ("rebars"), reinforcement grids, plates, steel tendons, fibers or other material to increase its tensile strength.

From buildings and bridges to roadways and more, rebar, rebar cages and concrete formwork play a critical role in structural integrity for a wide range of civil construction projects—but their unique designs can pose significant hazards to nearby workers if the proper work safety protocols are not followed. Every year, OSHA records fatalities involving accidents involving rebar, sometimes including impalement from a fall or dropped rebar.[6]

In addition, collapses or failures of reinforcing steel cages can occur with little warning—posing a threat of being crushed to those climbing on them as well as those working below or around them.

During every stage of reinforced concrete construction, from rebar cage fabrication to assembly and vertical positioning of concrete formwork, workers face risks specific to reinforced concrete construction tasks. While working at height, a worker's focus may be on the task at hand rather than potential job dangers, so an intimate familiarity with the unique risks associated with rebar, rebar cage and concrete formwork is the first step in developing an effective safety plan.

Workers may be required to step on foundational rebar and climb up or navigate around vertical rebar cages both on the ground and at height to perform a variety of tasks. While doing so, they are at risk for slips, trips and falls from height. Depending on the height and location of the rebar or cage, falls can occur due to being on a collapsing vertical rebar structure, improperly anchoring while work positioning or even tripping on foundational rebar or scraps while at height.

While structural collapses and falls may be among the more apparent hazards for workers working with rebar at heights and in concrete formwork construction, any of these scenarios involving rebar work can threaten the wellbeing of a construction crew:

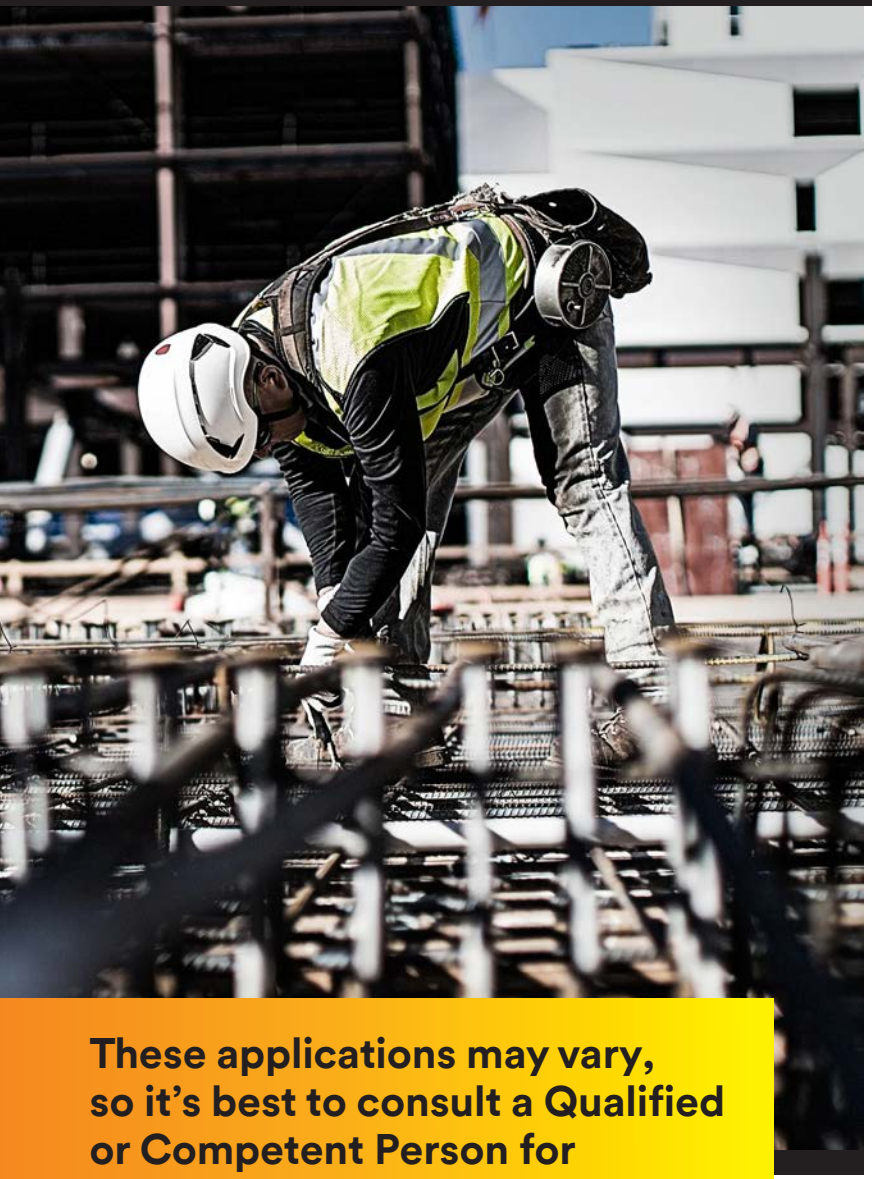
- Falling from heights onto exposed, protruding rebar, which can cause impalement
- Individual rebar falling from height and striking a worker
- Tools and other objects dropped by workers from vertical rebar
- Objects falling from platforms adjacent to vertical rebar
- Strikes to the head from protruding rebar
- Protrusive footing rebar blocking walking spaces and leading to trips and falls
- Rebar scraps on a jobsite leading to trips and falls
- Formwork pins protruding from low levels that can lead to injuries

While similar hazards exist at ground level, reaching and rescuing injured workers at height is often more challenging and time-consuming.

Once a rebar cage is erected, rebar workers, rod busters and iron workers often scale the structure to continue work at heights like cutting, reinforcing and shaping the bars, and installing fasteners and anchor points prior to concrete form installation. During these tasks, workers may be exposed to other hazards including:

- Arc burns from welding
- Foreign body injuries to eyes from flying particles and sparks
- Inhalation of contaminants from cutting and grinding
- Cuts from rebar binding wire

As a best practice, use a personal fall arrest system in conjunction with work positioning system.



**These applications may vary, so it's best to consult a Qualified or Competent Person for selection of a proper anchorage connector when working on steel and rebar systems.**

Reducing rebar cage work injury and fatality hazards starts by creating a culture of safety. Take a proactive approach to safety protocols to demonstrate your commitment to protecting your workers. When you take safety seriously, your team is likely to follow in your footsteps.

Beyond structural planning, there are many precautions construction teams can take to maximize their rebar and cage work safety at heights. Some of the most important considerations can help reduce the chance of harmful falls from elevated work areas:

- Train employees to recognize the presence of hazards when working on or around rebar
- Provide workers with the appropriate personal fall arrest systems (PFAS) and ensure they have been trained to use them
- Develop a rescue system to respond to falls
- Prioritize correct procedures when using work positioning system equipment
- Maintain and inspect all safety equipment regularly
- Avoid climbing overhanging rebar[8, 9]

These applications may vary, so it's best to consult a qualified or Competent Person for selection of a proper anchor when working on steel and rebar systems.

Remaining alert of one's surroundings can make the difference between life and death on a construction site. Every worker should know how to prepare and protect themselves from falls, and from objects that may fall. Workers must also account for the tripping hazards that can lead to a fall, along with the objects they could land on in the event of an accident:

- Remove scrap metal to prevent trips and falls
- Cap all rebar that could be in the path of a fall[10]
- If rebar caps are not available, bend the rebar over
- Always keep a safe distance from rebar being hoisted
- Exposed rebar should receive a steel-reinforced cap, even if it's horizontal

Safely accessing rebar and cage worksites is as important as any other construction safety process. Consider using a work platform, scaffold or elevating work platform to reach a rebar work area, if feasible. Climbing rebar may seem like the easier option, but it only takes one fall to hurt a worker and delay a project's progress. Additionally, there should be restrictions on access to the areas below rebar and cage work at heights. Again, every worker should be aware of their surroundings.

For personal fall arrest connection applications in rebar cage work and steel tensioning, in addition to SRLs with rebar snap hooks (see connecting device section below), other anchorage connection options may include products such as anchor straps, beam clamps or other approved anchorage connectors.

## A Anchorage Connector

**3M™ DBI-SALA® Fixed Beam Anchor**
Compact and lightweight design. Installs onto 12 in. to 36 in. wide I-beam flange (30.5-91.4cm) up to 1/2" to 2-1/2" thick (1.3-6.3cm).

## B Body Support

**3M™ DBI-SALA® ExoFit™ X100 Comfort Construction Weight Distribution Harness**

This harness is designed with high-quality components that have been developed to enhance the harness's safety and comfort while working at height on your job site. The X100 comfort harness is built with 6,000lb polyester webbing, nylon/polyester hybrid comfort padding and robust alloy steel hardware. The anti-slide back D-ring plate design helps reduce dorsal D-ring slide and enables a convenient adapter location to connect personal SRLs. Select configurations are also available with exclusive weight distribution systems to help reduce shoulder strain and fatigue.

## C Connecting Device

**3M™ DBI-SALA® Nano-Lok™ Edge Twin-Leg Quick Connect Self Retracting Lifeline, Cable 3500227**
This SRL features a twin leg Quick-Connector and steel rebar lock hooks. These allow for anchorage connection to the rebar. The SRL is designed for ease-of-use and is ideal for direct connection to most harnesses. It locks quickly, stopping a fall within inches and providing more protection at low heights. In addition, tension is always kept on the lifeline, which reduces dragging, snagging and trip falls.

## D Descent Device

**3M™ DBI-SALA® Rollgliss™ R550 Rescue and Descent Device**
Super-tough nylon makes the rescue wheel lightweight and durable. The design helps to provide a better grip and control to access a fallen worker.

## F Fall Protection for Tools

**3M™ DBI-SALA® Parts Pouch**
Designed for small parts such as rebar tie wire, nuts, bolts, screws and nails. The innovative Parts Pouch traps objects inside, making it nearly impossible for them to fall out when working at height.

## Engineered Systems

***For rebar work at height:***

**3M™ DBI-SALA® SecuraSpan™ Pour-in-Place Horizontal Lifeline System**
Used to help protect workers operating in the horizontal plane who may not otherwise have continuous access to suitable anchorage points. These systems are often designed for use with shock-absorbing lanyards and self-retracting lifelines. Per OSHA 29 CFR 1926.502(d)(8), horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.

***For rebar work in steel tensioning:***

**3M™ DBI-SALA® EZ-Line™ Retractable Horizontal Lifeline System**
This temporary horizontal lifeline system is easy to use, install and dismantle with a built-in tension crank and indicator. The innovative retractable design eliminates large and bulky coils of cable that are difficult to set up, relocate and store. These systems are often designed to be used with shock-absorbing lanyards and self-retracting lifelines. All horizontal lifeline systems must be installed and used under the supervision of an OSHA defined qualified person.

## Respiratory Protection

Some rebar cages are welded. Consider respiratory protection designed for welding where exposure hazards dictate.

**3M™ Rugged Comfort Quick Latch Half Facepiece Reusable Respirator**

This reusable respirator has a resilient silicone faceseal, offering extended facepiece life. The adjustable head cradle and straps work together to offer an optimal fit, and the facepiece features our proprietary quick latch design, which offers an easy, one-hand touch drop-down mechanism for putting the facepiece on and taking it off while moving in and out of contaminated areas. Consider 3M™ Advanced Particulate Filter 2297, P100, with Nuisance Level Organic Vapor Relief for welding fumes and 3M™ Advanced Particulate Filter 2291, P100 for grinding applications.

**3M™ Particulate Respirator 8214**

This N95 particulate respirator is designed to help provide respiratory protection for certain non-oil particles in applications such as welding, soldering and other construction operations in which metal fumes may be present. The respirator incorporates 3M's proprietary technology with advanced electrostatically charged microfiber filter media, designed for ease of breathing when you need it the most. The proprietary 3M™ Cool Flow™ Exhalation Valve helps reduce heat build up inside the respirator to help keep the wearer more comfortable.

## Head, Eye and Face Protection

**3M™ SecureFit™ X5000 Series Safety Helmets**

Safety helmets are designed to help protect workers from small falling objects with the security of a chinstrap. This climbing-style helmet delivers all-day comfort without sacrificing security. Its suspension system incorporates exclusive patented Pressure Diffusion Technology to deliver comfort without compromise.

**3M™ U5B-ANSI Faceshield Holder for SecureFit™ Safety Helmet**

Features a unique system that allows faceshield replacement in seconds. It connects a variety of 3M™ faceshields to the 3M™ SecureFit™ Safety Helmet series. Made of high impact-resistant polycarbonate materials, our faceshields offer reliable protection against impact with versatile features. Consider pairing with the 3M™ Dual Coated Clear Polycarbonate Faceshield WCP96 or 3M™ Clear Polycarbonate Faceshield WP96 standard polycarbonate.

**3M™ SecureFit™ 500 Series Safety Glasses**

Eyewear features a contemporary lens design in a variety of lens tints and coatings, coupled with adjustable ratchet temples and 3M™ Pressure Diffusion Temple (PDT) technology to help provide comfortable pressure equalization.

## Welding Eye and Face Safety

**3M™ Speedglas™ 100 Welding Helmet**

The Speedglas 100 Black Helmet with Auto-Darkening Filter 100V is good for Stick, MIG and most TIG welding processes. User selectable dark shades 8 through 12 and viewing area of 1.7 x 3.7 in. It has three user-selectable sensitivity levels for reliable arc detection and has excellent optical quality. For additional head protection use with 3M™ Speedglas™100 Hard Hat Adapter and 3M™ Cap Style H-700 Series Hard Hats.

**3M™ Adflo™ Powered Air Purifying Respirator HE System with 3M™ Speedglas™ Welding Helmet 9100 MP**

This system includes respiratory protection, a hard hat, optional hearing protection and flip-up weld shield. The system can help protect the face from sparks and splatter, and the eyes from intense light during MIG, TIG and stick welding.

## Hearing Protection

**3M™ E-A-R™ Push-Ins™ Earplug**

The 3M™ E-A-R™ Push-Ins™ Earplugs have firm fitting stems to help with easier fitting  just hold the fitting stems to push the soft foam ear tips into the ear canals. No need to touch the ear tips, helping to keep the ear tips clean longer even if hands are dirty. Noise reduction rating (NRR) 28db. CSA Class AL.

**3M™ PELTOR™ Electronic Earplug**

Helps protect workers' hearing and can help promote auditory situational awareness and communications in challenging environments.

## Coveralls

**3M™ Disposable Protective Coverall, 4520**

Built for protection and designed for comfort, it features breathable back panels and an anatomical fit for enhanced wear, coverage and comfort while working.

After the rebar or rebar cage is constructed, concrete forms may be erected to hold the concrete in place as it is poured and cured. Concrete anchors may be placed in the concrete to create permanent anchors for future use or temporary anchors which may be removed when construction is complete. The process of mixing the concrete, pouring it, finishing it or repairing it, may involve many hazards. These include working at heights, leading or sharp edges, exposure to silica dust and other chemicals, noise, potential for foreign body eye injuries, bumps to heads and falling objects and debris. Consider the following PPE options for these applications:

## Anchors

***For aerial bridge and high-rise concrete formwork:***

**3M™ DBI-SALA® Concrete Anchor Strap**

This disposable strap provides a temporary anchorage on concrete forms and is easy to install and use. Loop slips over rebar, then concrete is poured over. When no longer needed, simply cut strap and discard.

**3M™ DBI-SALA® Concrete D-ring Anchor**

Simple, versatile concrete anchor for temporary or permanent applications. Rugged design for extended life and jobsite flexibility. Secured to concrete decks and columns, these anchors are lightweight and compact, providing a secure 5,000 lb. (22 kN) tie-off point for enhanced worker mobility on concrete construction sites.

## Connectors

***For aerial bridge and high-rise concrete formwork:***

**3M™ DBI-SALA® Nano-Lok™ Edge Twin-Leg Quick Connect Self Retracting Lifeline, Cable 3500227**

Backpack design stays tight to the harness and helps evenly distribute the unit's weights. When working amongst formwork structures, its impact-resistant housing provides durability.

## Engineered Systems

Our broad selection of horizontal lifelines offers significant advantages in safety and productivity and has been precision engineered for specific applications, including connection point, connection type and number of users, and rigorously tested to meet industry standards.

***For aerial bridge concrete formwork:***

**3M™ DBI-SALA® SecuraSpan™ Rebar/Shear Stud Horizontal Lifeline System**

***For aerial high-rise concrete formwork:***

**3M™ DBI-SALA® SecuraSpan™ Pour-in-Place Horizontal Lifeline System**

## Respiratory Protection

For dust, silica from concrete spraying or pouring, demolition, concrete form work and concrete finishing.

**3M™ Aura™ Particulate Respirator 9205+**

The lightweight, three-panel designed respirator helps provide quality, reliable and convenient respiratory protection. 3M's proprietary filter media, 3M™ Advanced Electret Media, filters dust and other particles, while allowing for easy breathing.

**3M™ Rugged Comfort Quick Latch Half Facepiece Reusable Respirator**

This reusable respirator has a resilient silicone faceseal, offering extended facepiece life. The adjustable head cradle and straps work together to offer an optimal fit, and the facepiece features our proprietary quick latch design, which offers an easy, one-hand touch drop-down mechanism for putting the facepiece on and taking it off while moving in and out of contaminated areas. For aerial concrete bridge formwork, pair with 3M™ Particulate Filter 2091.

**3M™ Versaflo™ Heavy Industry PAPR Kit TR-600-HIK**

This system features loose-fitting headgear that eliminates fit testing and can accommodate certain limited facial hair. Faceshields help provide eye and face protection, and hard hats additionally help provide head protection. In addition, employees with prescription safety eyewear can keep their glasses on under loose-fitting headtops.

## Head, Eye and Face Protection

Per US OSHA 29 CFR 1926.701(f) Personal protective equipment, no employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment. Consider the following options:

**3M™ SecureFit™ X5000 Series Safety Helmets**

Safety helmets are designed to help protect workers from small falling objects with the security of a chinstrap. This climbing-style helmet delivers all-day comfort without sacrificing security. Its suspension system incorporates exclusive patented Pressure Diffusion Technology to deliver comfort without compromise.

**3M™ U5B-ANSI Faceshield Holder for SecureFit™ Safety Helmet**

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**3M™ SecureFit™ 500 Series Safety Glasses**

Eyewear features a contemporary lens design in a variety of lens tints and coatings, coupled with adjustable ratchet temples and 3M™ Pressure Diffusion Temple (PDT) technology to help provide comfortable pressure equalization.

# Mobile Elevating Work Platforms (MEWPs)

Most MEWPs also have built-in guardrail systems, so you might think that fall protection is taken care of—but this is not the case.

In some jurisdictions, fall protection by guardrail only is an acceptable practice in a specific set of circumstances, for example, if its use complies with all three of the following conditions:

- The device being used is a scissor lift, operating on a firm, substantially level surface
- The MEWP manufacturer permits fall protection by guardrail only
- The worker is not required to exit the work platform at height.

However, regulatory compliance for work at height is merely a starting point. MEWPs are different from scaffolds and other work platforms; the major difference is that they are mobile. To truly help protect people from harm, personal fall protection is strongly recommended when using this equipment.

Falling over guardrails is the cause of many injuries and fatalities with MEWPs. Typically, falling over MEWP guardrails is caused by workers reaching out beyond the guardrail system because the MEWP cannot adequately reach the required work location, or the guardrail itself inhibits the work in some way. The fundamental cause is poor planning, and this leads some workers to inappropriately extend their vertical reach by standing on mid rails, or even stand and balance themselves on top rails. They may also try to extend their reach horizontally over top rails or in between top rails and
mid rails.

Falling while entering or exiting a MEWP is also a concern. In some instances, workers use MEWPs solely for access. Work may need to be performed on a roof, mezzanine or other platform with limited access, therefore requiring workers to transition from a MEWP onto another platform. Fatal falls can occur if the worker does not use a personal fall arrest system (PFAS) and maintain 100% tie-off, including having an appropriate fall arrest system to connect to on the roof before exiting the MEWP, or if the MEWP:

- Does not have a well-designed gate for ease of access/egress
- Is not situated in close proximity to the landing surface

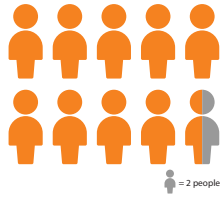
For more information about new ANSI/ASSP Z359.14-2021 Standard visit the Technical Bulletin.

Tip-over and ejection is another serious hazard. Generally speaking, a MEWP can become unstable if not operated on a firm, flat, level surface capable of withstanding all load forces imposed by the MEWP while operating.[11] Any of the following circumstances can also lead to potential instability:

- Moving the platform while elevated
- Exceeding the platform capacity
- Disregarding warning alarms and signals
- Using excessive manual force
- Hoisting materials with the MEWP
- Using the MEWP as a jack
- Altering, disabling, or overriding safety features/ devices (e.g., tilt alarm, limit switches)
- Failing to deploy stability-enhancing devices if the MEWP is so equipped (e.g., outriggers, stabilizers)
- Collisions with other vehicles, objects or structures
- Inadequate maintenance
- High wind speeds

Tip-overs are extremely dangerous not only to occupants of the MEWP, but also to other people in the vicinity. Ejection of an occupant or equipment, whether or not they are connected to an approved anchorage point with a PFAS or tool tethers, can be fatal or cause severe injuries. Although it is a matter of some contention, regulators and manufacturers generally deem it is safer to remain within the MEWP guardrail system than to be launched into the air. In other words, the occupants should remain as occupants at all times during operation.

**19**

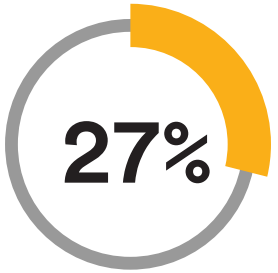



**fatalities related to mobile elevated work platforms occur each year in the global construction industry[12]**


**of elevating work platform deaths are from falls[13]**

**15%**

**of elevating work platform deaths are from electrocution[13]**




**of elevating work platform deaths are from overturns[13]**


As already noted, regulatory compliance is only a starting point. Both manufacturers and users of MEWPs have a responsibility to ensure that this equipment is operated as safely as possible.

Major manufacturers of MEWPs follow standards put forth by authorities like Canadian Standards Association and American National Standards Institute (CSA and ANSI) in designing their equipment, for instance, ensuring appropriate safety devices are in place. In terms of direction for users, manufacturers typically make general statements that users are responsible to conform to applicable national, territorial/provincial and local health and safety regulations. However, MEWP manufacturers do consistently cite specific safety precautions to be observed by MEWP operators, including those related to fall protection. Where additional fall protection is required, some MEWP manufacturers recommend using a fall restraint system to keep workers within the confines of the platform, and not exposing them to any hazards requiring a fall arrest.[14]

Organizations that employ this machinery can create site rules, such as making the use of a PFAS mandatory during operation. Many safety-conscious and high-performing organizations do this, placing an astute and appropriate emphasis on risk reduction to keep their people from harm. Furthermore, some have rules to help protect workers against ejection too.

**Make a plan for safety.**
Wherever you work, good planning well ahead of the task goes a long way. Assuming of course the task at hand cannot be practically executed from ground level or by other safer means, operational managers, line supervisors and safety professionals alike must consider if:

1. The MEWP selected for the task can adequately reach the working area, eliminating any need for workers to extend their reach beyond what the guardrail system allows by design
2. The worker is adequately protected by the guardrails as well as personal fall protection in the form of fall restraint, wherever possible, but at least fall arrest or PFAS
3. The worker can safely exit and re-enter the MEWP at height should the task require it and if permitted by the manufacturer, and always maintain 100% connection with a PFAS
4. Any worker required to operate a MEWP is adequately trained for the specific model they will operate to prevent causes of tip-over/ejection
5. Any worker required to occupy a MEWP, including an operator, is adequately trained in fall protection, to recognize all potential fall hazards
6. When the ANSI/ASSP Z359.14-2021 becomes effective, due to anchorage height locations in most MEWP units, the use of a Class 2 SRDs will be required.

Depending on the specific jurisdiction (country, province/territory, industry, employer location) where the work is taking place, there are several options for personal fall protection.
Learn more about fall protection solutions or register for training with 3M’s Fall Protection Group.

## New ANSI/ASSP Z359.14-2021 Standard Revision:

# Self-Retracting Lifelines

### Jobs change. Technology improves. Equipment evolves. All of these developments lead to changes in standards.

Whether you manufacture, distribute, purchase, design, install or use these systems, this new standard probably affects you. Here are some key changes that you need to be aware of. See our Technical Bulletin or contact customer service for more information.

How will the upcoming changes to ANSI/ASSP Z359.14-2021 affect you and your workers?

## New Definitions & Classes

Effective August 01, 2023 – Class A & B devices have been redefined as Class 1 and Class 2.

Class 1:


- For use on overhead anchorages AT or ABOVE the dorsal D-ring
- Subject to a maximum free fall of 2 feet

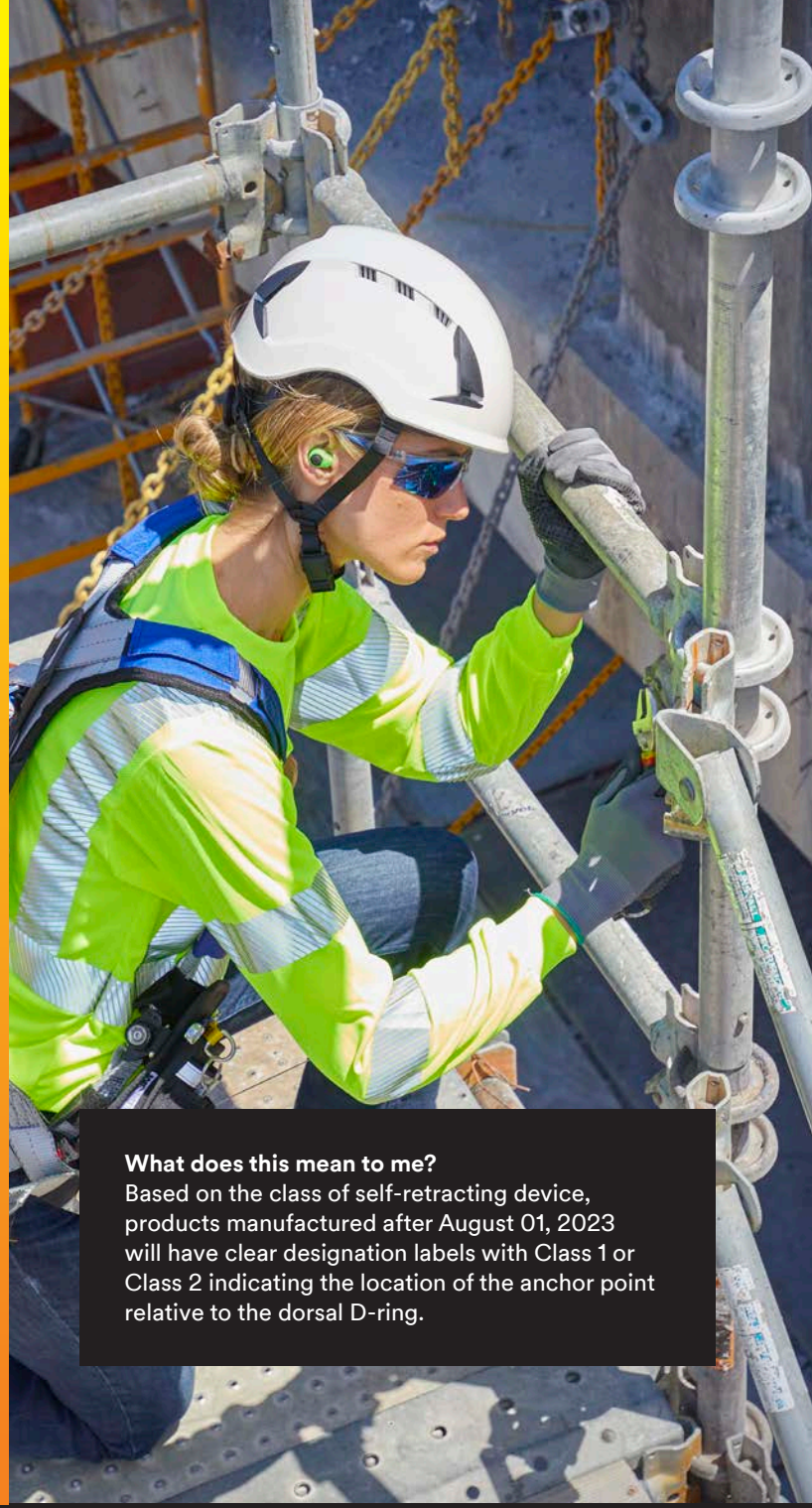
Class 2:


- For use when overhead anchorages are not feasible and anchorages are ABOVE or BELOW the dorsal D-ring
- Subject to a maximum free fall of 6 feet
- Leading Edge Rated

Additionally, Self-Retracting Devices (SRDs) have been designated into updated categories.

| | |
|---|---|
| SRL | **Self-Retracting Lanyard (or Lifeline)** |
| SRL-P | **Self-Retracting Lanyard, personal (New):** A single or twin model designed to be worn on the user's full body harness or alternatively mounted to an anchorage |
| SRL-R | **Self-Retracting Lanyard with integral rescue capability:** A SRL with integral means for assisted rescue via raising or lowering the rescue subject |

**Note:** the previous designation of SRL-LE is now redesignated as Class 2 SRD



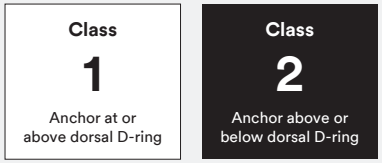
**What does this mean to me?**
Based on the class of self-retracting device, products manufactured after August 01, 2023 will have clear designation labels with Class 1 or Class 2 indicating the location of the anchor point relative to the dorsal D-ring.

## New Product Labeling

This standard revision requires several visual changes to the product labeling including:

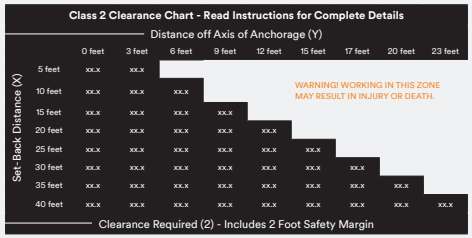
**Class Designation Icons:**

Based on the class of SRL, products manufactured after August 01, 2023, will have clear designation labels with Class 1 or Class 2 indicating the location of the anchor point.



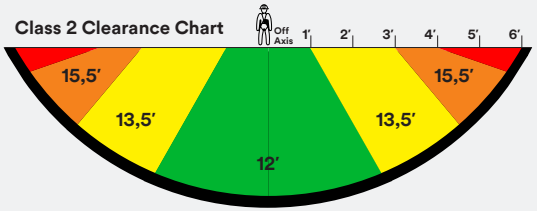

**Illustrated Fall Clearance Tables:**

Class 2 devices will include labels illustrating a fall clearance table and a diagram of the axis shown in the table. These labels will be on the product near the point of attachment to the body harness.




**Clearance Requirement Labels:**

Class 2 SRDs will include a fall clearance requirement label.




**Product Warning Card:**

For Class 2 SRDs (Leading Edge SRLs), a new orange warning card is now required to be provided. This card acknowledges that there are risks with leading edge applications and users should follow all manufacturer's instructions and warnings.

WARNING: This Class 2 self-retracting device, when attached to a foot-level anchorage, poses significant risk of injury. The user, the competent person and/or qualified person should all acknowledge that normal use of this device MAY NOT PREVENT A SERIOUS INJURY.

Failure to follow all manufacturer's instructions and warnings may result in serious injury or death.

- SRL Devices manufactured prior to August 01, 2023 can remain in service. All devices must meet the manufacturers' inspection requirements and be inspected by a competent person.
- SRL Devices manufactured prior to August 01, 2023 do not require labeling updates.

**What does this mean to me?**

There are now visual indicators that allow users to more easily select the right piece of Fall Protection equipment to safely do their job. Users of Self Retracting Devices are now able to reference a fall clearance calculation by referencing labeling on the product housing.

# New ANSI/ASSP Z359.14-2021 Standard Revision: Self-Retracting Lifelines

## Testing and Performance

Revised requirements apply to all SRDs where personal Fall Protection equipment is required.

This standard's change requires 3M to comply with increased testing procedures and requirements.

New testing methods and increased requirements help improve the robustness of our products.

## Classes


Former Class A and Class B devices have been redesignated as Class 1 and Class 2.
This change requires labeling on the product to indicate the required anchor point location.

| | Class 1 | Class 2 |
|---|---|---|
| Anchor Point (to d-Ring) | AT or ABOVE | ABOVE or BELOW |
| Max Free Fall Distance | 2 ft. | 6 ft. |
| Edge Rated: | No | Yes |

Self-Retracting Devices have been designated into categories:

**SRL** **SRL-P** **SRL-R**

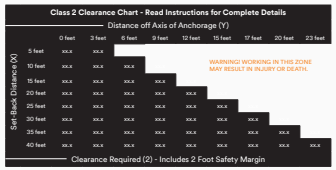
The previous SRL-LE classification has been removed and will now be designated as a Class 2 device.

## Labels and Instructions

Required visual changes to product labeling to allow users to more easily select the appropriate piece of Fall Protection Equipment.

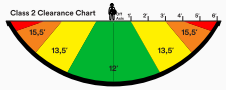
### What to look for after August 01, 2023

Fall Clearance Table

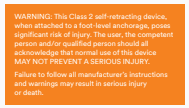



Class designation


Clearance Requirement Label




Product Warning Card




## Key Performance Changes

### Weight

Dynamic Performance Test Changes:
*Test weight increased from 282 lbs. to 310 lbs.*

Average Arresting Force:
*Increased from 900 lbs. to 1,350 lbs. (ambient) and 1,575 lbs. (in conditions)*

### Arrest Distance

Maximum Arrest Distance:
*Reduced from 54 in. to 42 in.*

Maximum Free Fall:
*Class 1: 2 ft. Class 2: 6 ft.*

Integral Energy Absorber Requirement:
*Required for Class 2 devices.*

### Strength & Force

Lifeline Webbing Strength Requirement:
*Increased from 4,500 lbs. to 5,000 lbs.*

Ambient Static Strength Requirements:
*Increased from 3,000 lbs. to 3,600 lbs.*

Minimum Tensile Breaking Strength:
*For Class 2 webbing & synthetic rope devices: 5,000 lbs.*

## What are some considerations for Safety Managers?

- If you are planning to anchor below the Dorsal D-ring of your full body harnesses, a Class 2 device is now required.
- Re-evaluate work procedures and SRL use in your applications:
  - Review potential clearance differences
  - Review anchorage strength requirements, as the average arresting force increased from 900 lbs. to 1,557 lbs.
  - Leading and sharp edge applications can shift from former SRL-LE to Class 2 rated products

## What devices will be required for use in Mobile Elevated Work Platforms (MEWP's)?

- Based on the design of MEWP platforms, Class 1 SRD's have to be anchored at or above D-ring height. Therefore, this application will require a Class 2 rated device for compliance. Additionally, the use of a work restraint system to support the MEWP personal fall arrest system is considered a best practice.

For more information see our technical bulletin.

There are many solutions available for MEWPs; here are some commonly used options to consider for use of personal fall arrest systems for work at height. Contact your 3M Fall protection representative for additional assistance.

## A Anchor

Most MEWP manufacturers will have appropriately identified anchorages installed for use with personal fall arrest systems.

## B Body Support

**3M™ DBI-SALA® ExoFit™ X300 Comfort Vest Safety Harness**

This harness is designed for those who refuse to compromise. The X300 harnesses are outfitted with high-quality components that have been developed to enhance the safety, convenience and performance for working at height on your job site. The X300 comfort harness is built with 6,000lb polyester webbing, robust nylon/polyester hybrid comfort padding with reflective 3M Scotchlite™ panels, and lightweight aluminum hardware. New technology in the Dorsal D-ring area helps workers make efficient connections and maintain a safe harness fit. Locking torso adjustment and quick-connect buckle options are available to optimize fit and worker experience. Select configurations are also available with exclusive weight distribution system to help reduce shoulder strain and fatigue.

## C Connecting Devices

For work in MEWPs, personal SRLs or shock-absorbing lanyards that limit travel to a minimum required to perform the work task should be considered as a best practice. As many MEWPs may have sharp edges, the use of leading edge or sharp edge rated products should be considered.

You may also consider the use of a fall restraint system as an alternate to a fall arrest system.

***For general elevating work platform use:***

**3M™ DBI-SALA® Nano-Lok™ Edge Quick Connect Self Retracting Lifeline**

This SRL is designed for foot-level tie-off and leading edge applications - often found in construction. This ANSI Z359.14 approved SRL is ergonomically designed for ease of use and is ideal for direct connection to most harnesses. The 3M™ DBI-SALA® Nano-Lok™ Edge Self-Retracting Lifeline's extremely compact and lightweight design is easily worn on the user's back and stays out of the way; it can also be used as a lanyard replacement.

***For elevating work platforms with leading or sharp edges consider:***

**3M™ DBI-SALA® Nano-Lok™ Edge Twin-Leg Quick Connect Self Retracting Lifeline, Cable 3500227**

Backpack design stays tight to the harness and helps evenly distribute the unit's weights. When working amongst formwork structures, its impact-resistant housing provides durability.

## D Descent Device

**3M™ DBI-SALA® Rollgliss™ R550 Rescue and Descent Device**

Used as an escape device when it is imperative to get to the ground as quickly as possible. Conveniently offered in multiple length options up to 500 ft. (152 m).

## F Fall Protection for Tools

**3M™ DBI-SALA® Parts Pouch**

Innovative self-closure system traps objects inside, making it nearly impossible for objects to fall out once placed in the bag. It makes it easy to retrieve objects while you work at heights since no opening or closing is necessary. Compatible with most tool belts.

**3M™ DBI-SALA® Hard Hat Tether**

Allows for easy, one-handed tethering of hard hats. The compact coil tether stays out of the way of the user, while a heavy-duty clip holds strong with a 4 lb. (1.8 kg) load rating.

## Head, Eye and Face Protection

***For aerial bridge and high-rise concrete formwork from a MEWP:***

**3M™ SecureFit™ X5000 Series Safety Helmets**

Safety helmets are designed to help protect workers from small falling objects with the security of a chinstrap. This climbing-style helmet delivers all-day comfort without sacrificing security. Its suspension system incorporates exclusive patented Pressure Diffusion Technology to deliver comfort without compromise.

**3M™ U5B-ANSI Faceshield Holder for SecureFit™ Safety Helmet**

Consider pairing with the 3M™ Dual Coated Clear Polycarbonate Faceshield WCP96 or 3M™ Clear Polycarbonate Faceshield WP96 standard polycarbonate.

***For general elevating work platform use:***

**3M™ Hard Hat with Uvicator**

Designed to help protect a worker's head from impact, these adjustable hard hats feature a four-point ratchet or pinlock suspension system to deliver a comfortable, secure fit that helps reduce slippage. A UVicator™ sensor lets the wearer know when to replace hard hat due to UV exposure and integrated vents help release heat buildup and allow air circulation for enhanced comfort.

**3M™ Faceshield Holder for Hard Hat H24M**

Designed to be compatible with 3M™ Hard Hats, the 3M™ Hard Hat Faceshield Holders help securely mount a faceshield to your hard hat. Compatible with a variety of 3M™ W-Series Faceshields that help protect against impact, splash and/or radiant heat. Consider pairing with the 3M™ Dual Coated Clear Polycarbonate Faceshield WCP96 or 3M™ Clear Polycarbonate Faceshield WP96 standard polycarbonate.

**3M™ SecureFit™ 500 Series Safety Glasses**

Eyewear features a contemporary lens design in a variety of lens tints and coatings, coupled with adjustable ratchet temples and 3M™ Pressure Diffusion Temple (PDT) technology to help provide comfortable pressure equalization.

## Welding Safety

**3M™ Speedglas™ 100 Welding Helmet**

The Speedglas 100 Black Helmet with Auto-Darkening Filter 100V is good for Stick, MIG and most TIG welding processes. User selectable dark shades 8 through 12 and viewing area of 1.7 × 3.7 in. It has three user-selectable sensitivity levels for reliable arc detection and has excellent optical quality. For additional head protection use with 3M™ Speedglas™100 Hard Hat Adapter and 3M™ Cap Style H-700 Series Hard Hats.

**3M™ Adflo™ Powered Air Purifying Respirator HE System with 3M™ Speedglas™ Welding Helmet 9100 MP**

This system includes respiratory protection, a hard hat, optional hearing protection and flip-up weld shield. The system can help protect the face from sparks and splatter, and the eyes from intense light during MIG, TIG and stick welding.

## Hearing Protection

**3M™ E-A-R™ Push-Ins™ Earplug**

The 3M™ E-A-R™ Push-Ins™ Earplugs have firm fitting stems to help with easier fitting  just hold the fitting stems to push the soft foam ear tips into the ear canals. No need to touch the ear tips, helping to keep the ear tips clean longer even if hands are dirty. Noise reduction rating (NRR) 28db. CSA Class AL.

**3M™ PELTOR™ Electronic Earplug**

Helps protect workers' hearing and can help promote auditory situational awareness and communications in challenging environments.

## Coveralls

**3M™ Disposable Protective Coverall, 4520**

Built for protection and designed for comfort, it features breathable back panels and an anatomical fit for enhanced wear, coverage and comfort while working.

# Scaffolding Work at Heights

Scaffolding gives construction teams access to work areas that would otherwise be difficult to reach. These structures are convenient and cost-effective, but their temporary nature exposes them to a different set of hazards than permanent structures. Whether completing structural maintenance, renovations or other types of construction work, safety remains a key consideration for anyone working on scaffolding systems.

Scaffolds are designed to support both people and materials, so it's important to account for both when assessing worksite hazards and risks. Additionally, the structural integrity of the scaffold itself impacts safety for workers and surrounding environments. From assembly to dismantling, meticulous care should be taken to follow your scaffold manufacturer's instructions, local regulations and jurisdictional requirements. Scaffolds should adhere to the manufacturer's recommended inspection guidelines or other inspection frequencies imposed by the employer, contractor, engineer or local authorities to ensure safety is maintained prior to use.

According to US OSHA, there are four main scaffolding hazards for construction work at heights.[15] These hazards can affect workers during the assembly, use and disassembly phases of a project.

**Common Hazards:**

**1 Falls**

Scaffolding without guardrails, and improperly installed guardrails, increase the risk of fall hazards for workers. The hazard becomes more dangerous when workers do not use an appropriate personal fall arrest system (PFAS) where hazards require. The method workers use to access the scaffold work platform may also impact their protection from falls.

**2 Scaffold Collapse**

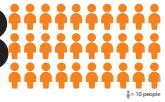
Erecting a scaffold correctly is critical for the safety of workers at heights. Proper construction methods can help prevent a collapse, so care should be taken to design the scaffold according to the project requirements. Account for the weight that the scaffold will have to support before anyone uses a scaffold. This should include the weights of materials, workers and the structure itself. Some jurisdictions require scaffolds to be designed by qualified individuals and inspected by competent persons before use.[16]

Other important hazard considerations include:

- Foundation stability
- Scaffold plank placements
- Tie-in requirements
- Position of the scaffold in relation to work area[17]

From the time scaffolding construction begins, worker safety depends on the plans you have in place. Account for collapse risks before anyone steps foot on the structure.

**298**



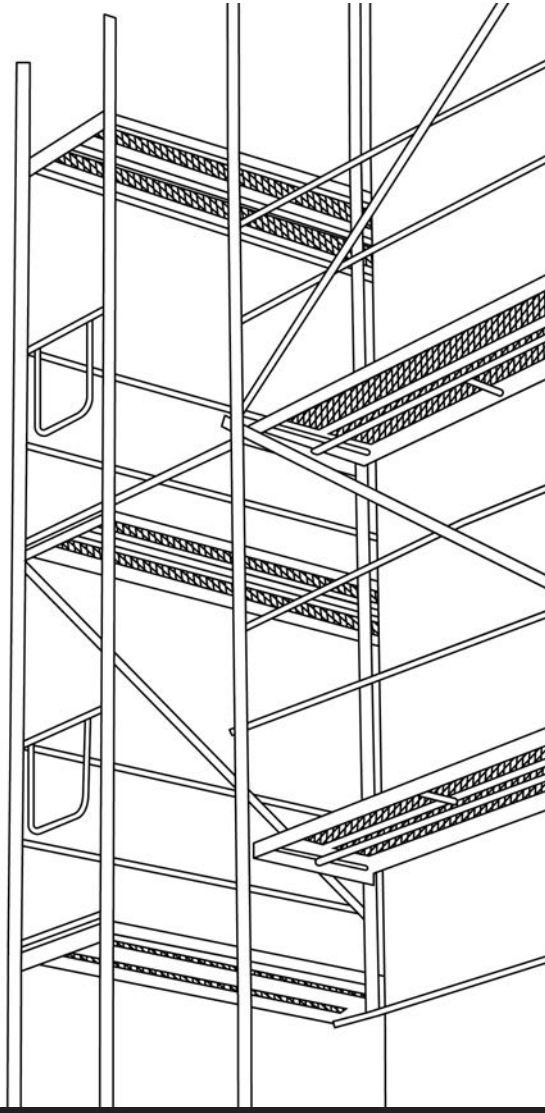
**fatalities between 2011 and 2016, due to falls from scaffolds in construction and 7,450 injuries[18]**


**of falls from height were falls from scaffolding in the Australian Construction industry between 2015 and 2019[19]**

**2nd**

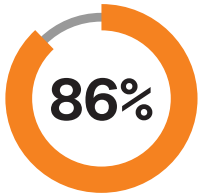
**leading cause of death in the workplace in France is falls from height, and the third leading cause of permanent disability and work stoppages[20]**


**of all workplace deaths in the UK were caused by falls in 2019[21]**



**7,000+**

non-fatal injuries in the United Kingdom were caused by falling objects[21]




of fatalities from scaffolds in the U.S. occurred in the Construction industry in 2018[22]

**#4**

cause of fatal US worker injuries is contact with objects and equipment in 2019[24]


of fatalities in the Australian construction industry between 2015 and 2019 were from falling objects.[19]

**16**

falling object recordables per day in the U.S. Construction industry in 2019[23]

**3 Struck by Falling Material**

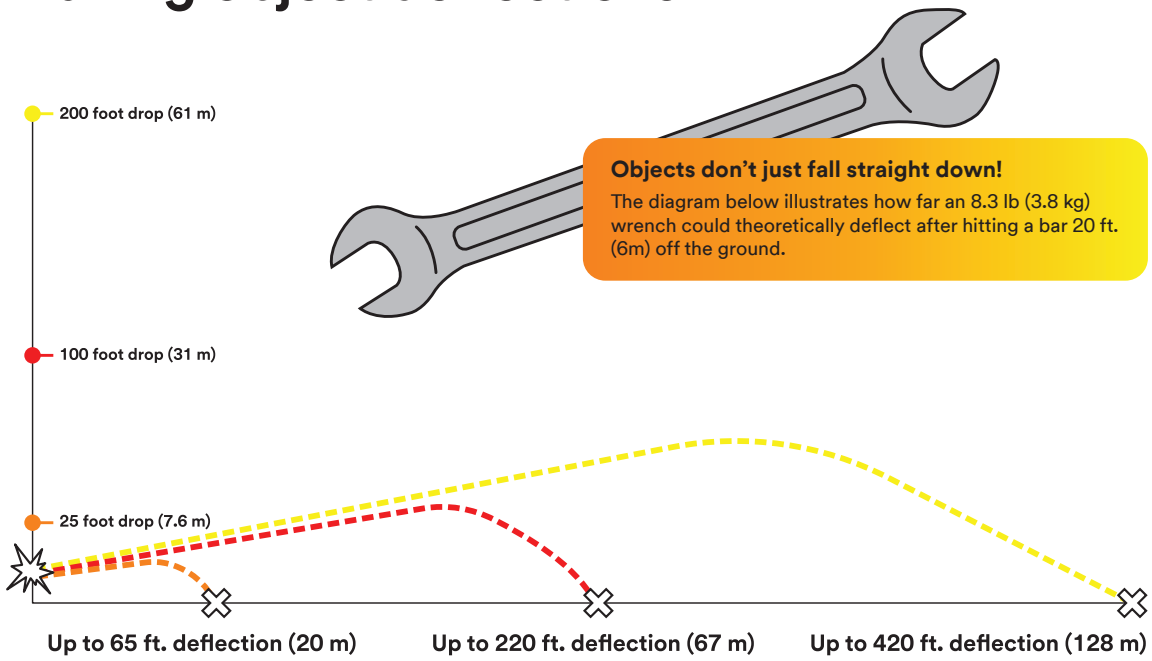
Objects such as tools and structural debris can easily fall towards construction site workers. These objects can strike the workers on the scaffold or those working below the structure. Depending on the weight and shape of the tool or object that is dropped, the forces of a direct impact can reach fatal levels—even when a hard hat is worn.

**4 Electrocution**

When working near overhead power lines, electrocution poses a significant hazard. Metal scaffolds pose the largest threat to worker safety, as the entire work area is conductive. Tools can also come into contact with power lines, leading to serious or fatal injuries. OSHA 29 CFR 1926.451(f)(6) describes the minimum clearance distance between power lines and scaffolding.

In addition to these hazards, a lack of proper safety training can lead to problems when working on scaffolding at heights. Serious injury or death can result from the improper construction or use of scaffolding equipment, so everyone who's involved with these responsibilities must understand the safety practices and procedures that are in place. Integrating the proper fall protection systems also requires an informed approach from a scaffolding competent person. As with every part of a construction project, awareness of the hazards can help minimize their potential impact.

## Falling object deflections

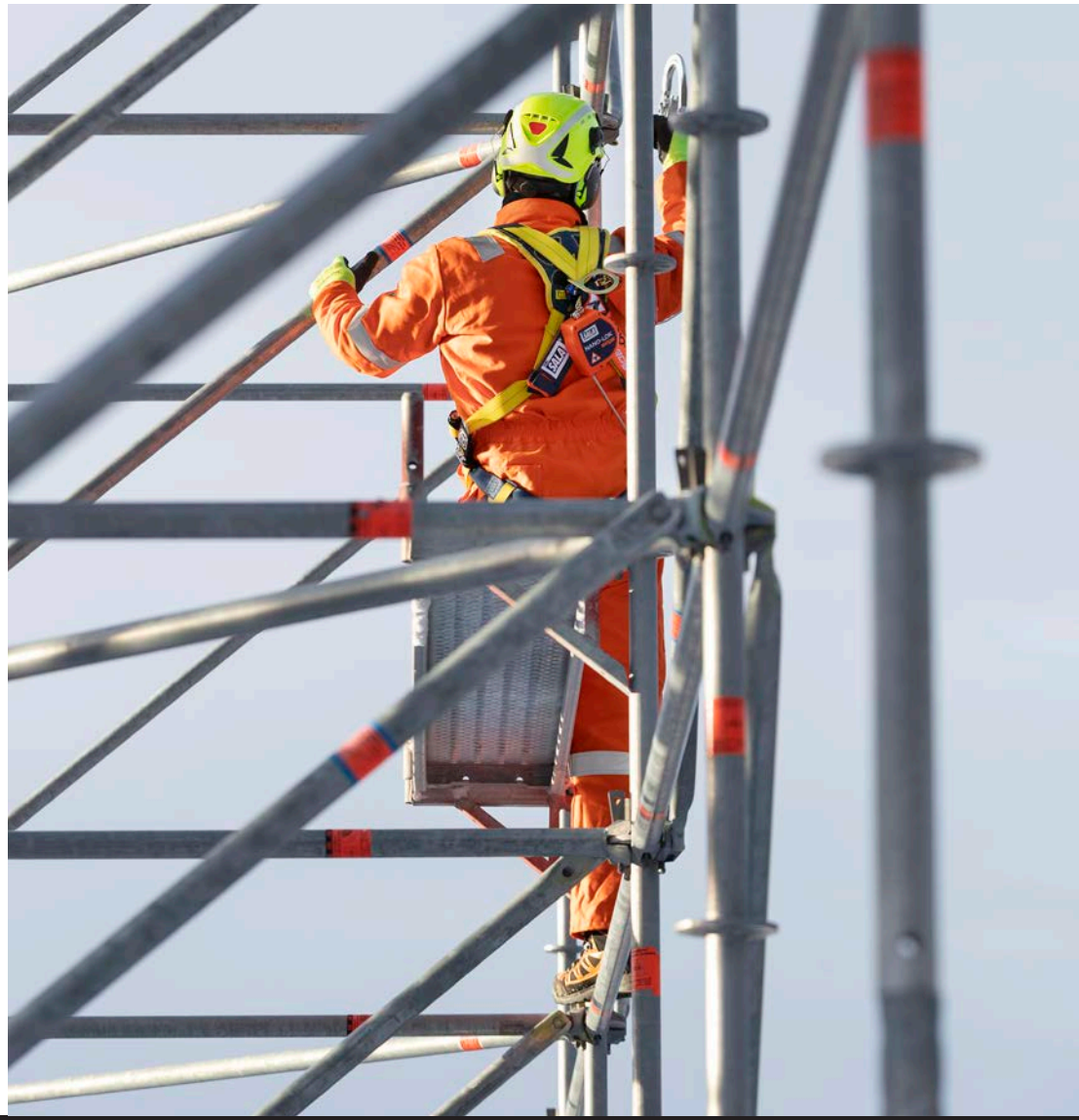


Leading by example is an effective way to help a construction crew prioritize safety during construction work. Before enacting new safety practices, provide background information that illustrates their importance. Educate your team on the hazards associated with scaffold work, and the measures they can take to protect themselves. Ensure that every construction worker is trained on the proper use of engineering controls such as guardrails and toe boards, any work practice controls such as properly accessing or carrying loads on the scaffold. Ensure that every construction worker understands the PPE they need and how to use it correctly. Mobility plays an important role in scaffold work, so help your team to add safety to every step they take.

**Assembly and Disassembly**

During the scaffold assembly and disassembly phases of a construction project, closely follow the scaffold manufacturer's guidelines. Makeshift solutions can lead to unforeseen safety hazards, and nobody knows the safest processes better than the manufacturer themselves. In addition, it's important to understand and follow local regulations that will help prevent a scaffold accident at a worksite. Some suggested practices may include:

- Assign a competent person to complete a scaffold inspection before beginning work
- Wait until necessary repairs are complete before working on scaffolding
- Develop a rescue plan in case a fall occurs
- To protect workers from falling debris, utilize[16]:
  - Toeboards
  - Guardrail systems
  - Debris nets
  - Screens
  - Barricades
  - Canopy structures
  - Catch platforms
  - Hard hats
- Use a personal fall arrest system when there are no scaffolding guardrails
- As a best practice utilize 100% tie-off personal fall arrest systems
- Educate workers on hazards associated with overhead power lines or other overhead circuits.
- Explain the electrical hazards that exist while erecting, moving or working on scaffolds.



Another essential safety practice is planning and implementing personal fall arrest systems for scaffold workers at heights. Every construction team member should be aware of the PPE that will help protect from fall hazards and how to properly use it. What's more, workers should understand the situations that call for personal fall arrest systems.

Per US OSHA, types of scaffolds that require PFAS typically include:

- Aerial lifts
- Boatswains' chair
- Catenary scaffold
- Crawling board
- Float scaffold
- Ladder jack scaffold
- Needle beam scaffold
- Self-contained adjustable scaffold supported by ropes
- Single-point and two-point suspension scaffolds[25]

A successful scaffold construction project is the result of careful planning. Some regulations require qualified individuals or competent persons to properly assess the worksite before each workday, as environmental factors will affect worker safety. From weather to ground conditions, every detail should affect how you approach scaffolding work at heights. Also take interference with other jobs or workers into account. There should be open communication between crew members about who will be working where every day. For additional information on safely working with scaffolding, please consult your local regulations and standards for additional guidance. Consider the ANSI/ASSP A10.8-2019: Scaffolding Safety Requirements and US OSHA 29 CFR 1926 Subpart L Scaffolds for additional information.

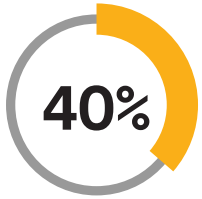
While scaffolding at heights presents many safety challenges, approaching projects with a comprehensive plan can improve protection for workers. Safety should be the top priority at every phase of a project, so be sure to demonstrate your commitment to safety protocols on a continuous basis. Construction workers are sure to appreciate an improved commitment to their safety, and every project will be more likely to come with fewer safety setbacks.


**A study of 114 workplace fall from height cases in the U.K. showed 98% missed critical risk management measures, such as:**

- **Proper risk assessment and mitigation**
- **Work platform and scaffolding guardrails or other engineering controls**
- **Training**
- **PPE[26]**

**11,000+**

**workers in India are estimated to die annually in construction accidents[27]**




**of fall-related fatalities in Australia from 2015-2019 occurred in the construction industry[28]**

**Every construction team member should be aware of the PPE that will help protect them from fall hazards and how to properly use it.**

# Suggested PPE Options

There are many solutions available for scaffolds; here are some commonly used options to consider for use of personal fall arrest systems for work at height. Contact your 3M Fall Protection representative for additional assistance.

## A Anchor

**3M™ DBI-SALA® Web Scaffold Choker Anchor**
Made of durable polyester construction and compact and lightweight design, this is an ideal anchorage device for scaffolding or piping.

## B Body Support

There are many body support options for scaffolding work at heights. Please contact 3M for more.

***For scaffolding assembly/disassembly:***

**3M™ Protecta® Construction Style Positioning Harness**
Features a fixed back D-ring to minimize workday readjustment and breathable shoulder/hip padding for added comfort during long periods of wear. Includes a durable and sturdy belt, tongue-buckle leg connection, quick-connect chest connection, and back and side D-rings.

***For general scaffolding use:***

**3M™ DBI-SALA® ExoFit™ X200 Comfort Vest Climbing/Positioning Safety Harness**
This harness is designed with high-quality components that have been developed to enhance the harness's safety, fit, and functionality while working at height on your job site. The X200 comfort harness is built with 6,000lb polyester webbing, nylon/polyester hybrid comfort padding and robust alloy steel hardware. Dorsal D-ring connections are faster and easier with the stand-up back D-ring. The anti-slide back D-ring plate design helps reduce dorsal D-ring slide and enables a convenient adapter location for connecting personal SRLs. There are also locking torso-adjustment and quick-connect buckle options available to help your team maintain a safe and comfortable harness fit.

***For applications requiring a boatswain chair:***

**3M™ DBI-SALA® ExoFit™ X300 Comfort Tower Climbing/Positioning/Suspension Safety Harness**
This harness comes equipped with integrated bosun chair.

## C Connecting Device

**3M™ DBI-SALA® Nano-Lok™ Edge Twin-Leg Quick Connect Self Retracting Lifeline**
No two construction sites are the same. That complexity is why we work closely with contractors to help us fine-tune our design on key products such as the 3M™ DBI-SALA® Nano-Lok™ Edge Self-Retracting Lifeline—used at sites where sharp edges are hazardous and foot level tie-off is needed. The available comfort grip connectors are ideal for scaffold use due to transverse loading and quick operation.
Watch video

## D Descent Device

**3M™ DBI-SALA® Rollgliss™ R550 Rescue and Descent Device**
Used as an escape device when it is imperative to get to the ground as quickly as possible. Conveniently offered in multiple length options up to 500 ft. (152 m).
Watch video

## F Fall Protection for Tools

***For scaffolding assembly/disassembly work:***

**3M™ DBI-SALA® Scaffold Wrench Holster with Retractor, Belt**
Quickly holster scaffold wrenches while working at height. Rear feed system allows retractor to tie off a scaffold wrench while staying out of the way.

**3M™ DBI-SALA® Hard Hat Tether**
Allows for easy, one-handed tethering of hard hats. The compact coil tether stays out of the way of the user, while a heavy-duty clip holds strong with a 4 lb. (1.8 kg) load rating.

***For general scaffolding use:***

**3M™ DBI-SALA® Dual Tool Holster, Belt**
Equipped with D-rings that are load rated for 5 lbs. (2.3 kg), this holster features a bottom drain vent that allows it to perform even in wet conditions.

## Head, Eye and Face Protection

***For scaffolding assembly/disassembly work:***

**3M™ Hard Hat with Uvicator**

Designed to help protect a worker's head from impact, these adjustable hard hats feature a four-point ratchet or pinlock suspension system to deliver a comfortable, secure fit that helps reduce slippage. A UVicator™ sensor lets the wearer know when to replace hard hat due to UV exposure and integrated vents help release heat buildup and allow air circulation for enhanced comfort. Pair this with a **3M™ DBI-SALA® Hard Hat Coil Tether** or a **3M™ Elastic Chin Strap X24**.

**3M™ Faceshield Holder for Hard Hat H24M**

Designed to be compatible with 3M™ Hard Hats, the 3M™ Hard Hat Faceshield Holders help securely mount a faceshield to your hard hat. Compatible with a variety of 3M™ W-Series Faceshields that help protect against impact, splash and/or radiant heat. Consider pairing with the 3M™ Dual Coated Clear Polycarbonate Faceshield WCP96 or 3M™ Clear Polycarbonate Faceshield WP96 standard polycarbonate.

***For general scaffolding use:***

**3M™ SecureFit™ X5000 Series Safety Helmets**

Safety helmets are designed to help protect workers from small falling objects with the security of a chinstrap. This climbing-style helmet delivers all-day comfort without sacrificing security. Its suspension system incorporates exclusive patented Pressure Diffusion Technology to deliver comfort without compromise.

**3M™ U5B-ANSI Faceshield Holder for SecureFit™ Safety Helmet**

Features a unique system that allows faceshield replacement in seconds. It connects a variety of 3M™ W-Series faceshields to the 3M™ SecureFit™ Safety Helmet series. Made of high impact-resistant polycarbonate materials, our faceshields offer reliable protection against impact with versatile features. Consider pairing with the 3M™ Dual Coated Clear Polycarbonate Faceshield WCP96 or 3M™ Clear Polycarbonate Faceshield WP96 standard polycarbonate.

**3M™ SecureFit™ 500 Series Safety Glasses**

Eyewear features a contemporary lens design in a variety of lens tints and coatings, coupled with adjustable ratchet temples and 3M™ Pressure Diffusion Temple (PDT) technology to help provide comfortable pressure equalization.

## Welding Safety

**3M™ Speedglas™ 100 Welding Helmet**

The Speedglas 100 Black Helmet with Auto-Darkening Filter 100V is good for Stick, MIG and most TIG welding processes. User selectable dark shades 8 through 12 and viewing area of 1.7 × 3.7 in. It has three user-selectable sensitivity levels for reliable arc detection and has excellent optical quality. For additional head protection use with 3M™ Speedglas™100 Hard Hat Adapter and 3M™ Cap Style H-700 Series Hard Hats.

**3M™ Adflo™ Powered Air Purifying Respirator HE System with 3M™ Speedglas™ Welding Helmet 9100 MP**

This system includes respiratory protection, a hard hat, optional hearing protection and flip-up weld shield. The system can help protect the face from sparks and splatter, and the eyes from intense light during MIG, TIG and stick welding.

## Hearing Protection

**3M™ E-A-R™ Push-Ins™ Earplug**

The 3M™ E-A-R™ Push-Ins™ Earplugs are designed for hearing protection on noisy construction jobs. Fitting stems help for an easier insertion of the earplugs even when wearing gloves and help keep the earplug clean for workers with dirty hands. No roll-down required–all it takes is a push to insert the soft foam eartip into the ear canal. The EARform™ eartip has a smooth surface to help it slide easily into the ear canal. Noise reduction rating (NRR) 28db. CSA Class AL.

**3M™ PELTOR™ Electronic Earplug**

Helps protect workers' hearing and can help promote auditory situational awareness and communications in challenging environments.

## Coveralls

**3M™ Disposable Protective Coverall, 4520**

Built for protection and designed for comfort, it features breathable back panels and an anatomical fit for enhanced wear, coverage and comfort while working.

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## Hearing and PELTOR

**⚠ WARNING**

These hearing protectors help reduce exposure to hazardous noise and other loud sounds. Misuse or failure to wear hearing protectors at all times that you are exposed to noise may result in hearing loss or injury. For correct use, consult supervisor and User Instructions, or call 3M PSD Technical Service in the USA at 1-800-665-2942.

**⚠ WARNING**

U.S. EPA specifies the NRR as the measure of hearing protector noise reduction. However, 3M makes no warranties as to the suitability of the NRR for this purpose. 3M strongly recommends personal fit testing of hearing protectors. Research suggests that users may receive less noise reduction than indicated by the attenuation label value(s) on the packaging due to variation in fit, fitting skill, and motivation of the user. Refer to applicable regulations or guidance on how to adjust attenuation label values. It is recommended that the NRR be reduced by 50% to better estimate typical protection.

## Eye Protection

**⚠ WARNING**

These eye or face protection products help provide limited eye and face protection. Misuse or failure to follow warning and instruction may result in serious potential injury, including blindness or death. For proper use, selection and applications against flying particles, optical radiation and/or splash see supervisor, read User Instructions and warning on the package or call 3M PSD Technical Service in the USA at 1-800-243-4630. In Canada, call 1-800-267-4414. 3M PSD products are for occupational use only.

## Head Protection

**⚠ WARNING**

3M Head and Face Products provide limited protection only. Misuse or failure to follow warnings and User Instructions may result in serious personal injury or death. For proper use, see supervisor, User Instructions, or call 3M Personal Safety Division Technical Assistance at 800-243-4630.

## Fall Protection

**⚠ WARNING**

Compliant fall protection and emergency rescue systems help prevent serious injuries associated with fall events. Users must read and understand the User Instructions provided with the product, and must be properly trained by their employers in the safe use of these systems before using them, per OSHA 1910.140 and 1926.503 or applicable local standards. Misuse or failure to follow warnings and instructions may result in serious personal injury or death. For proper use, see supervisor, User Instructions, or call 800-328-6146 (Opt. 1).

## Respiratory Protection

**⚠ WARNING**

These respirators help to protect against certain airborne contaminants. Before use, the wearer must read and understand the User Instructions provided as part of the product packaging. A written respiratory protection program must be implemented meeting all the requirements of OSHA 1910.134 including training, fit testing and medical evaluation. In Canada, CSA standards Z94.4 requirements must be met and/or requirements of applicable jurisdiction, as appropriate. Improper use may result in sickness or death. For correct use, see supervisor and User Instructions, or call 3M PSD Technical Service in USA at 1-800-243-4630 and in Canada at 1-800-267-4414.

## Welding Safety

**⚠ WARNING**

This product is designed to help protect the wearer's eyes and face from harmful radiation including visible light, ultra-violet radiation (UV), infra-red radiation (IR), sparks and spatter resulting from welding processes. These products must be used only by qualied persons who are properly trained in their use and maintenance. Misuse may result in permanent eye injury and vision loss. Always wear ANSI Z87.1 compliant safety spectacles in addition to any welding helmet. For correct use, see supervisor and User Instructions, or call 3M PSD Technical Service in U.S.A at 1-800-243-4630 and in Canada at 1-800-267-4414.

## Coveralls

Final determination as to the suitability of these products for a particular situation is the employer's responsibility. This information is subject to revision at any time. Always read and follow all User Instructions supplied with your 3M™ Protective Coveralls in order to ensure correct operation. If you have any questions, contact 3M Technical Service.

3M

**Personal Safety Division**
3M Center, Building 235
St. Paul, MN 55144-1000

**For more information:**
In U.S.:
Technical Assistance 1-800-243-4630
Customer Service 1-800-328-1667
3M.com/workersafety

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