

Introduction Thanks for volunteering to help at a construction site. Your efforts will make a difference not only to one particular family in need of decent, affordable housing but also the whole neighborhood.

Construction sites are inherently dangerous places compared to almost everywhere else you go. Your home is safer, your school or place of employment is safer, and driving your car is safer. Dangers on construction sites arise from many sources. You can fall off the edge of the deck or the roof or a ladder. You can get scratched or punctured by nails and screws. There are all sorts of trip hazards such as air hoses and blocks of wood. There are power tools galore, sharp knives, and powder-actuated .22 caliber nail guns. Not to mention it can get hot and tiring. Yet all this danger can be controlled if we all follow common-sense rules all the time.

In this [Construction Volunteer How-To article](#) we want you to learn how to be safe on a job site.

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Novices are dangerous [TOP](#)

Even regular construction sites, where everyone is a professional with a relatively great amount of experience, are dangerous places. But with experience comes safety, because the more time you spend on job sites the more of the safety rules you learn.

For example, an experienced sawyer knows how to make all sorts of cuts with a circular saw, even ones at awkward angles in cramped, overhead spaces from a ladder, without endangering himself or anyone else. An experienced carpenter who's walking under a place where there's a crew working on the open floor above will just automatically, without thinking about it, swerve right or left to avoid being directly under that crew, lest they drop something on her head. Looked at from the other perspective, the members of that experienced roof crew are automatically careful to make sure they don't do just that. Experienced job site employees know how to look out for themselves, and they know how to look out for everyone else. Many of these safety practices become almost instinctive from hundreds of hours of rote learning and then habit.

The typical construction volunteer – probably you – is more dangerous than that. The typical construction volunteer has not had time to learn and ingrain all those good safety habits, and we know that. That's why we wrote this article for you.

In this article we cannot possibly list all the ways you can get hurt or hurt someone else on a job site, and we don't purport to. But we do know that if you read it and study it and memorize it and follow all the rules in it, you will be less dangerous to yourself and to everyone around you. The safety of novice volunteers really is important to any site supervisor, and we want you to understand that.

You can find lots of additional safety information specific to some of the other [How-To articles](#) we've written, and we hope you'll feel free to peruse them as well.

General rules [TOP](#)

There are a few general rules we want to present first, then we'll go into a more detailed list.

Although a site supervisor is responsible for overall safety on the entire job site, obviously neither that person nor anyone else without supernatural powers can be everywhere at once. You must take responsibility for your own safety. You may not assume that the site supervisor can somehow magically – from afar – approve or disapprove anything you plan to do at any given moment.

It is quite rare for an injury to arise from a hidden defect in equipment such as a broken ladder rung or a cracked saw blade, which means that almost every injury results from human error. And that's *good* news, because those injuries are all preventable.

Safety Rule #1: If you are uncertain you can perform a particular procedure safely, don't perform it. Either figure out a safer way on your own or get help. No one, of course, will ever require you to do something you don't think you can do safely.

Who's got your back? You don't want to wake up tomorrow morning in a hospital bed with a fractured spine, but you also don't want to wake up tomorrow morning safe and cozy in your own bed having to re-face the realization that because of your negligence someone else is waking up in a hospital bed with a fractured spine. Take your own safety seriously, but take everyone else's just as seriously. If we all do this all the time – if we all look out for one another – we'll all be safer

That way you and all of us will leave the site at the end of the workday in the vehicles in which we arrived rather than an ambulance.

Foresee the future. Strive to foresee whether the future holds excessive danger. "When I get to the end of the cut I'm making, where will the scrap piece of wood fall?" "If I step down onto that board, is it attached to something or is it just resting there waiting to slide out from under me?" "If I leave my pry bar on top of this stepladder and walk away, will someone come along, snatch the ladder away from the wall, and get gashed in the forehead?"

We are counting on you, each and every one of our precious volunteers, to look around, watch out for yourself, watch out for others, and think things through.

Several more safety rules [TOP](#)

Below are some specific safety rules. They are in no particular order, so please read them all.

● **Power tools.** Some power tools used on sites are more dangerous than others. A cordless drill isn't much dangerous at all unless you count dropping it on your foot. On the other hand, a wood chipper will eat your arm without blinking. It is entirely up to the discretion of the site supervisor which volunteers may use which power tools under which circumstances.

The proper use of many power tools can be taught to willing and able novices, so just because you've never used a circular saw or a nail gun or any of a number of other tools doesn't mean you can't be taught how to use one safely, accurately and efficiently. Indeed, one of the bonuses for some volunteers is the opportunity to use new tools or at least see them in use.

If you are asked whether you know how to use a particular tool, make sure to tell the whole truth so the supervisor can best assign the various tasks. Sometimes you will be expected to prove you know how to use a dangerous tool properly before you are allowed free rein.

● **Reckless behavior.** We want you to enjoy your experience with us and your fellow volunteers on a job site. Indeed, we want you to have outright fun as you're working on your house. But, needless to say, we do not tolerate dangerous horseplay or any other reckless or irresponsible behavior, and anyone who engages in it may immediately be ordered off the property, without warning or appeal, by the site supervisor.

It should also go without saying that a job site is not the place for anyone to prove his or her machismo or machisma by taking on dangerous tasks without sufficient training.

● **Bear claws.** Sometimes when wood that was nailed down needs to be removed, such as a temporary brace, one or more nails will be left sticking up in the air where they used to be sunk in wood. Such a dangerous condition is called a *bear claw*, and **bear claws must never be allowed to exist** on any job site. As a certain person with construction experience going back to 1979 and two puncture wounds in his right heel going back to 2007 will tell you, if you step on a bear claw it hurts. It means medical attention for the short term and a pronounced limp for the middle term and a tetanus shot for the long term.

So, first, watch every step you take to make sure you're not stepping on an exposed nail or screw or anything else sharp and pointy like that. It is also a good idea to wear thick-soled footwear such as construction boots.

Second, if you create a bear claw or even happen to notice one someone carelessly left lying around, you must immediately fix the problem or see to it that someone does it for you. The very instant you become aware of a bear claw on a job site it becomes **your new first responsibility** to make sure it is safened.

If the board the bear claw is in is too small to save, toss the whole thing as is into a Dumpster or the designated trash pile. Another option is simply to hammer the points of the nails flat to the surface of the wood so they no longer pose a puncture hazard. This is called *clinking* the nails.

If the board with the bear claw is worth saving, you must remove each nail, called *de-nailing*.

- (1) Using the claw end of your hammer, straighten up any nails that are bent over. They need to be pretty straight in order to succeed at step 2.
- (2) Hammer the point of the nail back through the wood as far as you can, which will force the head out.
- (3) Flip the wood over and *yank* on each nail head using the claw end of your hammer. To gain extra mechanical advantage, apply force at the very butt end of the handle. A *framing hammer*, with its longer lever arm, is better for this step than a regular hammer.

● **Bobcat.** Sometimes you'll be working on a site where earth-moving equipment is in operation, often a skid-steer loader such as a Bobcat. It is imperative that you stay well clear of such machines unless you need to be close, such as for hand-loading rocks into its bucket. Although all qualified Bobcat operators are aware of how dangerously powerful their machines can be, you as a pedestrian in the vicinity should be aware that visibility from a Bobcat driver's seat is not nearly as good as that from a car. Also bear in mind that, unlike a car, a skid steer can spin quite quickly in its own radius.

● **Wood chipper.** If a wood chipper is in use where you are, you may not operate it or feed it or otherwise interact with it unless you have been specifically authorized to do so by a site supervisor, *which you almost certainly won't be*. A wood chipper is an extraordinarily violent machine that is necessarily designed with no respect for us delicate humans. During normal, expected use there are no safety features whatsoever except

training and experience, which we automatically assume no volunteers have.

First, a wood chipper is among the loudest machines you will encounter on any job site. Second, when branches of a certain shape are fed into it, those branches will twist instantly and swing into anyone nearby at a violent rate of speed and bruise an arm or abrade a cheek or lacerate an eye.

Third, anyone whose hand gets too close to the mouth of the machine will be sorry that the only benefit is an automatic 50% discount on all future manicures.

In the unlikely event you are specifically authorized by site a supervisor to feed the machine, **you should not wear gloves**. Your glove can get caught on a cusp of a branch and get pulled toward the danger, which means your hand might also get yanked towards the danger before you can wriggle loose fast enough, which you probably can't. If you are not wearing gloves, this disaster cannot occur. For the same reason, don't wear a scarf or jewelry on your neck, don't wear jewelry on your wrists or fingers, and don't wear a long-sleeved shirt. If you've got long hair, make sure it is secured. Also, no capes.

● **Poison ivy.** Sometimes we work in places where there are human-unfriendly weeds such as poison ivy and poison oak. It is your job to know what plants you might react poorly to and avoid them. Just because you have had no reaction to poison ivy exposure in the past doesn't mean you can't have a severely unpleasant and long-lasting reaction on the very next exposure. If you turn out to be reactive enough you could end up hospitalized for a couple days.

You should use any reliable references you want to learn what these poisonous plants look like and what to do about them. One source is the Centers for Disease Control and Prevention's Web page, with good photographs, at www.cdc.gov/niosh/topics/plants/.

If you spot poison ivy or some other noxious substance, it becomes **your new first responsibility to tell everyone** right away, **before people can be harmed**.

● **Carrying objects.** Be careful when carrying long objects such as a 16-foot board or a sheet of OSB or even a six-foot stepladder by yourself, especially when you make a turn. It's all too easy to forget about the half behind you and whack into someone or a ladder someone's on. The danger increases if your victim is also using a power tool or swinging a sledge hammer or something like that. If you're carrying the object, it's your responsibility alone – not anyone else's – to make sure you don't do any harm.

Also, perhaps especially for you guys, if you're about to step over a long board you'll probably want to make sure no one is about to lift it rapidly into the air at just the wrong moment. And of course, regardless of your gender, make sure you don't lift a board rapidly into the air if it can't be done safely.

– Two people. When the object to be carried needs two (or more) people, that means you must sometimes communicate with each other as to any hazards or other problems.

First, stop to think through how you two want to grab hold of the object. Generally, you want to be on the same side of it, and both people want to be walking forward. If you and a partner find yourselves assigned to carry a dozen sheets of OSB from the sidewalk into the garage, you'll quickly realize you need to get organized. (Also, please be careful not to bash in the corners, which are surprisingly crushable.)

Second, if there's anything unexpected along the way, talk to each other. If you're the front helper and there's a big rock or a slippery spot your partner might not see, say something. If you have to change your handhold as you step down onto some stairs, let your partner know. If you're in front, don't push or pull too hard; on the other hand, if you're in back, don't pull or push too hard.

Speaking of stairs, take a moment to decide, as you two grab the object, which of you should be at which end in case one of you weighs 100 pounds and the other weighs 200, because the person at the lower end of the

object on stairs and hills will be supporting more than half the weight of it. In case you're interested, the percentage is calculated by the formula $(\text{Angle} / 180) + 0.50$. For example, if the angle of the board is 36 degrees higher than level, the person at the bottom will be supporting 70% of its weight.

Carrying sheet goods such as OSB and floor decking is usually done more safely when the object is on edge rather than face up. For one reason, when it's face up it's hard for the person in the rear to see where his next step will land. For another, when it's on edge and leaned against the shoulder, the sheet can sometimes be carried with only one hand, leaving the other to help balance. The only other options are for the lead carrier to walk backwards, which is bad, or to carry the object behind the back, which is also prone to problems.

If you alone want to carry a large sheet of wood (and you're right-handed), you should approach it from the left side, tip it up on the front corner, and reach under with your right hand, thumb pointed backwards, to the exact center of the bottom edge. Then, keeping your back plumb, lift with your legs and grab the top edge with your left hand and start toting, keeping in mind that you can't see anything to the right of you at all.

● **Lifting objects.** Do not lift heavy objects using your back. One of the most common reasons for lost time from work is lower back pain. Humans just simply aren't designed well for excessive strain in that region.

Instead, use your leg muscles. Keep your back plumb (vertical) rather than bending over level (horizontal) at the waist. Then bend at the knees to lower yourself. When it comes time to lift, still keep your back vertical and again use your leg muscles.

Similarly, do not repeatedly bend over at the waist and then straighten up even if you aren't carrying anything heavier than your own body. For example, installing baseboard, which is a procedure always performed by volunteers on every house, requires that you perform a lot of that work just above the floor. You kneel (yes) or bend over at the waist (no) to take a measurement. Then you stand up with your back vertical (yes) or horizontal (no), you cut a piece of baseboard to length, and you repeat the process of kneeling, performing a procedure, and standing back up in order to install that piece. During these excursions up and down, try to keep your shoulders from moving forward of your hips.

Lifting the proper way does require extra effort from your leg muscles. But as between waking up tomorrow morning with sore legs or a herniated vertebral disk, you're way better off with a few sore legs.

Generally, if a particular task is excessively risky for your particular state of health at the moment, we do not want you to try it.

● When you use the reverse gear of a drill to quickly remove a long screw, the friction can make it hot to the touch for a while. Not hot enough to require medical attention, but hot enough to make you say "Ouch" or perhaps even a more expressive four-letter oath. Similarly, if you spend a long time cutting through, say, a length of reinforcing rod with a reciprocating saw, both new ends of rebar as well as the blade will be hot for a while.

● OSB (oriented strand board), which comes in 4-foot by 8- or 9-foot sheets, has a labeled UP side and DOWN side that make a difference when sheathing a roof. The DOWN side is a lot slicker than the UP side. If the DOWN side is up, the roof there will be dangerously slick to walk on, so get it right side up every time.

● Don't stand or place a ladder leg on or inside a coil of an electrical cord or air hose. If someone needs to move it, at best you're being a pest and at worst you will get it yanked out from under you. Notice that there is a whole, separate [How-To article on ladders](#).

Speaking of being a pest, when you're just standing around watching or waiting for something, don't park yourself in a doorway or other choke point. The rule is that if you aren't doing anything, you have to be or get out of the way of anyone who is.

- Remember to turn off any tools that have an on-off switch, even if they're not connected to power at the moment you stop using them. If you leave the switch of a router in the On position and it is later plugged in two rooms down the hall, the motor will immediately start turning, which could be disastrous to anyone near it. Looked at from the other perspective, make sure you don't plug in or reset the breaker for a tool that might be in the On position till you've made sure it's safe to do so.

- As mentioned at the top of this article, be careful about walking under people working overhead. During certain phases of construction, there are times when a hammer or other object can fall from several feet toward the deck or ground below, and you don't want to slow it down with your head. Get in the habit of checking what's above you that you want to know about.

Looked at from the other perspective, if you are working above where people might be, be extra careful not to let anything fall accidentally. If you do, immediately yell "Hammer." When you want to drop something on purpose such as a piece of wood you cut off, it is your responsibility to make sure no one can walk into its path before it lands and stops bouncing or sliding. To be extra safe, yell "Hammer" first anyway.

Safety equipment [TOP](#)

Several types of safety equipment are available to you. Here's a list of the body parts they can help to protect.

Head. Sometimes *hard hats* must be worn on the job site, and that's that. If a supervisor says it's hard-hat time, you have to wear one. You may, of course, wear one any other time you like.

Lungs. Certain procedures toss a lot of particulate matter into the air, such as sanding, insulating an attic, and gutting a rehab house. If you want a *dust mask* please let someone know.

Eyes. *Safety glasses* are available. Certain procedures, such as using a drywall router, always require their use. Others are at your option. If you have any doubt, go ahead and use them. After all, you've got only two eyes.

Hands. *Gloves* might be available, and they're just what you want for activities such as collecting certain debris. Wear gloves whenever you think your hands need protection.

But keep in mind that **gloves are neither needed nor desired for almost all the activities** we perform on sites throughout the whole building cycle. Ask yourself, "Do I *need* these gloves for this task?" If the answer is No, you should not wear them. Gloves always impede your ability to use your fingers precisely, such as for holding a hammer or a nail gun or a saw. Furthermore, gloves can get caught in machinery such as a table saw blade, which will then yank your hand *towards* the danger. Many novices *want* to wear gloves for some reason, whereas pros never do unless they absolutely have to, which is pretty much never. Be a pro.

Ears. Many objects on job sites make a lot of noise. Circular saws, concrete saws, reciprocating saws, table saws, miter saws, air compressors, generators, routers, hammer drills, powder-actuated .22 caliber nail guns, Bobcats and more all make such a loud noise that enough exposure will result in permanent hearing loss. Fortunately, there is always a way to reduce your exposure. Consider any of these methods of preserving your hearing.

- If you're a mere bystander, just simply walk away. The farther away you are, the less damage will be done to your ears. The intensity of the sound varies inversely by the *square* of the distance you are from it, so, for example, if you double your distance from the source, the intensity is only one fourth as loud. If you move from 8 feet away to 2 feet away from the noise source, the intensity will rise by a factor of *nine*. Every step you take makes a difference that could make a difference to the rest of your life.

- Sometimes another option is simply to walk to where there's a wall between your ears and the noise.

- And in combination with either method above, do bother to put your fingers in your ears. Such a simple act can reduce the damage considerably, and you can set a good example for the bystanders who didn't read this article. If you have only one hand free because you're using the other one to hold into a board someone else is sawing, do go ahead and cover that one ear. You aren't looking to keep the damage to both ears equal, you're looking to reduce the total damage.

- If you're *operating* the noisy device then you can't walk away or put more than one finger in your ears, so you have two options.

- One option is disposable *foam earplugs*. If you want to use foam earplugs, ask a site supervisor whether any are available. If you've never used them before, it can be a little tricky to get them seated correctly. Read the directions and keep trying till you get it right. The thing is, either you've got them inserted correctly or you don't, and if you don't then there's no reason to wear them at all, so keep trying.

- (1) Compress the plug longitudinally, so it's the same length but skinnier.

- (2) Insert the plug pointy end first into your external ear canal, striving to get it in pretty darned deep without letting it expand. This is the hard part, especially if you don't know which direction to push in. One way that might work is to reach behind your head with your left hand and grab your right ear in such a way that the canal is as straight and open as possible, but you still need to make sure you've got the angle right.

- (3) If you did it right, a moment or so after you let go the foam will expand and seal off your ear from the outside. To test it, snap your fingers next to your ear. If the sound isn't quite a bit quieter, you have to start over. Sometimes it takes several tries, but once you get it right you'll know.

- The other option is a pair of *earmuffs*, which are like headphones that completely cover your external ear (called circumaural), except they attenuate noises from the outside (and they do it better than foam earplugs).

- If you're the designated sawyer for the day, which means you'll be making many cuts with a noisy power tool, you may, of course, choose to wear both earplugs and earmuffs.

Knees. Some tasks such as applying tile and grout to floors and nailing baseboard to walls require frequent kneeling. If you need a pair of *kneepads* to make your work less painful, ask the site supervisor whether there are any. Also, as noted [above](#), be careful not to do too much such kneeling and standing the wrong way lest you injure your back.

Clothing and footwear [TOP](#)

Plan your wardrobe for the weather and the day's activities. No matter what, expect to get dirty.

For those lovely Spring and Autumn days when it starts out chilly and warms up, dress in layers you can gradually shed. Maybe a T-shirt under a flannel shirt under a jacket. If it's going to be cold and you can get your hands on some cold-weather work gloves, bring them.

Certain tasks such as blowing in insulation and sanding drywall compound will cover you in airborne particulate matter, so you might want to bring a knit cap or something to protect your hair.

Footwear. If you have construction boots, wear them. If you have thick-soled work shoes, wear them. Shoes with a slick sole are strongly discouraged. Wear sneakers only if you have no other choice. Expect that whatever you wear will get soiled.

People wearing sandals or flip-flops (even if they're wearing socks:) are not permitted on the property of a work site. People wearing sandals or flip-flops (even if they're wearing socks:) are not permitted on the property of a work site.

Heat is dangerous [TOP](#)

If it's too hot out and you work out too hard for too long out on a construction site or anywhere else, you are at risk of suffering from a heat-caused medical problem. They vary in severity from mild, momentary discomfort to severe, permanent death. All of them can be avoided.

One source of information is the Mayo Clinic's online pages about these three heat-caused problems: [heat cramps](#), [heat exhaustion](#), and [heatstroke](#). Another source is the U.S. Centers for Disease Control and Prevention's advice on the subject, handily all on one page [here](#).

We encourage you to seek out any other reliable advice on the drawbacks of working hard and long on hot days on a job site. The better prepared you are to forestall, recognize and respond to the signs and symptoms of heat-caused medical problems, the more useful you will be on the site that day. (Also, for those of you susceptible to sunburn, consider wearing a hat and sun-block lotion.)

If you're feeling affected by the heat and the work, take a break in the shade and drink some water. Better yet, go to your (or someone's) car and turn on the air conditioner and drink some water. Rest till you feel really ready to go back to work, then rest a few more minutes and drink a little more water just to make sure.

If you're feeling overwhelmed by the heat and the exertion, immediately notify someone in no uncertain terms, stop using any tools you're using, and get down or get help getting down from any ladders or roofs you're on. Heatstroke, dear volunteer, can *kill* you.

You can expect your job site will be shut down if the heat index reaches 103° Fahrenheit.

Water. No matter what, on hot days drink enough water.

If you're been sweating or expect to after lunch, consider adding a little extra salt to your meal to replace your body's loss of salts and electrolytes through perspiration. A banana is also a good choice for dessert. A minimum level of salt in your blood is essential on hot, hard days.

A good defense against medical problems caused by a hot day is water. Drink enough, and do feel free to pour some on yourself to further aid in cooling your body. The rule about drinking water on a hot day is this:

If you wait till you need to drink water, you've waited too long.

Lunch is dangerous [TOP](#)

More injuries occur on construction sites after lunch than before.

Back in 1999 a particular site supervisor had the opportunity to lead a group of volunteers who happened to be staff members of the emergency room of The University of Kansas Medical Center, a frequent recipient of trauma victims. That supervisor asked these experts a simple question: "Do you see more accident victims from construction sites before or after lunch?" The answer was plain: "We almost *never* see one till after lunch."

The point is that, however careful you've been before lunch, you must be even more careful after. There are three reasons you're more likely to get hurt or otherwise screw up after lunch.

- (1) You've probably managed to get through the morning session without getting hurt or hurting anyone else, so you might be feeling a little cocky.
- (2) You've eaten lunch, which means some of the muscular energy and blood flow that might have been used

to operate your voluntary muscles such as your arms and legs is now being used up, whether you want it to or not, to digest the food you ate, which can make you feel logy, which is a reason not to eat a large, heavy lunch.

(3) You're tireder. We know for sure it has been longer since you slept than when you arrived on the site that morning. Tired people make mistakes. Memorize that: **Tired people make mistakes.**

A common and insidious symptom of being tired is that you don't think you are. If you even *suspect* you are too tired, please do yourself and everyone else a favor and take a break or take on an easier task.

Tired people make **mental** mistakes such as thinking $37\frac{5}{8} + 49\frac{3}{4}$ equals anything but $87\frac{3}{8}$. Tired people make **judgment** mistakes such as taking a risk they wouldn't have when they were fresher. Tired people make **physical** mistakes such as losing control of a heavy, dangerous tool they could have controlled successfully three hours before.

Conclusion [TOP](#)

Dear novice volunteer, we thank you for reading this How-To article on the subject of safety on construction sites.

Some phases of construction are more dangerous than others, some tools are more dangerous than others, some procedures are more dangerous than others, but we always want you to be safe. We hope you will help us do that by remembering and obeying the safety rules above.

Thank you for volunteering on a construction site. We want you to have a good time, get some good work done, feel good about yourself for it, and most of all be good and safe.

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