

# Managing your Surveying Business in the 21<sup>st</sup> Century

Idaho Society  
~ of ~  
Professional Land Surveyors

Boise, Idaho

March 15, 2023

**Presented by**

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## **Biography of Gary R. Kent**

Gary Kent is a part-time Professional Surveyor with Schneider Geomatics, a land surveying and consulting engineering firm based in Indianapolis. He is in his 40th year with the firm and upon his transition to part-time status in 2020, he formed Meridian Land Consulting, LLC in order to provide training, consulting and expert witness services.

Gary is a graduate of Purdue University with a BS in Land Surveying; he is registered to practice as a professional surveyor in Indiana and Michigan. He served as chair of the joint ALTA/NSPS Workgroup on the ALTA/NSPS Standards from 1995 to 2021. Gary is a past-president of both the American Congress on Surveying and Mapping and the Indiana Society of Professional Land Surveyors.

A member of the adjunct faculty for Purdue University from 1999-2006, Gary taught Boundary Law, Legal Descriptions, Property Surveying and Land Survey Systems and was awarded “*Outstanding Associate Faculty*” and “*Excellence in Teaching*” awards for his efforts. Gary is on the faculty of GeoLearn ([www.geo-learn.com](http://www.geo-learn.com)), an online provider of continuing education and training for surveyors and other geospatial professionals. He is also a certified instructor for the International Right of Way Association.

Gary has served on the Indiana State Board of Registration for Professional Surveyors since 2004. He is frequently sought as an expert or consulting witness in cases involving boundaries, easements, riparian rights, survey standards and land surveying practice. He has presented programs on boundary law, easements and rights of way, surveying standards and practice, and leadership multiple times in each the 50 states and three times in Europe. He is also a columnist for The American Surveyor magazine.

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## Program Description

This program is designed to help surveyors navigate the constantly changing climate of today's economy, technologies and society. The program ranges from a close look at a number of traditional business topics such as financial statements, contracts, metrics and project management to a study of the elements of leadership that make for a healthy workplace, like understanding millennial employee motivations, leading by serving, and listening.

## Program Outline (with approximate timeframes)

### 8:00-9:30am

- I. The future of the profession vs. the future of the business  
What surveyors can do pursuant to their license is only partially related to what they can do in their surveying business. The opportunities are almost endless for our businesses. The future of the surveying profession is a bit more muddled.
- II. Employee challenges  
Your employees are your greatest asset with the possible exception of your reputation (assuming it's a good one!). One of the biggest, if not *the* biggest, challenge surveying businesses face today is in hiring and retaining employees that are — or may be, in the future — assets to your business.
  - A. Hiring
  - B. Retaining
  - C. Releasing
  - D. “Those millennials” (are they really self-absorbed, and unwilling to serve the time to earn what they think they are due?)

### 10:00am-Noon

- III. Your financial status and your financials  
It is striking that many surveying businesses really do not know where they stand financially beyond “*we invoiced this much, had these expenses, so we made this much.*” There is so much more to managing the finances of a successful business in the long term.
- IV. Project management  
Project management is where the money is made (or not) in surveying. What constitutes good, and bad, project management?

### Lunch

### 1:30-3:00pm

- V. Risk management  
Surveyors are in the risk-taking business. There is no way around that, it is inherent in the work

we do. Successfully managing that risk is a necessity or we will not be around for the long-term.

**3:30-5:00pm**

VI. Contracts

A major part of risk management is in the consistent use of well-constructed contracts. What should be in the fine print? How do you protect yourself without being unfair or overly burdensome to your clients?

VII. Safety

Another factor of that all important risk management is in how we manage safety in our company. Ultimately, we want our employees to go home safely at the end of each day, but there are also major risks to our businesses if we do not provide a safe workplace for our employees. And that is a challenge, when much of the time, our employees are on someone else's work site!

## The Future of Surveying

Current surveying and geospatial publications seem to be carrying an endless litany of columns that vary from “*sky is falling*” to “*the opportunities are endless.*”

Under the sky is falling category, we hear about technology supplanting what had traditionally been surveying-only roles and tasks. We hear about the dearth of people entering the profession at the bottom rungs. We hear about the lack of new registrants. And we hear ad nauseam about the age of the average surveyor which seems to get older every time we read about it.

With regard to technology, it is this writer’s belief that it will eventually win. When machine control came onto the scene, many surveyors said, “*Yeah, but they don’t know what they’re doing. They still need control. The verticals aren’t good enough.*” But what has happened? Technology — hardware, software and applications — have pretty much evolved to where they actually don’t need to know much what they’re doing, at least within the narrow confines of what they are trying to accomplish.

It reminds me a bit of years ago when we were trying to convince a pipe line company that they needed our services because we could as-built their underground installations to the nearest 0.1 feet. Their response? “*If we need to dig it up, we’re going to dig a 20 wide hole anyway, so we gain nothing by having as-builts to the nearest 0.1 feet versus the 1 foot that we are getting today on our own.*” Good point.

Some Boards of Licensure are vigorously pursuing what they deem to be unlicensed practice facilitated by technology. These actions will likely hasten the end of surveying as we have grown to know it rather than shore it up. At some point, the profession is going to have a very difficult time justifying to our legislators a definition of surveying that encompasses many things that literally anyone with a cell phone will be able to do.

It’s already here. There are national groups — with many willing ears in our legislatures — who want to delicense surveyors. To be sure, they actually want delicense just about every licensed profession other than medical, but that should not provide much comfort. In a way, surveyors are in a worse position than many of the other licensed professional and occupations because no one understands what we do, and technology either allows, or implies, that virtually anyone can do what we do.

The profession writ large should be hedging its bets by developing a cogent response to the more draconian measures that have been — and will continue to be — proposed.

In the chapter entitled, “The Drift from Domesticity” his 1929 book entitled The Thing, Gilbert Keith Chesterton laid out the principle that has become known as Chesterton’s Fence, viz.:

In the matter of reforming things, as distinct from deforming them, there is one plain and simple principle; a principle which will probably be called a paradox. There exists in such a case a certain institution or law; let us say, for the sake of simplicity, a fence or gate erected across a road. The more modern type of reformer goes gaily up to it and says, “I

*don't see the use of this; let us clear it away.” To which the more intelligent type of reformer will do well to answer: “If you don't see the use of it, I certainly won't let you clear it away. Go away and think. Then, when you can come back and tell me that you do see the use of it, I may allow you to destroy it.”<sup>1</sup>*

In short, don't tear things down until you understand why they exist in the first place. This could be the starting point for explaining why licensure of surveyors is necessary: Why were they licensed in the first place?

As a very important factual aside — and some groups have already recognized this — those with an agenda of getting rid of licensure have no interest in understanding any of this. They claim it's about jobs and access to them (never mind that it's not like there are people wandering around who cannot get a job), but it's really about libertarianism — essentially live and let live. “*Hey, if a bridge falls down and kills 7 people, by golly, we won't hire that engineer our contractor next time!*”

But that ignores the reasons for licensure which is, let's not let people get killed in the first place!

How does this apply to surveying? Private property rights are a keystone of a democratic society. That necessarily means that identifying and describing the boundaries of those rights is critical. Yes, technology provides the means by which highly accurate coordinates can be obtained by just about anyone, but, except in a very few cases, property boundaries are not about math or coordinates; they are about the law and evidence. That means education, training and experience are necessary. Math and technology can make the job quicker and more cost effective, but those do not supplant the core basis of boundaries, which is the law and evidence.

Surveyors are licensed in order to protect the public's property rights. If you do not understand or respect that, you will see no reason for licensure. A cell phone will locate property lines!

In the “*opportunities are endless*” category, things have never been brighter. Here we need to separate the future of the surveying profession from the future of the surveying business.

Drones, airborne LiDAR, scanners, satellite imagery, GIS, digital photography ... the technology and its applications are limitless for those with a bit of imagination, vision, and business acumen. All one needs to do is pick up a single industry publication and they will find multiple articles featuring out-of-the-box thinking.

## **Employer/Employee Challenges**

### **Hiring and Retaining employees**

With the possible exception of your reputation (assuming it's a good one, which is a topic that we will address off and on), your employees are your greatest asset. One of the biggest, if not the biggest, challenge surveying businesses face today is in hiring and retaining good employees that

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<sup>1</sup> <https://www.chesterton.org/taking-a-fence-down/>

are — or may be, in the future — tremendous assets to your business.

It is — fortunately for the surveying profession, but unfortunately for the surveying businessperson — an incredible “buyer’s market.” The person looking for employment is highly sought after and the subject of an intense recruitment effort.

The employee looking for new opportunities has practically unlimited opportunities and their current employer needs to understand that fact. Most employees have likely been approached either by friends or acquaintances looking for employees or by headhunters, or they have simply tested the waters on their own through an on-line job other working for one of the on-line job finders like Indeed or ZipRecruiter, etc.

A good employee tells you they have been approached, or even have an offer, and that offer represents a 20% increase in salary, or better benefits, or offers more opportunity for advancement, you need to think ahead. Maybe you would like to keep the employee, but simply cannot match the offer, so you let them walk. Now you are the one on the other side of the fence, and you will find that to replace that employee, you are going to have to bite the bullet and offer much more than you were paying the employee who left. Maybe you find that you will have to beef up the benefits you offer. And once you finally hire that person, you need to train them in your company’s processes and procedures.

You will have spent more time and money in the process than had you done what was necessary to keep that good employee in the first place.

Of course, employers cannot blindly make such decisions. It used to be that employees leaving might say they were leaving for more money — and they perhaps they actually did have an offer that would pay them more than what you are paying them — but historically most employees leave employment not for more money, but because they are not respected, they see no opportunity for advancement or because of their manager/supervisor. In those cases, the employee has already crossed the line and wants to leave. If you tempt them to stay by offering more money, that may very well be a waste of both of your time. They made the emotional decision to leave and had nothing to do with money; but you enticed them to stay with more money and all you have really done is delay the inevitable.

How do you know if you are interrupting an inevitable decision to leave, or if it really is about the money? You need to sit down with those employees and try your best to suss out the real reason they are leaving. If it is for something that you can readily address (albeit with some pain) — like pay or benefits — then it might well be worth your time to consider your options. Alternately, if it is obvious that they have already “checked out” you are only delaying the inevitable task of hiring a replacement by tempting them to stay.

### **Releasing Employees**

Sometimes, one of your employees is seemingly not working out. Before you fire them, you should look in the mirror to ask and answer some difficult questions.

Did you hire them into the right position? Have you provided them the guidance and training necessary for them to be successful in their job?

If you believe you have given them their due and you feel it is simply time to move on, you want to treat them respectfully, but honestly in releasing them from your employ.

**Millennials** (are they really self-absorbed, and unwilling to serve the time to earn what they think they are due?)

Millennials are defined as having been born between 1981 and 1996. The millennial generation is the largest generation in the United States, numbering around 83 million. Understanding them is critical to the success of our businesses because they make up about 1/3 of the current workforce of the United States.

It is easy to pigeonhole persons of a certain generation, and those assigned characteristics can take on a life of their own. However, at least one generally assumed characteristic of Millennials is demonstrably true: Millennials tend to be technologically astute. Beyond that, they want their ideas and concerns to be heard. In light of that, it is generally true that they are heavy participants in, and consumers of, social media, and they want meaning in their jobs.

Successfully managing millennials will entail keeping your enterprise up-to-date in technology and including them in the decision-making processes. If you do not, you need to be aware that they are not their parents, the boomers, or earlier generations: if they aren't satisfied in their current job, they will not hesitate to take a leap, especially in the current economy.

Millennials are generally ambitious and they value transparency in the workplace. Unlike many of their parents, they want a balance between their work and the rest of their lives. Related to that, they represent the epitome of the earlier discussion on retaining employees. Millennials are not exactly known for their loyalty to their employer.

Much has been written over the last year or so about “quiet quitting” which refers to an employee becoming disengaged and doing only the bare minimum requirements of their job; putting no more time, effort, or enthusiasm into their job than is absolutely necessary.<sup>2</sup>

If you do not want to experience your millennial employees quiet-quitting (which can be worse than actually having them leave), you need to include them in decision-making. If they don't feel that they are being respected and that their needs are not being addressed they will not hesitate to leave.

According to Donna Fuscaldo in her Business News Daily article *Managing Millennials in the Workplace*, there are six defining characteristics that define millennials and that we need to keep in mind while trying to manage them.<sup>3</sup>

1. They are technology natives. They prefer email, texting, and messaging apps over

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<sup>2</sup> See <https://www.investopedia.com/what-is-quiet-quitting-6743910>

<sup>3</sup> <https://www.businessnewsdaily.com/15974-millennials-in-the-workplace.html>

phone calls and face-to-face meetings. They crave new technology and apps, especially mobile apps.

2. They crave work-life balance. As mentioned, millennials are not their parents. They saw their parents give it all and miss soccer games and band concerts in favor of putting more time in at work. They may be willing to forgo a higher pay for flexible hours and the ability to have more of their own time. This is important to remember when considering benefits.

3. They expect collaboration. Collaboration something millennials like, even though for them collaboration may be by Teams, Zoom or video conferencing.

4. They require a seat at the table. Many of parents gave their millennial children a lot of say in family decisions and thus those millennials will want a similar say at work. They will show respect for those that grant them that say.

5. They want to keep on learning. Millennials generally understand that graduation was not the end of their education. They crave more learning and want to continue to grow. Providing the opportunity for continuing education and the ability to have a mentor will be a key factor in retaining millennial employees.

6. Their loyalty is fickle. If a millennial feels they are valued and respected, they will be loyal. If not, they will not hesitate to bail, especially to a company that provides opportunities for them to learn, grow, and balance their work and life.

The bottom line is that to retain millennials, companies will have to embrace technology, provide opportunities for remote collaboration, demonstrate that they trust and respect their employees, and honor their needs and wants, especially with respect to flexibility and work-life balance.

## **Your Financial Status and Financials**

*Surveyors are the only profession I know who fix prices low.* Bruce Blair, PLS, New Jersey

The next page shows a simple profit and loss statement with elements and metrics that we will discuss during the program.

- Net revenue
- Cost of services
- Gross margin
- Overhead/operating expenses (before bonuses)
- Income before interest and taxes
- Net revenue per total staff
- Effective labor multiplier (>3.0)

<b>Income Statement - June 2022</b>			
		<b>June</b>	<b>YTD</b>
<b>Revenue</b>			
	Service Income - Labor	\$146,320	\$758,522
	Other Income - Reimbursables	\$654	\$3,924
	Income - Subcontracted Services	\$7,500	\$24,562
	<b>Gross Revenue</b>	<b>\$154,474</b>	<b>\$787,008</b>
	Subcontracted Services	\$7,500	\$13,550
	<b>Net Revenue</b> (Total Income less Subcontracted Services)	<b>\$146,974</b>	<b>\$773,458</b>
<b>Cost of Services</b>			
	Wages - Direct	\$50,645	\$263,354
	Project Expenses	\$125	\$750
	Field Expenses	\$653	\$3,918
	Vehicle Expenses	\$849	\$5,094
	Errors and write offs	-\$2,000	-\$2,500
	<b>Total Cost of Services</b>	<b>\$50,272</b>	<b>\$270,616</b>
<b>Gross Profit</b>	(Net Revenue less Cost of Services)	<b>\$96,702</b>	<b>\$502,842</b>
<b>Gross Margin</b>	(Gross Profit/Net Revenue)	<b>65.8%</b>	<b>65.0%</b>
<b>Operating Expenses</b>			
	Wages - Indirect	\$12,125	\$82,450
	Rent	\$4,200	\$25,200
	Utilities	\$2,300	168
	Benefits - Insurance and Taxes	\$15,508	\$108,556
	Office Expense	\$435	\$3,045
	Furniture and fixtures	\$826	1300
	Bldg Maintenance	\$450	\$2,700
	Travel and Mileage - Indirect	\$523	\$3,138
	Sales and Marketing	\$4,567	\$27,402
	Insurance	\$3,200	\$19,200
	Depreciation	\$750	\$4,500
	<b>Total Operating Expense</b>	<b>\$44,884</b>	<b>\$277,659</b>
	<b>Total Expenses</b>	<b>\$95,156</b>	<b>\$548,275</b>
<b>Earnings before Interest and Taxes</b>	Net revenue less total expenses (before interest & taxes)	<b>\$51,818</b>	<b>\$225,183</b>
<b>Profit Margin</b>	Earnings before interest & taxes/Net Revenue	<b>35.3%</b>	<b>29.1%</b>
<b>Measures</b>	# Staff members	11	10
	Labor Multiplier (Service Inc./Direct Wages)	2.89	2.88
	Overhead (Oper.Exp./Direct Wages)	0.89	1.05
	Net Revenue per Total Staff (Annualized)	\$160,335	\$154,692
	Utilization Rate	72%	61%

## **Gross and Net Revenue**

Gross revenue helps indicate if potential consumers of your services are willing to buy the services you are offering. According to <https://blog.hubspot.com/the-hustle/gross-revenue-vs-net-revenue>, 34% of startups fail due to a lack of product or service-market fit. At that percentage, it is the most common reason new ventures fail: potential clients simply do not want, or are not willing to purchase, your services.

Net revenue is the actual money that you generated from sales during the specified period, *before* taking your costs into account.

## **Cost of Services**

Cost of Services (COS) are those costs directly involved in delivering a service. In surveying, the huge majority of COS is labor, but it would also include materials and, for example, the cost of transportation to get to and from the job site.

To calculate the fee to charge for a given service, you would divide the cost of services by 1 minus the desired profit margin (which must also account for overhead costs).

## **Gross Profit/Gross Margin**

Gross profit and gross margin are metrics used in measuring and expressing profitability. Gross profit is net revenue less the cost of goods sold and is expressed in dollars. Gross margin is gross profit divided by net revenue and is expressed as a percentage.

## **Overhead**

Overhead refers to the ongoing business expenses not directly attributed to creating a product or service. It is important for budgeting purposes but also for determining how much a company must charge for its products or services to make a profit. In short, overhead is any expense incurred to support the business while not being directly related to a specific product or service.<sup>4</sup>

We need to know our overhead in order to properly manage our companies. Our gross profit/margin may look great, but if our earnings are lagging, it is likely because our overhead is too high, or simply out of control.

## **Earnings before interest and taxes**

Earnings before interest and taxes (EBIT) is an indication of the profitability of a company. It is calculated by net revenue less expenses (but excluding tax and interest). EBIT is also called operating earnings or operating profit.

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<sup>4</sup> <https://www.investopedia.com/terms/o/overhead.asp>

### **Metrics - Labor Multiplier**

Labor multiplier in engineering and surveying is calculated as service income (from labor) divided by direct wages. A good number is around or over 3.0, but what is desirable or even achievable for your own firm depends on many factors.

### **Metrics - Overhead ratio**

The overhead ratio is computed by dividing direct wages by total operating expenses. In engineering and architectural firms 1.50-1.75 is considered in the normal range. Pure surveying firms may differ considerably (hopefully lower).

### **Metrics - Net revenue per total staff**

This ratio is computed by dividing net revenue by the total number of staff members. What is considered normal varies widely depending on the size of the firm and what type of work it typically undertakes, but “normal” these days seems to run from about \$43,000 for a small firm up to \$230,000 for a large firm.

### **Metrics - Utilization rate**

Utilization is one measure of the efficiency of the time spent by staff while on the job. Unfortunately, it is sometimes referred to as productivity rate, when it is really the “billability” rate. An employee might be very productive in developing a time-saving process, but not be very billable in the process. So her utilization rate may raise eyebrows, but if the results of her work will improve overall utilization rates for the rest of the staff, she was very productive. One question for those who are not considered production staff is this: do they spend their time making production staff more productive and billable? If staff knows that there is a strong focus on its utilization rate, there will be unintended consequences.

Adding to the complexity, if a staff member is on salary, and therefore not being paid for overtime, and if their total hours are used in the utilization calculation, the results may be misleading because the company is not paying the employee for time over 40 hours, whether billable or not.

Notwithstanding the above, utilization can be helpful in identifying overall trends or even negative corporate culture issues.

Utilizations of 70% and over for total staff are considered good for engineering firms; 60% may be more the norm.

### **Project Management**

Good project management is where a firm can make a lot of money. Poor project management will result in losing money quickly and regularly.

Project management covers a very wide variety of roles and tasks, but each firm needs to decide

who will actually handle some of those tasks — they may or may not want the designated “project manager” to take all of them on.

Project management roles include, but are not necessarily limited to, the following:

- Client Interview
- Scope Determination
- Proposal Preparation
- Project Scheduling
- Staff Projections
- Contract Assurance
- QA/QC
- Client & Internal Communication
- Project Initiation Meeting
- Production Management
- Financial/Schedule Tracking
- Specifications & Standards
- Managing Client Expectations
- Project Close-out
- Managing Scope “Creep”
- Client Satisfaction

Many persons see “production management” as project management, but that represents a misunderstanding of the role of the project manager.

All of those tasks and roles do not necessarily need to be addressed in-depth on each and every project. For example, if you are preparing residential plot plans for a regular builder client, you do not need to determine the scope each time, and you may already have a QA/QC process.

A major and critical part of both project and risk management is having a well-written contract that appropriately distributes responsibilities and liabilities between the client and the firm. This topic is addressed below.

### **Risk Management and Contracts**

Surveying firms must understand that they are, to some extent, in the liability business. Surveyors are liable for the work they perform if it does not meet published or legal standards or if they do not perform their work pursuant to the normal standard of care.

Exercising due diligence is a primary key to managing risk: written contracts, training for staff, picking good clients, staying on top of accounts receivables, putting QA/QC processes and procedures in place, maintaining good communications with clients and managing scope creep or additional services.

This program includes a copy of the NSPS handbook Staking Out Your Future - Schinnerer's Guide to Managing Professional Liability Exposure. This manual is an invaluable guide for surveyors and much of its content will be addressed during the program.

## **Safety and Health**

**NOTE – This portion of the program and handout are not intended to provide definitive regulatory or legal advice related safety issues, but rather to provide for general awareness on a variety of safety-related topics for field survey personnel. There are many OSHA publications and other resources including consultants and attorneys that should be consulted for specific guidance.**

### **Safety in General**

Safety on the job is really a function of just two primary things: promoting a culture of safety and taking personal responsibility for your safety and for those around you.

While we can, and will, talk about all of the factors that can go into a safety program – training, safety plans, equipment, safety manuals, hazard communication and so on - none if it matters if the company and/or the employees do not care.

Aside from the obvious wish to return safely to our families every night, there are practical concerns that companies and individuals need to consider. These include:

- Fines for noncompliance of laws and regulations
- Insurance ratings that will prevent you from taking on certain jobs
- Liability to third parties for your unsafe actions

### **Resources**

The Federal Department of Labor's Occupational Health and Safety Administration (OSHA) has a tremendous number of resources on their website. Their webpage listing all of their publications one can find a fact sheet addressing the life-threatening condition of Heat Stroke. A copy of this fact sheet is on the three pages of Appendix A towards the end of this handout.

### **Insurance, Regulatory and Client Considerations and Metrics**

Even though you may work on a field crew, it is important to know that accidents and injuries can have a serious adverse impact on your employer's ability to capture work and even to stay in business.

There are a number of metrics that clients and insurance companies (especially Workers Compensation) monitor as an indication of the safety-mindedness of your company. These include:

- OSHA 300 and 300A logs (See Appendix B)
  - Must be field out annually by companies having over 10 employees
- Experience Modification Rating (EMR)

- Compares your company's workers' compensation claims to other companies of similar size and which operate in the same industry
- If your company's workers' comp premiums exceed \$3,000 annually, it will likely receive an EMR rating from its insurance company
- Ratings over 1.0 are typically looked at unfavorably by safety-conscious clients.
- Rating are primarily affected by injuries or illnesses that result in treatment, time off work or job reassignment
- Tracks the company's record on a running three-year basis – a serious incident will have a very negative effect on a company's EMR for the next three years
- Total Recordable Incident Rate (TRIR)
  - Total number of OSHA recordable injuries and illnesses times 200,000 divided by number of hours worked by all employees
  - Numbers are reported on OSHA 300 log and 300A Summary
- Days Away, Restrictions and Transfers (DART)
  - Similar to TRIR and using the same equation, but only includes the number of recordable injuries and illnesses that resulted in in lost or restricted days or job transfer
  - This number will be less than your TRIR unless every recordable injury or illness resulted in lost or restricted days or reassignment, in which case they will be equal

Some companies and industries, such as pipe line companies, are extremely sensitive to metrics and a company can, in fact, be 'blacklisted' for having even one metric that is outside the allowable range. For a small company, one serious incident can be devastating; and serious incident can occur in the blink of an eye.

### **Taking Steps to Mitigate Hazards**

There are hundreds of websites that have a huge amount of helpful information including many that have free information for tool box talks. And even if you do not have tool box talks, the material can be used as reminders and to give basic guidance and guidelines related to safety issues.

Some such websites include:

<http://www.asa.net/Education/Safety/Toolbox-Talks>

[http://www.safetybob.com/shoppingcart/index\\_video.aspx](http://www.safetybob.com/shoppingcart/index_video.aspx)

<http://www.safetybob.com/Toolbox/index.shtml>

<https://www.osha.gov/pls/publications/publication.AthruZ?pType=AthruZ#D>

<http://www.toolboxtopics.com/Gen%20Industry/Gen%20Indus%20Contents.htm>

<http://www.oshatraining.com/Toolbox-Talks.php>

<http://www.safetytoolboxtalks.com/Files-Resources/>

<http://www.toolboxtopics.com/Construction/index.htm>  
<http://safetytoolboxtopics.com/Behavioral-Safety/>  
<http://www.alliedbarton.com/Security-Resource-Center/Security-Awareness-Tips>  
<https://www.osha.gov/confinedspaces/faq.html>  
<https://safety.cat.com/cda/layout?m=355419&x=7>  
<http://www.utexas.edu/safety/fire/extinguishers/quiz.php>  
<http://diseasemaps.usgs.gov/mapviewer/>

Of course, there are literally thousands of other web-based resources including, as mentioned previously, OSHA.

### **Training Opportunities**

Seeking out and taking advantage of training opportunities will strengthen one's knowledge of safety-related issues and hazards and lessen the chance of incurring a debilitating injury or illness. Training is available live, in-person at many providers. SCATS is a tremendous resource for training.

Providers such as Red Cross can offer valuable training such as First Aid and CPR.

### **Job Hazard Analysis**

One very beneficial and easy tool to utilize in the work place is the Job Hazard Analysis (sometimes referred to as a job hazard assessment or by other names). The JHA help employees set up a systematic way of assessing what hazards may be encountered on a project and how those hazards might be mitigated or eliminated.

A sample of the JHA used by The Schneider Corporation's survey department in Indianapolis is attached as Appendix C. A review of the document – which is set up as a fill-in-the-blank PDF – will show its use and application to be self-explanatory.

### **Weekly Tool Box Talk**

Aside from some clients requiring them (with documentation) a weekly tool box talk on a timely subject is a great way to communicate concern about safety issues and to give reminders. For example, as winter approaches, a tool box talk on driving in snowy weather would be appropriate. When school starts (now in early August), a tool box talk about school bus safety and driving in the vicinity of schools.

Some clients require safety talks annually on certain topics, usually – but not always - related to avoiding common injuries and illnesses. Such mandatory topics might include:

- Lifting and back care
- Personal protective equipment
- Slips, Trips and Falls

- Hazard Recognition
- Emergency Action Plans
- Trenching and Excavation
- Heat Stress

Tool box talks are designed to be only a few minutes in length, not full-blown training sessions. An example of the written materials for a tool box talk from The Schneider Corporation is included in Appendix D. A pre-printed sign-in sheet is also included.

## **Personal Protective Equipment**

Personal protective equipment (PPE) is the term used to describe protective clothing, helmets, goggles, or other garments or equipment designed to protect the wearer's body from injury or infection. The hazards that are mitigated by protective equipment can include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter.

PPE is mandatory on many job-sites and under many conditions. At The Schneider Corporation field crews and anyone working in the field are required to wear safety boots/shoes 100% of the time. Job site requirements or conditions might require, for example, hardhats, gloves, hearing protection, or eye protection. In some cases, employers must provide PPE at no cost, in other cases, they must make sure it is provided. Appendix A at page 40 in OSHA's publication (see below) explains this.

OSHA's publication on PPE can be found at <https://www.osha.gov/Publications/osha3151.html> and is very helpful. Following are some excerpts:

### **Introduction**

Hazards exist in every workplace in many different forms: sharp edges, falling objects, flying sparks, chemicals, noise and a myriad of other potentially dangerous situations. The Occupational Safety and Health Administration (OSHA) requires that employers protect their employees from workplace hazards that can cause injury.

Controlling a hazard at its source is the best way to protect employees. Depending on the hazard or workplace conditions, OSHA recommends the use of engineering or work practice controls to manage or eliminate hazards to the greatest extent possible. For example, building a barrier between the hazard and the employees is an engineering control; changing the way in which employees perform their work is a work practice control.

When engineering, work practice and administrative controls are not feasible or do not provide sufficient protection, employers must provide personal protective equipment (PPE) to their employees and ensure its use. Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits.

This guide will help both employers and employees do the following:

- Understand the types of PPE.

- Know the basics of conducting a "hazard assessment" of the workplace.
- Select appropriate PPE for a variety of circumstances.
- Understand what kind of training is needed in the proper use and care of PPE.

The information in this guide is general in nature and does not address all workplace hazards or PPE requirements. The information, methods and procedures in this guide are based on the OSHA requirements for PPE as set forth in the Code of Federal Regulations (CFR) at 29 CFR 1910.132 (General requirements); 29 CFR 1910.133 (Eye and face protection); 29 CFR 1910.135 (Head protection); 29 CFR 1910.136 (Foot protection); 29 CFR 1910.137 (Electrical protective equipment); 29 CFR 1910.138 (Hand protection); and regulations that cover the construction industry, at 29 CFR 1926.95 (Criteria for personal protective equipment); 29 CFR 1926.96 (Occupational foot protection); 29 CFR 1926.100 (Head protection); 29 CFR 1926.101 (Hearing protection); and 29 CFR 1926.102 (Eye and face protection); and for the maritime industry at 29 CFR 1915.152 (General requirements); 29 CFR 1915.153 (Eye and face protection); 29 CFR 1915.155 (Head protection); 29 CFR 1915.156 (Foot protection); and 29 CFR 1915.157 (Hand and body protection).

This guide does not address PPE requirements related to respiratory protection (29 CFR 1910.134) as this information is covered in detail in OSHA Publication 3079, "Respiratory Protection". There is a brief discussion of hearing protection in this publication but users should refer to OSHA Publication 3074, "Hearing Conservation" for more detailed information on the requirements to protect employees' hearing in the workplace.

### **The Requirement for PPE**

To ensure the greatest possible protection for employees in the workplace, the cooperative efforts of both employers and employees will help in establishing and maintaining a safe and healthful work environment.

In general, employers are responsible for:

- Performing a "hazard assessment" of the workplace to identify and control physical and health hazards.
- Identifying and providing appropriate PPE for employees.
- Training employees in the use and care of the PPE.
- Maintaining PPE, including replacing worn or damaged PPE.
- Periodically reviewing, updating and evaluating the effectiveness of the PPE program.

In general, employees should:

- Properly wear PPE,
- Attend training sessions on PPE,
- Care for, clean and maintain PPE, and
- Inform a supervisor of the need to repair or replace PPE.

Specific requirements for PPE are presented in many different OSHA standards, published in 29 CFR. Some standards require that employers provide PPE at no cost to the employee while others simply state that the employer must provide PPE. Appendix A at page 40 lists those standards that require the employer to provide PPE and those that require the employer to provide PPE at no cost to the employee.

## **Emergency Action Plans**

Emergency action plans are prepared so that conditions arising from emergencies and unanticipated natural events can be addressed in an organized and expedient manner. The emergency procedures and the organizational framework outlined in such a program is to provide protection for lives, property and operations through effective communication and use of on-site and local emergency services.

Emergency action plans should address actions to be taken (e.g., reporting procedures, evacuation, employee meeting areas, safe locations within a building) for such events as fires, severe weather (e.g., depending on the location tornadoes, hurricanes, earthquakes), workplace violence, and associated training.

## **Hazard Communication**

Hazard Communication Manuals contain important information and procedures pertaining to a company's Hazard Communication and Safety Program. Its purpose is to ensure that the company is in compliance with the OSHA Hazard Communication Standard (HCS) 29 CFR 1910.1200. All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately.

The passage of OSHA's Hazard Communication Standard gives the employer the responsibility to establish a written, comprehensive program which includes provisions for container labeling, safety data sheets (SDS), and employee information and training. The written program must contain a list of the hazardous chemicals in each work area, the means used to inform employees of hazards of non-routine tasks, and to chemicals to which they may be exposed.

The written Hazard Communication Program outlines the plan to establish the objectives of the standard. Each objective is defined and discussed in the plan document.

The written plan and its elements will be updated in the following situations:

1. New chemicals are introduced into the workplace.
2. When new processes involving chemicals are introduced.
3. When program job duties are changed.
4. When locations mentioned in the program are changed.
5. When other elements are changed.

Although virtually all materials are considered chemicals under this definition, the HCS identifies certain categories of chemicals that are not covered by the standard. These categories are [emphasis added]:

- Any consumer product or hazardous substance, as those terms are defined in the *Consumer Product Safety Act* and *Federal Hazardous Substances Act*, respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;
- Any hazardous waste as defined by the *Solid Waste Disposal Act* when subject to regulations issued under that Act by the Environmental Protection Agency;
- Any hazardous substance as defined by the *Comprehensive Environmental Response, Compensation and Liability Act* when the hazardous substance is the focus of remedial or removal action being conducted under that Act in accordance with Environmental Protection Agency regulations;
- Tobacco or tobacco products;
- Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted);
- Articles, defined as a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.
- Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace;
- Any drug, as that term is defined in the *Federal Food, Drug, and Cosmetic Act*, when it is in solid, final form for direct administration to the patient (e.g., tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (e.g., over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (e.g., first-aid supplies);
- Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;
- Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section;
- Ionizing and nonionizing radiation; and
- Biological hazards.

## **Safety Data Sheets (2012 & 2015 Revisions)**

A primary element of a Hazard Communication Manual is the inclusion of Safety Data Sheets (SDS) (formerly Material Safety Data Sheets – MSDS) for any non-excluded chemicals in the workplace.

The Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to downstream users to communicate information on these hazards. The information contained in the SDS is largely the same as the MSDS, except now the SDSs are required to be presented in a consistent user-friendly, 16-section format. This brief provides guidance to help workers who handle hazardous chemicals to become familiar with the format and understand the contents of the SDSs.

The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English (although it may be in other languages as well). In addition, OSHA requires that SDS preparers provide specific minimum information as detailed in Appendix D of 29 CFR 1910.1200. The SDS preparers may also include additional information in various section(s).

Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting). This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.

A description of all 16 sections of the SDS, along with their contents, is presented below:

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information\*

Section 13, Disposal considerations\*

Section 14, Transport information\*

Section 15, Regulatory information\*

Section 16, Other information, includes the date of preparation or last revision.

New information on a substance must be incorporated on an SDS within three months following the chemical manufacturer's receipt of the information. The new SDS must then be transmitted with the next shipment of the chemical to the employer.

### **First Aid and CPR<sup>5</sup>**

OSHA's standard for first aid training in general industry, 29 CFR 1910.151(b), provides:

*In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available.*

In the construction industry, 29 CFR 1926.50(c) provides:

*In the absence of an infirmary clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, which is available for the treatment of injured employees, a person who has a valid certificate in first-aid training from the U.S. Bureau of Mines,*

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<sup>5</sup> From [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=INTERPRETATIONS&p\\_id=25627](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=25627)

*the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the worksite to render first aid.*

The primary requirement addressed by these standards is that an employer must ensure prompt first aid treatment for injured employees, either by providing for the availability of a trained first aid provider at the worksite, or by ensuring that emergency treatment services are within reasonable proximity of the worksite. The basic purpose of these standards is to assure that adequate first aid is available in the critical minutes between the occurrence of an injury and the availability of physician or hospital care for the injured employee.

One option these standards provide employers is to ensure that a member of the workforce has been trained in first aid. This option is, for most employers, a feasible and low-cost way to protect employees, as well putting the employer clearly in compliance with the standards. OSHA recommends, but does not require, that every workplace include one or more employees who are trained and certified in first aid, including CPR.

The other option for employers is to rely upon the reasonable proximity of an infirmary, clinic or hospital. OSHA has consistently taken the view that the reasonable availability of a trained emergency service provider, such as fire department paramedics or EMS responders, would be equivalent to the "infirmary, clinic, or hospital" specified by the literal wording of the standards. Emergency medical services can be provided either on-site or by evacuating the employee to an off-site facility in cases where that can be done safely.

However, the requirements that emergency medical services must be "reasonably accessible" or "in near proximity to the workplace" are stated only in general terms. An employer who contemplates relying on assistance from outside emergency responders as an alternative to providing a first-aid-trained employee must take a number of factors into account. The employer must take appropriate steps prior to any accident (such as making arrangements with the service provider) to ascertain that emergency medical assistance will be promptly available when an injury occurs. While the standards do not prescribe a number of minutes, OSHA has long interpreted the term "near proximity" to mean that emergency care must be available within no more than 3-4 minutes from the workplace, an interpretation that has been upheld by the Occupational Safety and Health Review Commission and by federal courts.

Medical literature establishes that, for serious injuries such as those involving stopped breathing, cardiac arrest, or uncontrolled bleeding, first aid treatment must be provided within the first few minutes to avoid permanent medical impairment or death. Accordingly, in workplaces where serious accidents such as those involving falls, suffocation, electrocution, or amputation are possible, emergency medical services must be available within 3-4 minutes, if there is no employee on the site who is trained to render first aid. OSHA exercises discretion in enforcing the first aid requirements in particular cases. OSHA recognizes that a somewhat longer response time of up to 15 minutes may be reasonable in workplaces, such as offices, where the possibility of such serious work-related injuries is more remote.

The blood borne pathogens standard at 29 CFR 1910.1030(g)(2) requires employers to provide training to any employees who have occupational exposure to blood or other potentially infectious materials, such as employees assigned medical or first aid duties by their employers. The standard at 29 CFR 1910.1030(b) defines "occupational exposure" as "reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties." If an employee is trained in first aid and identified by the employer as responsible for rendering medical assistance as part of his/her job duties, that employee is covered by the blood borne pathogens standard.

You may find these standards on OSHA's website, <http://www.osha.gov> by following the link to "standards" and searching for "first aid," "blood borne pathogens," "logging," etc.

### **OSHA 10-Hour Construction Safety**

The OSHA 10-hour training course in construction standards was created by OSHA based on the federal OSHA 1926 construction standards and is intended to provide entry level construction workers with a basic knowledge of safety and health hazards found on many construction sites. The course is intended for workers in construction related jobs, like ground-up construction projects, demolition work, and major renovation projects.

The list of mandatory topics that must be taught in the OSHA 10-hour construction course are:

- Introduction to OSHA
- Fatal Four (leading causes of death in construction)
  - Falls
  - Electrocution
  - Struck-By (e.g., falling objects, trucks, cranes)
  - Caught-In or Between (e.g., trench hazards, equipment)
- Personal Protective and Lifesaving Equipment

The OSHA 10-hour course is not mandatory, but OSHA recommends outreach courses as an orientation to occupational safety and health for workers. Some states; however, have enacted laws mandating the training. Also, some employers, unions, organizations or other jurisdictions will require this training.

Training is available from many private providers, and also through the OSHA Outreach Training Program. See <https://www.osha.gov/dte/outreach/construction/>.

### **OSHA 30-Hour Construction Safety and Health**

The 30-hour outreach course provides greater depth and a variety of training on a broader list of topics associated with workplace hazards in the construction industry. It is intended for workers with some safety responsibility in the workplace.

Topics in the 30-hour course will include items in addition to the content of the 10 hour course such as (this is not an all-inclusive list) recordkeeping requirements, basic safety orientation, hazard communication, fire protection, materials handling and storage, hand and power tools, cranes and rigging, motor vehicles, stairways and ladders, confined spaces, and scaffolds.

As with the 10-hour course, training is available from many private providers, and also through the OSHA Outreach Training Program. See <https://www.osha.gov/dte/outreach/construction/>.

## **Being Aware**

Being safe is mostly a case of being aware of the environment around you.

- Think about possible hazards
- Point them out to your co-workers
- Correct those unsafe conditions that you have control over
- Get yourself out of those unsafe situations that you cannot correct

Some basic questions such as the following should be asked constantly.

- Where will the next accident happen?
- When will the next accident happen?
- Am I alert?

## **Some Outdoor Hazards**

### **“One-man” Field crews**

There was, in the last few years, an initiative in the State of California to require that survey crews have at least two persons for safety reasons. That initiative failed for several reasons, but in any event, it did raise the awareness of the dangers inherent in the “one-man” field crew.

## **The Lone Worker** **Safety Tips**

### **Parking Safety**

- Park your vehicle in a safe location --- avoid parking directly across the street from a driveway.
- When parking in a parking lot, choose a space away from other vehicles.
- If you park in a dead end area, face your vehicle towards the exit to escape quickly if needed.
- Perform a 360 of the area when you exit your vehicle (look for shady individuals, bad dogs, animals, etc.)

### **Personal Protection**

- Wear sunscreen.
- Look down at the ground to make sure you are not standing in an ant pile, dog pile, or debris.
- Stay on a sturdy path when walking around job sites, concrete driveways, and sidewalks.
- Do not cut through yards.

### **Protect Yourself from Animals**

- Carry your HALT Spray.
- Use your clipboard, wheel or hardhat for defense or for protection if needed.
- Do not put yourself in potentially bad situations. If you know there are dogs in the yard, do not enter the yard.
- When entering a back yard, look for doggy doors on the structure.

### **Communication**

- Before you leave, notify a coworker or update your calendar on your planned destination.
- Always carry your cell phone with you. Have security numbers programmed into the phone directory, i.e. Police, Sheriff, DCC, Corporate Security.
- If you enter a bad community, call a co-worker to advise them of your location. If the co-worker doesn't hear back from you within 10 or 15 minutes, they should immediately call the Police.
- The symbol \*\*\* means HOSTILE Customer in Customer Service System.

### **Mitigate Potential Hazards**

- Be visible. Identify yourself by driving a company vehicle and by wearing your hard hat, company shirt, or reflective vest.
- When you arrive at a customer's home, knock on the door to let the customer know you are on site.
- In areas that are difficult to access due to safety, be creative -- go around the block, look for another entry point, take pictures, use Google, use binoculars, use the buddy system...

## **Heat Illnesses<sup>6</sup>**

Workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. Exposure to extreme heat can result in occupational illnesses and injuries. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. Heat can also increase the risk of injuries in workers as it may result in sweaty palms, fogged-up safety glasses, and dizziness. Burns may also occur as a result of accidental contact with hot surfaces or steam.

Workers at risk of heat stress include outdoor workers and workers in hot environments such as firefighters, bakery workers, farmers, construction workers, miners, boiler room workers, factory workers, and others. Workers at greater risk of heat stress include those who are 65 years of age or older, are overweight, have heart disease or high blood pressure, or take medications that may be affected by extreme heat.

Prevention of heat stress in workers is important. Employers should provide training to workers so they understand what heat stress is, how it affects their health and safety, and how it can be prevented.

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<sup>6</sup> <http://www.cdc.gov/niosh/topics/heatstress/heatrelillness.html>

## **Heat Stroke**

Heat stroke is the most serious heat-related disorder. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106 degrees Fahrenheit or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given.

Symptoms of heat stroke include:

- Hot, dry skin or profuse sweating
- Hallucinations
- Chills
- Throbbing headache
- High body temperature
- Confusion/dizziness
- Slurred speech

Take the following steps to treat a worker with heat stroke:

- Call 911 and notify their supervisor.
- Move the sick worker to a cool shaded area.
- Cool the worker using methods such as:
  - Soaking their clothes with water.
  - Spraying, sponging, or showering them with water.
  - Fanning their body.

## **Heat exhaustion**

Heat exhaustion is the body's response to an excessive loss of the water and salt, usually through excessive sweating. Workers most prone to heat exhaustion are those that are elderly, have high blood pressure, and those working in a hot environment.

Symptoms of heat exhaustion include:

- Heavy sweating
- Extreme weakness or fatigue
- Dizziness, confusion
- Nausea
- Clammy, moist skin
- Pale or flushed complexion
- Muscle cramps
- Slightly elevated body temperature

- Fast and shallow breathing

Treat a worker suffering from heat exhaustion with the following:

- Have them rest in a cool, shaded or air-conditioned area.
- Have them drink plenty of water or other cool, nonalcoholic beverages.
- Have them take a cool shower, bath, or sponge bath.

### **Heat Syncope**

Heat syncope is a fainting (syncope) episode or dizziness that usually occurs with prolonged standing or sudden rising from a sitting or lying position. Factors that may contribute to heat syncope include dehydration and lack of acclimatization.

Symptoms of heat syncope include:

- Light-headedness
- Dizziness
- Fainting

Workers with heat syncope should:

- Sit or lie down in a cool place when they begin to feel symptoms.
- Slowly drink water, clear juice, or a sports beverage.

### **Heat Cramps**

Heat cramps usually affect workers who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture levels. Low salt levels in muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion.

Muscle pain or spasms usually in the abdomen, arms, or legs.

Workers with heat cramps should:

- Stop all activity, and sit in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous work for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention if any of the following apply:
  - The worker has heart problems.
  - The worker is on a low-sodium diet.
  - The cramps do not subside within one hour.

### **Heat Rash**

Heat rash is a skin irritation caused by excessive sweating during hot, humid weather.

Symptoms of heat rash include:

- Heat rash looks like a red cluster of pimples or small blisters.
- It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases.

Workers experiencing heat rash should:

- Try to work in a cooler, less humid environment when possible.
- Keep the affected area dry.
- Dusting powder may be used to increase comfort.

### **Lyme Disease<sup>7</sup>**

The early symptoms of Lyme disease may be mild and easily missed. If you find a tick attached to your skin, remove the tick with tweezers (see tick removal instructions below), and watch for the symptoms of Lyme disease. In 60-80% of cases the first symptom is a rash that:

- Occurs at or near the site of the tick bite.
- Is a "bull's-eye" circular patch or solid red patch that grows larger.
- Appears between three days and one month after the tick bite.
- Has a diameter of two to six inches.
- Lasts for about three to five weeks.
- May or may not be warm to the touch.
- Is usually not painful or itchy.
- Sometimes leads to multiple rashes.

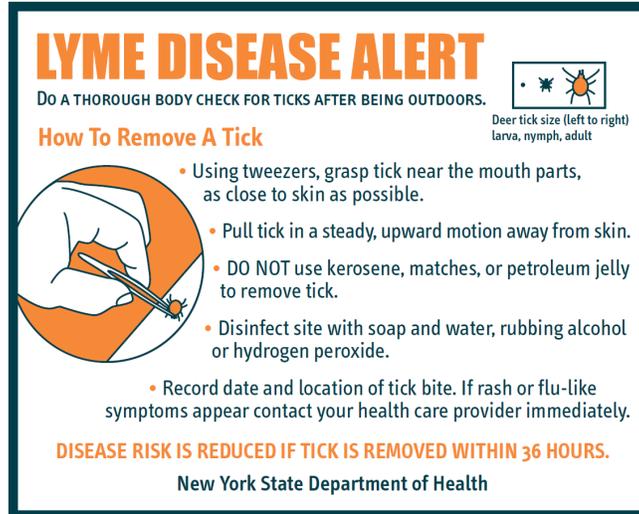
Ticks will attach themselves anywhere including the thighs, groin, trunk, armpits and behind the ears. If you are infected, the rash may be found in one of these areas.

Around the time the rash appears, other symptoms, such as joint pain, chills, fever and fatigue can occur, but they may seem too mild to require medical attention. As Lyme disease progresses, severe fatigue, a stiff neck, tingling or numbness in the arms and legs, or facial paralysis can occur.

The most severe symptoms of Lyme disease may not appear until weeks, months or years after the tick bite. These can include severe headaches, painful arthritis, swelling of the joints, and heart and central nervous system problems.

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<sup>7</sup> [www.health.ny.gov/diseases/communicable/lyme/](http://www.health.ny.gov/diseases/communicable/lyme/)



## Tick Repellants<sup>8</sup>

Tick and insect repellents can be effective at reducing bites and, therefore, may reduce the risk of getting some diseases, such as Lyme disease and certain forms of encephalitis. Repellents commonly available to consumers contain the active ingredients DEET (N, N-diethyl-m-toluamide), permethrin, or botanical oils. A few products containing other active ingredients (e.g. IR3535) are also available.

Using any of these repellents is not without risk of adverse reactions, especially if used in large amounts or applied improperly. Information in this brochure will help you decide when and if a repellent should be used.

Products labeled as insect repellents are regulated by the U.S. Environmental Protection Agency (EPA) and some states, and are tested for toxicity and effectiveness. The EPA does not require that all botanical repellents be tested or registered before their sale and use. The active ingredients for all products should be stated on the labels.

### Children, pregnant women and repellents

- Children may be at greater risk for adverse reactions to repellents, in part, because their exposure may be greater.
- Keep repellents out of the reach of children.
- Do not allow children to apply repellents to themselves.
- Use only small amounts of repellent on children.
- Do not apply repellents to the hands of young children because this may result in accidental eye contact or ingestion.
- Try to reduce the use of repellents by dressing children in long sleeves and long pants tucked into boots or socks whenever possible. Use netting over strollers, playpens, etc.

<sup>8</sup> <https://www.health.ny.gov/publications/2737/>

- As with chemical exposures in general, pregnant women should take care to avoid exposures to repellents when practical, as the fetus may be vulnerable.

Regardless of which repellent product you use, carefully read and follow all directions on the label before each use.

### **DEET and botanical products**

DEET products have been widely used for many years but these products have occasionally been associated with some adverse reactions. DEET concentrations range from a low of about five percent up to 100 percent. Skin reactions (particularly at DEET concentrations of 50 percent and above) and eye irritation have been the most frequently reported adverse effects. There have been some reports of central nervous system problems, more frequently reported in children than adults, ranging from slurred speech and confusion to seizures and coma. The use of DEET products primarily results in exposure from skin contact, although unintentional exposure by breathing and ingestion can also occur.

By using products with lower concentrations of DEET and by applying as little of the product as needed for your outdoor activities, you can reduce your exposure to DEET.

DEET concentrations as low as five percent have been shown to provide good, but not necessarily complete, protection from mosquito bites for periods up to about four hours<sup>4</sup>. Such lower concentration products may be adequate for activities like yard work or picnicking at times when mosquito activity is low.

Less information is available on DEET's effectiveness in repelling ticks although some data suggest that ticks may be more difficult to repel than mosquitoes. Products containing higher concentrations of DEET or those with controlled-release formulations (a controlled-release product extends protection time from insects by regulating its release) may be useful when in areas with high populations of ticks or biting insects for long periods of time. Skin reactions have been associated with higher concentration products (particularly at DEET concentrations of 50 percent and above).

Under demanding conditions, a two-part approach has been used to help protect people from ticks and other biting insects. The approach uses a repellent product containing about 33 percent DEET in a controlled-release formulation on exposed skin along with clothing treated with permethrin. (See Permethrin Products below). This may meet the needs of individuals spending long periods of time in areas with high populations of active ticks or mosquitoes.

Information about DEET's effectiveness in repelling insects comes from laboratory and field experiments<sup>6</sup>. The data are not completely consistent about how long DEET is effective or how completely it prevents insect bites. In general, the more concentrated the DEET product, the more protection (reduction of bites and length of this reduction) is provided. Also, in general, the more DEET exposure, the greater your risk of experiencing adverse effects. To reduce your risk

of adverse effects while maintaining sufficient protection, you should use as little DEET as necessary for your situation.

**The amount of repellent you may be exposed to depends on:**

- The concentration in the product
- In what form the product is applied
- The amount of the product put on the skin
- How carefully and how often the product is applied

The greater your exposure to the repellent, the greater the risk of health effects.

**Things to consider when choosing a repellent:**

- The type of pests present - ticks, mosquitoes, etc.
- The numbers and activity of pests.
- Where you are going - swamp, backyard, etc.
- Whether the area has pests carrying diseases.
- How long you will be in infested areas.
- Your tendency to be bitten.
- Age - child, adult.

**Recommendations for proper use of DEET products**

1. Particularly with children, try to reduce the use of repellents by dressing them in long sleeves and long pants tucked into socks or boots when possible or by applying repellent to clothing instead of skin. Use repellents only in small amounts, avoiding unnecessary repeat applications.
2. Do not apply repellents directly to children. Apply repellent to your own hands and then use your hands to apply repellent on the child.
3. Do not apply near eyes, nose or mouth and use sparingly around ears. Do not apply to the hands of small children because this may result in accidental eye contact or ingestion.
4. Avoid use of DEET products on skin damaged by sunburn, cuts, rashes or other skin conditions, such as psoriasis or acne.
5. Particular care should be taken to avoid breathing in DEET when applying products, especially spray products. Do not apply repellents in enclosed areas or directly to the face (products can be applied to hands and then rubbed on the face).
6. Do not use sunscreens or moisturizers that also contain DEET if the repellent is not needed.
7. Avoid prolonged and excessive use of DEET products. Use just enough repellent to cover exposed skin or clothing, and do not treat unexposed skin (skin covered by clothing).
8. After returning indoors, wash treated skin with soap and water.

9. DEET products can be applied to clothing, but may damage some synthetic fabrics and plastics, especially products with very high DEET concentrations. Launder treated clothing separately from other clothing.
10. Frequent reapplication or saturation is unnecessary for effectiveness. Use only what is required to maintain protection.

### **Botanical products**

Insect repellent products containing botanical (plant-based) oils, such as oil of geranium, cedar, lemongrass, soy or citronella, are also available. There is limited information on the effectiveness of botanical oils individually and when combined with other ingredients to make repellent products. Available information, however, indicates that, compared to the effectiveness of DEET or permethrin, botanical oils generally do not provide the same duration of protection. While two botanical products are reported to provide some protection (one to four hours) from mosquitoes, other products evaluated provided less. Limited, unpublished information on botanical products indicates some protection from ticks.

Because many botanical oils are regulated differently than DEET and permethrin, most have not been tested for their potential to cause short-or long-term toxic or reproductive effects, birth defects or cancer. By following recommendations one through eight listed above for the proper use of DEET products, you will reduce your exposure and, hence, the risk of adverse health effects when using botanical products.

### **Permethrin products**

Products containing permethrin are for use on clothing only - not on skin. Permethrin kills ticks and insects that come in contact with treated clothes. It is effective for two weeks or more if the clothing is not laundered.

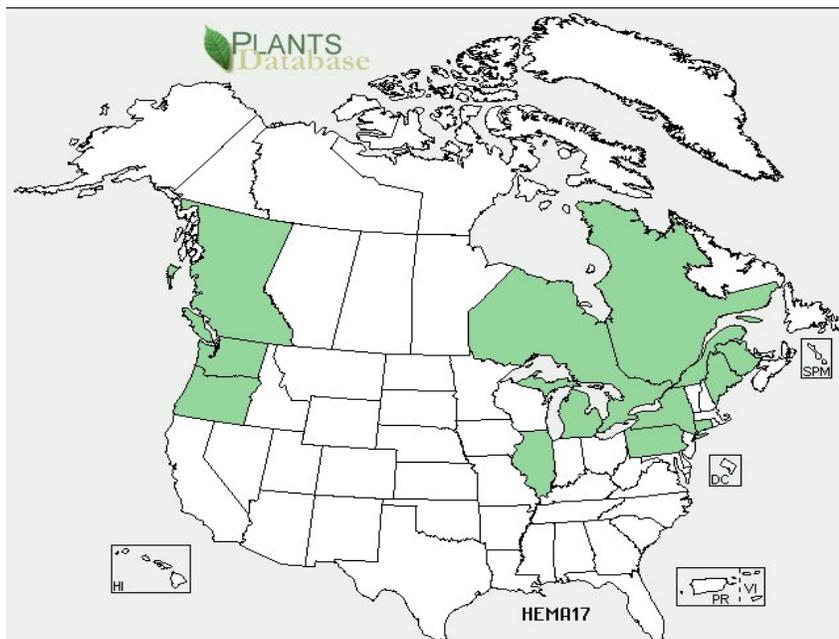
There are some health concerns associated with the use of permethrin products, particularly if they are not used according to the label directions. They can cause eye irritation. In addition, animal studies indicate that permethrin may have some cancer causing potential<sup>12</sup>. If used properly, however, the potential for adverse reactions is minimized. Some recommendations for proper use are:

A color brochure on Lyme disease is available for download at: <https://www.health.ny.gov/publications/2813.pdf>.

### **Giant Hogweed**

Giant hogweed *Heracleum mantegazzianum* is an invasive species of plant from the Caucasus Mountains region of Europe and southwest Asia. According to the University of Connecticut it was first introduced to the United States in 1917 as an ornamental.

The following image from Huffington Post<sup>9</sup> is not the most recent national map showing distribution (June 2013) that the author found.



Giant hogweed plants grow large quite rapidly, have large leaves and produce seeds prolifically, thus they will push out and replace native vegetation, leaving bare soil beneath which can result in soil erosion. It initially favors areas along rivers or streams, and can spread widely from those locations as seeds disperse. It grows in wet areas, on waste ground, near houses, in vacant lots, and along railways and roads. It favors moist areas and can rapidly overtake river and stream banks and in moist ravines.

#### **How to identify giant hogweed**

Giant hogweed is tall - up to 20 feet in height - but if it has been cut back or is an immature plant, it can be much smaller. The plant reaches maturity in about 2 years.

There are a number of plants that look quite similar to giant hogweed, especially cow parsnip, but also wild parsnip, angelica, and poison hemlock.

- Leaves have very deep lobes and can be up to 5 feet across.<sup>10</sup> They have bristles on the underside.

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<sup>9</sup> <http://i.huffpost.com/gen/1204859/original.jpg>

<sup>10</sup> Images from Huffington Post at [http://www.huffingtonpost.com/2013/06/21/giant-hogweed-plant-blindness-skin-irritation\\_n\\_3479022.html](http://www.huffingtonpost.com/2013/06/21/giant-hogweed-plant-blindness-skin-irritation_n_3479022.html) and New York Department of Environmental Conservation at <http://www.dec.ny.gov/animals/72766.html>



- Flowers grow in white (sometimes pink) clusters up to 2½ feet across.<sup>11</sup>



- The stems of mature giant hogweed plants are hollow, 2 to 4 inches in diameter and blotched with purple and having white bristles or hairs at the base of the leaf stalk.<sup>12</sup>



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<sup>11</sup> Images from New York Department of Environmental Conservation at <http://www.dec.ny.gov/animals/72766.html>

<sup>12</sup> Images from New York Department of Environmental Conservation at <http://www.dec.ny.gov/animals/72766.html>

- Seeds are dry, flat, oval-shaped and about 3/8 inches long. There are brown oil tubes that appear as lines running about 3/4 of the length of the seed.<sup>13</sup>



### **Toxicity**

Giant hogweed is highly toxic. The sap coating the plant can result in severe inflammation, painful blisters, long-term or permanent sensitivity to sunlight, scars that can last up to six years and even blindness.

### **Preventative Steps**

- Do not touch the plant with bare skin
- Do not touch bare skin with gloves or clothes that have touched the plant
- Do not clear plants yourself; call experts.
- If clearing the plants, stay away from others and do not use “weed-whackers” - the sap can splash up to 4 feet
- Apply sunscreen before working around giant hogweed
- Carefully launder clothes that have touched the plant
- Wash with water any equipment that has touched the plant
- Keep water, soap and eye-wash near the work area

### **If exposed to Giant Hogweed**

- Wash affected areas with soap and cold water as soon as possible
- Keep affected areas out of sunlight for 48 hours
- Use topical steroids as soon as any reaction is observed
- If sap gets into eyes, rinse with water and wear sunglasses
- Apply sun block liberally for a few years after exposure

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<sup>13</sup> Image from New York Department of Environmental Conservation at <http://www.dec.ny.gov/animals/72766.html>

- See a physician

### **Venomous Snakes<sup>14</sup>**

Venomous snakes found in the United States include rattlesnakes, copperheads, cottonmouths/water moccasins, and coral snakes. They can be dangerous to outdoor workers including farmers, foresters, landscapers, groundskeepers, gardeners, painters, roofers, pavers, construction workers, laborers, mechanics, and any other workers who spend time outside.

Although rare, some workers with a severe allergy to snake venom may be at risk of death if bitten. It has been estimated that 7,000–8,000 people per year receive venomous bites in the United States, and about 5 of those people die. The number of deaths would be much higher if people did not seek medical care. It is important for employers to train their workers about their risk of exposure to venomous snakes, how they can prevent and protect themselves from snake bites, and what they should do if they are bitten.

There are many species of rattlesnakes in the United States. Rattlesnakes are the largest of the venomous snakes in the United States. They can accurately strike at up to one-third their body length. Rattlesnakes use their rattles or tails as a warning when they feel threatened. Rattlesnakes may be found sunning themselves near logs, boulders, or open areas. These snakes may be found in most work habitats including the mountains, prairies, deserts, and beaches.

Signs or symptoms associated with a snake bite may vary depending on the type of snake, but may include:

- A pair of puncture marks at the wound
- Redness and swelling around the bite
- Severe pain at the site of the bite
- Nausea and vomiting
- Labored breathing (in extreme cases, breathing may stop altogether)
- Disturbed vision
- Increased salivation and sweating
- Numbness or tingling around your face and/or limbs

Employers should protect their workers from venomous snake bites by training them about:

- Their risk of exposure to venomous snakes
- How to identify venomous snakes
- How to prevent snake bites
- What they should do if they are bitten by a snake

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<sup>14</sup> <http://www.cdc.gov/niosh/topics/snakes/>

## **Preventing Snake Bites**

Workers should take the following steps to prevent a snake bite:

- Do not try to handle any snake.
- Stay away from tall grass and piles of leaves when possible.
- Avoid climbing on rocks or piles of wood where a snake may be hiding.
- Be aware that snakes tend to be active at night and in warm weather.
- Wear boots and long pants when working outdoors.
- Wear leather gloves when handling brush and debris.

## **First Aid**

Workers should take the following steps if they are bitten by a snake:

- Seek medical attention as soon as possible (dial 911 or call local Emergency Medical Services.)
- Try to remember the color and shape of the snake, which can help with treatment of the snake bite.
- Keep still and calm. This can slow down the spread of venom.
- Inform your supervisor.
- Apply first aid if you cannot get to the hospital right away.
  - Lay or sit down with the bite below the level of the heart.
  - Wash the bite with soap and water.
  - Cover the bite with a clean, dry dressing.

Do NOT do any of the following:

- Do not pick up the snake or try to trap it.
- Do not wait for symptoms to appear if bitten, seek immediate medical attention.
- Do not apply a tourniquet.
- Do not slash the wound with a knife.
- Do not suck out the venom.
- Do not apply ice or immerse the wound in water.
- Do not drink alcohol as a painkiller.
- Do not drink caffeinated beverages.

## **West Nile Disease**

Most people who become infected with the West Nile virus actually do not develop any symptoms or have any sign of the disease. However, if symptoms do develop, they usually appear within 3 to 15 days of exposure. Symptoms in mild cases include fever, headache, body aches and occasionally a skin rash or swollen glands (lymph nodes).

Severe case symptoms can include headache, high fever, neck stiffness, muscle weakness, altered mental status, tremors, convulsions, paralysis, inflammation of the brain or its membranes and spinal cord, or coma. Only about 1 in 150 persons infected with West Nile virus end up with a severe case and even then, death is rare and recovery typically complete.

### **Prevention and Treatment**

There are no vaccines for West Nile virus in humans and antibiotics do not treat viral infections, thus, prevention is the best way to lower the risk of becoming infected. Keep as much of your skin as possible covered and apply insect repellent on any skin that remains exposed. Keep screens in windows and doors in good repair. Eliminate any standing water around your property.

### **Traffic Safety**

There are a variety of guidelines and rules as for working in traffic, some of which may even be ostensibly in conflict with each other.

Even when all traffic control measures are taken, a confused or unaware driver can crash through a work site, or a daydreaming worker can step into the path of a speeding vehicle. Any person who has worked on a field crew for more than about a year has experienced drivers taking reckless chances or even being purposefully aggressive in work zones. Drivers will run stop signs, change lanes without signaling, and ignore flaggers and construction speed limits.

Survey field crews must be prepared for the unexpected on the road, both during and after work hours. When your worksite involves moving traffic, safety awareness should be at its peak, to protect both the public and the crew. Here are some basic safety procedures:

Planning: All traffic control must be carefully planned and preferably approved by governing authorities before work begins. The person responsible for this planning should drive through the traffic pattern before any work starts to insure that the public will understand how to control their vehicles appropriately. If there is any possibility of driver confusion in the pattern, change it.

Signage: The Manual on Uniform Traffic Control Devices (MUTCD) and local or state regulations should be followed for proper signage and barricading. Place initial warning signs at the designated minimum from traffic revisions. All signs and related equipment should be in good condition and highly visible. In some cases, independent traffic safety contractors handle warning signs and barricades.

Barricades: Devices which guide traffic such as cones, and barrels should be highly visible and spaced relatively close together, so drivers will not deviate from an assigned traffic flow. All such barriers should be made of material that will cause little or no damage if a vehicle contacts it.

Safety Gear: All employees must wear hard hats and high-visibility orange or day-glow vests. When working at night, the vest should have light-reflective strips.

Flaggers: Roadside construction sites should have at least one individual assigned to traffic control. A highly visible sign paddle should be used during daylight hours. It should be octagonal in shape, at least 18 inches across, and have letters at least six inches high that say *STOP* on one side and *SLOW* on the other. Flaggers should have two-way radios. When flaggers are present, a sign indicating this must be placed at the appropriate distance from the beginning of the detour. Flagging is not a job to be undertaken by someone who is not trained. We have all come upon a flagger whose motions were not clear and or was texting or talking on the phone.

Vehicles: All construction vehicles should be equipped with backing alarms, two-way radios, and *Slow Moving Vehicle* signs when appropriate. Ideally, they should be painted a highly visible color and many jurisdictions also require flashing yellow beacons. All operators must be qualified and trained to operate the equipment they are using. If a vehicle will be parked along-side the road, orange safety cones should be placed around it to alert drivers.

Night Work: If work is done at night, the entire site must be illuminated. Increase warning distances in areas of fast-moving traffic as light fails. Flaggers should have orange-cone flashlights and barricades should be equipped with flashing lights. Any excavations or utility accesses should be taped off and barricaded with flashing warning lights.

Training: All company employees and subcontractors involved in the project must receive an initial safety orientation, informing them of the potential hazards of the project, including traffic safety. Changes or unusual conditions should be communicated to workers immediately.

An entire day could easily be dedicated to traffic safety when surveying, but that is beyond the scope of this session. Suffice it to say that the following list is a non-exhaustive list of considerations when working in or along the roadway:

- Vests, hard hats, safety work shoes and safety clothing
- Safety orientation sessions
- Cease operations when conditions until unanticipated hazards are mitigated
- Safety and first aid training
- Personal responsibilities
- Vehicle warning lights
- Work zone signage (e.g., work zone, no shoulder, flag person ahead)
- Flaggers and spotters
- Cones

## **Fall Protection**

In order to properly address fall protection. It is necessary to know what conditions require fall protection and what options are available to mitigate or eliminate the dangers.

Falls are the leading cause of death in the construction industry.

Fall protection is required in certain conditions outlined by OSHA<sup>15</sup>. *The general rule is that if an employee could fall six feet or more onto a lower level, fall protection must be provided.* The specific rules include but are not necessarily limited to conditions under which employees:

- Are on a walking/working surface that has an unprotected edge.
- Are constructing a leading edge.
- May fall through a hole in the walking/working surface.
- Are working on the face of formwork or reinforcing steel.
- Are on ramps, runways and other walkways.
- Are working at the edge of an excavation, well, pit, or shaft.
- Are working above dangerous equipment (even at less than 6 feet).
- Are performing overhand bricklaying and related work.
- Are performing roofing work.
- Are engaging in precast concrete erection (with certain exceptions).
- Are engaged in residential construction (with certain exceptions)

The options for fall protection include:

- **Personal fall arrest system**
- **Guardrails**
- **Safety net**
- **Fall Protection Plan** may be developed outlining measures that will be taken to reduce or eliminate fall hazards in cases where the above are infeasible or if utilizing conventional fall protection equipment creates a greater hazard.

### **Personal Fall Arrest Systems**

A personal fall arrest system is comprised of a variety of components – anchorage, lifeline and body harness. The body harness must be fastened to a secure anchorage so a worker cannot free fall any further than 6 feet. The anchorage must be capable of supporting at least 5,000 pounds per person relying on it. *Body belts are not acceptable personal fall arrest systems.*

Some primary requirements of a personal fall arrest system include:

- No free fall more than 6 feet.
- A procedure for prompt rescue after a fall
- Inspected prior to each use
- Not be used until inspected by a competent person

A free fall of even 6 feet will be exceptionally traumatic to the body. It is desirable that any system have a braking system to prevent the sudden shock of being fall-arrested extremely quickly.

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<sup>15</sup> See the associated OSHA regulation at 29 CFR 1926.502 [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10758](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10758)

It is also important that the harness have built in foot stirrups so the worker can step into them after a fall to release pressure on the legs and groin area while waiting for rescue. Many workers have suffered permanent injury not from the arrested fall, but while waiting an extended time for rescue, so a rescue plan is an integral part of the overall fall protection plan.

### **Guardrails**

Guardrails are an acceptable method of fall protection, however, they must meet or be constructed in accordance with very specific requirements in order to provide effective protection.

- The top edge of the guardrail must be 39-45 inches above the walking/working level.
- There must also be protection from falling between the top rail and the walking/working surface. Midrails, screens, mesh, or intermediate vertical members may be used for this purpose. There are specific requirements for their installation.
- Wood, chain and wire rope may be used for top rails and midrails, as long as the barriers are strong enough to support a person otherwise falling.

### **Safety Nets**

Safety net systems are designed to catch workers that actually fall. A safety net must:

- Be strong enough to support a falling employee
- Have sufficiently small mesh openings so the employee cannot fall through the net
- Be close enough to the surface of the walking/working surface so that the fall into the safety net will not injure the employee (a maximum of 30 feet below the walking/working surface)
- Be close enough to the edge of the working surface so that the falling employee will not slip past the net (the outer edge of the net must be between 8 and 13 feet from the edge of the walking/working surface, depending on the distance down from the walking/working surface to the net)

Safety nets must be drop tested after installation and before use as a fall protection system by dropping a 400 pound bag of sand from the working surface.

### **Fall Protection Plans**

Fall protection plans must follow OSHA rules and be prepared by a qualified person. Fall protection plans must identify locations where conventional fall protection methods cannot be used and set up controlled-access zones and any necessary safety monitoring systems (e.g., a spotter whose sole job is to monitor activities near the fall hazard).

Fall protection plans must:

- Be prepared by a qualified person, be site-specific and be maintained up to date.
- Be implemented under the supervision of a competent person.

- Document the reasons why the use of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety nets systems) are infeasible or why their use would create a greater hazard.
- Include a written discussion of other measures that will be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection from the conventional fall protection systems
- Identify each location where conventional fall protection methods cannot be used
- Designate the controlled-access zones
- Include a safety monitoring system when no other alternative method is implemented
- Include a statement which provides the name or other method of identification for each employee who is designated to work in controlled access zones (no other employees may enter controlled access zones)

### **Trenches and Excavation**

While most survey companies do not conduct trenching or excavation themselves and therefore, do not have responsibility for them, survey field personnel should have a basic understanding of what constitutes obviously unsafe situations so they do not enter into them.

Some general considerations (there are many others) include:

- Work in an excavation or trench must at all times be under the immediate supervision of a qualified person. Ask the general contractor who their designated “qualified person” is.
- Safe access/egress must be provided (stairway, ladder, ramp, etc.). Access must be provided and located so no worker must laterally travel more than 25 feet to access the egress point in any trench or excavation deeper than 4 feet. The equipment must be securely fastened in place.
- ALL trenches and excavations over 5 feet in depth must be protected from cave-ins unless they are made *entirely* of stable rock. Protection can be provided by adequately sloping back the sides of the cut, installing shoring, shielding or by benching the excavation. If shoring or trench boxes are used the top of the box/shoring must extend at least 18 inches above the hole. If the hole is deeper than 6 feet, fall protection should be installed around the perimeter to protect those working on the surface.
- For all excavations 4 feet or greater in depth, adequate precautions must be taken to protect personnel where oxygen deficiency or another hazardous atmosphere exists. Conduct air quality tests as often as necessary.
- All spoil piles must be placed at least 2 feet back from the edge of the hole. This is measured from the point where the slough of the pile ends. Placing the spoil any closer exerts excessive pressure on the walls of the excavation and thus increases the chance of a wall failure.
- Water accumulation into excavation must be controlled before entering. Always consider ground water seepage as a potential cause of collapse of any trench or excavation.

- Tabulated data on the shoring equipment must be onsite while in use.
- Adequate precautions must be taken to ensure that vibrating equipment and vehicular traffic do not cause a cave-in.

If the field crew does not feel that an excavation or trench is properly and safely maintained, they should not enter into it.

## **Confined Space**

Confined space in construction is newly regulated by OSHA by virtue of 29 CFR 1926.1200 et seq.<sup>16</sup> OSHA has an excellent web page providing employers with information and guidance related to confined space at <https://www.osha.gov/confinedspaces/>.

Previously, confined space was regulated under OSHA's general industry classification, but employees continued to be killed in confined-space accidents during construction operations, so the new regulation was developed.

In situations where the field crew's employer is acting as a contractor or subcontractor, there are many safeguards built into the construction industry, and even the general industry, confined space regulations. However, when field crews are out on their own and faced with potential confined space situations, there may not be the same inherent safeguards in place prior to encountering the situation. Thus, they must be informed enough to understand the hazards.

A confined space is identified by three characteristics, all of which must be present. The space must:

- Be large enough and so configured that an employee can bodily enter it
- Have limited or restricted means for entry and exit
- Not be designed for continuous employee occupancy

A permit-required confined space has – in addition to the above – one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entering employee
- Has an internal configuration such that an employee could be trapped or asphyxiated by inwardly converging walls or by a downward-sloping floor
- Contains any other recognized serious safety or health hazard

Entry into permit-required confined space must involve an attendant stationed outside who continuously assesses the status of authorized entrants into the confined space.

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<sup>16</sup> [https://www.osha.gov/confinedspaces/1926\\_subpart\\_aa.pdf](https://www.osha.gov/confinedspaces/1926_subpart_aa.pdf)

Locations that field crews might find themselves faced with in which confined space may occur include, but are not limited to pits, crawlspaces, manholes of all kinds, utility vaults, storm drains, and drilled shafts.

Hazards must be controlled in a confined space and there are a variety of means to do, so depending on the threat. Precautions include, *but are most certainly not limited to*, a requirement that employees must leave the space immediately if a hazard is detected, ensuring a safe means of exit and entry, verification that the space is safe for entry prior to anyone entering it, and continuous atmospheric monitoring unless it can be shown that periodic monitoring is sufficient.

In construction, unlike in general industry, OSHA requires that the host employer (normally the owners of the site) must provide information to the controlling contractor as to the location and potential hazards of any known confined spaces. Precautions implemented for employee safety must also be provided. The controlling contractor must share this information with any parties that will be entering the space (subcontractors) or that could potentially introduce a hazard into the confined space.

Each subcontractor must then inform the controlling contractor of its permit space program and any anticipated hazards. Thus, no employee should enter a confined space related to construction activities unless very specific information has been provided regarding that space and the employer has communicated a plan.

The OSHA Standard also includes a requirement that a competent person evaluate the confined space. It also encourages continuous atmospheric monitoring. There must also be an early-warning system that continuously monitors hazards such as flash-flooding.

### **Bloodborne Pathogens<sup>17</sup>**

As with other work-related safety hazards, OSHA has an excellent web page providing guidance on dealing with blood borne pathogens.

A blood borne pathogen is defined as an infectious microorganism in human blood that can cause disease in humans. They pathogens include, but are not limited to, hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV). Workers in many occupations, including first aid team members, housekeeping personnel in some industries, nurses and other healthcare personnel may be at risk of exposure to blood borne pathogens. In surveying, there can be opportunities for contracting hepatitis such as when taking measure-downs in sanitary manholes and working on landfill sites.

When employees may be exposed to blood borne pathogens, an employer must implement an exposure control plan for the worksite with details on employee protection measures designed to reduce or eliminate the related hazards. The plan must describe how the employer will use a combination of engineering and work practice controls, ensure the use of personal protective

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<sup>17</sup> See <https://www.osha.gov/SLTC/bloodbornepathogens/>

clothing and equipment, provide training, medical surveillance, hepatitis B vaccinations, and signs and labels, among other provisions.

Engineering controls are the primary means of eliminating or minimizing employee exposure and include – in the case of health-care workers - the use of safer medical devices, such as needleless devices, shielded needle devices, and plastic capillary tubes.

In surveying, work practice controls may provide for most protection by defining the safest ways to perform exposure-related tasks. Some routine suggestions include:

- Hand washing is one of the most important considerations and is an OSHA requirement if the risk of blood borne pathogens exists or if potentially contaminated items are encountered inadvertently.
- Cleaning the faucet nozzle after washing your hands is a good follow-up procedure to prevent recontamination or the potential passing of pathogens to others.
- Areas of contamination (e.g., counter tops, floors, shelves, desktops, sinks) should be sanitized with bleach or a similar disinfectant. Keyboards, due to the difficulty of cleaning and sanitizing, should be replaced if contaminated.
- Avoid handling needles, broken glass, or sharp objects that have blood or human tissue on them – use a brush and dust pan instead.
- Avoid placing any food items or drinks near the location of an exposure event.
- Workplace vaccinations are a good way to prevent your workforce from getting hepatitis B.

Best practices for disposal and handling of contaminated items are listed below. If you are unsure how to handle a situation, contact a health official, or the Center for Disease Control, with questions and inquiries.

- Options for disposal include taking materials to the hospital, using a burn barrel to incinerate items, or contacting a waste disposal business to have the contaminants removed from your facility.
- Ensure that hazard signs and puncture-proof disposal containers are available for use.
- Make appropriate PPE available to those who are responsible for disposal. PPE could include the use of gloves, a mask, safety glasses, an apron, a coat, or shoe sheaths.

Keep a well-stocked first aid cabinet that includes a biohazard kit. Keep towels, bandages, and disinfectants available at all times.

Facts on Blood borne Pathogens from the Center for Disease Control (CDC):

- 70,000 new cases of hepatitis B are discovered every year
- Approximately 3 million people suffer from hepatitis C
- 500,000 incidents of blood borne pathogens exposure occur annually
- Biohazard labels and materials are designated by an orange/red color coding

Symptoms for exposure to blood borne pathogens include:

- For hepatitis B and hepatitis C, exposure is typically followed by mild flu-like symptoms, jaundice (yellowing of the skin), fatigue, nausea, loss of appetite, stomach pain, and darkening of the urine.
- For HIV, symptoms include weakness, fever, sore throat, nausea, headaches, diarrhea, and flu-like reactions.
- As is the case with all three of these conditions, symptoms may appear and abate without warning and can lie dormant in the human body for years.

### **Safety Summary**

Workers have a right to a safe workplace. The law requires employers to provide their employees with safe and healthful workplaces. The OSHA law also prohibits employers from retaliating against employees for exercising their rights under the law (including the right to raise a health and safety concern or report an injury). For more information see [www.whistleblowers.gov](http://www.whistleblowers.gov) or Workers' rights under the OSH Act.

OSHA can help answer questions or concerns from employers and workers. To reach your regional or area OSHA office, go to OSHA's Regional & Area Offices webpage or call 1-800-321-OSHA (6742).

Small businesses may contact OSHA's free On-site Consultation services funded by OSHA to help determine whether there are hazards at their worksites. To contact free consultation services, go to OSHA's On-site Consultation webpage or call 1-800-321-OSHA (6742) and press number 4.

Workers may file a complaint to have OSHA inspect their workplace if they believe that their employer is not following OSHA standards or that there are serious hazards. Workers can file a complaint with OSHA by calling 1-800-321-OSHA (6742), online via eComplaint Form, or by printing the complaint form and mailing or faxing it to the local OSHA area office. Complaints that are signed by a worker are more likely to result in an inspection.

If you think your job is unsafe or if you have questions, contact OSHA at 1-800-321-OSHA (6742). Your contact will be kept confidential. We can help. For other valuable worker protection information, such as Workers' Rights, Employer Responsibilities, and other services OSHA offers, visit OSHA's Workers' page.

# OSHA<sup>®</sup> FactSheet

## Protecting Workers from the Effects of Heat

At times, workers may be required to work in hot environments for long periods. When the human body is unable to maintain a normal temperature, heat illnesses can occur and may result in death. It is also important to consider that hot work environments may exist indoors. This fact sheet provides information to employers on measures they should take to prevent worker illnesses and death caused by heat stress.

### What is Heat Illness?

The following are illnesses that may result from exposure to heat in the workplace.

**Heat Stroke** is the most serious heat-related health problem. Heat stroke occurs when the body's temperature regulating system fails and

#### Occupational Factors that May Contribute to Heat Illness

High temperature and humidity  
Low fluid consumption  
Direct sun exposure (with no shade) or extreme heat  
Limited air movement (no breeze or wind)  
Physical exertion  
Use of bulky protective clothing and equipment

body temperature rises to critical levels (greater than 104°F). *This is a medical emergency that may result in death!* The signs of heat stroke are confusion, loss of consciousness, and seizures. Workers experiencing heat stroke have a very high body temperature and may stop sweating.

If a worker shows signs of possible heat stroke, **get medical help immediately**, and call 911. Until medical help arrives, move the worker to a shady, cool area and remove as much clothing as possible. Wet the worker with cool water and circulate the air to speed cooling. Place cold wet cloths, wet towels or ice all over the body or soak the worker's clothing with cold water.

**Heat Exhaustion** is the next most serious heat-related health problem. The signs and symptoms of heat exhaustion are headache, nausea, dizziness, weakness, irritability, confusion, thirst, heavy sweating and a body temperature greater than 100.4°F. Workers with heat exhaustion should be removed from the hot area and given liquids to drink.

Cool the worker with cold compresses to the head, neck, and face or have the worker wash his or her head, face and neck with cold water. Encourage frequent sips of cool water. Workers with signs or symptoms of heat exhaustion should be taken to a clinic or emergency room for medical evaluation and treatment. Make sure that someone stays with the worker until help arrives. If symptoms worsen, call 911 and get help immediately.

**Heat Cramps** are muscle pains usually caused by the loss of body salts and fluid during sweating. Workers with heat cramps should replace fluid loss by drinking water and/or carbohydrate-electrolyte replacement liquids (e.g., sports drinks) every 15 to 20 minutes.

**Heat Rash** is the most common problem in hot work environments. Heat rash is caused by sweating and looks like a red cluster of pimples or small blisters. Heat rash may appear on the neck, upper chest, groin, under the breasts and elbow creases. The best treatment for heat rash is to provide a cooler, less humid work environment. The rash area should be kept dry. Powder may be applied to increase comfort. Ointments and creams should *not* be used on a heat rash. Anything that makes the skin warm or moist may make the rash worse.

### Prevention Made Simple: Program Elements

Heat Illness Prevention Program key elements include:

- A Person Designated to Oversee the Heat Illness Prevention Program
- Hazard Identification
- Water, Rest, Shade Message
- Acclimatization
- Modified Work Schedules
- Training
- Monitoring for Signs and Symptoms
- Emergency Planning and Response

### ***Designate a Person to Oversee the Heat Stress Program***

Identify someone trained in the hazards, physiological responses to heat, and controls. This person can develop, implement and manage the program.

### ***Hazard Identification***

Hazard identification involves recognizing heat hazards and the risk of heat illness due to high temperature, humidity, sun and other thermal exposures, work demands, clothing or PPE and personal risk factors.

Identification tools include: OSHA's Heat [Smartphone App](#); a Wet Bulb Globe Thermometer (WBGT) which is a measure of heat stress in direct sunlight that takes into account temperature, humidity, wind speed, sun and cloud cover; and the National Weather Service [Heat Index](#). Exposure to full sun can increase heat index values up to 15°F.

### ***Water, Rest, Shade***

Ensure that cool drinking water is available and easily accessible. (Note: Certain beverages, such as caffeine and alcohol can lead to dehydration.)

Encourage workers to drink a liter of water over one hour, which is about one cup every fifteen minutes.

Provide or ensure that fully shaded or air-conditioned areas are available for resting and cooling down.

### ***Acclimatization***

Acclimatization is a physical change that allows the body to build tolerance to working in the heat. It occurs by gradually increasing workloads and exposure and taking frequent breaks for water and rest in the shade. Full acclimatization may take up to 14 days or longer depending on factors relating to the individual, such as increased risk of heat illness due to certain medications or medical conditions, or the environment.

New workers and those returning from a prolonged absence should begin with 20% of the workload on the first day, increasing incrementally by no more than 20% each subsequent day.

During a rapid change leading to excessively hot weather or conditions such as a heat wave, even experienced workers should begin on the first day of work in excessive heat with 50% of the normal workload and time spent in the hot environment, 60% on the second day, 80% on day three, and 100% on the fourth day.

### ***Modified Work Schedules***

Altering work schedules may reduce workers' exposure to heat. For instance:

- Reschedule all non-essential outdoor work for days with a reduced heat index.
- Schedule the more physically demanding work during the cooler times of day;
- Schedule less physically demanding work during warmer times of the day;
- Rotate workers and split shifts, and/or add extra workers.
- Work/Rest cycles, using established industry guidelines.
- Stop work if essential control methods are inadequate or unavailable when the risk of heat illness is very high.

Keep in mind that very early starting times may result in increased fatigue. Also, early morning hours tend to have higher humidity levels.

### ***Training***

Provide training in a language and manner workers understand, including information on health effects of heat, the symptoms of heat illness, how and when to respond to symptoms, and how to prevent heat illness.

### ***Monitoring for Heat Illness Symptoms***

Establish a system to monitor and report the signs and symptoms listed on the previous page to improve early detection and action. Using a buddy system will assist supervisors when watching for signs of heat illness.

### ***Emergency Planning and Response***

Have an emergency plan in place and communicate it to supervisors and workers. Emergency plan considerations include:

- What to do when someone is showing signs of heat illness. This can make the difference between life and death.
- How to contact emergency help.
- How long it will take for emergency help to arrive and training workers on appropriate first-aid measures until help arrives.
- Consider seeking advice from a healthcare professional in preparing a plan.

### ***Engineering Controls Specific to Indoor Workplaces***

Indoor workplaces may be cooled by using air conditioning or increased ventilation, assuming that cooler air is available from the outside. Other methods to reduce indoor temperature include: providing reflective shields to redirect radiant heat, insulating hot surfaces, and decreasing water vapor pressure, e.g., by sealing steam leaks and keeping floors dry. The use of fans to increase the air speed over the worker will improve heat exchange between the skin surface and the air, unless the air temperature is higher than the skin temperature. However, increasing air speeds above 300 ft. per min. may actually have a warming effect. Industrial hygiene personnel can assess the degree of heat stress caused by the work environment and make recommendations for reducing heat exposure.

### **Additional information**

For more information on this and other issues affecting workers or heat stress, visit: [www.osha.gov/heat](http://www.osha.gov/heat); [www.cdc.gov/niosh/topics/heatstress](http://www.cdc.gov/niosh/topics/heatstress); and [www.noaa.gov/features/earthhobs\\_0508/heat.html](http://www.noaa.gov/features/earthhobs_0508/heat.html).

Workers have the right to working conditions that do not pose a risk of serious harm, to receive information and training about workplace hazards and how to prevent them, and to file a complaint with OSHA to inspect their workplace without fear of retaliation.

For more information about workers' rights, see OSHA's workers page at [www.osha.gov/workers.html](http://www.osha.gov/workers.html).

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

**For assistance, contact us. We can help. It's confidential.**



**[www.osha.gov](http://www.osha.gov) (800) 321-OSHA (6742)**



U.S. Department of Labor

DTSEM FS-3743 08/2014



# OSHA's Form 300 (Rev. 01/2004)

## Log of Work-Related Injuries and Illnesses

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. For free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

**Attention:** This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20 \_\_\_\_\_  
**U.S. Department of Labor**  
 Occupational Safety and Health Administration

Establishment name: XYZ Company  
 City: Anytown State: MA

Identify the person		Describe the case			Classify the case			Enter the number of days away from work, transfer or restriction		Select the "injury" column or illness or choose one type of illness:						
(A) Case no.	(B) Employer's name	(C) Job title (e.g. Welder)	(D) Date of injury or onset of illness	(E) Where the event occurred (e.g. Loading dock south end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burn on right forearm from scaphoid fracture)	(G) Days away from work	(H) Job transfer or restriction	(I) Other recordable cases	(K) Away from work	(L) On job transfer or restriction	(1) Skin disorders	(2) Respiratory conditions	(3) Poisoning	(4) Hearing loss	(5) All other	(6) Illness
RESET 1	Mark Bright	Welder	5 / 25	basement	fracture, left arm and left leg, fell from ladder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12 days	15 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESET 2	Shirna Alexander	Assembly man	7 / 2	pouring deck	poisoning from lead fumes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7 days	30 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESET 3	Sam Sander	Electrician	8 / 5	2nd floor storeroom	broken left foot, fell over box	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3 days	30 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESET 4	Ralph Borckla	Laborer	9 / 17	packaging dept	back strain lifting a box	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3 days	30 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESET 5	Jared Daniels	Machine op.	10 / 23	production floor	dust in eye	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3 days	30 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESET						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3 days	30 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESET						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3 days	30 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESET						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3 days	30 days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Be as specific as possible. You can use two lines if you need more room.

Revise the log if the injury or illness progresses and the outcome is more serious than you originally recorded for the case. Cross out, erase, or white-out the original entry if hard copy. (If using the PDF's fillable form feature, simply change your selections. You can also clear the entire case entry from the Log using the Reset button.)

Choose ONLY ONE of these categories. Classify the case by recording the most serious outcome of the case, with column G (Death) being the most serious and column J (Other recordable cases) being the least serious.

Note whether the case involves an injury or an illness.

## Summary of Work-Related Injuries and Illnesses

**Note: You can type input into this form and save it.**  
 Because the forms in this recordkeeping package are "fillable/writable" PDF documents, you can type into the input form fields and then save your inputs using the [free Adobe PDF Reader](#).

Year 20

U.S. Department of Labor  
 Occupational Safety and Health Administration



Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
------------------------	--	--	--

(G) \_\_\_\_\_ (H) \_\_\_\_\_ (I) \_\_\_\_\_ (J) \_\_\_\_\_

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
-------------------------------------	---

(K) \_\_\_\_\_ (L) \_\_\_\_\_

### Injury and Illness Types

Total number of . . .

- |                                  |                               |
|----------------------------------|-------------------------------|
| (M) _____                        | (4) Poisonings _____          |
| (1) Injuries _____               | (5) Hearing loss _____        |
| (2) Skin disorders _____         | (6) All other illnesses _____ |
| (3) Respiratory conditions _____ |                               |

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Send comments regarding this burden estimate or any aspect of this collection of information, including suggestions for reducing this burden, to Washington, DC 20503. Do not send the completed form to this office.

### Establishment Information

Your establishment name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

Industry description (e.g., *Manufacture of motor truck trailers*) \_\_\_\_\_

Standard Industrial Classification (SIC), if known (e.g., 3713) \_\_\_\_\_

OR

North American Industrial Classification (NAICS), if known (e.g., 336212) \_\_\_\_\_

**Employment information** (If you don't have these figures, see the Worksheet on the next page to estimate.)

Annual average number of employees \_\_\_\_\_

Total hours worked by all employees last year \_\_\_\_\_

**Sign here**

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company executive \_\_\_\_\_

Title \_\_\_\_\_

Phone \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

Save Input

## APPENDIX C (3 pages - partial example of JHA)



### JOB HAZARD ANALYSIS

DATE: \_\_\_\_\_ PREPARED BY: \_\_\_\_\_ CLIENT NAME & PHONE #: \_\_\_\_\_

PROJECT NAME/NUMBER: \_\_\_\_\_ PROJECT ADDRESS/LOCATION: \_\_\_\_\_

NEAREST NON-EMERGENCY LOCATION - OCCUPATIONAL CLINIC (Address & Phone #): \_\_\_\_\_

NEAREST EMERGENCY LOCATION - HOSPITAL (Address & Phone #): \_\_\_\_\_

SCOPE OF WORK: \_\_\_\_\_

**SERIOUS INJURY DEFINITION (EMERGENCY LOCATION SHALL BE UTILIZED IF INJURY MEETS ANY PART OF DEFINITION):**

- Life threatening, or
- The employee is unconscious, or
- The employee is bleeding heavily, or
- The employee is unable to move, walk or be transported with minimum assistance or
- The employee is unresponsive

Is everyone properly trained / qualified / badged / competent in assigned tasks? YES  NO

If no, list current action plan: \_\_\_\_\_

Is traffic control necessary? YES  NO

If yes, list specific set-up: \_\_\_\_\_

Are there any unique safety concerns / hazards? YES  NO

If yes, please describe: \_\_\_\_\_

If working alone, who is the Safety Buddy & their phone number (person who knows field crew's location & return time): \_\_\_\_\_

**Check all required PPE (Personal Protective Equipment) necessary for this job:**

- |                                       |  |   |   |  |
|---------------------------------------|--|---|---|--|
| <input type="checkbox"/> Hard Hat     | <input type="checkbox"/> Hearing Protection      | <input type="checkbox"/> Reflective Vest              | <input type="checkbox"/> Steel Toed Shoes         | <input type="checkbox"/> Safety Glasses  |
| <input type="checkbox"/> Work Gloves  | <input type="checkbox"/> Knee Pads               | <input type="checkbox"/> Fall Protection, type: _____ | <input type="checkbox"/> Respirators, type: _____ |  |
| <input type="checkbox"/> Sunscreen    | <input type="checkbox"/> Fire Retardant Clothing | <input type="checkbox"/> Tyvek Suits                  | <input type="checkbox"/> Insect Repellent         | <input type="checkbox"/> Chemical Gloves |
| <input type="checkbox"/> Other: _____ |  |   |   |  |

*This Job Hazard Analysis (JHA) assesses each step of the project and addresses the hazards which could result in an injury to an individual. This document focuses on the relationship between the worker, the activity/task, the tools and protective equipment necessary, and the hazards and control methods of the work environment.*

The objective of this JHA is to determine the necessary controls to eliminate or reduce the hazards to an acceptable risk level.

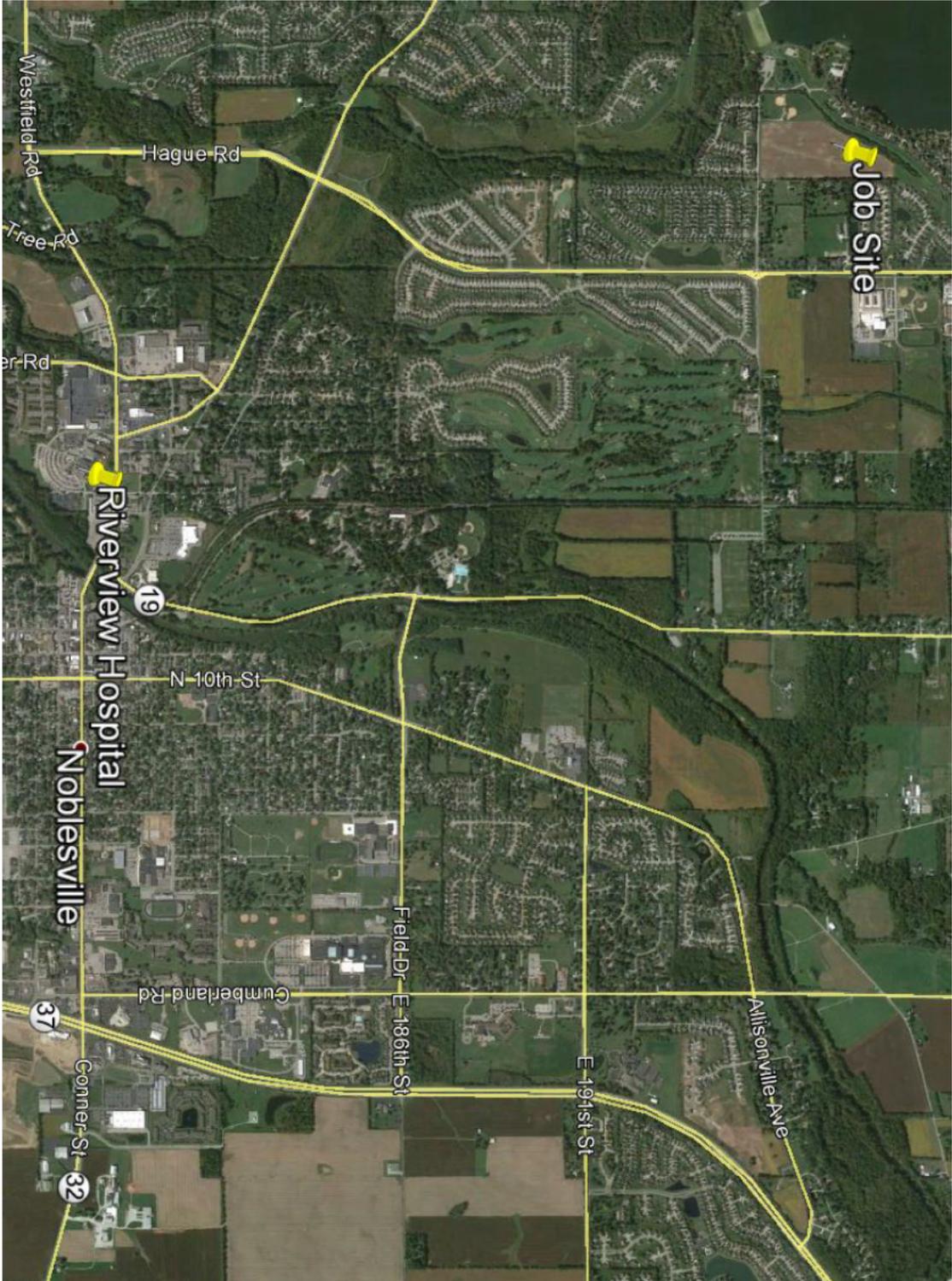
This JHA must be reviewed and/or revised with all affected employees including, but not limited to: Project manager, supervisor of field crew, and field crew (See Page Four for Signatures): \*\*

- Before the start of the project.
- Prior to the beginning of each work shift.
- When the scope of work / job tasks change.
- When surrounding conditions change which could impact the health and safety of any employee.

**JOB HAZARD ANALYSIS**  
**GENERAL SITE HAZARDS**

TASK	POTENTIAL HAZARDS (Check all that apply)	CONTROLS / PPE	RESPONSIBLE PARTY
<input type="checkbox"/> Lifting Heavy Equipment/Materials	<input type="checkbox"/> Muscle Strains  <input type="checkbox"/> Overexertion	<input type="checkbox"/> Utilize proper lifting techniques and avoid over-reaching. <input type="checkbox"/> Ensure adequate help for heavy and/or unbalanced loads.  <input type="checkbox"/> Know your limits. Get help when in doubt, and always stay hydrated.	
<input type="checkbox"/> Unloading Materials from Truck or Trailer	<input type="checkbox"/> Lacerations from sharp edges  <input type="checkbox"/> Potential for Fingers/Toes to get Pinched	<input type="checkbox"/> Utilize work gloves while unloading materials. <input type="checkbox"/> Exercise caution when cutting items and handling sharp materials.  <input type="checkbox"/> Wear gloves for all material handling <input type="checkbox"/> Use caution when handling materials to avoid muscle strains, injuring themselves, others, or their surroundings. <input type="checkbox"/> Boots are to be worn at all times and have steel or composite toes.	
<input type="checkbox"/> Pounding Survey Stakes	<input type="checkbox"/> Eye injury  <input type="checkbox"/> Hand Injury	<input type="checkbox"/> Eye protection must be utilized when pounding survey stakes to protect individuals from potential eye injuries.  <input type="checkbox"/> Inspect tool before use to ensure its free from defects <input type="checkbox"/> Use tools only the way that they were intended for	
<input type="checkbox"/> Parking along roadways	<input type="checkbox"/> Roadway traffic	<input type="checkbox"/> Utilize appropriate safety protocols when working in or parking along roadway. This includes setting-up "Survey Crew Ahead" signs and traffic cones, turning on your vehicle's strobes lights PRIOR to you exiting your vehicle, and required to wear reflective safety vest 100% of the time.	
<input type="checkbox"/> Use of Hand Tools	<input type="checkbox"/> Incorrect Tool Use/Defective Tool	<input type="checkbox"/> Employees will be trained on particular devices being used. <input type="checkbox"/> All Hand tools will be inspected before each use. If any abnormalities are found including any guards missing the tool will be tagged and placed out of service until proper repairs can be made. <input type="checkbox"/> Hand and eye protection are required when operating tools.	
<input type="checkbox"/> Working in Weeds	<input type="checkbox"/> Insect Bites  <input type="checkbox"/> Poison Ivy/Oak	<input type="checkbox"/> Wear protective clothing, such as long sleeves and pants, and apply chemical treatments to discourage ticks if desired <input type="checkbox"/> Inspect for ticks during & after work  <input type="checkbox"/> Apply preventative treatments for poison ivy/oak <input type="checkbox"/> Wash immediately after contact; wash clothes	

**Image of Job Site and proximity to Emergency Services (North to the TOP of sheet)**



## ***Tool Box Talk – February 21, 2023***

### **Ladder Safety**

*"It is better to be careful 100 times than to get killed once."* Mark Twain

**Note: No safety issues were reported at any job-sites or offices during the past week. Any items otherwise discussed during this week's Tool Box Session are listed below.**

Ladders are involved in many accidents, some of which are fatal. Your life literally can depend on knowing how to inspect, use, and care for this tool.

#### **INSPECTING LADDERS**

Before using any ladder, inspect it. Look for the following faults:

1. Loose or missing rungs or cleats.
2. Loose nails, bolts, or screws.
3. Cracked, broken, split, dented, or badly worn rungs, cleats, or side rails.
4. Wood splinters.
5. Corrosion of metal ladders or metal parts.

If you find a ladder in poor condition, don't use it. Report it. It should be tagged and properly repaired or immediately destroyed.

#### **USING LADDERS**

Choose the right type and size ladder. Except where stairways, ramps, or runways are provided, use a ladder to go from one level to another. Keep these tips in mind:

1. Be sure straight ladders are long enough so that the side rails extend above the top support point by at least 36".
2. Don't set up ladders in areas such as doorways or walkways where they may be run into by others, unless they are protected by barriers. Keep the area around the top and base of the ladder clear. Do not run hoses, extension cords, or ropes on a ladder and create an obstruction.
3. Don't try to increase the height of a ladder by standing it on boxes, barrels, or other materials. Don't try to splice two ladders together!
4. Set the ladder on solid footing against a solid support. Don't try to use a step ladder as a straight ladder.
5. Place the base of straight ladders out away from the wall or edge of the upper level about one foot for every four feet of vertical height. Do not use ladders as a platform, runway, or scaffold.
6. Tie in, block, or otherwise secure the top of straight ladders to prevent them from being displaced.
7. To avoid slipping on a ladder, check your shoes for oil, grease, or mud and wipe it off before climbing.
8. Always face the ladder and hold on with both hands when climbing up or down. Do not try to carry tools or materials with you.
9. Don't lean out to the side when you're on a ladder. If something is out of reach, get down and move the ladder over.
10. Most ladders are designed to hold only one person at a time. Two may cause the ladder to fail or throw it off balance.

#### **CARE OF LADDERS**

Store them in a well ventilated areas, away from dampness.

**TOOL BOX MEETING - ATTENDANCE SHEET [RETURN TO GARY KENT]**

**TOPIC:** Ladder Safety    **DATE:** 03/21/2019    **SPEAKER (Sign):** \_\_\_\_\_

NAME	SIGNATURE	Department
1. Kent, Gary		Survey Field
		Survey Office
		Survey Office/Re-searcher
		Survey Office