

WORKPLACE
Material Handling & Safety



Construction Safety: Protect Your Workers

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Contents

- 3** Respiratory Hazards in Construction Work
- 5** IH Competent Persons and Controls for Construction Health Risk Reduction
- 7** Top OSHA Workplace Violations – Fall Protection, Construction – Regulation 29 CFR 1926.501
- 9** Gorbels and Fall Protection
- 11** How to Prevent the Most Common Safety Hazards in Road Construction
- 12** Safety, Quality, & Comfort
- 15** Four Steps to Prevent Hearing Loss in Construction
- 17** Hand Protection in Construction and Manufacturing Environments
- 19** Achieving Unobstructed Vision on an Increasingly Masked Jobsite
- 22** Big Data: Transforming Construction, One ERP at a Time
- 24** Fall Protection Anchorage: Are You Anchoring Properly?
- 27** A Site-Specific Program to Prevent Falls
- 29** 5 Ways To Improve Project Safety



Respiratory Hazards in Construction Work

Construction can be a pretty dirty business. Over 2 million workers in the U.S. have regular exposure to dusty conditions at work. Approximately 90% of those 2 million are employed in the construction industry.

A commercial construction project subjects personnel to a wide variety of conditions, including noise, vibration, weather, uneven working surfaces and numerous respiratory hazards. Injury and illness data indicate a direct correlation between elongated work in the construction industry and future health-related issues for those that work in the trades.

Let's break up a typical interior building renovation project into two basic phases—demolition and new installation—and examine the general activities and variety of respiratory hazards that can be present in each phase.

DEMOLITION

During the demolition phase, trade workers can expect to be exposed to an abundance of airborne particulates that can occur during the breaking, crushing or chipping of existing materials to make way for new materials. Common activities in a demolition project include:

- **Concrete removal:** concrete mixes contain large amount of quartz (silica) and limestone
- **Drywall removal:** gypsum exposure possible
- **Carpet removal:** carpet fibers and general dust accumulated in the carpet
- **Ceiling tile removal:** possible exposure to cellulose (The tops of ceiling tiles always contain dust, especially if the metal deck above has sprayed on fireproofing, which commonly contain slag wool and Portland cement.)
- **Steel removal using a torch:** lead fumes and other metal fumes
- **Insulation removal:** fiberglass and rockwool

NEW INSTALLATION

The installation phase contains plenty of opportunities for exposure to airborne hazards. Typical activities in this phase include:

- **Cutting wood:** sawdust generation
- **Installing drywall:** gypsum dust
- **Sanding joint compound:** quartz, limestone, perlite dust
- **Daily housekeeping (sweeping):** general nuisance dust and whatever debris falls to the floor during installation activities
- **PVC Pipe installation (primer and solvent cement):** methyl ethyl ketone, acetone, cyclohexanone
- **Tile mastic:** limestone, quartz, volatile organic compounds (VOCs)
- **Metal pipe installation:** soldering fumes
- **Duct sealant:** VOCs
- **Latex (water-based) paint application using an airless sprayer:** polyvinyl acetate, titanium dioxide.

HOW MUCH IS TOO MUCH?

As you can see, there are plenty of opportunities for personnel on the site to inhale a wide variety of contaminants throughout the entire project. How many industries have the potential for these constant respiratory exposures (and in different settings and constantly changing environments) to exist day after day, year after year?

OSHA lists an 8-hour, time-weighted average exposure limit of 15mg/m³ for total dust exposure to Particulates Not Otherwise Regulated (PNOR) and a respirable dust exposure limit of 5mg/m³. Many of the particulate exposures a trade worker would commonly be exposed to fall under this standard. Even so, samples for total dust and respirable dust are not commonly collected during construction work.

Of the data that is collected, it indicates that tradespersons in general have total dust exposure well below OSHA levels. We should keep in mind that the total dust and respirable dust exposure limits set by OSHA are decades old. Silica exposure, which causes silicosis, a serious health condition which causes premature death, has gained some traction in the last 20+ years—for good reason. However, daily exposure to dusty conditions, as found every day in the construction industry, is not healthy—especially considering the synergistic effect of particulate inhalation and cigarette smoking, which is still fairly prevalent in the construction industry.

HOW TO REDUCE RISKS

So, what can be done? The use of wet methods during the demolition phase will absolutely reduce airborne particulate exposure for not just the demolition crew, but the

entire work site. Using water or water mist to reduce airborne concentration of dusts is possible but not always feasible. Issues include lack of availability, constant cleanup, freezing or icy conditions in cold weather, etc.

The next best option, utilizing negative air pressure, also significantly reduces airborne particulates. Containing a demolition project to be able to produce an adequate negative pressure environment is also possible—but again, not always feasible, because of logistical issues around creating the necessary airflows for contaminate reduction.

Using vacuums instead of brooms only has limited applicability. That leaves most projects in the position of combining an engineering control (such as water mist) with personal protective equipment (respiratory protection) to keep personnel safe.

The construction industry has struggled for many years with proper respiratory protection for the workforce. Complying with regulations is important, but gaining employee acceptance is everything. After being properly trained and fit-tested, if a tradesperson finds their respiratory protection to be uncomfortable; doesn't have the right look; or is extremely inconvenient, the likelihood that they will continue to wear that respirator falls dramatically.

The respirator of choice for the construction industry has been the N95 due to its light weight and availability. More important is the N95's high level of convenience due to its disposable nature. Case studies at workplaces that require moderate respirator use show the annual total cost of ownership (per wearer) for a disposable N95 mask is extremely high compared to the cost of re-usable, half-face air-purifying respirators fitted with HEPA cartridges. However, the culture of the construction industry leans towards the disposability of an N95, and that remains the standard.

The lack of availability of the N95 due to the COVID-19 pandemic has caused many tradespersons to wear inadequate or no respiratory protection. While half-face, air-purifying respirators with HEPA cartridges have been available during the pandemic, the overall culture of the construction industry does not support an instant change to re-usable respiratory protection.

Clouds of dust have been widely accepted as an effect of construction work. It's way past time to change the narrative. ■

Neil Webster, CSP, OHST, is the EHS Manager for DPS Group, a full-service engineering and construction management firm that specializes in the Life Sciences industry.



Case studies show the annual total cost of ownership (per wearer) for a disposable N95 mask is high compared to the cost of re-usable, half-face air-purifying respirators fitted with HEPA cartridges. (photo courtesy DPS Group)

IH Competent Persons and Controls for Construction Health Risk Reduction



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Safety has long been an important part of well-run construction projects, however historically the level of IH support has been far less. While it is common to see IH support in general industry it is not as common in construction. Recognition of occupational illnesses (or lack of) plays a large part of this. Another part is lack of clearer definition in the OSHA regulation [1926.20\(b\)\(2\)](#)

*Such programs shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by **competent persons** designated by the employers.*

The “competent persons” specified is all too often taken to be “safety” competent missing the “health” part in construction work. There is no definition that limits this to safety, in fact job site “competent persons” should be capable of recognizing safety AND health hazards. To fully meet this it may require different people with different competencies to be used. The lack of illness recognition and clear “competent person” definition can lead many companies to miss focusing on many of the health hazard aspects of construction work.

Most injuries (other than minor) typically manifest themselves immediately and can be easily tracked by the job site or project. Occupational illnesses are for the most part a different matter flying mostly under the radar.

Acute illnesses would likely manifest themselves during the shift making it easier to identify as

possibly work related. Even then though it may be considered a personal illness not due to something in the workplace (lack of recognition).

Chronic illnesses on the other hand manifest themselves over a long term like liver, kidney, neurological, cancer, and respiratory diseases. Many take decades to develop. Recognition is less likely that the illness could have been caused by occupational exposures rather than bad personal health issues. A linkage to a specific workplace and activities would not be as likely due to the passing of decades, great number of work sites and employers during that time. All of this makes it less likely illnesses will be identified and tracked like for injuries.

This makes it even more important to identify and control health risks on the jobsite. In Industrial Hygiene a core job function is exposure risk assessment and control. Due to the fast paced continually changing work environment a task-based exposure assessment is more frequently used for construction. Tasks presenting a higher risk potential should have controls established to ensure unprotected exposures do not exceed recommended levels (not specifying OSHA levels as most are seen as far too high for true health protection). Exposure health risk assessments and controls can be used as a leading indicator for health performance.

Worksites should have an Industrial Hygienist evaluate work activities and develop health risk

assessments for the different tasks anticipated on a jobsite. Control measures (PPE, work practice, engineering) should be incorporated into job instructions and made part of the daily “competent person” job inspections. Periodic reviews by an Industrial Hygienist should be done to verify they remain effective. Much of these recommendations are similar to what OSHA came out with in the silica regulation just being applied to a broader range of health hazards.

There are many good examples of controls available from organizations like NIOSH, CPRW, and OSHA (silica as an example) among others. To add to this the AIHA Construction Committee is developing additional control examples as a series of one page reference sheets. These will be available thru the AIHA website and made available for publication.

Task Activity Control Measures for Health Risk Reduction

- Task Activity:
- Health Risk:
- Control Measures:
- Verifications:
- Notes:

Visit us at <https://www.aiha.org>. ■



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Focus Four for Health

An Initiative to Address Four Major Construction Health Hazards

Guidance Document



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Raise awareness about health hazards in the construction industry

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Top OSHA Workplace Violations – Fall Protection, Construction – Regulation 29 CFR 1926.501

FALL PROTECTION, CONSTRUCTION

Regulation 29 CFR 1926.501

ENFORCEMENT FROM OCT 2018-SEPT 2019

Total citations 7,242

Total inspections: 7,039

Total proposed penalties: \$39,489,226

MOST FREQUENTLY VIOLATED OSHA STANDARD RANKING – Number 1

INDUSTRIES MOST OFTEN VIOLATING LOTO STANDARD:

- Special Trade Contractors \$35,3 Million (in proposed penalties)
- Construction of Buildings \$3.5 Million
- Merchant Wholesalers, Durable Goods \$203,085
- Heavy and Civil Engineering Construction \$151,595
- Administrative and Support Services \$33,552
- Repair and Maintenance \$32,771
- Waste Management and Remediation Services \$31,273
- Real Estate \$29,003
- Fabricated Metal Product Mfg. \$28,770
- Utilities \$19,383

HAZARDS: FALLS ARE THE LEADING CAUSE OF DEATH IN CONSTRUCTION

In 2018, there were 320 fatal falls to a lower level out of 1,008 construction fatalities (BLS data).

WHY IS FALL PROTECTION IMPORTANT?

Falls are among the most common causes of serious work-related injuries and deaths. Employers must set up the workplace to prevent employees from falling off of overhead platforms, elevated workstations, or into holes in the floor and walls.

WHAT CAN BE DONE TO REDUCE FALLS?

Employers must set up the workplace to prevent employees from falling off of overhead platforms, elevated workstations, or into holes in the floor and walls. OSHA requires that fall protection be provided at elevations of 4ft in general industry workplaces, 5ft in shipyards, 6ft in the construction industry and 8ft in longshoring operations. In addition, OSHA requires that fall protection be provided when working over dangerous equipment and machinery, regardless of the fall distance.

To prevent employees from being injured from falls, employers must:

- Guard every floor hole into which a worker can accidentally walk (using a railing and toe-board or a floor hole cover).
- Provide a guard rail and toe-board around every elevated open sided platform, floor or runway.
- Regardless of height, if a worker can fall into or onto dangerous machines or equipment (such as a vat of acid or a conveyor belt), employers must provide guardrails and toe-boards to prevent workers from falling and getting injured.
- Other means of fall protection that may be required on certain jobs include safety harness and line, safety nets, stair railings and handrails.

OSHA requires employers to:

- Provide working conditions that are free of known dangers.
- Keep floors in work areas in a clean and, so far as possible, a dry condition.
- Select and provide required personal protective equipment at no cost to workers.
- Train workers about job hazards in a language that they can understand.

THREE STRATEGIES TO PREVENT FALLS IN CONSTRUCTION

1. Plan ahead to get the job done safely

When working from heights, employers must plan projects to ensure that the job is done safely. Begin by deciding how the job will be done; what tasks will be involved; and what safety equipment may be needed to complete each task.

When estimating the cost of a job, employers should include safety equipment and plan to have all the necessary equipment and tools available at the construction site. For example, in a roofing job, think about all of the different fall hazards, such as holes or skylights and leading edges, then plan and select fall protection suitable to that work, such as personal fall arrest systems (PFAS).

2. Provide the right equipment

Workers who are 6ft or more above lower levels are at risk for serious injury or death if they should fall. To protect these workers, employers must provide fall protection and the right equipment for the job, including the right kinds of ladders, scaffolds and safety gear.

Use the right ladder or scaffold to get the job done safely. For roof work, if workers use personal fall arrest systems (PFAS), provide a harness for each worker who needs to tie off to the anchor. Make sure the PFAS fits, and regularly inspect it for safe use.

3. Train everyone to use the equipment safely

Every worker should be trained on proper set-up and safe use of equipment they use on the job. Employers must [train workers](#) in recognizing hazards on the job.

AT-RISK FALL EXPOSURES

- Ladders
- [Floor openings](#)
- [Fixed scaffolds](#)
- [Bridge decking](#)
- [Reroofing](#)
- [Leading edge work](#)
- [Solar industry](#)
- [Skylights](#)
- Wind towers
- Telecommunication towers
- Residential construction
- Commercial construction
- Aerial devices & elevating equipment

FATALITY REPORTS:

- [Roofer Falls 20ft from Roof](#) (PDF). Washington Report: 71-139-2015, (September 2015).
- [Hispanic Roofer's Fall Protection Failed Causing Him to Fall 29.91 Feet to his Death, Kentucky](#). NIOSH, Kentucky Case Report: 14KY030, (July 2015).
- [Horse Breeder Falls 11-12ft from Hayloft When Throwing Hay Bale – Michigan](#). NIOSH, Michigan Case Report: 12MI281, (July 2015).
- [Two Construction Workers Fall to Their Death through Temporary Wooden Bridge Platforms](#) (PDF). New Jersey Department of Health.

Resources:

- [OSHA Fall from a Telecommunications Tower](#) (PDF). OSHA FATAL Facts No. 7, (2014)
- [OSHA Fall Prevention Training Guide – A Lesson Plan for Employers](#) (PDF)
- OSHA Alliance Program Toolbox talks and Training products

If you missed OSHA's 7th Annual Safety Stand-Down to Prevent Falls in Construction, which took place September 14-18, you can still hold your own stand-down, with safe social distancing in mind. Information is available on the [OSHA website](#).

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- » **September** – ASSP Show issue and NSC Preview Issue
- » **October** – NSC Show Issue



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Gorbel and Fall Protection

Every year since 2012, fall protection violations have earned the top spot on OSHA's Top 10 list of most cited violations. In 2017, there were 6,887 total violations cited by OSHA, highlighting the need for warehouse companies to improve their fall protection measures. Failure to make fall protection a top priority can result in harsh penalties and fines for your construction company. Even more important, inadequate fall protection

can put your business at a higher risk for employee injury and death.

The path to effective fall protection begins with a top-notch safety training program. When properly organized, safety training will effectively engage employees and prime them for safe and productive employment. With OSHA citing falls as one of the most common causes of work injuries and deaths, it is paramount that employees receive in-depth training on fall protection strategies. Employees should have a strong working knowledge of the most common causes of falls and the specific measures they can take to avoid high-risk situations.

Establishing a culture of safety starts with the active participation of senior management and stakeholders. Senior managers must then secure the buy-in of supervisors, who must secure a commitment to safety from front-line employees.

Once you have established a culture of safety and identified the high-risk areas in your construction site, it is time to focus on your fall protection equipment. By investing in robust, dependable fall protection systems, you can reduce the risk of injury on site.

Not all manufacturers are created equal, so it is important to carefully evaluate equipment providers to ensure that the systems you purchase are both reliable and cost-effective. Fortunately, Gorbel offers a host of ergonomic fall protection systems that are ideal for use on construction sites. Here are a few of the products that can help you optimize fall protection:

- **Overhead fall arrest system:** Gorbel's Tether Track™ Rigid Rail Fall Arrest System offers workers mobility and flexibility while helping to prevent them from falling to lower levels. Most systems are made to accommodate multiple workers who weigh up to 310 pounds with their tools.
- **Free standing systems:** Gorbel's free standing monorail fall protection systems are ideal for facilities with workers who maintain, inspect, and unload flatbed trucks and tankers. You can choose from heights up to 26 feet to provide adequate protection for workers.
- **Mobile or portable fall protection systems:** Mobile or portable systems are ideal for busy warehouse environments where workers are highly mobile. A Mobile Fall Arrest System is an active means of protecting workers from injury due to falls. A complete personal fall arrest system includes an anchor, a body harness and a connector- such as a shock-absorbing fall arrest lanyard or self-retracting lanyard (SRL). Gorbel's Ranger Mobile Fall Protection anchor is Fall Protection on-the-go. Gorbel offers 5 day quick shipping on most of their mobile systems.

There are many ways for construction sites to safeguard against falls. However, the single best way to protect against falls is to contact an expert in the fall protection industry. With over 40 years of experience protecting the lives of employees, Gorbel has established itself as an international leader in the fall protection arena. The fall protection specialists with Gorbel are eager to assist you in your mission to protect your employees and look forward to assisting you.

Learn more at <https://hubs.ly/H0nZcFc0>. ■



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Finding a balance between safety and productivity doesn't have to be a losing battle. Gorbel's Tether Track Fall Protection solutions were designed to protect the things that matter most to you – your people – without sacrificing productivity or profits. We take the guesswork out of fall protection by helping you select a system designed specifically for your needs.

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How to Prevent the Most Common Safety Hazards in Road Construction

Road construction is vital for all drivers, but it can be a potentially dangerous setting for workers. Collisions, overexertion, falls, and weather are the main hazards to watch out for. Subtler dangers like dust can also harm worker health.

To adequately prevent these hazards, you can take the following steps.

1. TRAIN EMPLOYEES CONTINUOUSLY

Each worksite will look different, which means they will each require a different approach. The best practice for adapting to every scenario is to train your employees continuously. They'll need proper guidance for traffic control, equipment usage, hazard recognition, and emergency protocols. They'll also need general guidance on what to watch out for on the job.

Training should be a mandatory part of the job. Employees can complete online courses or you could have an instructional class at your organization's main facility. Every so often, you can add content to the courses or evaluate how much workers have learned.

2. USE PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) comes in many forms. Most prominently, safety hats and goggles are essential. Earplugs or earmuffs protect from loud [noises that can cause hearing damage](#) or loss.

High-visibility PPE, like vests and arm-bands, are essential during the evening

and night or any instance of low visibility, like fog.

An N95 mask or a similar one will be a necessity on some roadside jobsites as well. When employees are working with dust, especially, they need masks that can filter out harmful particles.

You should also aim to incorporate technology as protective equipment. Wearable devices like smart watches can monitor vitals and alert emergency services if something is wrong.

3. CONTROL TRAFFIC

Traffic is perhaps one of the biggest hazards on the job, particularly in blind spots or on highways where cars are driving fast. In these instances, it's best to assume the drivers won't see the workers. That way, you'll take the best proactive measures.

First, workers will need to [set up the site zone](#), with cones leading up to the actual site. This perimeter lets drivers merge with ample time to prevent collisions. Reducing lanes will also reduce speed, which is good for employee safety on highways. When reducing a road down to one lane, workers will need to stop and start traffic flows.

4. ACCOUNT FOR THE WEATHER

Weather can sometimes cancel an entire day of work. In extreme winter conditions, it becomes unsafe for anyone to be on the roads besides plows. However, you'll need to account for extreme heat as well.

In both extreme heat and cold, workers can become easily dehydrated or rundown. It's important that everyone on-site takes regular breaks to drink water and find shade or a change of warm clothes. If clothes get wet during freezing temperatures, workers should change immediately to prevent frostbite.

Summer weather also [brings the risk of dry air and dust](#), which can adversely impact worker health over time. In these climate conditions, water trucks are seasonable equipment that can spray down a roadside jobsite and reduce the spread of dust during hot weather episodes.

5. BE CAREFUL WITH HEAVY MACHINERY

Heavy machinery can be dangerous in untrained hands. Part of continuous employee training should include [hands-on experience with equipment](#) before moving on to a project. Workers can get the hang of machinery in the facility first.

Then, with the right skills, they'll need to take caution with any type of heavy machinery for road construction. With the right perimeter, other vehicles shouldn't interfere. However, workers still need to be careful and ensure the area around them is clear of other workers.

They should always use the parking brake when the vehicle is not in use. If they're working on an incline, they'll need to put blocks in front of or behind the tires.

6. KEEP AN ONGOING AWARENESS

Just as training will evolve, so do the on-site practices and tools that workers use. Consistent changes require an employee on the job whose responsibility is to make sure everyone is safe, addressing hazards as they happen. For instance, if they notice cars driving too closely to the site, they can expand the perimeter to give workers more space.

Additionally, this employee, and all other workers, [should have set protocols in place](#), guiding them on what to do during an emergency. Typically, workplaces will have a number to call for injuries to get the paperwork started. In potential life-or-death situations, though, workers will need to know the exact steps to follow.

THE SAFEST ROAD CONSTRUCTION PRACTICES

With these steps, you foster an environment of safety while employees work on roads and highways. You cover every hazard, down to the ones that are easy for workers to overlook. Then, everyone can efficiently complete their tasks and responsibilities with substantially reduced dangers on the job. ■

About the Author:

Evelyn Long is the editor-in-chief of [Renovated](#), a web magazine for the home and construction industries. Her work focuses on safety and workforce topics for professionals.

Safety, Quality, & Comfort

The 3 main approaches in all Tingley gear and our construction picks are no different. We keep people safe so that they can go home at the end of the day (or night, depending on the job). Our quality products are long lasting, so you don't have to worry about them falling apart on you before the end of their lifespan, and anyone who has been on their feet in a grueling 8-12 hour shift knows the importance of comfort in the products they wear. With safety, quality, and comfort in mind, here's the list of our 10 Top Picks for Construction, check it out...

1. PILOT SAFETY TOE PR KNEE BOOT

A full safety boot with several unique features... Tingley's Calf Relief Expansion (CRE)[™], a steel toe that meets ASTM F2413-18 M/I/C for toe impact and compression (and the boot is electric hazard (EH) rated), 100% waterproof, cleated outsole for good traction, but most importantly, this boot contains a flexible, steel puncture resistant midsole that spans the entire footbed and meets ASTM F2413-18 PR requirements to reduce risks from sharp objects under foot. All puncture injuries are extremely dangerous and cause inherently dirty wounds that can lead to infection or tetanus. "An ounce of prevention is worth a pound of cure and if you're working in areas where there's a risk of foot punctures, it makes sense to protect yourself", said JB McCollum, Tingley's Project Specialist.



2. BADGER BOOTS STEEL TOE



These ASTM F2413-18 M/I/C steel toe boots feature a breathable neoprene upper that will protect your legs from foul weather without causing discomfort, removable insoles help to wick moisture and absorb shock, while steel shanks are ideal for all day arch support especially when climbing ladders or digging with shovels. "Badger Boots are 100% liquid proof for rain, snow, mud, and whatever else

you might step in. No matter what the conditions, the Badger Boot works as hard as you to get the job done", said Robert N. Petersen, Tingley's Senior Product Manager.

3. WORKBRUTES G2 17 INCH OVERBOOT

An upgrade to the original Workbrutes PVC overshoe line. Improvements were made to the fit, functionality, and styling. "Our customers let us know that our original Workbrutes[®] needed improvements," said Robert N. Petersen, Senior Product Manager, "and from working closely with them during design and testing we know that the Workbrutes G2 will fit much better and will be incredibly easy to put on." Workbrutes G2 have wider ball widths, higher toe boxes, and overall larger proportions to better fit the larger types of footwear that are worn by construction workers. Additional improvements include refinements in styling, innovative expansion pleats and unique grips to help making donning easier.



4. PILOT STEEL TOE KNEE BOOT



Extremely affordable all day comfort. Working in wet, muddy conditions, these boots provide easy walking and all day protection. 100% waterproof, with a steel toe that meets ASTM F2413 M/I/C and flexible material to make walking easier, a cleated outsole that spits out debris as you walk, and removable cushion insole to help keep feet dry and comfortable.

5. WORK RUBBER OVERSHOE

The original industry standard of overshoes. With its reinforced heel and toe, these work overshoes are designed to stand up to tough daily wear. These stretch easily to fit over the bulkiest of work shoes and boots, are 100% waterproof, and have excellent tensile strength that won't crack or stiffen in the cold weather, with an ease of stretch and tear resistance for more durability.



6. ICON

The Icon is a premium, ANSI 107 compliant jacket that is waterproof, breathable, and comfortable. Made from Polyurethane on 300 denier polyester, it's engineered to provide superior comfort and safety in the toughest work environments. The Icon jacket is available in a range of styles. The Type R Class 3 compliant yellow-green and fluorescent orange-red are ideal for environments where high visibility and breathability are desired for wearer safety and comfort, while the Type O Class 1 compliant black is loaded with premium features for more multipurpose applications. The Icon

is the star of our versatile SYNC System jacket combinations. Connect any SYNC System liner with the Icon jacket for the ultimate weather, work and play versatility. “Rather than the classic approach to a 3-in-1 style, our SYNC System allows the wearer to select the liner option that best fits their application, creating their own custom insulated Icon jacket,” said Meg Bowser, Tingley’s Product Manager.

7. JOB SIGHT PREMIUM T-SHIRT

Cool, calm, and protected. The ANSI 107 Type O Class 1 and Type R Class 2 t-shirts are super lightweight and breathable, with advanced polyester material engineered to resist snags and pulls. Our partially segmented Sawtooth™ reflective tape allows for additional breathability, flexibility and reduced heat stress, with a black front panel to conceal dirt and increase longevity.

8. BOMBER II

Our most popular winter wear jacket, the Bomber II is a highly visible insulated winter wear jacket designed to provide warmth, comfort and safety at an affordable price. An ANSI/ISEA 107 compliant, 100% waterproof

jacket with a quilted polyester insulated lining that provides warmth and comfort. A 210 denier polyester shell, the Bomber II can be purchased in Type R Class 3 compliant fluorescent yellow-green and fluorescent orange-red for excellent day-time visibility, as well as in Type O Class 1 black fabric and two-tone silver reflective tape. Regular and tall sizes (in yellow-green only) are also available. Don’t just take our word for it, check out one of the many five star reviews: “I have a closet full of very expensive jackets that do not come close to the wind, rain protection and comfort this jacket provides, it is GREAT!!! I am a commercial cargo pilot with a major cargo company. Being on the ramp at night, cold, wet and blowing rain it exceeded my expectations. I was completely dry and comfortable, no wetness at all. -Mike S.”

9. JOB SIGHT SURVEYOR VEST

With big visibility in all sizes, the Type R Class 2 Two-Tone Surveyor Vest offers sizing big to small with 4X/5X all the way down to XXS/XS (yellow-green only), fitting just about any and everyone. Available in both our fluorescent yellow-green and fluorescent

orange-red with the contrasting two-tone reflective tape. 100% polyester solid in the front, breathable mesh in the back, this vest also features 5 exterior pockets; 3 interior pockets and a zipper front closure.

10. X-BACK HOODIE

Offering dual compliance in both the USA and Canada, the X-back hoodie and SYNC System Liner features ANSI 107 and CSA Z96 Class 2 Level 1 adherence with styles in Type R Class 3 fluorescent yellow or Type O Class 1 black. Constructed of a comfortable, high density polyester material and lined sleeves, this is our only sweatshirt with a detachable hood and contrasting two-tone silver reflective tape in an X-pattern design on the back. Zip this bad boy into any of our SYNC shells to add in waterproof capabilities. ■

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- » Manufacturing/Industrial
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Four Steps to Prevent Hearing Loss in Construction

Noise might not seem as dangerous as other hazards present on construction and demolition sites, but it can have a tremendous impact on worker safety and health. Here are steps you can take to mitigate this risk.

By: **Scott Fowler**, ASSP Content Specialist

Jackhammers drilling into the ground; saws cutting lumber; dump trucks and bulldozers moving materials—these are just a few examples of the noises construction workers encounter as they do their jobs each day. While noise may not seem as dangerous as other hazards present on construction and demolition sites, it can have a tremendous impact on worker safety and health.

The average construction site has a noise level of between 80-90 decibels (dB). CDC reports that approximately 51 % of construction workers have been exposed to hazardous noise and 31 % of those workers report not wearing hearing protection. Furthermore, approximately 14 % of all construction workers have hearing difficulty.

How can you know if your job site is too loud? What steps can you take to protect workers' hearing? Here are four steps you can follow.

KNOW THE LIMITS

The first step of protecting workers' hearing is understanding the level at which workplace noise can be hazardous. ANSI/ASSP A10.46, Hearing Loss Prevention for Construction and Demolition Workers establishes an acceptable noise level of 85dB over an 8-hour day, with a 3-dB doubling rate. As defined by NIOSH, a 3-dB doubling rate means that for every 3-dB increase in noise level, the allowable exposure time is reduced by half and, conversely, a 3-dB decrease in noise level doubles the allowable exposure time.

Technology has made it possible for employers and safety professionals to determine the noise levels of their job sites. Sound level meters can be downloaded onto a smartphone that can be used to accurately identify noisy tasks.

Another useful tool is Appendix 2 of the A10.46 standard, which provides probable noise levels of common construction tools and equipment, such as air hammers, electric grinders, nail guns and circular saws. Using this appendix as a guide, you can determine what noise levels could be at different areas of the job site and take appropriate measures to protect workers' hearing.

ESTABLISH A SAFE DISTANCE

Once you determine the noise levels throughout your site, you can institute engineering controls to minimize the hazardous noise. Engineering controls could include retrofits or mufflers for older equipment, or siting equipment away from workers. Some pieces of noisy equipment, such as an air compressor, can be sited 10-15ft away from where work is being performed. You can also rotate workers between noisier tasks and quieter tasks to minimize their risk.

Along with minimizing noise levels, engineering controls can also help you evaluate your noise-reduction program. Using a sound level meter, you can see if you are effectively reducing or controlling noise levels.

USE THE LATEST TOOLS

Once engineering controls are in place, use PPE to provide an extra barrier between workers and hazardous noise. Advances in hearing technology have made it possible for workers to protect their hearing, while still being able to communicate with coworkers and help them be more aware of the activity on the job site.

For example, electronic earmuffs contain a microphone that monitors noise levels and will reduce the noise level inside the earmuff to 85dB or below, thereby allowing for easier communication between workers—and encouraging consistent use of the earmuffs.

TEACH YOUR WORKERS

In addition to reminding workers how to properly wear hearing protection, you should also explain why workers need to wear it consistently and the potential long-term health impacts of not wearing hearing protection. Scheduling regular hearing tests for workers is an important preventative step, as well.



Workplace noise is not just a health hazard; it can be a safety hazard, if noise hinders communication or prevents workers from hearing a piece of machinery moving toward them. (photo courtesy Getty Images)

Workers also need to recognize that workplace noise is not just a health hazard. It can be a safety hazard, if noise hinders communication or prevents them from hearing a piece of machinery moving toward them. It is in everyone's best interests to have administrative and engineering controls in place, and to properly wear hearing protection to reduce exposure to hazardous noise.

Since hearing loss occurs gradually and can have a dramatic effect on one's quality of life, it's best to take preventative measures to avoid hearing loss from occurring in the first place. ■



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Hand Protection in Construction and Manufacturing Environments

By: **William Soellner**, *Contributor*

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If you research the numerous hand protection standards set by the ASTM and EN388 regulatory testing organizations, you will find at least 15 standards that apply to hand protection. These standards measure everything from cut resistance to puncture, impact, thermal and chemical resistance, and other potential hazards. They set and regulate test proceeds so we can evaluate the various hand protection products available to protect workers from these hazards.

Along with keeping workers safe from potential injury, the use of gloves to protect workers' hands can reduce the type and severity of injuries, increase worker productivity and keep workers comfortable on the job. Since the type of injuries and hazards are similar in both construction and manufacturing environments, the glove solutions are similar in both industries. The cost of a lost-time injury to the hands runs between \$6,000 and \$12,000 average, depending on the severity of the injury and how long it takes the worker to get back to work. Severe injuries can result in OSHA actions and legal fees, in addition to medical expenses. Coupled with lost time of experienced and skilled workers, no employer wants to risk on-the-job hand injuries.

Types of injuries typically experienced in both construction and manufacturing environments:

1. Cuts and abrasions. Sharp and rough edges are found in both work scenarios. Sheet metal, glass, rebar, rough stone and concrete, and the use of sharp tools all create the same cut and abrasion hazards. The sharpness of the hazard (a knife as opposed to rough edged metal) will be a factor in how bad an injury can take place. Repeated handling of a sharp object can weaken even the strongest

protective glove material. Each job needs to be evaluated for past injury history, common sense review, known hazard levels (“Hey! That metal is razor sharp! Be careful!”) and the degree of worker training and experience in the particular job. The recent advent of nine levels of cut resistance measurement has resulted in many choices for worker protection. Look for comfort, dexterity and the proper level of cut resistance for the job.

- 2. Dropping of heavy objects.** Dexterity and grip come into glove selection. If a worker is handling heavy objects like castings or stone, grip and the dexterity are especially important. The right glove coating needs to be used to enhance wet and dry grip while still being comfortable. Materials like foamed latex or nitrile can offer exceptional grip and the new “sandy” finishes increase the abrasion resistance for longer glove life.
- 3. Puncture hazards.** Are pointed materials present? Nails, fasteners, fittings and glass all can cause serious injury. Will the glove material be adequate to protect? Simple, common materials like leather and latex on the gripping surfaces can offer just enough puncture protection for a given job function. For extreme puncture hazards, specialized anti-puncture gloves are recommended.
- 4. Chemical hazards.** Are cleaning agents (caustics or solvents) being used? Are there petrol-chemical oils, lubricants or drying agents like grouts and cements present? All these substances can cause burns, skin absorption issues, dermatitis or other skin related injuries. Choosing the right glove for those hazards reduces both short- and long-term injuries. It is important to evaluate any chemicals present and

refer to the chemicals MSDS sheet for the proper protection required. Polymers including latex, nitrile, PVC, Viton, PVA, neoprene and butyl rubber all have specific chemical resistance and test data that helps workers choose the right gloves.

- 5. Thermal hazards.** It is interesting to note that insulation works both ways. Thermal insulation protects against both extreme heat and extreme cold. It is the choice of the glove design and the insulation material being used that determine the right glove for the job. Worker comfort and protection from burns and frost bite are obviously the desired results.
- 6. Impact hazards.** The occurrence of pinch and crush injuries has been noted for many years. Hammer strikes, rolling tubes, pipes and cylinders, and couplings all create difficult-to-avoid injury scenarios. Assembly of fitted units like scaffolds and pipe joints all can be hazards. One of the newest glove standards, ANSI/ISEA 138, measures the striking force of an object against back of hand protective cushions. There is now a wide variety of products available to reduce hand impact.
- 7. ARC/flame and electrical shock hazards.** These injury hazards are being reviewed and cautioned more today than ever. While there have been long standing regulations of products used for preventing electric shock from close work with live current electricity, there has been continuous improvement in hand protection against electric arc flash and flame injury. With the advent of more electric vehicles, tools and electronic controls, this is an ever-increasing area for review and evaluation.

The best way to protect workers' hands is to get a qualified glove expert to evaluate the job, the hazards and the gloves currently used, as well as the workers compliance in using the gloves. It is proven that wearing the right glove on the job reduces injuries by at least 60%. It only makes sense to work toward compliance of use by getting the worker involved in glove choice, from testing and trying the right gloves for the job. Comfort, dexterity and picking the right glove for the hazards present will keep workers safe and productive. ■

William Soellner is Director of Sales & Marketing at United Glove, a family-owned manufacturer of hand protection with sales throughout the U.S. He has more than 30 years' experience in the safety industry and has worked for seven major manufacturers and two major specialty industrial distributors. Soellner has a BA from Western Michigan University, a Certificate of Innovative Distribution from Purdue University and a Certificate of Developmental Sales Coaching from Richardson Sales Training (www.unitedglove.com).



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Achieving Unobstructed Vision on an Increasingly Masked Jobsite

Safety glasses have been a staple on the jobsite for years, but increasingly workers now need to wear them with respirators, face coverings, and/or face shields. Manufacturers of eye protection and other forms of personal protective equipment (PPE) are taking these factors into consideration when designing products and developing PPE solutions that work together in unison, ultimately providing users with solutions that allow them to protect their eyes and also wear additional PPE without any interference. To adhere to this ever-changing landscape, there are multiple new factors that manufacturers must take into consideration when creating eye protection such as industry standards, testing methods, and user preference.

According to data from the Bureau of Labor Statistics, 44% of all occupational eye injuries happen in the construction field. In 2018, there were nearly 20,000 eye injuries across all occupations and over 8,000 eye injuries on construction jobsites alone. When it comes to eye protection, there are multiple standards and testing methods detailing performance and safety. The American National Standards Institute (ANSI) divides eyewear and face protection regulations into different sections. Within the ANSI Z87.1 standard, optical, physical, and markings requirements make up the first segment and optional requirements such as anti-fog properties make up the second. A third section further details any optional feature requirements and describes the

physical requirements of the different projectiles used for any impact procedures. To meet these standard requirements, eyewear manufacturers are required to run their products through a series of tests:

- **Anti-Scratch:** To test scratch resistance performance, safety glasses are often put through a series of abrasions and then put into a machine that measures the resulting haze. The higher the haze, the more scratches the lens, leading to a lower scratch resistance performance rating. Milwaukee® offers a lineup of Anti-Scratch Safety Glasses with a durable hard coat to protect the lenses from the common demands of the jobsite.
- **Anti-Fog:** To measure anti-fog performance, manufacturers soak lens in distilled water for an extended period then allow them to air dry naturally. Once dry, they are once again placed in water and fog-resistance is measured by how long it takes the lens to fog up. For maximum performance, some manufacturers surpass the standard when testing fog-resistance. Milwaukee also has a lineup of Fog-Free Safety Glasses to help users maintain clear vision in even the toughest conditions.
- **Z87.1 Compliance:** To see if eye protection meets the Z87.1 Standard, glasses are tested to see if they meet a minimum light transmittance and don't exceed a set value of astigmatism that would

distort vision. Finally, glasses are also exposed to ignition and impact tests.

- **Military Grade Impact Protection:** To see if eye protection meets military standards beyond Z87.1 compliance, they are challenged to ballistic fragmentation tests. These tests consist of shooting projectiles at the lenses at 725 ft/second. If perforated, cracked, or shattered, the lens will not pass the test.

Despite all these standards and testing procedures, not all modern eye protection is living up to user needs and expectations. Historically, eye protection has been perceived as a consumable because scratches, breakage, fogging, and other frustrations are expected to occur at one point or another. Simply meeting the standard requirements is no longer enough. To exceed user expectations, Milwaukee Tool also takes fit, performance, and style preferences into consideration. All the anti-scratch and fog-free safety glasses are designed for extended wear and equipped with comfortable temple arms for all day wear.

With all these standards in place, manufacturers, safety managers, and contractors have an excellent opportunity to equip their jobsites with the proper eye protection, helping users STAY SAFE. STAY PRODUCTIVE™. ■



STAY SAFE.
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MILWAUKEE® has taken the time to understand users' needs and develop personal protective equipment from the ground up, delivering hard hats that allow users to adapt to each job and safety glasses that can be worn all day with lasting, fog-free lenses. MILWAUKEE® is focused on creating innovative PPE solutions that won't slow users down, helping them STAY SAFE. STAY PRODUCTIVE.™

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Big Data: Transforming Construction, One ERP at a Time

By: **Mike Vidas**, Contributor

Big data has changed the way companies operate across almost every sector, and the construction industry is no exception. As anyone in the field knows, construction is a time-consuming and costly process that involves complex projects and thin profit margins. With so many variables to account for—employees, suppliers, subcontractors and logistics—accurately budgeting, organizing and managing a construction project to scope can be nearly impossible. However, big data and enterprise resource planning (ERP) are transforming the way many companies in the construction industry operate by enabling them to improve capacity and efficiency like never before.

IMPACT OF BIG DATA ON CONSTRUCTION INDUSTRY

Left untouched and in its purest form, big data isn't worth all that much—but when paired with a data analytics solution, big data can be used to create opportunities for construction companies to improve productivity and profitability. An ERP can use that data to offer improved scheduling capabilities; more accurate forecasting; real-time information delivery; better quality assurance; and, last but certainly not least, greater job site safety.

PRE-CONSTRUCTION ANALYSIS

Data and data management have always been vital to the construction industry. With the advent of the computer, construction companies were able to take advantage of programs such as Excel to manage data in an unstructured database. Then came the introduction of business software, such as Building Information Modeling, which enabled companies to store and track data in a structured environment for reporting and analysis.

Today, we once again find ourselves in the midst of a shift in the way data is managed and utilized. With big data and ERP systems, companies now have the ability to make use of their data in a more streamlined and efficient manner, which enables them to make predictions based on qualified information and identify trends early on in the construction process.

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REAL-TIME MANAGEMENT: SCHEDULES, RESOURCES, BUDGETS

Big data enables construction companies to view their projects in real time. Without this ability, project managers wouldn't get the full scope of a job and would lack insight into its current status. Thanks to big data, technological advances and new capabilities for mobile devices, construction companies can gain full, real time visibility into all aspects of a project, which reduces the time delay for site reports to update job costs and progress tracking.

The ability to see projects in real time enables companies to identify the causes for project overruns and delays or other factors that might affect a job, and to then capture that information in a structured system. By analyzing project overrun data and other business intelligence, construction companies can recognize inefficiencies and trends, which enables them to improve operations and strategies with concrete data and analytics.

CONSTRUCTION EQUIPMENT & ASSET TRACKING

Construction companies have a tremendous amount of assets that need to be mobilized, tracked and moved from one location to another. Moving these assets can be a costly and time-consuming endeavor. Big data can help schedulers and supervisors see exactly where assets are at any given point in time, whether that is at a manufacturer's facility, in a warehouse, on the road or at a job site. By using big data analytics to view assets onsite or in-transit, mobilization supervisors can make better decisions on what equipment to move and when, where and how to move it. In short, with the ability to view assets in real time, construction companies can make more effective decisions about how to utilize them.

COLLABORATION

Big data can give suppliers, builders and managers greater insight into the requirements of a project, giving them the ability to make more informed and accurate predictions and budgets. Big data also allows for visualizations and simulations, which facilitate communications between architects, engineers and workers. This cross-channel collaboration and communication reduces the back-and-forth that might occur over minor changes and revisions by giving all involved parties insight into the impact of a change. It also enables crews to efficiently manage multiple clients and projects at any given point in time.

JOB SITE SAFETY

Construction is notorious for being one of the most dangerous industries to work in, which is why construction companies must perform their due diligence to ensure the safety of their crews. With an ERP system, construction companies can identify and reduce potential risks; keep projects on track; find the right subcontractor for the job; and empower onsite workers to report hazards from their mobile devices.

HARNESSING THE POWER OF BIG DATA

In order to harness the full power that big data offers and consequently improve profits and productivity, construction companies need a structure database that is able to run reporting and analysis in near-real time.

Many companies are looking to ERP solutions that are able to integrate with other key systems such as CRMs and business intelligence. So-called "point solutions," once the go-to tool in the construction industry, lost favor following the financial crisis in 2008. After the economic crash, companies added services and expanded their markets up and down the supply chain. Although this strategy reduced exposure to future market downturns, it also made it clear that point solutions were not the way forward.

ERP software not only provides real time analysis and reporting, but also delivers the features and functionalities general contractors and specialty contractors need. ERP systems give construction companies the ability to diversify their options, expand their portfolios and gain a competitive advantage, without having to purchase niche solutions for each industry or vertical in which they work. Building new technology into your existing operation offers incredible opportunities to transform your business and turn your valuable data into dollars. ■

Mike Vidas is National Sales Director, Business Analytics, for Hitachi Solutions Canada.

Fall Protection Anchorage: Are You Anchoring Properly?



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Insufficient anchorage strength and inappropriate anchorage connection are two common mistakes made with fall protection equipment.

Due to the complexity of anchorage connectors, safety professionals and users need to take steps to confirm that the anchorage point selected is strong enough to safely arrest a fall and that the anchorage is at a point that will allow a worker to avoid injury should they fall.

GET TO KNOW ANCHORAGE CONNECTOR TYPES

The first step to using anchorage connectors properly is understanding the different types of connectors and their unique purpose and capabilities. [ANSI/ASSP Z359.18, Safety Requirements for Anchorage Connectors for Active Fall Protection Systems](#), divides anchorage connectors into three different classes:

Type A: An anchorage connector (other than Type T or Type D) designed for an active fall protection system.

Type T: An anchorage connector designed to support a suspended component/tie-back line or for an active fall protection system.

Type D: An anchorage connector designed to allow deformation or movement when arresting a fall with the purpose of absorbing fall energy and reducing the strength requirements of the anchorage to which it is attached. Deformation may be permanent or temporary.

Typically, the anchorage connector itself must have a strength of 5,000 lbs. In some cases, Type D anchorage

connectors may not be suitable for work positioning, rescue, rope access and suspended component/tie-back because of their low serviceability rating. Travel restraint may also be acceptable based on the serviceability rating and deformation limits of the individual product.

SELECT APPROPRIATE ANCHOR POINTS

In addition to selecting the right anchorage connector for a particular task, you need to verify that the anchor point is strong enough and placed so it will safely arrest a fall.

[ANSI/ASSP Z359.0, Z359 Committee Guidance Document for Definitions and Nomenclature Used in Z359 Fall Protection and Fall Restraint Standards](#), defines a swing fall as “a pendulum-like motion that occurs during and/or after a vertical fall. A swing fall results when an authorized person begins a fall from a position that is located horizontally away from a fixed anchorage.”

To confirm that anchor points are correct for a particular task, a qualified person can certify that an anchor has the minimum required strength.

ANSI/ASSP Z359.18 also requires that:

A connection point support only one user or system at a time.

A connection point eye on a Type T anchorage connector be a closed eye with a minimum 1-inch inside radius.

Except for cinching anchorage connectors, anchorage connectors shall not have closed loops that are not intended for, or could be mistaken for, a connection point.

Anchorage connectors that include an operate gate, rings, buckles, adjusters or other hardware covered by [ANSI/ASSP Z359.12, Connecting Components for](#)



[Personal Fall Arrest Systems](#), shall use hardware that complies with the requirements of ANSI/ASSP Z359.12.

Multiple connection points shall only be permitted on tripod and davit style anchorage connectors.

USE ANCHORAGE CONNECTORS AS DIRECTED

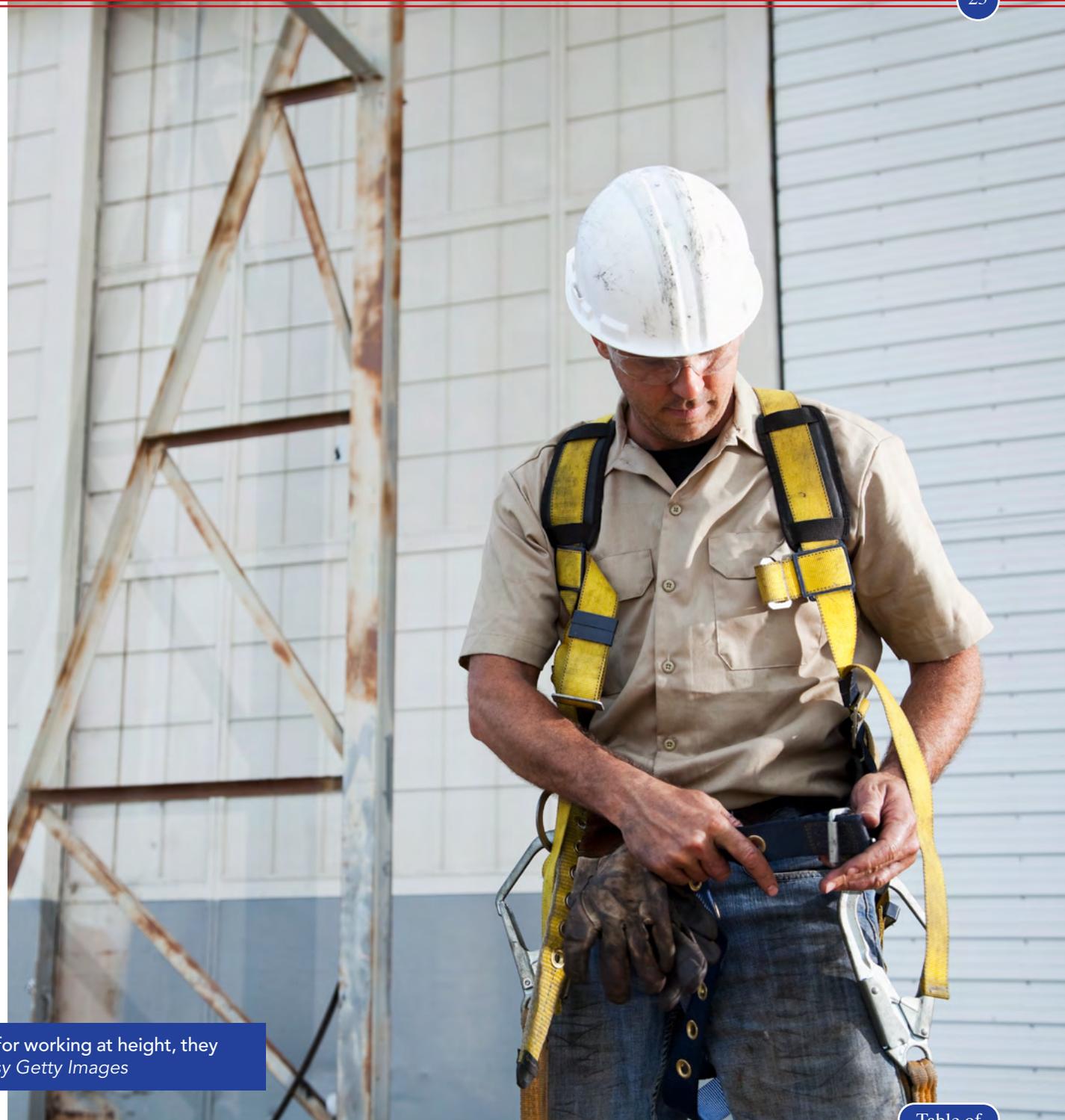
Although a simple step, one critical step you can take to keep workers safe at height is to read and understand the instructions for using anchorage connectors correctly. Manufacturers can design anchorage connectors to manage the energy of a fall in different ways, so workers need to understand what an anchorage connector has been designed to do.

While the concept of what anchorage connectors do appears to be simple, they are the most complicated part of the fall protection system and need to be used as intended to be effective. ■

[Click here to view all of ASSP's Fall Protection Resources](#)

[Download your free copy of Z359 overview document](#)

While anchorage connectors are important tools for working at height, they are only effective if used properly. *Photo courtesy Getty Images*



TO KEEP CONSTRUCTION WORKERS SAFE, **YOU NEED THE RIGHT TOOLS.**

Working at height is hazardous and a leading cause of injuries in the construction industry. Our resources can help you address this challenge by understanding how to properly design, implement and use fall protection systems.



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Download your free copy of The Fall Protection Code, a detailed overview of the Z359 Fall Protection and Fall Restraint Standards.

Access Fall Protection Resources at
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A Site-Specific Program to Prevent Falls

By: **Paul Satti**, *Chicagoland Construction Safety Council*

Falls from heights continue to be the leading cause of death in the construction industry, accounting for approximately one-third of reported fatalities. This includes falls from roofs, wall openings, scaffolds, and other elevated work surfaces. A site-specific fall management program is essential to reducing, and eliminating, the number of these tragic incidents.

A site-specific fall management program consists of four elements:



MANAGEMENT COMMITMENT & EMPLOYEE INVOLVEMENT

Falls are not only the leading cause of death, but also the most frequently cited OSHA violation. A commitment to workplace safety begins with upper-level management. Preventing falls should be an integral part of every business decision, from cost estimation to daily execution to project completion. Supervisors must

have knowledge of the federal rules and regulations governing worker protection. They must also reward employees and jobsite personnel who take active steps to prevent falls. In return, workers must understand the value that business managers place on fall safety measures.

Working at heights is a significant risk that, if not properly planned for, will result in unsafe conditions and behaviors. Employers have the responsibility to develop a safety program that identifies fall hazards and assigns competent persons to conduct inspections of construction sites. These competent persons must have knowledge of unsafe conditions, as well as applicable safety standards. The Code of Federal Regulations establishes the duty to have fall protection for workers (29 CFR 1926.501) and stipulates fall protection systems and practices (29 CFR 1926.502) to be employed in the design, construction, and use of guardrails, hole covers, safety nets, warning lines, and personal fall arrest systems.

Compliance with government regulations, by itself, is insufficient. The American Society of Safety Professionals produces a catalog of consensus best practices that also helps employers plan effective fall prevention strategies. These recommendations relate to the use and inspection of protection systems and equipment (i.e., harnesses, lanyards, SRLs, anchor points) that ensure the highest level of safety.

WORK-SITE ANALYSIS

An efficient site-specific program also requires a thorough analysis of the tasks to be accomplished on site, the workplace environment, and the tools necessary to perform a job safely. This assessment must be completed before – not during or after - the work begins. It should result in development of a comprehensive safety plan

that accounts for fall hazards and implements strategies to prevent any such occurrence. Documentation and communication of the plan to all workers is critical to gaining buy-in from those who are directly impacted.

HAZARD PREVENTION & CONTROLS

Awareness and anticipation of worksite injuries go a long way towards preventing them from ever happening. Proper prevention is a three-phase approach that not only provides redundancy, but also takes into consideration this hierarchy of controls:

Engineering Controls - equipment or technology to reduce the risk of falls, such as guardrails, nets, hole covers, scaffolds, and aerial lifts.

Administrative Controls - preventative measures taken to reduce the likelihood of a fall, such as controlling access to work areas and restricting jobsites to qualified workers.

Personal Fall Arrest Systems - PPE devices worn by employees, including full-body harnesses that utilize anchor points and lanyards, that are designed to protect, not prevent, falls.

1 Incorporate Engineering Controls to reduce and eliminate hazards

2 Implement Administrative Controls that ensure safe work practices and procedures

3 Add Personal Fall Arrest Systems (and other PPE) to protect workers in the event of a fall

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SAFETY TRAINING

Active and frequent participation in hazard awareness training represents an everlasting commitment to safety. It keeps all company personnel current in their knowledge of the rules related to working at heights. Furthermore, it empowers individuals to recognize jobsite risks and take a proactive response – before it's too late. The National Safety Education Center (www.nsec.niu.edu) is one of 26 OSHA-authorized training centers that offers educational programs to prevent falls and save lives. Instruction is also available throughout the national network of OSHA Training Institute Education Centers (www.osha.gov/training).

In the end, safety is a shared responsibility of employers and employees. It requires attitudes and behaviors that must be learned - and reinforced - daily. The consequences of non-compliance, especially when working at heights, are tragic for workers, co-workers, family members, business owners/supervisors, and others. For these reasons, the construction industry dedicates itself to a National Safety Stand-Down (www.osha.gov/stop-falls-stand-down) each year as a constant reminder of the importance of a site-specific fall management safety program. ■



Chicagoland Construction Safety Council support of the National Safety Stand-Down to Prevent Falls in Construction

5 Ways To Improve Project Safety

By: **CHRISTINE TORRES**



The Engineering and Construction Industry is a big part of the global economy, with \$10 Trillion spent on construction-related goods and services each year. Project managers and crews face enormous pressure to meet deadlines and stay within budget. Here are five strategies to improve efficiency and safety in construction on any job site:

SET EXPECTATIONS

At least 60% of inspections by the Occupational Safety and Health Administration were in the construction industry. These visits can slow projects down, make workers nervous, and can overrun budgets. OSHA's Safety and Health Regulations for Construction, OSHA 29 CFR 1926, serve as a baseline for safety requirements. Management can reinforce these regulations and go beyond by continuously leading by example and making safety a priority before work begins. By setting clear safety expectations from the beginning, managers can set the tone to ensure each worker understands their personal responsibility.



Photo courtesy Graphic Products

This will help everyone work together toward preventing injuries and improving efficiency.

As a safety manager, it's important to "walk the talk" on workplace safety and health. "The example you set, and the way you talk to workers about safety, has a huge impact on the company's safety and health program, safety culture, and the ability to reduce injury and illness," [according to OSHA](#). When workers can recognize the value management has for their well-being, it helps build trust. Make it clear that it is everyone's responsibility to follow the rules, procedures, and best practices to [prevent accidents on the job site](#). Incorporate safety language into policies and procedures. This makes it a natural part of a worker's daily routine.

Toolbox talks continue to be the most effective means of communicating safety to workers. It sparks valuable discussion on general safety and tools, equipment, materials, and processes. Utilize [OSHA's website](#) to help create or obtain a presentation. Make sure the content is relevant to your specific worksite and feature engaging elements like visuals and anecdotes.

PROMOTE COMMUNICATION

The authors of Crucial Conversations conducted a survey of 1,500 workers in 22 organizations. It found 93% of employees say their workgroup is at risk from a safety issue that is not being discussed. Also, almost half knew of an injury that occurred because someone didn't speak up. Trust and quality of relationships heavily influence the safety and overall productivity of workers. Always encourage employees to speak up; this can help to avoid incidents, injuries, and fatalities. If improvements to a worker's performance can be made, approach them in a constructive, positive way and focus on the behavior.

PLAN AHEAD

Ensure all prework activities, such as approvals, are completed before work begins. A thoughtful planning process can help the workday start on a more efficient and safe foot. Implement zoning to block off dangerous areas.

Install nets and catch platforms, and apply any other safety measures. Stage and stock each work area with the correct type of tools, PPE, and equipment before each workday.

EFFECTIVE TECHNOLOGIES

Provide new opportunities to address safety challenges and experience immediate cost savings. Technology can be worth the investment to help bridge time and distance constraints, improving efficiency and safety in the long term.

The growth of digitization in construction now makes it possible to make real-time decisions remotely. Unmanned aerial vehicles (UAVs), known as drones, are already in use in the industry and provide a convenient way to conduct site inspections, observations, and safety audits. Managers can use smartphones, tablets, and project management software to share data instantaneously from remote worksites. Allowing everyone to have immediate access to the same information eliminates waste and keeps everyone consistently on the same page.

A [recent report by Dodge Data & Analytics](#) found that 82% of contractors who use wearable technology see instant site-safety improvements. These capabilities offer immediate safety benefits. Several free iOS applications exist to promote hazard prevention efforts.

EASY SOLUTIONS

One of the most important parts of safety on a construction site is clear and effective communication. Employers can easily communicate with workers through safety signs and labels. Comply with OSHA and ANSI standards and reinforce safety anywhere on the worksite with easy to install [premade construction labels and signs](#). For on-demand custom, site-specific procedures and instructions, [DuraLabel printers and supplies](#) are a reliable safety communication solution. All supplies are built to last in the harsh conditions that exist in the construction industry.

Thoughtfully implementing each of these strategies will help to prevent downtime and improve overall safety on a construction site. ■

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Safety is not an option, no matter the jobsite. Get everyone on the same page and create a stronger safety culture with Graphic Products' **Best Practice Guide for Construction Safety Managers**. This in-depth resource breaks down the major requirements and recommendations for safety in the construction industry, along with recommendations to improve operations and protect workers on future projects.



List of OSHA's Required Written Plans



Pre-Work Inspection Checklist Template



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